

CITY DOCUMENT

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ANNUAL REPORT  
OF THE  
WATER SUPPLY BOARD  
OF THE  
CITY OF PROVIDENCE  
RHODE ISLAND

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For the Year Ended September 30, 1954



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ANNUAL REPORT  
OF THE  
WATER SUPPLY BOARD  
OF THE  
CITY OF PROVIDENCE  
RHODE ISLAND

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For the Year Ended September 30, 1954



# REPORT

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ADMINISTRATIVE OFFICE,  
WATER SUPPLY BOARD  
CITY OF PROVIDENCE  
OCTOBER 1, 1954

TO THE HONORABLE WALTER H. REYNOLDS, MAYOR, AND  
THE HONORABLE CITY COUNCIL:

*Gentlemen:*

In compliance with Chapter XX of the Charter of the City of Providence, enacted by the General Assembly of the State of Rhode Island at its January Session, A. D. 1940, and approved April 26, 1940, we have the honor to present the thirteenth annual report of the Water Supply Board for the year ended September 30, 1954.

On January 7, 1954 John A. Doherty was re-appointed a member of the Water Supply Board for a 4-year term ending on the first Monday in January 1958.

At the re-organization meeting of the Board held on January 29, 1954 Thomas H. Driscoll was re-elected Chairman and John J. Deary was re-appointed Secretary.

The Board has held regular meetings throughout the year, meeting practically every week, at which careful consideration has been given to the many problems arising in connection with maintenance and operating activities, the Department's financial structure, matters relative to taxes levied on property owned in nearby communities, and other miscellaneous departmental duties which properly come before the Board. Special meetings

were held throughout the year for consideration of particular problems which have arisen.

The report of the Chief Engineer with many important tables and statistical data is appended hereto, to which we invite your attention for details and particular information regarding the finances of the Department and conduct of the work during the above period.

Respectfully submitted,

WATER SUPPLY BOARD

THOMAS H. DRISCOLL, *Chairman*

JOHN A. DOHERTY

EARL H. ASHLEY

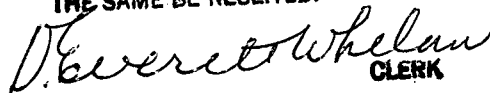
UGO RICCIO

MICHAEL N. CARDARELLI, *Ex-Officio*



IN CITY COUNCIL  
FEB 3 - 1955

READ:  
WHEREUPON IT IS ORDERED THAT  
THE SAME BE RECEIVED.

  
CLERK

## REPORT OF THE CHIEF ENGINEER

Providence, R. I.  
October 1, 1954

WATER SUPPLY BOARD  
CITY OF PROVIDENCE

*Gentlemen :*

The following is the report of operations of the Providence Water Works for the fiscal year ended September 30, 1954:

Departmental operations were placed on an emergency basis with the event of the hurricanes of August 31 and September 11. The most direct effect of these storms was the loss of power at both the Neutaconkanut and Bath Street pumping stations which supply the high service distribution system. Auxiliary gasoline engine driven pumping units were immediately placed in service, with power at Bath Street being restored the following day after the more severe storm of August 31 ; but the larger, Neutaconkanut Station was without electrical service for a period of four days. Telephone connections, and consequently metering and storage level indicators between the Purification Works, Hydro-Electric Station pumping stations and distribution reservoirs were completely interrupted for several days, requiring emergency runner service on a 24 hour basis between all key points.

There were no serious breaks in the distribution mains, although numerous investigations were made of complaints in flooded areas, which in every case turned out to be ground or tidal waters. Six additional daily sampling locations in the flooded downtown area were immediately established to pinpoint any possible contamination or pollution of the distribution system, with negative results shown for each sample taken. Extra crews

for emergency work were kept on standby duty until the situation was considered normal.

Following the hurricane of August 31, the hourly consumption of water fluctuated tremendously during the daytime, which was attributed to the cleaning up operations in areas where electrical service had been restored.

Fortunately only minor damage was suffered to building structures within the department which required parapet and roof repairs at the Administration building and Purification Works. Some losses in reforested plantings at the Source of Supply are covered in the section of this report under Reforestation.

Plant scale experiments in higher rates of filtration were continued throughout the year. Filter number 2 which was rebuilt in July 1950 with a 24 inch depth of 0.65 millimeter sand was kept in continuous operation with numerous tests and observations made at frequent intervals throughout each run. This data, along with all other data obtained from the small scale experimental filters, was tabulated and compared in graphical form with the regular plant filters which were operated at comparable high and lower rates of filtration. From all experimental data which began in 1948, and plant observations carried out for a similar period, it was concluded that higher rates of filtration, up to 3.5 gallons per square foot per minute, could be satisfactorily used without impairing the high quality of the plant effluent.

Fortunately these conclusions were reached at a time when the increasing plant demand during the summer months was accelerating to the point where the maximum plant capacity would have to be increased to meet the loads without further delay. This was evidenced by the fact that during the summer of 1953, it was necessary to operate the plant on 89 days at effluent rates that were far in excess of normal (61.6 m.g.d.).

Using 3.0 gallons per square foot per minute rate of filtration, the plant output could be increased to 105 m.g.d., representing

an increase of 43.4 m.g.d. over the normal or present capacity of 61.6 m.g.d. To accomplish the increase by new construction, and based on an estimating unit cost of \$60,000.00 per million gallons of plant capacity, any new facilities would represent a construction cost of approximately \$2,500,000.00. The alternative method of increasing plant output to 105 m.g.d. capacity by rebuilding the filters and metering facilities was estimated to be slightly in excess of \$100,000.00. This work would necessitate rebuilding only 9 of the 14 filter units, since filter number 2 was rebuilt in 1950, and the effective size of the sand in filters number 11 to 14 inclusive, which were built in 1940, was sufficiently coarse to permit the higher rate of 3.0 gallons per square foot per minute.

Consequently the necessary plans and specifications were prepared and a contract entered into with the Campanella and Cardi Construction Company in the amount of \$95,327.00 to rebuild the necessary filters and metering facilities. Work under this contract began on January 19, 1954 and progressed satisfactorily to completion on June 26, 1954. The effective size of the sand used in the rebuilt filters ranged from 0.50 to 0.55 millimeters with the average size at 0.52 millimeters. Since completion, the rebuilt filters have been placed in continuous service, and tests and observations continued as before. Thus far the tests and operation indicate that the rebuilt filters will produce the same excellent quality of effluent at the higher rates.

To begin a long range program of replacement of badly worn filter control valves at the Purification Works, a contract was awarded in June 1954 to the W. B. Parsons Company of Boston representing S. Morgan Smith Company for the purchase of four (4) twelve (12) inch effluent butterfly control valves to replace those originally installed in 1926. This valve program anticipates the eventual replacement of all filter effluent and wash water gate valves, with the newer type of rubber lined butterfly valve which is becoming increasingly popular in filter plant design throughout the country, and which promises to effect a much greater degree of flow control than the older type of gate valve.

Due to increased electrical demand load at the Water Purification Works, engineering studies are being undertaken to provide greater power transmission facilities from the Hydro Electric Station at Scituate Reservoir. This study will anticipate the additional electrical demands for the next twenty year period and provide sufficient transformer capacity with standby to meet the estimated plant loads up to the year 1975.

Work began in October on the construction of Additions and Alterations to the Administration and Operations building to centralize the departmental operations in a single location. This work was under contract with the Agostini Construction Company of Pawtucket, R. I. in the amount of \$348,855.00. Progress of the work was somewhat slowed by the winter months and occupancy by the various departments began on July 26, 1954 while various portions of the finish work were being completed.

The new two story addition, approximately 27 feet by 143 feet in size, adjoins the original building and houses the meter and accounting office, ledger card room, public relation and application office, engineering office, board room and chief engineer's and secretary's office. Engineering records, meter records, billing room, meter readers' office, carpenter shop, toilets and rest room facilities are provided along the street side of the original building. Automobile repairs and stock, meter testing and repairing, general stock and garage facilities for all automotive and construction equipment are provided at ground level in the main building. Off street parking facilities for visitors and all departmental employees are provided in the yard area in the rear of the building. Small pipe stock, fittings, hydrants, etc., which are required in daily operations are stored in the yard area which is effectively screened off from the adjoining residential section by a fence of evergreen trees.

The construction of new extensions to the distribution system and replacement of existing mains required the installation of 53,493.31 feet of various size pipe. The greater part of this footage was installed by private contractors under competitive bidding. Four groups involving a total of 43,849 feet of main



extensions and replacements were awarded during the year, three to the Fanning and Doorley Construction Company, Inc., for 33,616 feet and one for 10,233 feet to John Ambrose. The amount of pipe laid under contract during the year totalled 52,231.68 feet. Due to highway construction work in the City, 1,261.73 feet of water main was installed, this work being done by our own forces. During the year, main extensions were laid in 180 different streets within the area served by this department and at the end of the year approximately 7,557 feet contracted for during the fiscal year remained to be laid.

The back log on the construction schedule which totalled 25,000 feet at the beginning of the year was reduced to 18,700 feet by the end of November. Applications requiring main extensions, however, increased the schedule to 23,800 feet during the early part of December, but by the end of April it was reduced to 7,800 feet. Applications received during May increased the schedule to 16,900 feet, which was gradually reduced to 9,500 feet at the end of the year.

Studies were completed relative to pressure deficiencies in the Greenville Avenue and northwest section of the distribution system, and construction plans and specifications were immediately drawn up to provide the necessary reinforcement for this area. Our studies indicated that the increase in consumption in the high service areas, which include the northwest section, was far greater than the low service area in the most recent years. It has been apparent for some time that additional outlets would have to be provided in the distribution system to utilize more fully the existing pumping facilities, or to have sufficient outlet capacities for additional pumping units either at the Neutaconkannut or Bath Street Pumping Stations. It has also been recognized that much of the growth in our system has been in the highly elevated areas of North Providence and Johnston. Consequently a new 24 inch High Service Force Main was designed on a consumption basis projected to the year 1980, prime consideration being given to the areas of growth and the pumping requirements.

Eight separate bids were received on May 10, 1954 for this work, ranging in price from \$537,417.00 to \$695,433.00. The low bidder was the Fanning and Doorley Construction Company of Providence, who were awarded the contract and began work on July 12, 1954.

This new High Service Force Main is designed for a flow of 6 m.g.d. based on a moderately low velocity of 3 feet per second. It comprises approximately 30,400 linear feet of 24 inch prestressed reinforced concrete cylinder pipe and extends from our Neutaconkanut Pumping Station in Johnston to Putnam Pike at George Waterman Road in North Providence, traversing and serving new areas not now served. Provisions are made to reinforce several points in the distribution system along the way, and future connections are provided to serve other water companies or districts in areas adjoining the limits of our system. Future plans anticipate the extension of this new main to connect directly into the Longview Reservoir thereby providing an outer loop encompassing the northwest portion of the distribution system. At five critical points rotary plug valves will be installed to effect quick control in emergencies and the conventional gate valves are to be used at intermediate points for sectionalizing.

This work is to be financed out of the Water Depreciation and Extension Fund and represents the only major improvement to the High Service system since 1938. A time limit of 450 calendar days was estimated for this work, but as of September 30, the contract was 31 per cent complete indicating that the project can be completed in less than one year's time.

In April the gasoline engine of the 16-inch, 7,500 gallons per month pump at Neutaconkanut Pumping Station was partially dismantled and overhauled by the Buffalo Engine Service Company of Buffalo, N. Y. Connecting rod bearings were refitted, new piston rings installed, fuel pumps and distributors repaired, and the engine restored to efficient operation.

The installation of new totally enclosed metal switchgear, transformers and control equipment at the Bath Street Pumping

Station was completed in May 1954 at a total cost of \$13,252.00. This work was done under contract with the Liberty Electric Company of Providence. Sequence control equipment, operating over a single pair of leased telephone wires, was installed as a part of the new work. This control feature now provides complete flexibility of control for any combination of pumping units in the two stations, by the operators located at the Neutaconkanut Station. Metering signals for Bath Street are also transmitted back to the remote control station. The completion of this work has also removed the danger of exposure to high voltage electrical equipment in a densely occupied residential area.

Applications for water service totalled 1140 or 100 less than in the previous year. Of the 1140 applications 234 required extensions to the distribution system. Installation of new services totalled 1105, a decrease of 65 over the previous year.

The City of Warwick, who have depended upon two connections to our distribution system to supply their needs in the portion of that City supplied by this department, made arrangements to supplement these services with two additional 12-inch connections; one on Oaklawn Avenue and one on Dresden Street, both in the City of Cranston. The Oaklawn Avenue connection required an extension of our 12-inch main in that street which was completed on July 27, 1954, and the service connection, made by the Bragger Construction Company for the City of Warwick, was opened on September 22, 1954. The Dresden Street connection, which is to be made to our 30-inch Southeastly Trunk Main, is expected to be completed during the early part of the next fiscal year.

Under the terms of Chapter 1525 of the Ordinances and Resolutions of the City of Providence for 1946, this department was charged with the operation of the sewer rental law which took effect October 1, 1946. During the fiscal year ended September 30, 1954, the gross sewer rental collection totalled \$150,222.54. Of this amount, however, \$3.06 of the current year's collection, and \$19.52 of the previous year's collection was refunded, making a net total of \$150,199.96.

At the end of the year, the automotive and construction equipment owned and in use by the department totalled 25 various trucks, 18 passenger cars including 2 jeeps, 9 compressors, various pumps and other miscellaneous pieces of construction equipment. The records of the department indicate that during the year, trucks were operated a total of 34,199 truck hours at a cost of 54.3 cents per hour, including depreciation, compressors 2,633 hours at 62.3 cents per hour, and passenger cars were driven a total of 221,063 miles at a cost of 5.0 cents per mile.

The Engineering Staff has been engaged in the preparation of various specifications, preparing estimates and plans for extensions to the distribution system and the usual problems pertaining to the operation and maintenance of water works structures and equipment. Other work included real estate surveys, inventories and appraisals, consumer demands in respect to service requirements and proper size meters, inspection of water pipe installations for the existence of cross connections, observing and conducting flow tests at various points in the distribution system, compiling pertinent data and records, etc.

Other duties included attention to water works property in the various communities served by the system outside the City of Providence, in connection with tax valuations and assessments, which are shown on Table 53 of the appendix.

## SOURCE OF SUPPLY

### SCITUATE WATERSHED—RAINFALL AND RUNOFF

The rainfall on the 92.8 square mile Scituate Watershed above Gainer Dam was measured as usual by gages at Rocky Hill, Hopkins Mills, North Scituate, Westcott District and Gainer Dam. For the year ending September 30, 1954, a total of 59.10 inches was recorded; 11.04 inches above the 39-year (1915-1954) long-term average of 48.06, equivalent to 123.0% of the average.

The longest period of rainfall was between July 20 and July 29, 1954, both inclusive, when a total of 2.03 inches was recorded; with a maximum of 0.66 on July 21 and a minimum of 0.002 on July 29. The longest period in which no rainfall was recorded was between November 8 and November 21, 1953.

During October, November and December, 1953 and April, May, August and September, 1954, rainfall exceeded the 39-year average for their respective months; the maximum monthly rainfall occurring in August when 9.10 inches was recorded, exceeding the average for August by 4.55. The maximum day's rainfall was on September 11, when 4.97 inches was recorded, with the station at Rocky Hill reporting 5.53. The minimum monthly rainfall, 1.55 inches, was measured during June, 1954. This was 2.22 inches below the 39-year average for that month.

During the months of October, 1953 and January, February, March, June and July, 1954, the monthly runoff was below the 39-year average for their respective months, with a maximum deficiency of 1.20 inches in March, 1954. The maximum monthly runoff in December, 1953, when the amount collected totalled 4.32 inches, or 1.90 above the 39-year average for the month.

Statistical rainfall and runoff data for the current year and for the 39 years of watershed record may be found in Tables 1, 2, 3 and 4 of the Appendix.

## SCITUATE WATERSHED

### STORAGE, DRAFT AND YIELD

On October 1, 1953 the water in Scituate Reservoir was at elevation 276.08, or 7.93 feet below the spillway level; the total storage amounting to 28,780,000,000 gallons or 77.8% of reservoir capacity. At the end of the year (October 1, 1954) the reservoir was at elevation 282.61, or 1.40 feet below the spillway; the storage amounting to 35,513,000,000 gallons or 96.0% of capacity. From October 1, 1953 and continuing to November 21, 1953 the water level receded 10.55 feet to elevation 273.46, the minimum for the year, with a storage of 26,306,000,000 gallons or 71.1% of capacity. From this date the level rose steadily to the maximum elevation 285.31 on May 11, 1954, with a storage of 38,461,000,000 or 103.9% of capacity. The spillway level, 284.00, was reached on April 18, 1954. The storage remained above the spillway to June 17, 1954, fluctuating gradually downward to elevation 279.21 on August 28, 1954 and rising to elevation 282.61 at the end of the year.

The combined storage on the watershed, including Regulating, Westconnaug, Barden, Moswansicut, Ponaganset and Scituate Reservoirs, on October 1, 1953 amounted to 32,586,000,000 gallons or 79.0% of total capacity; and at the end of the year (October 1, 1954) the storage was 39,803,000,000 gallons or 96.4% of combined total capacity. The maximum combined storage during the year was 42,596,000,000 gallons, 103.2% of total capacity, on May 8, 1954. The minimum during the year was 30,148,000,000 gallons, 73.0% of combined total capacity, on November 21, 1953.

Available storage statistics in detail will be found in Table 5 of the Appendix.

The total draft from the watershed for the year was 37,673,710,000 gallons, or an average of 103,220,000 gallons per day. The draft for water supply purposes was 14,699,640,000 gallons, or an average of 40,280,000 gallons per day; and the discharge

to the river totalled 22,974,070,000, equal to 62,940,000 gallons per day. The discharge to the river was released during hours and at rates most advantageous for the use of mills on the Pawtuxet River below Gainer Dam.

The yield from Scituate watershed for the year was 44,890,-710,000 gallons, or an average of 122,990,000 gallons per day; 19,770,000 gallons per day in excess of the total draft, and 14,280,000 gallons in excess of the 39-year average (1915-1954).

Draft and yield statistics will be found in Table 6 of the Appendix.

## SCITUATE WATERSHED

### FORESTRY OPERATIONS

Forestry operations during the 1954 year were confined to pruning and thinning out the plantations, brush control, selective thinning of natural stands, fire control, replanting open areas, and other miscellaneous related operations.

We were extremely fortunate that the hurricanes of August 31 and September 11 caused only minor damage to the replanted areas. It is estimated that approximately 4000 plantings were lost in these storms, ranging in age growths from 20 to 28 years. Of these 4000 trees, probably 2400 would be removed in future thinnings, leaving an estimated loss of 1600 final crop trees. The loss in merchantable products would represent approximately 240 tons of cord or pulpwood and a potential timber yield of around 320,000 f.b.m. of sawlogs.

Forest conditions on the watershed have indicated a forestry program which will result in:

- (1) Timber Stand Improvement in Hardwoods
- (2) Thinning in the Pine Plantations
- (3) Conversion of Hardwood Site Possession to Pine

Under timber stand improvement we shall eliminate undesirable species, such as gray birch, red maple, pitch pine and scrub oak. Coppice growth (stump sprouts) will be removed in favor of seedling growth as coppice stands are very slow growing and have a decided tendency toward butt rot at an early age. Existing hardwood stands will be operated to remove badly formed and poor quality trees.

Under our thinning program, we are now operating our older pine plantations for pulpwood. These plantations are showing a decrease in growth rate, due to overcrowding. As trees grow older their crowns and roots expand, and thus we find in their 20th year that the individual trees are competing with one another for light, water and mineral nutrients. By removing selected trees we reduce crown and root competition, while leaving the better trees to grow at a faster rate. The trees to be removed are marked by the Forester on the basis of tree form, vigor and spacing. Volume removal is usually limited to no more than  $\frac{1}{3}$  of the total volume of the stand, and in many cases it is less. The ideal thinning leaves a maximum number of trees per acre which can completely utilize the available supplies of light, moisture and mineral nutrients.

Thinning methods on the watershed usually fall into two categories:

- (1) In alternate row red and white pine plantations, it is usually necessary to remove the white pine almost completely due to the heavy weevil damage to the white pine leaders which allow the red pine to overtop and suppress the white.
- (2) In pure stands of red or white pine, tree marking is entirely on the basis of form, vigor and spacing on a selective basis.

Our program of converting forest cover from hardwood to pine is continuing. This program involves the clear cutting of hardwoods to release a good understory of white pine. This is a



reasonable practice wherever pine of sufficient size and stocking occurs as an understory, and on soil capable of growing good pine, In most cases hardwood of low quality and vigor is removed in order to make way for a crop which can better utilize the site and is more valuable economically.

Pruning operations were continued during 1954 and involved the following types.

- (1) Pruning pine stands before pulpwood operations.
- (2) Crop tree pruning.
- (3) Pruning lower limbs to reduce roadside fire hazard.

In carrying out a thinning operation in white pine it is necessary to first prune all dead branches to a height of 6'. This is due to the white pine's habit of retaining dead branches and making it impossible to approach the butt of the tree to mark or cut it. After the plantation has been thinned, 150 to 175 of the finest trees in the plantation are pruned to a height of 16' in order to assure the production of knot free, high quality lumber at the earliest opportunity. In reduction of roadside fire hazard, we prune the lower limbs of all conifers to a nominal height of 7' in an attempt to restrict any fire to a surface fire on the ground rather than a fire running through the lower limbs into the crown and producing a devastating crown fire.

The fire control record for the past year was exceptional. Three fires were discovered and controlled at their inception resulting in a burned area of less than an acre. These fires were of careless origin by passing motorists or trespassers in or on the borders of pine plantations. Damage was held to a minimum as a result of excellent work on the part of the volunteer fire companies in the area.

We have continued our planting program of re-establishing forest cover on open field areas. 6,000 Eastern Larch, 2,000 Douglas Fir and 2,000 Balsam Fir were set out during the 1954 Spring season.

Our program for the reduction of the roadside fire-hazard has been enlarged upon. During 1954 we completed work on both sides of the North Scituate-Hope Road from Brandy Brook to the Danielson Pike. The North Scituate-Hope Road from the Purification Plant to North Scituate is now under a program of annual brush control in order to maintain the excellent appearance of and minimize the danger of fire to our woodlands bordering this heavily travelled highway.

In addition, we were able to expand this program further by applying the same principles to the Hartford Pike from its intersection with North Scituate-Hope Road to the Elmdale Cross Road. Both the northerly and southerly sides of Hartford Pike were treated in a manner to improve their aesthetic appearance and to reduce the fire hazard. This area is also under annual brush control. With the completion of these two sections, we will shift to the Tunk Hill Road.

As mentioned in the 1953 report, we have completed the first year requirement of the eight year fencing program of the Water Supply Board Aqueduct property, 3,000 feet of fence was erected on the southerly property line from Budlong Road to Oaklawn Avenue in Cranston. Present plans call for fencing of the Aqueduct property by 1960.

Regular maintenance of property at the Source of Supply was carried on throughout the year.

#### 1954 FORESTRY OPERATIONS—AREA AND YIELD

##### PULPWOOD

Pine. . . . .	50 Acres	831.4 tons	16.6 tons/acre	\$12.42/acre	\$621.01
Oak. . . . .	5 Acres	76.38 cords	15.28 cords/acre	\$15.28/acre	\$ 76.38

##### MISCELLANEOUS INCOME

Evergreen Boughs . . . . .	\$165.75
Lumber:	
8800 f.b.m.—White Pine . . . . .	\$88.00
5100 f.b.m.—Oak. . . . .	\$30.60

#### GAINER DAM HYDRO-ELECTRIC PLANT

The Hydro-Electric Station at Gainer Dam has been in satisfactory operation throughout the year. The plant was operated

on 268 days for a total of 3271.41 hours. Power generated from the discharge of 22,614,490,000 gallons through the 1875 K.V.A. Hydro-Electric Turbo Generator to the Pawtuxet River amounted to 4,360,000 Kilowatt-hours or an average of 5,186.81 gallons per kilowatt hour. Of the power generated 3,782,400 kilowatt hours or 86.7% was sold to the Narragansett Electric Company and 394,200 kilowatt-hours was used at the Water Purification Works. The rate of discharge through the station, concentrated during the hours of operation, averaged 165.91 million gallons per day.

Power plant statistics on the basis of the "Contract Year" with the Narragansett Electric Company are shown in Table 8 of the Appendix.

#### WATER PURIFICATION WORKS

The Water Purification Works, located on the North Scituate-Hope Road about three fourths of a mile from the Scituate Reservoir, has been in continuous and satisfactory operation throughout the year.

Water was drawn from Scituate Reservoir between elevations 213 and 220 and totalled 14,699,640,000 gallons, or an average of 40,270,000 gallons per day; the maximum for any one day being 69,350,000 gallons on June 21, 1954 and the minimum 16,630,000 gallons on September 11, 1954.

This water was treated with Ferri-Floc, aerated, dosed with slaked lime, mixed in the tangential mixer and coagulated in two concrete basins operated in series. Following a sedimentation period of from four to five days, it was filtered through rapid sand filters, treated with Sodium Silicofluoride, and finally chlorinated before being delivered into the Scituate Aqueduct leading to the water distribution system.

With the exception of a few short-period shutdowns to examine plant structures and service equipment, influent flow and chemical treatment were carried on 24 hours daily to obtain

a constant and unvarying degree of coagulation and filter efficiency. The Ferri-Floc Feeders and the Quicklime Feeders and Slakers are the Omega Gravimetric type, the automatic operation of each being controlled by an electric signalling device proportional to the rate of flow of water through the influent Venturi.

Water for dissolving Ferri-Floc and for lime slaking was maintained at a temperature of from 90 to 100 degrees Fahrenheit. The Ferri-Floc was dissolved by using a ratio of three pounds of water to each pound of chemical and the Quicklime was slaked by using a ratio of four pounds of water to each pound of lime.

Ferri-Floc used totalled 1,309,475 pounds, or an average of 3,588 pounds daily; with a maximum for any one day of 7,555 pounds on June 21, 1954 and a minimum of 1,439 pounds on September 11, 1954. The dosage averaged 0.62 grains per gallon, the maximum for any one day being 0.82 grains per gallon and the minimum 0.43 grains per gallon.

Quicklime used during the year totalled 1,374,893 pounds, or an average of 3,767 pounds daily; with a maximum for any one day of 6,938 pounds on July 14, 1954 and a minimum of 1,743 pounds on September 11, 1954. The lime dosage averaged 0.65 grains per gallon, the maximum for any one day being 0.73 grains per gallon and the minimum 0.52 grains per gallon.

Filters were operated a total of 70,662.56 hours during the year, at an average of 193.60 filter hours per day; the average length of filter runs being 86.16 hours which is 4.61 hours, or 5.65 per cent more than the average of 81.55 hours for the previous year. The maximum daily average of filter runs was 184.75 hours on July 9, 1954 as compared to a maximum of 173.75 hours during the previous year; and the minimum was 31.50 hours on November 8, 1953 as compared to a minimum of 42.00 hours during the previous year.

Wash water rates varied from 14 to 34 inches rise per minute, the rate of rise being adjusted inversely to the temperature of

the wash water. From October to January filters 1 to 10, exclusive of number 2, were washed at rates which varied from 17 to 27 inches rise per minute and an average sand expansion of 44%. As described in another part of this report, the 0.40 millimeter sand in these filters was removed and replaced with 0.52 millimeter sand to increase the plant capacity. Upon completion of work on these filters the washing operation was changed to give wash water rates which varied from 22 to 32 inches rise per minute and an average sand expansion of 33%. Filter number 2 which has 0.65 millimeter sand was washed at rates varying from 32 to 34 inches per minute rise and an average sand expansion of 33%. Filters 11, 12, 13, and 14 which have 0.46 millimeter sand were washed at rates varying from 14 to 27 inches rise per minute and an average sand expansion of 38%. A total of 250 tests were made during the year to determine the sand expansion and rate of rise. The total wash water used was 111,714,000 gallons, an average of 306,000 gallons per day, or 125,380 gallons per wash. The 111,714,000 gallons of wash water used was 4.17% more than the 107,241,000 gallons for the previous fiscal year.

The total water filtered for the year amounted to 13,952,503,000 gallons, an average of 38,226,000 gallons daily; the maximum day being 68,623,000 gallons on July 14, 1954 and the minimum 24,882,000 gallons on January 1, 1954. The average rate of filtration per filter was 4,740,000 gallons per day and the average amount of water filtered per filter per run was 17,020,000 gallons, or 2.22% more than the 16,650,000 gallons for the previous year.

The total plant effluent, or pure water delivered to the Scituate Aqueduct and the Kent County Water Authority, totalled 13,840,789,000 gallons, an average of 37,920,000 gallons per day; with a maximum of 68,324,000 gallons on July 14, 1954 and a minimum of 24,577,000 gallons on January 1, 1954.

With the exception of a few short-period shutdowns to make inspections and adjustments to the Fluoridizer and the Chlorinators, Fluoridation and Chlorination of the plant effluent were

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carried on 24 hours daily. With respect to Fluoridation, the City of Providence Water Supply Board is acting solely as the agents of the R. I. State Health Department in carrying out their directives relative to the chemical used, the applied dosage and the type of feeding equipment. Sodium Silicofluoride, the source of the fluoride ion, has been added in amounts sufficient to produce a concentration throughout the distribution system of 1.2 parts per million from October 1, 1953 to May 31, 1954 and 1.0 part per million from June 1, 1954 to September 30, 1954.

Plant effluent delivered to the Scituate Aqueduct, and treated with Sodium Silicofluoride amounted to 13,235,154,000 gallons, an average of 36,261,000 gallons per day. Sodium Silicofluoride used during the year totalled 187,673 pounds, or an average of 514 pounds per day; with a maximum for any one day of 814 pounds on July 14, 1954 and a minimum of 325 pounds on August 15, 1954. The actual dosage of fluoride ion averaged 1.01 parts per million, the maximum and minimum dosages being 1.21 and 0.79 parts per million. Water delivered to the Kent County Water Authority is not treated with Sodium Silicofluoride.

Constant chlorination of the plant effluent delivered to the Scituate Aqueduct was carried on for the purpose of insuring and safeguarding the supply of pure water from any possible contamination. Plant effluent to the Scituate Aqueduct was treated with chlorine and amounted to 13,766,915,000 gallons, an average of 37,717,000 gallons per day. Water delivered to Kent County is chlorinated separately by their facilities.

Chlorine used during the year totalled 36,562 pounds, or an average of 100 pounds per day; with a maximum for any one day of 169 pounds on October 20, 1953 and a minimum of 61 pounds on January 1, 1954. The chlorine dosage averaged 0.32 parts per million, the maximum and minimum dosages being 0.48 and 0.25 parts per million. Chlorine residual of the water at a point adjacent to the main Aqueduct averaged 0.026 parts per million, and of the tap water at the Water Supply Board Office 0.009 parts per million.

The following statistics show that the chemical cost of treatment for the fiscal year ended September 30, 1954 was \$4.28 per million gallons. This is 1.38% less than the figure of \$4.34 last year. The price of Ferri-Floc was increased from a low of \$45.63 per ton last year to a high of \$49.38 per ton this year, an increase of \$3.75 per ton, or 8.22% ; while the price per ton of Quicklime increased from \$18.33 last year to \$18.93 this year, an increase of \$0.60 per ton, or 3.27%. The price of Sodium Silicofluoride increased from \$136.00 per ton last year to \$144.08 per ton this year, an increase of \$8.08 per ton, or 5.94%. The price of chlorine has remained the same for the two years,—\$0.0875 per pound.

<i>Chemicals Used, etc.</i>	<i>Year Ended Sept. 30, 1951</i>	<i>Year Ended Sept. 30, 1952</i>	<i>Year Ended Sept. 30, 1953</i>	<i>Year Ended Sept. 30, 1954</i>
Chlorine. . . . .	0.37 P.P.M.	0.30 P.P.M.	0.34 P.P.M.	0.32 P.P.M.
Ferri-Floc. . . . .	0.65 G.P.G.	0.68 G.P.G.	0.64 G.P.G.	0.62 G.P.G.
Quicklime. . . . .	0.62 G.P.G.	0.65 G.P.G.	0.69 G.P.G.	0.65 G.P.G.
Sodium Silicofluoride. . . . .			1.07*	1.01*
Length of Filter Runs. . . . .	89.82 Hrs.	86.72 Hrs.	81.55 Hrs.	86.16 Hrs.
Tap Water—Color	5 P.P.M.	6 P.P.M.	6 P.P.M.	7 P.P.M.
Tap Water—Iron..	0.01 P.P.M.	0.01 P.P.M.	0.02 P.P.M.	0.01 P.P.M.
Cost of Chemicals per M.G. of Water Treated..	\$2.95	\$3.17	\$4.34	\$4.28

\*Dosage expressed as P.P.M. of fluoride.

Operating figures and statistics relative to chemical use and cost will be found in Tables 9 and 10 of the Appendix.

The Ferri-Floc used as a coagulant was obtained under contract from Faesy and Besthoff, Inc., New York, for the period October 1, 1953 to September 30, 1954 at \$49.38 per ton. Specifications for Ferri-Floc read as follows: "The material furnished shall be Ferric Sulphate. It shall contain not less than sixty-nine per cent (69%) of water soluble Ferric Sulphate ( $\text{Fe}_2(\text{SO}_4)_3$ ). The content of ferrous iron shall not exceed one and one-half per cent (1.5%) as (Fe). It shall be free of foreign material or material deemed undesirable in water purification processes. The material shall be in granular or lump

form. Not more than thirty-five per cent (35%) shall pass a 20 mesh per inch screen, and no particle shall be larger than will pass a one-inch mesh screen. Deliveries to be made in cars suitably lined to protect the material from moisture and foreign matter." The specifications contain a provision that allows us to penalize the manufacturer at the end of the contract year in the event that the total amount of material received falls below an average of sixty-nine per cent (69%) of water soluble Ferric Sulphate ( $\text{Fe}_2(\text{SO}_4)_3$ ).

Ferri-Floc has been delivered in bulk carload lots to the railroad siding at Washington, R. I., about five and one-half miles from the Water Purification Works. Deliveries to the plant have been made by our force with the use of a Holly Pneumatic Transfer Truck, which removes the Ferri-Floc from the car and delivers it into a storage silo of glazed segment tile masonry. This silo has an inside diameter of 16 feet, a height of 55 feet and a capacity for 180 tons of the material; which, in addition to the 40-ton storage provided in the feeding hopper on the fifth floor of the Purification Works Head House, assures a maximum of approximately 116 average days' supply. The stored Ferri-Floc in the silo is conveyed pneumatically through a 4-inch underground conveyor pipe approximately 600 feet to the concrete feeding hopper within the Purification Works building by means of a motor-driven air blower and control equipment, housed in a single story brick building adjacent to the silo.

Analysis of the Ferri-Floc received has shown an average ferrous iron content of 0.841% which is 0.659% less than the maximum of 1.500% allowed by the specifications. The average water soluble Ferric Sulphate ( $\text{Fe}_2(\text{SO}_4)_3$ ) content of the twelve deliveries received was 69.840%, or 0.840% more than the minimum of 69% demanded by specification requirements. The average amount of material passing a 20 mesh per inch screen was 34.0%, as compared to the permissible maximum of 35.0%. The following table shows the date of delivery, together with the per cent of ferrous iron, per cent of water soluble Ferric Sulphate and per cent passing a 20 mesh per inch screen.



<i>Date Received</i>	<i>Percent Ferrous Iron</i>	<i>Percent water soluble Ferric Sulphate</i>	<i>Percent passing a 20 mesh per inch screen</i>
December 8, 1953.....	1.005	68.739	34.3
December 14, 1953.....	0.894	69.577	37.5
December 21, 1953.....	1.005	71.181	15.5
April 21, 1954.....	1.083	69.183	42.1
April 27, 1954.....	1.128	70.741	22.9
May 3, 1954.....	0.335	70.741	30.5
June 17, 1954.....	0.558	69.581	52.3
June 23, 1954.....	0.759	68.944	32.4
July 1, 1954.....	0.759	69.140	41.9
July 15, 1954.....	0.771	70.379	35.5
July 21, 1954.....	0.905	70.300	34.8
September 30, 1954.....	0.894	69.577	28.6

The table shows that out of 12 deliveries received, 2 failed to meet specifications on the water soluble Ferric Sulphate content, and 5 failed to meet screen test requirements. Each time a delivery failed to meet specifications, the manufacturer was notified to this effect and requested to conform to his obligations.

Quicklime was obtained under contract with the J. C. Goff Company, Providence, from October 1, 1953 to February 19, 1954 at \$18.82 per ton. Specifications for the Quicklime purchased from this company read as follows: "The material furnished shall be granular or fine grain Quicklime, of which 100% shall pass a 4 mesh per inch screen and not less than 85% shall be retained on a 100 mesh per inch screen. Insoluble matter shall be less than 2%, and Magnesium Oxide shall be less than 3%. It shall have an Available Calcium Oxide (CaO) content of not less than 90%. The calculation of Available Lime shall be on an 'As Received' basis."

Analysis of the Quicklime received from the J. C. Goff Company showed an average available Calcium Oxide (CaO) content of 93.2% which is 3.2% greater than specification requirements. The per cent of material passing a 4 mesh per inch screen was 100% on every delivery and the per cent retained on a 100 mesh per inch screen averaged 97.8%. The following table shows the date of delivery, together with the per cent of Available Calcium Oxide and the per cent of material retained on a 100 mesh per inch screen:

<i>Date Received</i>	<i>Percent Available Calcium Oxide</i>	<i>Percent Retained on a 100 mesh per inch screen</i>
October 1, 1953.....	89.4	99.3
October 8, 1953.....	94.7	98.7
October 15, 1953.....	91.1	97.8
November 18, 1953.....	93.6	98.0
November 27, 1953....	94.8	98.6
December 2, 1953.....	92.8	98.5
February 1, 1954.....	94.3	91.2
February 8, 1954.....	94.1	99.4
February 19, 1954.....	94.1	98.9

The table shows that one of the nine deliveries received failed to meet specifications on the per cent of available Calcium Oxide. The manufacturer was notified to this effect and requested to conform to his obligations.

Shipments of Quicklime received from June 7, 1954 to July 15, 1954 were obtained under contract with the Manchester & Hudson Company, Providence, at a price of \$18.93 per ton. These deliveries were subject to the same specifications as the Quicklime purchased from the J. C. Goff Company.

Analysis of the Quicklime received from the Manchester & Hudson Company showed an average available Calcium Oxide content of 91.5%, which is 1.5% greater than specification requirements. The per cent of material passing a 4 mesh per inch screen was 100% on every delivery and the per cent retained on a 100 mesh per inch screen averaged 98.3%. The following table shows the date of delivery, together with the per cent of available Calcium Oxide and the per cent of material retained on a 100 mesh per inch screen:

<i>Date Received</i>	<i>Percent Available Calcium Oxide</i>	<i>Percent Retained on a 100 mesh per inch screen</i>
June 7, 1954.....	92.2.....	96.1
June 10, 1954.....	84.8.....	98.2
June 16, 1954.....	88.5.....	98.7
July 6, 1954.....	94.6.....	99.3
July 8, 1954.....	95.2.....	98.0
July 15, 1954.....	93.8.....	99.6

The table shows that two of the six deliveries received failed to meet specification requirements, showing available Calcium Oxide contents of 84.8% and 88.5%. Again, the manufacturer was notified of deviations from the specifications.

The Quicklime has been delivered in bulk carload lots to the railroad siding at Washington, R. I. Deliveries to the plant have been made by our force with the use of the same Holly Pneumatic Transfer Truck used for transporting the Ferri-Floc. There is a separate storage silo, 4-inch underground conveyor pipe, feeding hopper, motor-driven air blower and control equipment for the pneumatic handling of the Quicklime which is an exact duplicate of the pneumatic handling system for Ferri-Floc. The Quicklime storage silo has a capacity for 180 tons of the material; which, in addition to the 40-ton storage provided in the feeding hopper on the fifth floor of the Purification Works Head House, assures a maximum of approximately 123 average days' supply.

The liquid Chlorine used to treat the water was obtained under contract from the Fields Point Manufacturing Co., Inc., Providence, for the period October 1, 1953 to September 30, 1954 at \$0.0875 per pound. This material was delivered to the Purification Plant by our force in lots of 14 cylinders, each containing 150 pounds of Chlorine.

The Sodium Silicofluoride was purchased under contract with the T. H. Baylis Company, Providence, from October 1, 1953 to June 24, 1954 at a price of \$136.00 per ton. A delivery received on August 26, 1954 was obtained from the General Chemical Division, Allied Chemical & Dye Corporation, New York, at a contract price of \$144.08 per ton. The specifications covering both contracts called for a minimum available fluoride ion content of 59.4% . All shipments received showed fluoride ion contents higher than the minimum. The following table shows the date of completed delivery, together with the per cent of available fluoride ion. The average fluoride ion content was 60.33%.

<i>Date Received</i>	<i>Percent Available Fluoride Ion</i>
October 1, 1953.....	60.59
January 22, 1954.....	60.15
April 28, 1954.....	59.99
June 24, 1954.....	60.30
August 26, 1954.....	60.62

A special pneumatic conveying system operates to transfer the chemical from the drums to the storage collector supplying the Fluoridizer hopper. The Fluoridizer is an Omega gravimetric type feeder equipped with a non-flooding gate to prevent any possible overtreatment. The feeder is operated automatically by an electric signalling device proportional to the rate of flow of water to the Scituate Aqueduct.

Number 6 fuel oil was used for heating the plant from October 1953 to May 1954 inclusive, and during September 1954, and totalled 63,607 gallons, an average of 5,300 gallons per month. Number 2 fuel oil was used during the entire year, with the exception of December 1953 and February 1954, for heating water and amounted to 4,187 gallons, an average of 349 gallons per month.

#### WATER PURIFICATION WORKS LABORATORY

The fully equipped and modern laboratory maintained at the Purification Works for control over the quality of the water supply, from the raw water on the watershed to the tap at the consumers' premises, has been in operation throughout the year, with constant vigilance being exercised by the chemists and bacteriologists. Samples of tap water were obtained daily from not less than eight consumers' taps in various parts of the distribution system, the Water Supply Board office building in Providence, and from Longview and Neutaconkanut distribution reservoirs. Also, samples for analysis were obtained from the brooks, streams and reservoirs on the watershed, the raw water from the lower intake of Scituate Reservoir, the Reservoir Surface water, Gainer Memorial Dam Meter Chamber, Fiskeville Reservoir, twelve locations on the Pawtuxet River below the Dam, the various stages of the purification process, coincident with the investigation of complaints, from extensions to the distribution system, and selected locations in the distribution system.

Studies on filtration were continued throughout the year. From October 1, 1953 to January 19, 1954 when work on rebuilding nine plant filters with coarser size sand began, comparative examinations were made of four plant filters. These

were number 2, having sand of an effective size of 0.65 millimeters; number 8, with an effective size of 0.40 millimeters, and numbers 13 and 14, with 0.46 millimeters. Filters 2 and 14 were operated at rates which varied from 1.76 to 3.00 gallons per square foot per minute while filters 8 and 13 were operated at a rate of 1.76 gallons per square foot per minute. Samples were obtained from the effluents of these filters at the start of the run, each morning after that, and at the completion of the filter run. Filters 8 and 13 were operated until the loss of head reached 7.5 feet, and number 14 until the loss reached 8 feet. During October, November and December, 1953, number 2 was operated until the loss of head reached 8 feet. During January and February, 1954, this filter was removed from service at a loss of head corresponding to the beginning of passage of coagulated material. As described earlier in this report, filters 1 to 10, exclusive of number 2, were rebuilt with sand having an effective size of 0.52 millimeters.

The new filter sand was in accordance with the standard specifications of the American Water Works Association, Designation B 100-50, as approved January 1950, with some slight modifications. Numerous tests made on each shipment of sand as received at the site showed excellent conformity to specification requirements.

Upon completion of operations comparative examinations were made of numbers 2 and 14, and the nine rebuilt filters during the remainder of the year. Rates of filtration were varied from 1.76 to 3.00 gallons per square foot per minute with operation to 7.5 feet loss of head. Samples were obtained from the effluents of these filters at the start of the run, each morning after that, and at the completion of the run. Determinations made on these samples included chemical and sanitary chemical tests in addition to bacteriological examinations. Glass cartridge filters containing absorbent cotton which were placed on the effluents of the filters were examined at the time of sampling to observe whether any coagulated material was passing through the sand. At the end of each filter run, the cotton was removed, ignited and a determination made of the floc content deposited on the cotton throughout the run. The total number of samples obtained

from the filters during the year was 4,628, which is 27.7% of the total number of samples obtained from all sources. Tests made on these samples totalled 26,189, or 22.7% of all the determinations made in the laboratory during the past year.

The total number of samples obtained from all sources during the year amounted to 16,688 which, based on a forty-hour work week, means that one sample or another was obtained every 7.5 minutes. Tests made on these samples included chemical, sanitary chemical and mineral analyses, and bacteriological and microscopical examinations. The total number of tests made amounted to 115,506 which, based on a forty-hour work week, means that the water was receiving one test or another every 65 seconds. Each delivery of Ferri-Floc and Quicklime was tested to determine its conformance to specifications and the optimum dosages required for coagulation and pH control. Each delivery of Sodium Silicofluoride was also tested, not only for conformance to specifications but to assure that the proper concentration of fluoride ion would be maintained throughout the distribution system. Filter washings were regulated by means of tests on the sand expansion and rate of rise of wash water. Samples of sand from the filters were tested for cleanliness, mud ball formations, effective size, and uniformity coefficient. Samples taken after sterilization of extensions to the distribution system were tested for chlorine residual, B. Coli, 37°C and 20°C bacteria before permitting any extension to be placed in service. Consumer complaints were serviced and recommendations made to eliminate the source of trouble. Following Hurricane "Carol" of August 31, 1954, samples were obtained from various locations in the down town area to be sure that no tidal water had entered our mains. Six locations were sampled daily from September 1 to September 9, 1954, excluding September 5th and 6th. These samples showed that the water was of excellent quality, consistent with that throughout the distribution system.

Some idea of the laboratory control over the quality of the water supply may be had by a comparison of our sampling schedule with that recommended by the U. S. Public Health Service Standards. The following table taken from the Standards shows the minimum number of bacteriological samples that

should be obtained from the distribution system per month for any given population served.

<i>Population Served</i>	<i>Minimum Number of Samples per Month</i>
2,500 and under.....	1
10,000. . . . .	7
25,000. . . . .	25
100,000. . . . .	100
300,000. . . . .	180
400,000. . . . .	200
1,000,000. . . . .	300
2,000,000. . . . .	390
5,000,000. . . . .	500

The population served by the City of Providence water supply, exclusive of the Kent County System, is approximately 372,000. From the above table, it may be seen that the minimum number of bacteriological samples that should be obtained from the distribution system per month for this population is 195. The actual number of bacteriological samples obtained in the distribution system for the year amounted to a total of 3,236, or an average of 270 per month, a figure 38.5% greater than recommended by the Standards and more than is required for a population of 500,000. A sample for chemical and sanitary chemical analysis was also obtained with each bacteriological sample.

Coagulation tests were made on one liter quantities of raw water treated with various amounts of Ferri-Floc and Slaked Lime, simulating all the operations of the purification processes on a laboratory scale, for the purpose of determining the most economical dosage consistent with good coagulation.

Rigid laboratory control has resulted in the continuation of economies consistent with an excellent quality of water. Constant vigilance over and technical maintenance of the chemical treatment machinery and the filter controls have aided greatly in keeping the cost of treatment low despite increased costs of chemicals, the filter runs long, and the quality of water at a high degree of purity.

Tables 11 to 21, inclusive, of the Appendix show statistics relative to the quality of the water and the kind and number of laboratory examinations made during the past year.

## TRANSMISSION AND DISTRIBUTION

### SCITUATE AQUEDUCT

The Scituate Aqueduct, which conveys the effluent water from the Water Purification Works in Scituate to the distribution system, has been in continuous and satisfactory service throughout the year. The rapid development of housing projects adjacent to the Aqueduct in the City of Cranston has necessitated a long range project of fencing the Aqueduct property to prevent unauthorized access. During the year 3,000 feet of fence has been erected on the southerly property line from Budlong Road to Oaklawn Avenue. It is expected that this project will be completed by 1960. Maintenance of the property along this line included cutting and burning brush, repairs to grassed embankments, repairs to fencing and other miscellaneous work as required.

### HIGH SERVICE PUMPING STATIONS

Neutaconkanut and Bath Street Pumping Stations, supplying water to the high service system of the distribution system generally above elevation 140, and to the special high pressure fire service in the congested area of downtown Providence, have been in satisfactory operation through the year. Water pumped into the high service area totalled 2,360,850,000 gallons, or an average of 6,468,082 gallons per day. Neutaconkanut Station pumped 1,688,680,000 gallons or 4,626,520 gallons per day, and Bath Street Station pumped 672,170,000 gallons or 1,841,561 gallons per day.

The total power required for pumping at both stations amounted to 956,751 kilowatt-hours. Neutaconkanut Station required 690,300 kilowatt-hours, and Bath Street Station 266,451 kilowatt-hours. The cost of power at both stations was \$15,984.47, or \$6.77 per million gallons pumped.



The auxiliary gasoline engine driven pump at Neutaconkanut Pumping Station was operated a total of 63 hours and 15 minutes, pumping 17,630,000 gallons for the year. The greater part of this operation occurred during the period from August 31 to September 4 when the pump was operated 33 hours due to electric power failure as a result of the hurricane of August 31st. The amount pumped during that period was 8,825,000 gallons. Periodic test runs were made during the year accounting for the remaining pumpage.

Weekly test runs of the gasoline driven pumps at the Bath Street Pumping Station were made throughout the year. The pumps were operated a total of 163 hours and 5 minutes, pumping 20,510,000 gallons.

Operating statistics for the high service pumping stations will be found in Tables 22 and 23 of the Appendix.

#### DISTRIBUTION RESERVOIRS

The 42 million gallon Neutaconkanut Low Service Distribution Reservoir on Neutaconkanut Hill, Johnston, and the 12-million gallon Longview High Service Distribution Reservoir on Mineral Spring Avenue and Smithfield Road in North Providence have been in continuous and satisfactory operation during the year.

Routine maintenance activities were carried on with respect to the care of equipment, grounds, fencing, etc.

Operating statistics for the Distribution Reservoirs will be found in Tables 24 and 25 of the Appendix.

#### WATER DISTRIBUTION SYSTEM

The water distribution system has been maintained in satisfactory and continuous operation throughout the year. Work done included the extensions of mains, the installation of gate valves, hydrants and services, and making necessary repairs

and replacement to the various appurtenances of the system when and where required. As was the case during the previous year, the extensive highway repairs and reconstruction program accounted for the greater part of repairs and replacements to the system.

The amount of pipe laid during the year, all sizes, totalled 53,493.31 feet, including 1,188.47 feet which replaced existing mains.

A total 1,194.47 feet of pipe were removed or abandoned, resulting in a net increase to the system of 52,298.84 feet. In the City of Providence the net increase amounted to 5,540.56 feet and in the City of Cranston the net increase amounted to 31,271.55 feet. In the Town of North Providence the net increase was 12,391.82 and in the Town of Johnston 3,094.91 feet. Of the 53,493.31 feet installed, 53,236.27 feet was laid with cement-asbestos pipe, the remaining footage being laid with cast iron pipe.

At the end of the year, the total length of mains in the distribution system, all sizes, aggregated 696.24 miles, not including 12.71 miles in the special high service fire system in the City of Providence. The total amount of cement-asbestos pipe in the system at the end of the year was 496,265.49 feet, which consisted of 327,153.99 feet of 6-inch, 158,454.81 feet of 8-inch, 9,271.22 feet of 12-inch and 1,385.47 feet of 16-inch. With the exception of that portion of the Scituate Aqueduct beginning at the Siphon Chamber, which consists of 1,584 feet of 48-inch, and 8,448 feet of 66-inch steel pipe; the Neutaconkanut Conduit consisting of 715 feet of 36-inch, 15,312 feet of 48-inch, and 20,570 feet of 60-inch reinforced concrete pipe; and portions of the Southeasterly Trunk Main, which consists of 104.38 feet of 16-inch, 2,210.50 feet of 24-inch and 19,553.66 feet of 30-inch prestressed concrete pipe, the remaining footage is laid with cast iron pipe.

Details of the pipe laid, removed, replaced, and in use at the end of the year are shown in Tables 26 and 27 of the Appendix.

A total of 155 stop gates were added to the system during the year, 101 six-inch, 51 eight-inch, 3 twelve-inch. Four stop gates were removed, 2 six-inch, 2 eight-inch, and 8 stop gates were replaced, 7 six-inch, and 1 twelve-inch. At the end of the year there was a total of 10,055 stop gates in the system ranging from 6-inch to 48-inch including 10 sixteen-inch rotary plug valves. A total of 63 six-inch hydrant gates were installed. Four 8-inch hydrant gates were removed in conjunction with the replacement of flush hydrants by post hydrants. The number of gates on unwatering hydrants remained the same at twenty-seven. The total number of gates, all sizes, in use at the end of the year totalled 13,397, an increase of 213 over the previous year.

Details of gates in use on September 30, 1954 are shown in Table 28 of the Appendix.

The number of private pipes connected to the system at the end of the year totalled 353, a reduction of 16 over the previous year. In the City of Providence there was a total of 202, in Cranston 93, in Johnston 26, and 32 in North Providence. The number of services connected to these private pipes totalled 596, a decrease of 33 from the previous year. In Providence there were 301, Cranston 197, Johnston 35, and 63 in North Providence.

Statistics relative to private pipes will be found in Table 29 of the Appendix.

A total of 1,105 new services, general and fire supplies, were installed during the year; 384 in Providence, 471 in Cranston, 112 in Johnston, and 137 in North Providence. Eighty-five services no longer required, were removed or abandoned; 55 in Providence, 19 in Cranston, 7 in Johnston, and 4 in North Providence. Forty services were replaced and 87 services repaired. The number of services in the system at the end of the year was 65,539, including both general and fire supplies.

Statistics relative to service pipes installed, removed, replaced and repaired are shown in Table 30 of the Appendix.

Services in use at the end of the year were 56,567, an increase of 873 from the beginning of the year. The number of metered services in use at the end of the year was 56,150 as compared with 55,246 at the beginning of the year, an increase of 904. Unmetered services in use decreased by 31 from 448 to 417. Metered services at the end of the year constituted 99.26% of total services in use, an increase of 0.07% over the previous year.

Statistics relative to metered and unmetered services will be found in Tables 31 and 32 of the Appendix.

Public fire hydrants in use at the end of the year totalled 4,124. Flush hydrants totalled 2,462, and post hydrants 1,662. In Providence 28 flush hydrants were replaced by post hydrants. One flush hydrant in Johnston was replaced by a post hydrant. Four hundred seventy-eight flush hydrants have been replaced by post hydrants since the adoption in March, 1947 of the New York Pattern Post Hydrant for installation in the system.

The replacement of flush hydrants by the post type and new installations increased the number of post hydrants in Providence from 622 to 668, and reduced the number of flush hydrants to 2,443. In Cranston the number increased by 20 and in North Providence by 6, and in Johnston by 1.

Statistics relative to public fire hydrants will be found in Tables 33 and 34 of the Appendix.

Leaks in the distribution and transmission mains totalled 79 during the year, 28 occurring at joints and 51 as a result of ruptured mains. These leaks were of minor nature and caused little or no damage. Leaks at joints averaged 1 for every 25.32 miles of main, while total leaks averaged 1 for every 8.97 miles of main.

The number of meters repaired and tested in our Meter Repair Shop was 6,529, while those receiving attention in the field numbered 228, making a total of 6,757. The number repaired last year in shop and field was 6,523. The cost of meter repairs in

the shop averaged \$3.70 per meter as against \$2.34 last year. Meters requiring servicing in the field involved an average expenditure of \$2.04 per meter during the current year as compared with \$1.90 the previous year.

The number, make and size of meters on active services at the end of the year are shown in Table 35 of the Appendix.

### CONSUMPTION

Water consumption for the year ended September 30, 1954 amounted to 13,840,620,000 gallons or at an average of 37,920,000 gallons per day. This average was 940,000 gallons per day less than the average for the previous year. The decrease occurred during the months of November, December, and May through September, ranging from 240,000 gallons per day in December to 5,590,000 gallons per day in June. During the remaining months the average daily consumption exceeded the average for the corresponding months of the previous year, ranging from 260,000 gallons daily in January to 1,680,000 gallons daily in February.

The maximum daily consumption occurred on July 14, 1954 when 68,564,000 gallons were consumed, or 1,436,000 gallons less than the previous maximum of 70,000,000 gallons on July 22, 1952.

Water consumption statistics will be found in Tables 36, 37, 38 and 39 of the Appendix.

## FINANCIAL SUMMARY

The gross income for the year ended September 30, 1954 totalled \$2,449,654.56, an increase of \$12,551.48, or 0.51% over the previous year. Revenue from the sale of water alone was \$2,146,947.18, an increase over the previous year of \$53,321.33. The remaining income of \$302,707.38 was received from other sources, including hydrant rentals, sale of power, installation of services, miscellaneous items, and surpluses in the Meter Revolving Fund and Main Extension Account. The receipts for these items show a decrease of \$40,769.85.

During the year total payments for water main extensions amounted to \$94,390.40, a decrease over the previous year of \$61,138.14.

Income from service connection charges amounted to \$70,849.00, an increase over the previous year of \$10,646.00.

At the end of the year unpaid water bills totalled \$154,439.34 as compared with \$123,671.74 at the beginning of the year or 6.95% of the total net billing.

Miscellaneous accounts receivable was \$3,798.38 at the end of the year as compared with \$2,311.20 at the beginning of the year.

Operating expenses totalled \$1,105,335.14, a decrease over the previous year of \$67,112.21. This is due chiefly to the reduction of Water Main Extensions during the present fiscal year.

Fixed charges amounted to \$1,107,509.56 or 45.21% of gross revenue. As in previous years, the largest single item continues to be the interest charge on the bonded indebtedness, which amounts to \$610,000.00, equivalent to 24.90 cents per dollar of the gross income.

The aggregate of all expenditure of the Board during the year totalled \$2,212,844.70, which deducted from the gross revenue

of \$2,449,654.56 leaves a net balance of \$236,809.86, which according to law reverts to the Sinking Fund for the retirement of Water Bonds.

As none of the bonds will mature until 1956, at which time the next \$1,000,000 principal amount will be payable, there was no reduction in the gross bonded indebtedness during the year. Bonds outstanding in the amount of \$15,000,000 will become due in various amounts periodically between 1956 and 1968. At the end of the year, Sinking Fund balance totalled \$9,944,000.84, or \$45,317.00 in excess of the amortization requirements on that date.

The net bonded debt at the end of the present year was \$5,055,999.16 and at the end of the previous year \$5,472,579.46, showing a reduction of \$416,580.30.

Financial accounts of the department, tabulation of water works property, statement of revenues, various funds, outstanding bonds, and sinking fund requirements, inventories and other statistics may be found in Tables 40 to 51 of the Appendix.

A summary of statistics of the Providence Water Supply Board for the year ended September 30, 1954 as recommended by the New England Water Works Association may be found in Table 53 of the Appendix.

Respectfully submitted,

PHILIP J. HOLTON, JR.  
*Chief Engineer*

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**TABLE 1**  
MONTHLY RAINFALL IN INCHES ON SCITUATE WATERSHED

STATIONS ON WATERSHED		YEAR ENDED SEPTEMBER 30, 1954													
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Monthly Avg.
	Rocky Hill....	5.83	6.06	5.78	3.07	3.32	4.22	5.07	5.20	2.39	2.39	10.35	8.68	62.36	5.20
	Hopkins Mills..	5.31	6.36	5.68	3.31	3.32	4.39	5.18	4.12	1.37	2.44	8.88	7.43	57.79	4.82
	North Scituate.	5.70	6.67	5.76	2.70	3.23	4.44	5.37	5.05	1.77	2.37	9.15	7.64	59.85	4.99
	Westcott .....	5.37	5.30	5.70	2.67	3.07	4.30	5.58	4.66	1.27	2.99	7.46	6.87	55.24	4.60
	Gainer Dam ...	5.64	6.73	4.90	2.79	2.87	4.43	5.67	5.50	0.93	3.62	9.65	7.52	60.25	5.02
	AVERAGE..	5.57	6.22	5.56	2.91	3.16	4.36	5.37	4.91	1.55	2.76	9.10	7.63	59.10*	4.93

**\*Total of monthly averages.**

**TABLE 2**  
**MONTHLY AND YEARLY RAINFALL IN INCHES ON SCITUATE WATERSHED**

Year	YEARS ENDED SEPTEMBER 30												Jan.-Dec.	
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Year
1915-1916.....	2.75(e)	2.88	5.86	1.88	5.88	2.46	3.60	4.83	5.71	7.38	1.33	1.24	45.80	1916
1916-1917.....	2.61	2.34	3.50	3.96	2.18	4.91	2.70	4.15	4.34	1.51	6.13	2.66	40.99	1917
1917-1918.....	6.71	0.48	3.23	3.56	3.73	2.15	4.36	3.73	4.49	5.13	4.14	8.79	50.09	1918
1918-1919.....	1.07	2.60	3.75	4.89	3.42	6.05	4.31	5.99	3.65	5.47	6.65	6.07	53.52	1919
1919-1920.....	2.29	5.05	2.58	3.03	6.10	4.90	6.28	3.95	7.93	4.44	3.86	3.04	53.45	1920
1920-1921.....	1.34	5.85	5.09	3.46	3.06	3.72	5.45	3.73	4.30	6.80	2.97	2.53	48.30	1921
1921-1922.....	1.26	8.02	2.54	1.91	2.67	6.40	1.98	5.22	6.34	8.36	9.09	5.35	59.14	1922
1922-1923.....	2.92	1.41	3.11	6.78	1.82	3.73	5.92	1.48	4.93	2.78	2.35	2.15	39.38	1923
1923-1924.....	5.67	5.68	5.10	4.49	2.92	2.80	6.12	3.66	1.49	1.72	5.85	5.28	50.78	1924
1924-1925.....	0.21	2.23	2.38	4.41	2.22	4.76	2.85	2.72	2.36	6.14	1.70	2.96	34.94	1925
1925-1926.....	4.32	4.83	5.18	3.26	6.10	3.73	2.46	2.27	1.74	3.80	3.94	1.89	43.52	1926
1926-1927.....	5.04	5.55	3.55	2.98	3.31	1.59	2.56	3.41	3.36	3.99	8.55	2.61	46.50	1927
1927-1928.....	5.24	9.22	5.63	2.72	4.32	2.70	5.43	1.45	3.91	5.06	5.50	4.80	55.98	1928
1928-1929.....	3.99	2.50	3.21	5.20	4.89	3.92	7.56	3.47	2.27	2.06	2.93	1.35	43.35	1929
1929-1930.....	3.09	3.06	4.15	2.86	2.88	3.23	2.03	2.74	3.05	3.33	3.00	1.35	34.77	1930
1930-1931.....	3.36	4.65	3.10	3.55	2.57	6.37	3.36	4.19	6.31	3.74	5.66	1.97	49.13	1931
1931-1932.....	2.22	1.03	3.16	6.16	2.57	6.16	1.97	2.57	2.25	2.57	6.44	11.75	49.16	1932
1932-1933.....	6.63	7.13	2.09	2.02	3.81	6.55	3.76	3.76	4.04	2.00	3.80	7.56	55.37	1933
1933-1934.....	3.41	1.48	3.72	4.87	4.33	4.03	5.24	3.98	4.79	2.20	3.89	7.37	48.51	1934
1934-1935.....	3.25	4.44	3.55	7.24	3.09	1.93	4.76	2.27	5.12	4.10	1.42	3.59	44.76	1935
1935-1936.....	1.04	5.86	0.88	8.81	4.16	9.31	3.80	1.98	2.98	2.63	3.28	7.72	52.45	1936
1936-1937.....	2.00	1.25	9.83	5.02	2.45	4.09	5.42	3.05	3.40	1.58	4.47	4.19	48.75	1937
1937-1938.....	5.92	8.10	2.89	5.29	2.91	2.70	2.60	4.17	8.32	11.49	3.10	6.76	62.55	1938
1938-1939.....	2.64	3.91	3.64	3.08	5.66	5.86	4.53	0.94	2.95	1.20	6.52	3.47	43.80	1939
1939-1940.....	5.76	1.40	3.40	2.82	5.97	4.04	6.00	5.76	2.45	4.41	2.01	2.63	46.65	1940
1940-1941.....	2.00	6.81	2.28	3.12	3.37	2.97	1.36	3.16	4.92	5.90	4.00	0.20	40.09	1941
1941-1942.....	1.75	3.35	3.78	4.95	3.30	8.35	0.89	2.80	3.88	5.38	4.32	1.94	44.69	1942
1942-1943.....	4.26	5.52	6.39	3.56	1.95	3.68	3.90	3.87	1.99	3.41	2.15	1.30	41.98	1943
1943-1944.....	6.38	3.43	1.22	1.79	2.50	5.05	4.31	1.35	3.75	1.74	2.01	11.03	44.36	1944
1944-1945.....	2.71	8.45	4.33	3.45	5.79	2.13	3.36	4.89	5.17	2.74	3.06	2.84	48.92	1945
1945-1946.....	2.21	9.03	7.58	3.82	3.81	1.42	2.37	4.92	3.31	2.49	11.48	3.69	56.13	1946
1946-1947.....	0.48	1.32	3.90	2.98	2.60	3.85	5.40	3.37	4.10	4.86	2.91	4.02	39.79	1947
1947-1948.....	3.26	6.42	3.91	7.14	2.57	4.26	3.97	9.36	4.20	3.73	3.14	1.59	53.55	1948
1948-1949.....	4.86	7.43	3.45	4.38	3.62	2.47	4.65	4.03	0.10	1.24	6.07	3.49	45.79	1949
1949-1950.....	2.27	3.47	2.79	3.68	4.62	3.99	3.68	3.51	2.93	1.62	5.04	2.03	39.63	1950
1950-1951.....	2.23	7.21	4.57	4.95	4.48	5.91	3.97	5.20	2.71	3.36	3.08	2.41	50.08	1951
1951-1952.....	4.14	9.64	5.53	4.88	4.81	4.13	4.41	3.97	3.16	1.20	7.33	2.21	55.41	1952
1952-1953.....	1.94	3.02	4.20	7.38	4.64	9.33	7.54	3.24	1.67	4.27	2.94	2.74	52.91	1953
1953-1954.....	5.57	6.22	5.56	2.91	3.16	4.36	5.37	4.91	1.55	2.76	9.10	7.63	59.10	1954
Average.....	3.25	4.67	3.96	4.16	3.68	4.36	4.17	3.68	3.77	3.81	4.55	4.00	48.06*	Avg.
Maximum.....	6.71	9.64	9.83	8.81	6.10	9.33	7.56	9.36	8.62	11.49	11.48	11.75	62.55	Max.
Minimum.....	0.21	0.48	0.88	1.79	1.82	1.42	0.89	0.94	0.10	1.20	1.33	0.20	34.77	Min.

(e Estimated; \*Total of monthly averages; †38-year Average.

**TABLE 3**  
**MONTHLY AND YEARLY RUNOFF IN INCHES ON SCITUATE WATERSHED (92.8 SQ. MI.)**

YEARS ENDED SEPTEMBER 30															Jan.-Dec.	
Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Year	Total	
1915-1916.....	0.75(e)	1.24(e)	3.03(e)	2.50	3.70	3.99	4.64	3.69	3.42	2.74	1.09	0.42	31.21	1916	28.25	
1916-1917.....	0.51	0.58	0.97	1.91	1.30	4.29	3.05	2.79	2.18	0.79	0.71	0.63	19.71	1917	22.41	
1917-1918.....	1.79	1.59	1.38	1.83	4.04	3.17	3.40	2.24	1.24	0.47	0.82	1.81	23.78	1918	23.75	
1918-1919.....	1.02	1.34	2.37	3.81	2.27	5.01	4.43	3.86	1.27	1.35	0.91	3.33	30.97	1919	32.65	
1919-1920.....	1.45	2.25	2.71	1.19	1.69	9.60	5.10	3.73	4.15	1.38	0.79	0.34	34.38	1920	33.29	
1920-1921.....	0.37	1.73	3.22	2.79	1.69	4.19	3.68	2.85	0.95	2.56	0.93	0.31	25.27	1921	24.52	
1921-1922.....	0.24	1.65	2.68	1.13	1.80	4.81	3.92	3.50	2.39	3.50	3.59	4.39	33.60	1922	33.32	
1922-1923.....	1.66	1.26	1.37	4.16	2.46	6.10	4.06	2.68	1.15	0.64	0.40	0.25	26.19	1923	29.75	
1923-1924.....	1.27	2.01	4.57	4.52	1.88	5.70	3.38	3.38	1.05	0.20	0.56	0.68	29.25	1924	23.31	
1924-1925.....	0.49	0.45	0.97	0.91	3.65	3.41	2.46	1.46	0.52	0.58	0.39	0.32	15.61	1925	19.04	
1925-1926.....	0.61	1.48	3.25	2.23	3.11	4.38	3.00	1.70	0.62	0.40	0.42	0.17	21.37	1926	21.03	
1926-1927.....	0.76	2.15	2.09	3.34	2.64	3.05	1.71	2.03	1.44	0.32	1.59	0.64	21.76	1927	30.14	
1927-1928.....	1.95	6.73	4.70	2.62	3.76	2.86	3.18	2.05	1.15	1.08	1.17	0.80	32.05	1928	23.03	
1928-1929.....	1.21	1.16	1.99	4.02	3.65	5.56	6.09	3.56	0.48	0.06	0.07	-0.09	27.76	1929	25.18	
1929-1930.....	0.07	0.53	1.18	1.96	2.38	2.74	1.84	0.88	0.42	0.09	0.04	-0.11	12.02	1930	11.82	
1930-1931.....	0.12	0.63	0.83	1.56	2.11	5.95	3.21	3.10	2.97	0.69	0.85	0.10	22.12	1931	21.67	
1931-1932.....	0.07	0.15	0.91	3.35	2.16	4.10	3.08	1.35	0.39	0.07	0.35	3.27	19.25	1932	30.15	
1932-1933.....	3.48	6.29	2.26	2.24	2.70	6.28	6.88	1.93	1.57	0.17	0.25	1.52	35.57	1933	27.13	
1933-1934.....	0.95	0.82	1.82	3.78	1.18	5.48	6.08	2.88	1.47	0.08	0.14	1.40	26.08	1934	28.94	
1934-1935.....	1.33	1.91	3.21	4.78	2.83	4.22	4.05	1.71	1.78	0.62	-0.14	0.26	26.56	1935	21.82	
1935-1936.....	-0.13	1.09	0.75	3.94	1.93	11.51	4.45	1.59	0.44	0.03	-0.02	0.82	26.40	1936	31.64	
1936-1937.....	0.46	0.43	6.06	4.59	2.77	3.34	3.79	2.52	0.75	0.02	0.60	0.57	25.90	1937	27.16	
1937-1938.....	0.79	4.17	3.25	4.15	2.99	7.99	2.29	1.84	2.85	6.93	1.32	1.66	35.23	1938	33.76	
1938-1939.....	1.22	1.90	3.62	2.11	4.12	5.24	4.90	1.08	0.31	-0.24	0.22	0.09	24.57	1939	21.35	
1939-1940.....	0.63	1.35	1.54	2.03	1.51	4.86	6.89	3.17	1.65	0.84	-0.14	-0.04	24.29	1940	23.98	
1940-1941.....	-0.07	1.63	1.65	1.53	2.88	2.42	1.65	1.16	1.33	0.54	0.10	-0.41	14.41	1941	12.43	
1941-1942.....	-0.15	0.32	0.86	1.87	2.54	7.14	1.75	1.06	0.59	0.86	0.26	-0.17	17.13	1942	22.77	
1942-1943.....	0.45	1.86	4.56	2.45	3.46	4.40	2.68	3.01	0.36	0.02	-0.16	-0.22	22.87	1943	17.97	
1943-1944.....	0.60	0.95	0.42	0.73	1.23	3.24	3.53	1.08	0.43	-0.26	-0.31	1.73	13.37	1944	18.61	
1944-1945.....	0.50	3.16	3.55	2.91	2.58	5.61	2.15	3.10	1.26	0.15	-0.12	-0.15	24.70	1945	24.02	
1945-1946.....	0.06	1.88	4.59	3.93	2.98	3.70	1.43	2.50	1.65	0	2.35	0.56	25.63	1946	21.08	
1946-1947.....	0.49	0.30	1.19	2.16	1.52	4.01	3.31	2.86	1.09	0.53	0.12	0.31	17.89	1947	20.47	
1947-1948.....	0.23	2.94	1.39	1.55	3.15	7.16	3.76	5.25	3.12	0.56	0.15	-0.21	29.05	1948	29.08	
1948-1949.....	0.35	2.24	2.00	3.57	3.22	2.92	3.20	1.78	-0.02	-0.26	0.02	0.09	19.11	1949	16.40	
1949-1950.....	0.05	0.57	1.26	2.03	2.42	4.16	3.01	2.20	1.00	-0.11	0.22	-0.02	16.79	1950	19.39	
1950-1951.....	0.04	1.85	2.59	3.24	4.95	4.36	4.30	2.70	1.21	0.14	0.07	-0.07	25.38	1951	30.16	
1951-1952.....	0.34	4.62	4.30	4.24	3.30	5.02	2.97	2.46	0.98	-0.35	0.53	-0.20	28.21	1952	20.27	
1952-1953.....	-0.20	0.37	1.15	4.61	4.35	7.24	6.36	3.07	0.20	0.17	-0.05	-0.13	27.17	1953	32.41	
1953-1954.....	0.38	1.86	4.32	2.12	2.66	3.56	4.01	3.71	0.33	-0.01	0.93	3.96	27.83	1954		
Average.....	0.67	1.78	2.42	2.78	2.71	4.76	3.74	2.50	1.28	0.70	0.54	0.74	24.62*	Avg.	24.58†	
Maximum.....	3.48	6.73	6.06	4.78	4.95	11.51	6.89	5.25	4.15	6.93	3.59	4.39	35.57	Max.	33.76	
Minimum.....	-0.20	0.15	0.42	0.73	1.18	2.42	1.43	0.88	-0.02	-0.35	-0.31	-0.41	12.02	Min.	11.82	
35 Years																

(e) Estimated; \*Total of monthly averages; †38-year Average.

**TABLE 4**  
**MONTHLY AND YEARLY PERCENT OF RAINFALL COLLECTED ON SITUATE WATERSHED**

YEARS ENDED SEPTEMBER 30															Jan.-Dec.	
Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Year	Total	
1915-1916	27.3(e)	43.0(e)	51.7(e)	133.0	62.9	162.2	128.9	76.4	59.9	37.1	82.0	33.9	68.1	1916	66.4	
1916-1917	19.5	24.8	29.4	48.2	59.6	87.4	113.0	67.2	48.0	52.3	11.6	23.7	48.1	1917	51.9	
1917-1918	26.7	33.2	42.7	51.4	108.3	147.4	74.6	71.8	27.6	9.2	19.8	20.6	47.5	1918	50.4	
1918-1919	95.3	51.5	63.2	77.9	66.4	82.8	102.8	64.4	34.8	24.7	13.7	54.8	57.4	1919	57.9	
1919-1920	63.3	44.6	105.0	39.3	27.7	195.9	81.2	94.4	52.3	31.1	20.5	11.2	64.3	1920	59.6	
1920-1921	27.6	29.6	63.3	80.6	55.2	112.6	67.5	76.4	22.1	37.6	31.3	12.2	52.3	1921	51.2	
1921-1922	19.0	20.6	105.5	59.2	67.4	75.2	198.0	67.0	37.7	41.9	39.5	82.0	56.8	1922	60.8	
1922-1923	56.8	89.4	44.0	61.4	135.2	163.5	68.6	181.1	23.3	23.0	17.0	11.6	66.5	1923	61.5	
1923-1924	22.4	35.4	89.6	100.7	64.4	122.5	93.1	92.3	70.5	11.6	9.6	12.9	57.6	1924	59.5	
1924-1925	233.3	20.2	40.8	20.6	164.4	71.6	86.3	53.7	22.0	9.4	22.9	10.8	44.7	1925	42.8	
1925-1926	14.1	30.6	62.7	68.4	51.0	117.4	122.0	74.9	35.6	10.5	10.6	9.0	49.1	1926	48.5	
1926-1927	15.1	38.7	58.9	112.1	79.8	191.8	66.8	59.5	42.8	8.0	18.6	24.5	46.8	1927	57.5	
1927-1928	37.2	73.0	83.5	96.3	87.0	105.9	58.6	141.4	29.4	21.3	21.3	16.7	37.2	1928	50.5	
1928-1929	30.3	46.4	62.0	77.3	74.6	141.8	80.6	102.6	21.1	2.9	2.4	-6.7	64.0	1929	57.3	
1929-1930	2.3	17.3	28.4	68.5	82.6	84.8	90.6	32.1	13.8	2.7	1.3	-8.1	34.6	1930	33.2	
1930-1931	3.6	13.5	26.8	43.9	82.1	93.4	95.5	74.0	47.1	18.4	14.3	5.1	45.0	1931	48.8	
1931-1932	3.2	14.6	28.8	54.4	90.8	66.6	156.3	52.5	14.2	2.7	5.4	27.8	39.2	1932	51.4	
1932-1933	57.5	88.2	108.1	110.9	70.9	95.9	111.3	51.3	38.9	8.5	6.9	20.1	64.2	1933	56.4	
1933-1934	27.9	55.4	48.9	97.7	26.0	136.0	116.0	72.4	30.7	3.6	3.6	19.0	53.8	1934	56.6	
1934-1935	40.9	43.0	90.4	66.0	91.6	218.6	85.1	75.3	34.8	15.1	-9.8	7.2	59.3	1935	52.8	
1935-1936	-12.5	18.6	85.2	44.7	46.4	123.6	117.1	80.3	14.8	1.1	-0.6	10.6	50.3	1936	54.8	
1936-1937	23.0	34.4	61.6	91.4	113.1	81.7	69.9	82.6	22.0	1.3	9.3	13.6	33.1	1937	53.7	
1937-1938	23.2	51.5	112.5	78.4	102.7	110.7	88.1	44.1	33.1	60.3	42.6	24.6	56.3	1938	58.4	
1938-1939	46.2	48.6	99.4	68.5	81.4	89.4	108.2	114.9	10.5	-20.0	3.4	2.6	36.1	1939	48.3	
1939-1940	10.9	96.4	45.3	72.0	25.3	120.3	114.8	55.0	67.3	19.0	-7.0	-1.5	52.1	1940	50.8	
1940-1941	-3.5	23.9	72.4	49.0	87.4	81.5	121.3	36.7	27.0	9.2	2.5	-205.0	35.9	1941	32.8	
1941-1942	-8.6	15.5	22.8	37.8	77.0	85.5	196.6	37.8	15.2	16.0	6.0	-8.8	38.3	1942	43.8	
1942-1943	10.6	53.7	71.4	68.8	177.4	119.6	68.7	77.8	18.1	0.6	-7.4	-16.9	54.5	1943	48.8	
1943-1944	9.4	27.7	34.5	40.8	49.2	64.2	85.9	80.0	11.5	-14.9	-15.4	15.7	30.1	1944	38.1	
1944-1945	18.4	37.4	82.0	84.3	44.6	263.4	64.0	63.4	24.4	5.5	-3.9	-5.3	50.5	1945	46.0	
1945-1946	2.7	20.8	60.6	102.9	78.2	260.6	60.3	50.8	49.8	0	20.5	15.2	45.7	1946	49.0	
1946-1947	102.1	22.7	30.5	72.5	58.3	104.2	61.3	84.9	76.6	10.9	4.1	7.7	45.0	1947	42.9	
1947-1948	7.0	45.8	35.5	21.7	122.6	168.1	94.7	56.1	74.3	15.0	4.8	-13.2	54.2	1948	52.2	
1948-1949	7.2	30.1	58.0	81.5	89.0	118.2	68.8	44.2	-20.0	-21.0	0.3	2.6	41.7	1949	42.5	
1949-1950	2.2	16.4	45.2	55.2	52.4	104.3	81.8	62.7	34.1	-6.8	4.4	-1.0	42.4	1950	43.0	
1950-1951	1.8	25.6	56.7	65.4	110.5	73.8	108.3	51.9	44.6	4.2	2.3	-2.9	50.7	1951	54.5	
1951-1952	8.2	47.9	77.8	86.9	68.6	121.5	67.3	61.7	31.0	-29.2	7.2	-9.0	50.9	1952	44.8	
1952-1953	-10.3	12.2	27.4	62.5	93.8	77.6	74.6	98.8	12.0	1.6	-1.7	-4.7	51.4	1953	53.0	
1953-1954	6.8	29.9	77.7	72.8	84.2	81.6	74.7	75.6	21.3	-0.4	10.2	51.9	47.1	1954	53.0	
Average	20.6	38.1	61.1	66.8	73.6	109.2	89.7	67.9	34.0	18.4	11.9	18.5	51.2	Avg.	51.3†	
Maximum	233.3	331.2	112.5	133.0	177.4	263.4	198.0	181.1	74.3	60.3	82.0	82.0	68.1	Max.	66.4	
Minimum	-12.5	12.2	22.8	20.6	25.3	64.2	58.6	32.1	-20.0	-29.2	-15.4	-205.0	30.1	Min.	32.8	

(e Estimated; †38-year Average.

**TABLE 5**  
**SCITUATE WATERSHED**  
(92.8 Square Miles)

STATISTICS OF STORAGE FOR YEAR ENDED SEPTEMBER 30, 1954

1953- 1954	1 REGULATING RESERVOIR		2 WESTCONNAUG RESERVOIR		3 BARDEN RESERVOIR		4 MOSWANSICUT RESERVOIR		5 PONAGANSET RESERVOIR		6 SCITUATE RESERVOIR		7 TOTAL 1-6	
	Elev.	Avail. Storage M. G.	Elev.	Avail. Storage M. G.	Elev.	Avail. Storage M. G.	Elev.	Avail. Storage M. G.	Elev.	Avail. Storage M. G.	Elev.	Avail. Storage M. G.	Avail. Storage M. G.	% of Total Avail.
Oct.	280.50	112	453.17	396	344.80	829	301.69	694	632.50	653	276.08	28,380	31,064	78.2
Nov.	281.10	137	453.47	413	345.21	862	301.92	717	632.58	659	274.38	26,712	29,500	74.2
Dec.	285.70	437	454.32	461	345.25	865	302.16	742	633.68	741	274.86	27,168	30,414	76.5
Jan.	285.62	431	452.97	385	345.11	854	302.12	737	634.23	784	279.60	31,956	35,147	88.4
Feb.	285.64	432	450.37	255	345.21	852	302.00	725	634.22	783	280.19	32,572	35,629	89.6
Mar.	285.69	436	451.73	323	345.27	867	302.04	729	634.30	789	281.50	33,923	37,069	93.3
Apr.	285.67	435	454.17	453	345.24	864	302.02	727	634.03	768	283.75	36,332	39,579	99.6
May	285.67	435	454.07	447	345.28	867	302.01	726	634.13	776	284.92	37,630	40,881	102.8
June	285.62	431	453.89	437	345.17	859	301.99	724	633.78	749	284.48	37,138	40,338	101.5
July	285.53	423	452.52	363	344.90	837	301.91	716	633.38	718	283.05	35,583	38,640	97.2
Aug.	285.20	397	450.67	270	345.16	858	301.82	707	632.98	688	281.11	33,508	36,428	91.6
Sept.	285.73	440	451.77	325	345.58	891	302.08	733	633.38	718	280.22	32,602	35,709	89.8
	September 11		April 17		September 11		September 11		September 11		May 11		May 8	
Max. For Year	286.20	479	454.77	487	346.60	975	302.45	792	634.48	803	285.31	38,061	41,074	103.3
	October 24		January 30		October 17		October 24		October 24		November 21		October 24	
Min. For Year	279.50	76	450.17	246	344.60	813	301.60	685	631.98	616	273.46	25,906	28,626	72.0

1. Regulating Reservoir—Spillway Elev.	285.50; Total Storage	428 M.G.;	Dead Storage	7 M.G.; Total Available Storage	421 M.G.
2. Westconnaug " "	434.17; " "	453 " "	" "	" "	453 " "
3. Barden " "	345.10; " "	853 " "	" "	" "	853 " "
4. Moswansicut " "	301.90; " "	1,781 " "	" "	1,066 " "	715 " "
5. Ponaganset " "	633.03; " "	742 " "	" "	49 " "	693 " "
Total 1-5 Reservoir—Spillway Elev.	284.01; " "	4,257 M.G.;	Dead Storage	1,122 M.G.; Total Available Storage	*3,135 M.G.
6. Scituate Reservoir—Spillway Elev.	284.01; " "	37,011 " "	" "	400 " "	36,611 " "
Total 1-6		Total Storage 41,268 M.G.;	Dead Storage	1,522 M.G.; Total Available Storage	†39,746 M.G.

NOTE: Elevations shown are in feet above mean high water in Providence Harbor.  
Statistics shown are for the first day (7 A.M.) of the month indicated.

**TABLE 6**  
**SCITUATE WATERSHED**  
(92.8 Square Miles)

DRAFT AND YIELD FOR YEAR ENDED SEPTEMBER 30, 1954

DRAFT FROM SCITUATE RESERVOIR Million Gallons					WATERSHED YIELD Million Gallons				
1953- 1954	To River Below Gainer Dam			Total	For Month	Avg Per Day	For Month	1953- 1954	39-Year Mean 1916-1954
	Over Spillway	Through Gatehouse	Total						
Oct.	0	871.86	871.86	1,309.74	2,181.60	70.37	617.60	19.92	34.86
Nov.	0	906.00	906.00	1,185.83	2,091.83	69.73	3,005.83	100.19	95.69
Dec.	0	1,044.11	1,044.11	1,197.57	2,241.68	72.31	6,974.68	224.99	125.90
Jan.	0	1,757.81	1,757.81	1,175.42	2,933.23	94.62	3,415.23	110.17	144.63
Feb.	0	1,769.17	1,769.17	1,085.58	2,854.75	101.95	4,294.75	153.38	156.09
Mar.	0	2,045.81	2,045.81	1,177.98	3,223.79	103.99	5,733.79	184.96	247.64
Apr.	†92.21	3,969.53	4,061.74	1,102.92	5,164.66	172.15	6,466.66	215.56	201.06
May	†234.87	5,161.42	5,396.29	1,135.01	6,531.30	210.69	5,988.30	193.17	130.06
June	†26.09	800.19	826.28	1,411.62	2,237.90	74.60	539.90	18.00	68.81
July	0	746.24	746.24	1,442.89	2,189.13	70.62	-22.87	-0.74	36.42
Aug.	0	939.62	939.62	1,276.16	2,215.78	71.48	1,496.78	48.28	28.09
Sept.	0	2,609.14	2,609.14	1,198.92	3,808.06	126.93	6,380.06	212.67	39.78
For Yr.	353.17	22,620.90	22,974.07	14,699.64	37,673.71	103.22	44,890.71	122.99	108.71

†Flashboard Leakage.



**TABLE 7**  
**SCITUATE WATERSHED — REFORESTATION**  
**NUMBER AND KINDS OF TREES PLANTED IN VARIOUS YEARS**

Planted During Calendar Year	Balsam Fir	Red Pine	White Pine	Douglas Fir	Austrian Pine	Scotch Pine	Jack Pine	White Spruce	Norway Spruce	Hemlock	Larch	Total Number Planted Yearly
1926 .....	0	160,000	40,000	0	0	0	0	0	0	0	0	200,000
1927 .....	0	60,000	150,000	0	0	0	0	0	0	0	0	210,000
1928 .....	0	10,000	10,000	0	0	0	0	0	0	0	0	20,000
1929 .....	0	10,000	75,000	0	0	0	0	0	0	0	0	85,000
1930 .....	0	40,000	40,000	0	0	0	0	0	0	0	0	80,000
1931 .....	0	40,000	50,000	0	0	0	0	9,000	0	0	0	99,000
1932 .....	0	40,000	40,000	0	0	0	0	20,000	0	0	0	100,000
1933 .....	0	0	0	0	0	0	0	0	0	0	0	0
1934 & 1935 .....	0	755,000	255,000	0	36,000	136,000	4,000	505,000	204,000	3,000	0	1,898,000
1936 .....	0	453,700	111,000	0	14,400	0	0	20,000	15,000	26,000	0	640,100
1937 .....	0	481,100	0	0	0	0	0	213,200	0	0	0	694,300
1938 .....	0	229,000	21,693	0	0	0	0	0	0	0	0	250,693
1939 .....	0	8,000	761,000	0	0	0	50,000	0	0	0	0	819,000
1940 .....	0	267,387	618,828	0	45,916	0	67,750	0	0	0	0	999,881
1941 .....	0	51,000	295,650	0	0	0	0	34,350	0	0	0	381,000
1942 .....	0	0	308,120	0	0	0	0	0	0	0	0	308,120
1943 .....	0	0	0	0	0	0	0	0	0	0	0	0
1944 .....	0	0	0	0	0	0	0	0	0	0	0	0
1945 .....	0	0	0	0	0	0	0	0	0	0	0	0
1946 .....	0	0	0	0	0	0	0	0	0	0	0	0
1947 .....	0	0	0	0	0	0	0	0	0	0	0	0
1948 .....	0	0	0	0	0	0	0	0	0	0	0	0
1949 .....	0	0	0	0	0	0	0	0	0	0	0	0
1950 .....	0	0	0	0	0	0	0	0	0	0	0	0
1951 .....	0	0	1,500	12,000	0	0	0	0	0	0	0	13,500
1952 .....	0	20,000	0	0	0	0	0	10,000	0	0	10,000	40,000
1953 .....	0	10,000	0	0	0	0	0	6,000	0	0	0	16,000
1954 .....	2,000	0	0	2,000	0	0	0	0	0	0	6,000	10,000
<b>TOTALS .....</b>	<b>2,000</b>	<b>2,635,187</b>	<b>2,777,791</b>	<b>14,000</b>	<b>96,316</b>	<b>136,000</b>	<b>121,750</b>	<b>817,550</b>	<b>219,000</b>	<b>29,000</b>	<b>16,000</b>	<b>6,864,594</b>

TABLE 8

GAINER DAM HYDRO-ELECTRIC PLANT\*  
POWER STATISTICS ON THE BASIS OF THE "CONTRACT  
YEAR" WITH THE NARRAGANSETT ELECTRIC COMPANY

Contract Year	KWH Generated at Gainer Dam	KWH Used at Gainer Dam and Water Purification Works	Net KWH Delivered to Narrag. Elec. Co.	Payment Received
(Period June 20-30, 1930)....	87,000	6,470	75,100	\$300.40
July 1930—June 1931.....	3,023,000	152,940	2,758,340	20,000.00
July 1931—June 1932.....	4,201,500	158,070	3,980,570	19,600.00
July 1932—June 1933.....	7,024,900	155,210	6,697,656	26,790.62
July 1933—June 1934.....	5,080,900	152,420	4,837,371	19,349.48
July 1934—June 1935.....	7,102,900	174,710	6,756,101	27,024.40
July 1935—June 1936.....	5,761,200	173,530	5,394,176	21,576.70
July 1936—June 1937.....	5,626,000	174,110	5,262,807	21,051.23
July 1937—June 1938.....	6,438,300	156,710	6,069,927	24,279.71
July 1938—June 1939.....	8,915,000	159,860	8,457,980	33,831.92
July 1939—June 1940.....	4,681,100	231,850	4,329,115	17,316.46
July 1940—June 1941.....	3,291,200	185,540	2,982,991	16,000.00
July 1941—June 1942.....	2,585,300	194,250	2,322,916	15,600.00
July 1942—June 1943.....	4,655,800	170,520	4,372,359	17,489.44
July 1943—June 1944.....	2,290,100	183,250	2,096,811	14,597.25
July 1944—June 1945.....	4,146,200	187,080	3,879,622	15,518.49
July 1945—June 1946.....	4,754,100	200,200	4,460,596	17,343.70
July 1946—June 1947.....	3,494,400	251,270	3,224,049	13,600.00
July 1947—June 1948.....	5,576,900	249,940	5,313,209	21,252.84
July 1948—June 1949.....	3,790,500	264,160	3,521,404	14,085.62
July 1949—June 1950.....	1,972,200	303,460	1,548,000	9,288.00
July 1950—June 1951.....	4,965,900	322,220	4,476,900	26,861.40
July 1951—June 1952.....	6,381,400	329,080	5,836,700	35,020.20
July 1952—June 1953.....	4,993,400	351,080	4,429,900	26,579.40
July 1953—June 1954.....	3,945,700	389,050	3,389,000	20,334.00

\*1875 KVA 3 Phase, 60 Cycles, 2300 Volts, 80 Ft. Head Turbo-Generator.

**TABLE 9**  
**WATER PURIFICATION WORKS**  
**OPERATING STATISTICS FOR YEAR ENDED SEPTEMBER 30, 1954**

1953-1954	Influent Aerator Hours Operated	Plant Influent Mil. Gals.		Water Filtered Mil. Gals.		Wash Water Mil. Gals.		% of Water Filtered		Plant Effluent Mil. Gals.		Plant Effluent Flow Hours	Number of Filters In Operation			Avg. Rate of Filtration per Filter— M.G.D.
		Total	Avg. per Day	Total	Avg. per day	Total	Avg. per Day	Total	Avg. per Day	Total	Avg. per Day		Max.	Min.	Avg.	
Oct. ....	725.9	1,309.74	42.25	1,191.454	38.434	8.004	0.258	0.7	0.258	1,183.450	38.176	744.0	14.0	3.0	8.7	4.42
Nov. ....	712.2	1,185.83	39.53	1,068.946	35.631	7.044	0.235	0.7	0.235	1,062.386	35.397	720.0	13.0	3.0	8.2	4.36
Dec. ....	744.0	1,197.37	38.63	1,094.677	35.312	7.592	0.245	0.7	0.245	1,087.085	35.067	744.0	14.0	4.5	8.6	4.10
Jan. ....	744.0	1,175.42	37.92	1,092.104	35.229	11.905	0.384	1.1	0.384	1,080.199	34.845	744.0	12.5	5.5	8.7	4.05
Feb. ....	670.1	1,085.58	38.77	1,010.691	36.096	13.674	0.488	1.3	0.488	997.017	35.608	672.0	12.5	4.0	8.8	4.08
Mar. ....	744.0	1,177.98	38.00	1,106.489	35.693	11.437	0.369	1.0	0.369	1,095.032	35.324	744.0	12.0	3.0	8.5	4.18
Apr. ....	719.0	1,102.92	36.76	1,062.116	35.404	8.404	0.280	0.8	0.280	1,053.712	35.124	719.0	13.0	3.5	7.6	4.65
May ....	744.0	1,135.01	36.61	1,096.464	35.370	10.502	0.339	0.9	0.339	1,085.962	35.031	744.0	12.5	1.0	7.5	4.72
June ....	713.8	1,411.62	47.05	1,364.449	45.482	11.505	0.383	0.8	0.383	1,352.944	45.098	716.8	14.0	1.0	7.8	5.87
July ....	744.0	1,442.89	46.54	1,411.941	45.546	8.005	0.258	0.6	0.258	1,403.936	45.288	744.0	14.0	2.0	7.2	6.35
Aug. ....	741.0	1,276.16	41.17	1,269.685	40.957	7.033	0.227	0.5	0.227	1,262.652	40.731	744.0	13.0	1.0	7.4	5.50
Sept. ....	720.0	1,198.92	39.96	1,182.803	39.427	6.589	0.220	0.5	0.220	1,176.214	39.207	720.0	13.0	3.0	7.8	5.06
Totals ....	8,722.0	14,699.64	40.27	13,952.503	38.226	111.714	0.306	0.8	0.306	13,840.789	37.920	8,755.8	.....	.....	.....	.....
Average ....	726.8	.....	40.27	.....	38.226	.....	0.306	0.8	0.306	.....	37.920	729.6	.....	.....	8.1	4.74

Raw water treated with Ferri-Floc before Influent Aeration.  
Quick lime added to Ferri-Floc treated water in conduit opposite Fluoridation Room.  
Chlorine added to water after filtration.  
Sodium Silicofluoride added to water after filtration.  
Raw water drawn from lower intake at Gainer Memorial Dam all year.

**Table 9 (Continued)**  
**WATER PURIFICATION WORKS**  
**OPERATING STATISTICS FOR YEAR ENDED SEPTEMBER 30, 1954**

1954 1953—	Number of Filters Washed			Ferri-Floc Used			Quicklime Used			Chlorine Used			Sodium Silicofluoride Used			Fuel Oil Used for Heating—Gals.	
	Total	Avg. per Day	Gr. per 100 Gals.	Lbs.	Avg. per Day	Gr. per Gal.	Lbs.	Avg. per Day	Gr. per Gal.	Lbs.	Avg. per Day	Parts per Mil.*	Lbs.	Avg. per Day	Parts per Mil.*	No. 2	No. 6
Oct. ....	61	2.0	108.00	99,652	3,214	0.53	127,491	4,113	0.68	4,335	140	0.44	17,968	580	1.11	420	3,966
Nov. ....	54	1.8	107.37	83,017	2,767	0.49	97,895	3,263	0.58	3,084	103	0.35	15,557	518	1.12	229	6,737
Dec. ....	68	2.2	100.23	77,564	2,502	0.45	94,702	3,055	0.55	2,722	88	0.29	15,142	522	1.11	0	10,974
Jan. ....	117	3.8	60.75	102,259	3,299	0.61	105,465	3,402	0.63	2,834	91	0.31	16,127	520	1.11	57	11,706
Feb. ....	116	4.1	73.20	106,878	3,817	0.69	99,045	3,537	0.64	2,633	94	0.32	15,195	543	1.12	0	10,356
Mar. ....	88	2.8	90.84	111,167	3,586	0.66	107,238	3,459	0.64	2,926	94	0.32	16,369	528	1.11	51	11,168
Apr. ....	65	2.2	84.09	101,901	3,397	0.65	103,362	3,445	0.66	2,674	89	0.30	14,953	498	1.06	287	5,409
May ....	79	2.5	77.00	104,802	3,381	0.65	109,073	3,518	0.67	2,710	87	0.30	16,138	520	1.08	325	2,791
June ....	82	2.7	67.36	151,815	5,060	0.75	141,078	4,703	0.70	3,316	110	0.29	15,042	501	0.90	657	0
July ....	58	1.9	88.07	148,035	4,775	0.72	144,990	4,677	0.70	3,422	110	0.29	16,670	538	0.86	799	0
Aug. ....	53	1.7	117.28	121,504	3,919	0.67	127,133	4,101	0.70	3,080	99	0.29	15,241	492	0.87	719	0
Sept. ....	50	1.7	104.20	100,881	3,563	0.59	117,421	3,914	0.68	2,826	94	0.29	13,271	442	0.91	643	500
Totals ...	891	.....	.....	1,309,475	.....	.....	1,374,893	.....	.....	36,562	.....	.....	187,673	.....	.....	4,187	63,607
Average .	.....	2.4	86.16	.....	3,588	0.62	.....	3,767	0.65	.....	100	0.32	.....	514	1.01	349	5,300

Total filter hours for year, 70,662.56; average per day, 193.60.  
Average quantity of water filtered per filter per run, 17.02 m. g.  
\* Dosage expressed as p.p.m. of Fluoride ion.

**TABLE 10**  
**WATER PURIFICATION WORKS**  
**CHEMICALS USED DURING THE FISCAL YEAR ENDED**  
**SEPTEMBER 30, 1954**

Chemicals	Pounds of Chemicals Used		Total Gallons of Water Treated	Cost of Chemicals	Pounds of Chemicals Used per 1,000,000 Gals. of Water Treated (Avg.)	Cost of Chemicals Per 1,000,000 Gals. of Water Treated
	Total	Lbs. Per Day (Avg.)				
Ferri-Floc. . . . .	1,309,475	3,588	14,699,000,000	\$32,330.94	89.08	\$2.20
Quicklime. . . . .	1,374,893	3,767	14,699,250,000	12,962.18	93.53	0.88
Chlorine. . . . .	36,562	100	13,766,915,000	3,199.17	2.65	0.23
Sod. Silicofluoride. . . . .	187,673	514	13,235,154,000	12,831.38	14.18	0.97
Totals. . . . .	2,908,603	.....	.....	\$61,323.67	.....	\$4.28

Price of Ferri-Floc—From Oct. 1, 1953 to Sept. 30, 1954—\$49.38 per ton.  
Price of Quicklime—From Oct. 1, 1953 to June 6, 1954—\$18.82 per ton; from June 7 to Sept. 30, 1954—\$18.93 per ton.  
Price of Chlorine—From Oct. 1, 1953 to Sept. 30, 1954—\$0.0875 per pound.  
Price of Sodium Silicofluoride—From Oct. 1, 1953 to Aug. 8, 1954—\$136.00 per ton; from Aug. 9 to Sept. 30, 1954—\$144.08 per ton.

**TABLE 11**  
**WATER PURIFICATION WORKS**  
**\*CHEMICAL AND PHYSICAL CHARACTERISTICS OF WATER IN**  
**PROCESS OF FILTRATION**  
**YEAR ENDED SEPTEMBER 30, 1954**

Monthly Averages	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
<b>Alkalinity</b>													
Raw .....	5.1	4.2	4.3	4.2	4.1	4.1	4.0	3.9	3.8	4.1	4.0	4.3	4.2
Effluent .....	18.3	15.8	15.2	15.5	14.6	14.9	15.5	15.6	15.1	15.5	16.0	16.7	15.7
Tap .....	16.0	14.9	13.9	13.6	12.9	13.0	13.5	13.6	13.6	13.7	14.0	15.0	14.0
<b>Hardness</b>													
Raw .....	9	10	10	10	10	10	9	9	9	9	9	9	9
Effluent .....	27	28	26	27	26	28	27	27	27	27	28	27	27
Tap .....	28	28	27	27	28	28	27	27	27	28	28	27	27
<b>Hydrogen Ion Concentration</b>													
Raw .....	6.0	6.2	6.2	6.2	6.3	6.3	6.4	6.3	6.2	6.1	6.0	6.1	6.2
Aerated Influent .....	4.1	4.2	4.3	4.1	4.1	4.1	4.2	4.2	4.2	4.1	4.2	4.3	4.2
Treated .....	9.7	9.7	9.7	9.7	9.6	9.6	9.7	9.7	9.6	9.6	9.6	9.7	9.6
Settled .....	9.6	9.6	9.5	9.6	9.5	9.5	9.5	9.6	9.5	9.5	9.5	9.6	9.5
Filtered .....	9.6	9.5	9.5	9.6	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.6	9.5
Effluent .....	9.6	9.5	9.5	9.6	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.6	9.5
Tap .....	9.4	9.3	9.3	9.3	9.2	9.2	9.2	9.3	9.3	9.3	9.3	9.4	9.3
<b>Free CO<sub>2</sub></b>													
Raw .....	4.9	1.7	1.7	2.1	2.7	2.1	1.9	2.3	3.1	4.6	6.0	4.4	3.1
Aerated Influent .....	6.3	5.6	5.1	6.6	8.2	7.4	7.1	6.5	7.6	8.2	8.0	6.1	6.9
<b>Phenolphthalein Alkalinity</b>													
Treated .....	11.6	11.0	10.7	10.9	10.1	10.5	10.8	10.8	10.1	9.6	10.0	11.4	10.6
Settled .....	10.7	10.5	10.2	10.2	9.7	9.5	9.7	9.9	9.3	9.3	9.3	10.1	9.9
Filtered .....	10.5	10.3	10.0	9.9	9.4	9.3	9.6	9.7	9.2	9.2	9.2	10.0	9.7
Effluent .....	10.5	10.1	9.9	9.9	9.3	9.2	9.4	9.6	9.2	9.2	9.3	10.0	9.6
Tap .....	8.0	7.6	7.2	7.1	6.6	6.7	6.9	6.8	7.0	7.0	7.0	7.8	7.1
<b>Color</b>													
Raw .....	12	10	11	14	15	14	13	13	13	13	13	13	13
Effluent .....	6	5	6	7	7	7	7	7	8	7	7	6	7
Tap .....	5	5	6	7	7	7	7	7	8	8	7	6	7
<b>Turbidity</b>													
Raw .....	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Settled .....	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Effluent .....	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
<b>Iron</b>													
Raw .....	.16	.09	.07	.08	.03	.02	.01	.02	.02	.02	.04	.08	0.05
Settled .....	.22	.18	.21	.59	.51	.57	.29	.29	.30	.28	.24	.26	.31
Effluent .....	.01	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00
Tap .....	.02	.02	.01	.01	.01	.00	.00	.00	.00	.01	.01	.01	.01
<b>Manganese</b>													
Raw .....	.09	.03	.01	.02	.02	.01	.02	.01	.01	.03	.08	.10	0.03
Settled .....	.02	.01	.00	.01	.01	.01	.01	.01	.01	.01	.02	.02	.01
Effluent .....	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Tap .....	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00
<b>Fluoride</b>													
Raw .....	0.23	0.18	0.18	0.21	0.24	0.25	0.25	0.19	0.24	0.23	0.23	0.24	0.22
Effluent .....	0.15	0.15	0.15	0.16	0.17	0.19	0.18	0.16	0.18	0.17	0.16	0.18	.17
Tap .....	1.15	1.15	1.11	1.17	1.18	1.17	1.08	1.10	0.94	0.96	0.98	0.97	1.08
<b>Temperature (°F.)</b>													
Air (av. of daily max.)	63	56	46	34	45	46	58	64	75	76	75	68	59
Air (av. of daily min.)	44	34	29	16	25	28	40	46	56	59	57	52	40
Raw water .....	56	52	45	36	35	38	45	50	56	56	57	62	49
Water on filters .....	56	51	43	35	36	39	47	53	59	59	60	62	50
Tap .....	59	58	53	42	38	42	44	49	61	63	63	64	53

\*Parts per million, except pH and Temperature.

**TABLE 12**  
**WATER PURIFICATION WORKS**  
**\*CHEMICAL AND PHYSICAL CHARACTERISTICS OF WATER IN**  
**VARIOUS BROOKS AND RESERVOIRS ON SCITUATE WATERSHED**  
**YEAR ENDED SEPTEMBER 30, 1954**

Monthly Analyses	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
<b>Color</b>													
Coventry Brook	50	30	18	21	31	20	27	27	28	18	12	34	26
Wilbur Brook	60	85	33	33	48	43	74	68	150	66	175	90	77
Westconnaug Res.	40	14	19	16	27	18	18	26	17	12	23	19	21
Barden Reservoir	20	42	34	30	29	20	32	28	23	16	22	58	29
Cork Brook	50	13	14	11	18	14	17	27	12	9	12	13	17
Rush Brook	35	34	22	23	31	22	40	33	68	27	38	56	36
Huntinghouse Brook	20	32	25	22	23	23	31	29	28	22	23	37	26
Harrisdale Brook	20	28	23	21	23	24	30	29	28	27	21	37	26
Blanchard Brook	**	190	80	72	62	68	210	152	370	230	295	256	180
Moswansicut Pond	35	18	18	13	18	17	19	18	90	95	17	32	32
Regulating Reservoir	35	40	27	23	30	23	42	38	70	23	36	63	37
Quonapaug Brook	180	135	63	60	59	62	125	108	240	120	190	248	132
Hemlock Brook	18	45	32	28	24	28	33	27	24	17	22	60	30
Betty Pond Stream	**	32	15	20	12	13	17	16	33	30	28	32	22
Spruce Brook	70	35	29	27	33	34	58	44	43	43	13	62	41
<b>Turbidity</b>													
Coventry Brook	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1
Wilbur Brook	0.0	0.0	0.2	0.1	0.2	0.2	0.1	0.1	0.2	0.4	0.2	0.2	0.1
Westconnaug Res.	0.0	0.0	0.2	0.1	0.1	0.6	0.3	0.1	0.1	0.1	0.1	0.2	0.1
Barden Reservoir	0.2	0.1	0.2	0.2	0.2	0.4	0.1	0.2	0.1	0.3	0.1	0.2	0.2
Cork Brook	0.3	0.0	0.1	0.0	0.1	0.2	0.2	0.0	0.1	0.3	0.1	0.2	0.1
Rush Brook	0.0	0.1	0.1	0.0	0.2	0.3	0.2	0.0	0.3	0.6	0.2	0.1	0.2
Huntinghouse Brook	0.0	0.1	0.0	0.1	0.2	0.4	0.1	0.1	0.1	0.3	0.2	0.1	0.1
Harrisdale Brook	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.0	0.1	0.1	0.1	0.1	0.1
Blanchard Brook	**	0.0	0.1	0.1	0.3	0.1	0.1	0.0	0.1	0.1	0.6	0.0	0.1
Moswansicut Pond	0.1	0.8	0.1	0.1	0.3	0.3	0.2	0.1	0.4	2.5	0.3	0.3	0.4
Regulating Reservoir	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.0	0.2	0.2	0.3	0.2	0.1
Quonapaug Brook	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1
Hemlock Brook	0.2	0.0	0.3	0.1	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.2	0.1
Betty Pond Stream	**	0.1	0.0	0.1	0.0	0.0	0.1	0.2	0.2	0.3	0.1	0.3	0.1
Spruce Brook	0.0	0.0	0.0	0.1	0.2	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.1
<b>Iron</b>													
Coventry Brook	0.05	0.43	0.02	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.05
Wilbur Brook	.09	.80	.08	.07	.04	.04	.18	.15	1.20	.55	1.80	.58	.46
Westconnaug Res.	.10	.80	.03	.04	.03	.02	.03	.04	.22	.17	.21	.10	.15
Barden Reservoir	.05	.70	.09	.08	.02	.12	.06	.07	.09	.09	.17	.14	.14
Cork Brook	.05	.02	.00	.02	.00	.02	.02	.08	.01	.01	.01	.01	.02
Rush Brook	.10	.05	.02	.02	.01	.04	.07	.09	1.18	.80	.70	.55	.30
Huntinghouse Brook	.10	.11	.07	.09	.02	.00	.13	.12	.37	.31	.23	.33	.16
Harrisdale Brook	.10	.10	.06	.09	.02	.10	.13	.14	.36	.32	.20	.20	.15
Blanchard Brook	**	.42	.18	.14	.09	.20	.53	.23	1.20	.97	1.20	.98	.56
Moswansicut Pond	.10	.37	.45	.20	.20	.00	.65	.03	2.10	2.80	.02	.54	.62
Regulating Reservoir	.08	.10	.09	.03	.01	.01	.05	.06	1.15	.65	.65	.53	.28
Quonapaug Brook	.20	.30	.09	.07	.09	.01	.18	.10	1.17	.59	.21	.72	.31
Hemlock Brook	.10	.10	.11	.08	.02	.01	.04	.04	.09	.18	1.05	.14	.16
Betty Pond Stream	**	.20	.01	.17	.01	.01	.07	.08	.35	.42	.04	.05	.13
Spruce Brook	.08	.10	.01	.03	.02	.02	.03	.04	.21	.10	.01	.04	.06
<b>Manganese</b>													
Coventry Brook	0.00	0.00	0.00	0.02	0.07	0.02	0.01	0.00	0.01	0.01	0.00	0.01	0.01
Wilbur Brook	.01	.02	.01	.02	.02	.00	.02	.02	.02	.02	.02	.06	.02
Westconnaug Res.	.00	.00	.00	.02	.00	.00	.04	.04	.01	.01	.00	.02	.01
Barden Reservoir	.00	.04	.03	.04	.02	.00	.04	.02	.02	.01	.01	.15	.03
Cork Brook	.05	.00	.00	.02	.01	.03	.01	.03	.01	.01	.00	.00	.01
Rush Brook	.00	.02	.00	.02	.03	.00	.01	.01	.03	.02	.02	.01	.01
Huntinghouse Brook	.00	.01	.01	.02	.00	.00	.02	.09	.02	.01	.01	.01	.01
Harrisdale Brook	.00	.01	.00	.02	.01	.05	.02	.02	.01	.01	.00	.02	.01
Blanchard Brook	**	.02	.00	.04	.04	.02	.01	.00	.02	.02	.02	.03	.02
Moswansicut Pond	.02	.00	.00	.03	.00	.00	.03	.02	.20	.04	.02	.01	.03
Regulating Reservoir	.01	.01	.02	.01	.06	.01	.01	.01	.01	.02	.01	.01	.01
Quonapaug Brook	.05	.01	.01	.00	.02	.00	.01	.00	.02	.02	.03	.04	.02
Hemlock Brook	.04	.04	.08	.03	.01	.03	.03	.04	.01	.01	.00	.15	.04
Betty Pond Stream	**	.01	.02	.02	.00	.00	.02	.02	.01	.02	.01	.02	.01
Spruce Brook	.06	.01	.00	.00	.01	.01	.01	.01	.01	.01	.00	.02	.01

\*Parts per million.

\*\*No Sample Obtained—Brook Dry.

**Table 12 (Continued)**  
**WATER PURIFICATION WORKS**  
**\*CHEMICAL AND PHYSICAL CHARACTERISTICS OF WATER IN**  
**VARIOUS BROOKS AND RESERVOIRS ON SCITUATE WATERSHED**  
**YEAR ENDED SEPTEMBER 30, 1954**

Monthly Analyses	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
<b>Hydrogen Ion Concentration</b>													
Coventry Brook ....	6.1	5.9	5.9	6.1	6.1	6.1	6.1	6.2	6.2	6.3	6.3	6.1	6.1
Wilbur Brook .....	5.9	5.8	5.8	6.0	6.0	6.0	6.1	6.1	6.1	6.2	6.3	5.8	6.0
Westconnaug Res. ....	6.2	6.2	6.1	6.3	6.3	6.3	6.4	6.3	6.3	6.3	6.5	6.3	6.3
Barden Reservoir .....	6.1	5.7	5.8	6.1	6.1	6.1	6.2	6.3	6.3	6.6	6.5	5.9	6.1
Cork Brook .....	6.2	5.9	6.0	6.3	6.1	6.1	6.3	6.2	6.3	6.8	6.5	6.3	6.2
Rush Brook .....	6.0	5.9	6.0	6.3	6.1	6.1	6.3	6.3	6.1	6.3	6.0	6.1	6.1
Huntinghouse Brook .....	6.7	6.1	6.1	6.3	6.3	6.2	6.3	6.3	6.5	6.7	6.7	6.3	6.4
Harrisdale Brook ....	6.6	6.1	6.1	6.3	6.3	6.3	6.4	6.4	6.5	6.9	6.9	6.3	6.4
Blanchard Brook .....	**	5.7	5.5	5.8	5.9	5.6	5.7	5.7	5.9	6.0	5.9	5.5	5.7
Moswansicut Pond .....	6.0	6.1	6.1	6.2	6.5	6.2	6.4	6.7	6.1	6.5	6.7	6.1	6.3
Regulating Reservoir ..	6.0	6.0	6.0	6.2	6.1	6.1	6.3	6.3	6.0	6.1	6.2	6.1	6.1
Quonapaug Brook ....	5.9	5.8	5.6	5.8	5.8	6.0	5.7	5.7	5.9	6.1	6.0	5.7	5.8
Hemlock Brook .....	6.3	5.8	5.9	6.0	6.1	6.1	6.2	6.3	6.3	6.7	6.5	6.1	6.2
Betty Pond Stream...	**	6.0	5.8	5.9	6.1	6.1	6.2	6.2	5.7	6.0	6.1	5.9	6.0
Spruce Brook .....	6.0	5.8	5.8	6.1	6.0	6.0	6.1	6.2	6.1	6.4	6.6	6.0	6.1
<b>Free CO<sub>2</sub></b>													
Coventry Brook ....	8.0	5.0	4.5	5.0	4.0	4.0	5.0	4.0	3.0	3.0	3.5	5.5	4.5
Wilbur Brook .....	12.0	8.0	7.5	8.0	6.0	5.5	8.5	5.0	7.0	5.0	8.5	11.5	7.7
Westconnaug Res. ....	3.5	2.0	4.5	3.5	3.0	3.5	2.5	4.0	2.5	2.5	2.0	3.0	3.0
Barden Reservoir .....	1.0	5.0	4.0	5.0	4.0	3.5	5.0	3.0	2.0	2.0	2.0	4.5	3.4
Cork Brook .....	1.5	8.5	4.0	4.5	3.0	3.0	3.5	2.0	1.5	1.5	1.5	3.0	3.1
Rush Brook .....	10.5	4.5	5.5	4.5	3.5	3.0	4.5	2.5	7.5	7.5	9.0	8.0	5.9
Huntinghouse Brook .....	2.5	3.0	4.5	5.5	4.0	3.0	4.5	2.5	3.0	2.5	3.0	5.0	3.6
Harrisdale Brook ....	2.5	4.0	4.0	6.0	4.0	2.5	5.0	2.0	2.5	2.5	2.5	5.0	3.5
Blanchard Brook .....	**	13.0	12.5	19.0	8.5	8.5	14.0	8.0	15.0	14.0	10.0	15.5	12.5
Moswansicut Pond .....	9.5	8.0	5.5	5.5	3.5	6.0	6.5	2.0	14.0	6.0	1.5	7.0	6.2
Regulating Reservoir ..	11.0	4.0	5.0	4.5	3.5	3.0	3.5	2.5	8.0	4.5	4.5	6.5	5.0
Quonapaug Brook ....	12.0	10.0	12.0	17.0	9.0	8.5	12.0	6.0	16.0	9.0	14.0	20.0	12.1
Hemlock Brook .....	1.5	5.5	4.5	6.0	4.5	3.0	4.0	5.0	4.0	1.0	1.0	6.0	3.8
Betty Pond Stream...	**	4.0	8.5	21.5	4.0	3.5	5.5	2.5	9.0	5.5	4.0	8.0	6.9
Spruce Brook .....	5.5	6.5	5.0	4.5	5.5	4.5	4.5	3.0	4.0	3.5	1.0	7.0	4.5
<b>Alkalinity</b>													
Coventry Brook ....	4.0	3.5	5.5	4.5	5.0	4.0	4.5	4.5	5.5	6.5	4.5	4.0	4.7
Wilbur Brook .....	5.5	3.5	4.5	4.0	4.0	5.0	5.0	6.0	9.0	7.5	7.5	4.0	5.4
Westconnaug Res. ....	7.0	4.5	4.0	4.5	5.5	5.0	4.5	4.0	5.5	5.0	4.0	4.0	4.8
Barden Reservoir .....	4.0	2.5	3.0	6.0	3.0	4.5	4.0	4.5	4.0	4.5	4.5	3.0	3.9
Cork Brook .....	4.5	4.5	4.0	4.5	3.5	4.0	4.5	4.0	4.5	4.0	4.0	3.5	4.1
Rush Brook .....	8.5	3.5	4.5	4.5	3.5	3.5	5.0	5.0	8.5	8.0	8.0	5.5	5.7
Huntinghouse Brook .....	11.0	5.5	6.5	6.5	5.5	5.5	6.5	7.5	11.0	11.5	10.5	6.5	7.8
Harrisdale Brook ....	10.5	6.0	7.5	7.0	5.5	6.0	6.5	7.0	11.5	11.5	11.0	7.0	8.1
Blanchard Brook .....	**	3.0	3.5	3.5	2.0	3.5	4.0	3.5	4.0	5.0	4.0	3.0	3.5
Moswansicut Pond .....	6.5	10.0	7.5	8.0	7.5	8.0	10.5	5.5	14.5	14.0	6.0	11.5	9.1
Regulating Reservoir ..	9.0	5.0	5.0	5.0	3.5	4.0	5.0	5.0	7.5	7.5	7.5	6.0	5.8
Quonapaug Brook ....	6.0	3.5	4.0	4.0	3.5	5.0	5.0	4.0	9.5	8.0	9.0	3.5	5.4
Hemlock Brook .....	3.5	2.5	4.5	3.0	3.0	4.5	4.5	3.5	5.0	4.5	4.0	3.0	3.8
Betty Pond Stream...	**	6.0	5.5	7.0	4.0	5.0	5.0	4.5	5.0	5.0	4.0	4.0	5.0
Spruce Brook .....	3.0	2.5	7.0	5.0	3.5	4.0	4.5	3.0	4.5	5.0	4.0	3.0	4.1

\*Parts per million, except pH.

\*\*No Sample Obtained—Brook Dry.



**TABLE 13**  
**WATER PURIFICATION WORKS**  
**CHEMICAL AND PHYSICAL CHARACTERISTICS OF WATER IN**  
**VARIOUS PARTS OF THE DISTRIBUTION SYSTEM**  
**YEAR ENDED SEPTEMBER 30, 1954**

Monthly Averages	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
<b>Hydrogen Ion Concentration</b>													
Neutaconkanut Reservoir...	9.4	9.3	9.3	9.3	9.3	9.2	9.2	9.3	9.3	9.3	9.3	9.4	9.3
Wayland Ave., Cranston...	9.4	9.3	9.3	9.4	9.3	9.2	9.3	9.3	9.3	9.3	9.3	9.4	9.3
Westminster St., Olneyville	9.4	9.3	9.3	9.4	9.3	9.2	9.3	9.3	9.3	9.3	9.3	9.4	9.3
Budlong Road, Cranston...	9.4	9.3	9.3	9.4	9.3	9.2	9.3	9.3	9.4	9.3	9.3	9.4	9.3
Reservoir Ave., Cranston...	9.4	9.3	9.3	9.4	9.3	9.2	9.3	9.3	9.3	9.3	9.3	9.4	9.3
Post Road, Warwick.....	9.3	9.3	9.2	9.2	9.2	9.2	9.2	9.2	9.3	9.3	9.3	9.4	9.2
Biltmore Hotel .....	9.4	9.3	9.3	9.4	9.3	9.2	9.3	9.3	9.3	9.3	9.3	9.4	9.3
Crown Hotel .....	9.4	9.3	9.3	9.4	9.3	9.2	9.3	9.3	9.3	9.3	9.3	9.4	9.3
Sewer Maintenance Bldg...	9.6	9.4	9.4	9.5	9.5	9.4	9.5	9.5	9.6	9.4	9.5	9.6	9.5
Longview Reservoir .....	9.4	9.3	9.3	9.3	9.3	9.3	9.2	9.3	9.3	9.3	9.3	9.4	9.3
<b>Phenolphthalein Alkalinity</b>													
Neutaconkanut Reservoir...	8.1	7.6	7.5	7.1	6.8	6.7	6.7	6.8	7.2	7.1	7.1	7.7	7.2
Wayland Ave., Cranston...	8.0	7.6	7.2	7.2	6.7	6.6	6.9	6.8	6.9	7.1	7.1	7.7	7.1
Westminster St., Olneyville	8.1	7.5	7.4	7.1	6.9	6.6	7.1	7.0	7.1	7.2	7.1	7.9	7.2
Budlong Road, Cranston...	8.2	7.6	7.4	7.3	6.8	6.6	7.3	7.1	7.4	7.3	7.4	8.1	7.4
Reservoir Ave., Cranston...	8.2	7.6	7.3	7.3	6.8	6.7	7.3	7.2	7.2	7.0	7.1	7.9	7.3
Post Road, Warwick.....	7.8	7.2	7.1	6.8	6.4	6.6	7.0	6.9	7.3	7.1	7.2	7.9	7.1
Biltmore Hotel .....	8.1	7.7	7.4	7.2	6.9	6.5	7.2	7.2	7.4	7.1	7.3	7.9	7.3
Crown Hotel .....	8.1	7.6	7.4	7.2	7.0	6.7	7.2	7.1	7.4	7.2	7.2	7.8	7.3
Sewer Maintenance Bldg...	10.3	9.1	9.0	8.7	8.4	8.4	9.0	9.1	9.6	9.2	9.0	9.6	9.1
Longview Reservoir .....	8.5	8.0	7.8	7.2	6.9	6.9	6.8	6.9	7.3	7.3	7.3	8.0	7.4
<b>Methyl Orange Alkalinity</b>													
Neutaconkanut Reservoir...	16.3	14.9	14.3	13.6	13.0	12.9	13.3	13.6	13.8	13.8	14.0	15.0	14.0
Wayland Ave., Cranston...	15.9	14.7	13.9	13.6	13.0	12.8	13.6	13.5	13.5	13.8	14.0	15.0	13.9
Westminster St., Olneyville	16.1	14.4	14.0	13.8	13.2	12.9	14.0	13.6	13.5	14.0	14.1	15.2	14.1
Budlong Road, Cranston...	16.2	14.6	14.0	13.8	13.0	12.9	14.0	13.8	13.8	14.2	14.4	15.3	14.2
Reservoir Ave., Cranston...	16.3	14.5	13.9	13.8	13.1	12.9	14.0	13.8	13.6	13.8	14.0	15.2	14.1
Post Road, Warwick.....	16.0	14.1	13.8	13.2	12.6	12.6	13.6	13.6	13.7	13.6	14.0	15.1	13.8
Biltmore Hotel .....	16.2	14.6	14.1	13.7	13.1	12.8	13.9	13.6	13.8	13.8	14.1	15.2	14.1
Crown Hotel .....	16.1	14.5	14.0	13.7	13.3	12.8	13.8	13.5	13.8	13.8	14.1	15.2	14.0
Sewer Maintenance Bldg...	18.6	16.7	15.7	15.5	14.5	14.8	15.2	16.1	16.3	16.2	16.4	17.4	16.1
Longview Reservoir .....	16.9	15.5	14.6	14.3	13.6	13.4	13.6	13.8	14.1	14.2	14.3	15.6	14.5
<b>Color</b>													
Neutaconkanut Reservoir...	5	5	5	7	7	6	7	7	7	7	7	6	6
Wayland Ave., Cranston...	5	5	6	6	6	6	7	7	7	7	7	6	6
Westminster St., Olneyville	5	5	6	6	6	6	7	6	7	7	7	6	6
Budlong Road, Cranston...	5	5	6	6	6	7	7	7	7	7	7	6	6
Reservoir Ave., Cranston...	5	5	5	6	6	6	7	6	7	7	7	6	6
Post Road, Warwick.....	5	5	5	6	6	7	7	7	7	7	8	6	6
Biltmore Hotel .....	5	5	5	6	6	6	7	7	7	7	7	6	6
Crown Hotel .....	6	5	5	6	6	6	7	7	7	7	7	6	6
Sewer Maintenance Bldg...	5	5	5	6	6	6	7	7	7	7	7	6	6
Longview Reservoir .....	5	5	5	5	6	6	7	7	7	7	7	6	6
<b>Iron</b>													
Neutaconkanut Reservoir...	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wayland Ave., Cranston...	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
Westminster St., Olneyville	.00	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
Budlong Road, Cranston...	.03	.03	.01	.02	.00	.03	.00	.00	.00	.00	.00	.00	.01
Reservoir Ave., Cranston...	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
Post Road, Warwick.....	.01	.02	.01	.01	.01	.03	.01	.00	.01	.01	.02	.01	.01
Biltmore Hotel .....	.01	.01	.00	.01	.01	.00	.00	.00	.00	.00	.00	.01	.00
Crown Hotel .....	.02	.02	.01	.01	.01	.01	.01	.00	.01	.02	.00	.02	.01
Sewer Maintenance Bldg...	.01	.01	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
Longview Reservoir .....	.01	.02	.01	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00

TABLE 13 (Continued)

## WATER PURIFICATION WORKS

CHEMICAL AND PHYSICAL CHARACTERISTICS OF WATER IN  
VARIOUS PARTS OF THE DISTRIBUTION SYSTEM

YEAR ENDED SEPTEMBER 30, 1954

Monthly Averages	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
<b>Chlorides</b>													
Neutaconkanut Reservoir..	3.4	3.2	2.7	2.7	2.4	2.5	2.4	2.5	2.4	2.7	2.5	2.7	2.7
Wayland Ave., Cranston...	3.3	3.1	2.7	2.6	2.3	2.5	2.4	2.5	2.4	2.5	2.4	2.7	2.6
Westminster St., Olneyville	3.3	3.2	2.8	2.6	2.4	2.4	2.3	2.4	2.5	2.6	2.5	2.6	2.6
Budlong Road, Cranston...	3.3	3.1	2.7	2.6	2.2	2.3	2.4	2.5	2.5	2.6	2.5	2.7	2.6
Reservoir Ave., Cranston...	3.2	3.1	2.7	2.6	2.3	2.4	2.3	2.6	2.5	2.7	2.6	2.6	2.6
Post Road, Warwick.....	3.4	3.1	2.8	2.5	2.3	2.4	2.3	2.4	2.5	2.7	2.5	2.6	2.6
Biltmore Hotel .....	3.2	3.1	2.9	2.5	2.4	2.4	2.3	2.5	2.5	2.7	2.5	2.7	2.6
Crown Hotel .....	3.3	3.1	2.8	2.6	2.3	2.4	2.5	2.4	2.5	2.6	2.5	2.6	2.6
Sewer Maintenance Bldg...	3.3	3.1	2.6	2.5	2.4	2.3	2.3	2.5	2.5	2.7	2.6	2.7	2.6
Longview Reservoir .....	3.3	3.1	2.7	2.6	2.4	2.4	2.6	2.4	2.6	2.9	2.5	2.7	2.7
<b>Nitrites</b>													
Neutaconkanut Reservoir..	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Wayland Ave., Cranston...	.001	.000	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001
Westminster St., Olneyville	.001	.001	.003	.001	.002	.002	.001	.001	.001	.001	.001	.001	.001
Budlong Road, Cranston...	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001
Reservoir Ave., Cranston...	.001	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001
Post Road, Warwick.....	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001
Biltmore Hotel .....	.001	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001
Crown Hotel .....	.001	.000	.000	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001
Sewer Maintenance Bldg...	.001	.000	.000	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001
Longview Reservoir .....	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.002	.002	.001
<b>Taste</b>													
Neutaconkanut Reservoir..	0	0	0	0	0	0	0	0	0	0	0	0	0
Wayland Ave., Cranston...	0	0	0	0	0	0	0	0	0	0	0	0	0
Westminster St., Olneyville	0	0	0	0	0	0	0	0	0	0	0	0	0
Budlong Road, Cranston...	0	0	0	0	0	0	0	0	0	0	0	0	0
Reservoir Ave., Cranston...	0	0	0	0	0	0	0	0	0	0	0	0	0
Post Road, Warwick.....	0	0	0	0	0	0	0	0	0	0	0	0	0
Biltmore Hotel .....	0	0	0	0	0	0	0	0	0	0	0	0	0
Crown Hotel .....	0	0	0	0	0	0	0	0	0	0	0	0	0
Sewer Maintenance Bldg...	0	0	0	0	0	0	0	0	0	0	0	0	0
Longview Reservoir .....	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Odor</b>													
Neutaconkanut Reservoir..	0	0	0	0	0	0	0	0	0	0	0	0	0
Wayland Ave., Cranston...	0	0	0	0	0	0	0	0	0	0	0	0	0
Westminster St., Olneyville	0	0	0	0	0	0	0	0	0	0	0	0	0
Budlong Road, Cranston...	0	0	0	0	0	0	0	0	0	0	0	0	0
Reservoir Ave., Cranston...	0	0	0	0	0	0	0	0	0	0	0	0	0
Post Road, Warwick.....	0	0	0	0	0	0	0	0	0	0	0	0	0
Biltmore Hotel .....	0	0	0	0	0	0	0	0	0	0	0	0	0
Crown Hotel .....	0	0	0	0	0	0	0	0	0	0	0	0	0
Sewer Maintenance Bldg...	0	0	0	0	0	0	0	0	0	0	0	0	0
Longview Reservoir .....	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Fluoride</b>													
Neutaconkanut Reservoir..	1.08	1.14	1.05	1.10	1.17	1.16	1.11	1.09	1.00	0.93	0.96	0.93	1.07
Wayland Ave., Cranston...	1.13	1.05	1.02	1.15	1.19	1.15	1.05	1.11	.93	.94	.96	.94	1.05
Westminster St., Olneyville	1.12	1.15	1.03	1.18	1.17	1.16	1.14	1.10	.95	.99	.99	.96	1.08
Budlong Road, Cranston...	1.12	1.05	0.99	1.12	1.19	1.16	1.01	1.14	.97	.96	1.00	.95	1.05
Reservoir Ave., Cranston...	1.13	1.14	1.02	1.18	1.19	1.16	1.05	1.10	.98	.95	.98	.92	1.07
Post Road, Warwick.....	1.13	1.18	1.07	1.15	1.19	1.15	1.10	1.13	.97	.96	.97	.97	1.08
Biltmore Hotel .....	1.15	1.17	1.14	1.17	1.19	1.21	1.08	1.11	.96	.97	.98	.95	1.09
Crown Hotel .....	1.15	1.16	1.08	1.17	1.17	1.18	1.09	1.11	.96	.97	.99	.96	1.08
Sewer Maintenance Bldg...	1.15	1.15	1.13	1.16	1.18	1.17	1.03	1.09	.95	.98	.99	.96	1.08
Longview Reservoir .....	1.07	1.12	1.06	1.08	1.14	1.15	1.03	1.08	1.04	.89	.95	.93	1.04

**TABLE 14**

**WATER PURIFICATION WORKS**  
**BACTERIOLOGICAL EXAMINATION OF WATER IN**  
**PROCESS OF FILTRATION**  
**YEAR ENDED SEPTEMBER 30, 1954**

1953-1954	BACTERIA per ml. (48 HOURS ON AGAR AT 20°C.)											
	Raw Water			Settled Water			Filtered Water			Tap Water		
	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
Oct. ....	87	0	20	850	0	211	160	0	40	0	0	0
Nov. ....	200	0	25	1300	0	401	190	0	69	1	0	0
Dec. ....	160	0	17	1100	0	211	110	0	25	0	0	0
Jan. ....	20	0	8	500	0	124	160	0	44	10	0	1
Feb. ....	12	0	5	1800	0	223	310	0	56	25	0	1
Mar. ....	9	0	3	350	0	66	350	0	34	7	0	1
Apr. ....	15	1	5	620	0	263	320	0	80	60	0	7
May ....	45	1	10	2000	0	379	50	0	15	6	0	0
June ....	70	1	12	1500	0	163	58	0	9	20	0	1
July ....	150	0	20	140	0	55	110	0	23	50	0	3
Aug. ....	50	1	16	250	5	63	47	0	8	7	0	1
Sept. ....	505	6	47	210	8	83	65	0	18	22	0	4
For Year .....	505	0	16	2000	0	187	350	0	35	60	0	1

**TABLE 15**  
**WATER PURIFICATION WORKS**  
**BACTERIOLOGICAL EXAMINATION OF WATER IN**  
**PROCESS OF FILTRATION**  
**YEAR ENDED SEPTEMBER 30, 1954**

1953-1954	BACTERIA per ml. (24 HOURS ON AGAR AT 37°C.)											
	Raw Water			Settled Water			Filtered Water			Tap Water		
	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
Oct. ....	250	0	11	10	0	1	50	0	2	220	0	8
Nov. ....	100	0	7	500	0	29	85	0	4	160	0	10
Dec. ....	40	0	3	650	0	31	80	0	3	1	0	0
Jan. ....	250	0	12	70	0	4	1	0	0	3	0	0
Feb. ....	170	0	10	500	0	32	250	0	11	35	0	2
Mar. ....	60	0	5	28	0	2	60	0	3	120	0	4
Apr. ....	25	0	2	25	0	2	40	0	2	4	0	0
May ....	280	0	15	250	0	29	160	0	15	35	0	3
June ....	45	0	7	40	0	4	1	0	0	45	0	4
July ....	130	0	16	70	0	8	300	0	24	17	0	1
Aug. ....	1400	1	75	120	0	17	40	0	3	70	0	4
Sept. ....	100	0	21	450	0	33	20	0	2	120	0	7
For Year .....	1400	0	15	650	0	16	300	0	6	220	0	3

**TABLE 16**  
**WATER PURIFICATION WORKS**  
**BACTERIOLOGICAL EXAMINATION OF WATER IN**  
**PROCESS OF FILTRATION**  
**YEAR ENDED SEPTEMBER 30, 1954**

1953-1954	B. COLI											
	Raw Water			Settled Water			Filtered Water			Tap Water		
	No. of 10 ml. Portions Tested	No. of Tests Confirmed	Index per ml.	No. of 10 ml. Portions Tested	No. of Tests Confirmed	Index per ml.	No. of 10 ml. Portions Tested	No. of Tests Confirmed	Index per ml.	No. of 10 ml. Portions Tested	No. of Tests Confirmed	Index per ml.
Oct. ....	52	22	.042	52	0	.000	52	0	.000	130	0	.000
Nov. ....	46	40	.087	46	2	.004	46	0	.000	115	0	.000
Dec. ....	52	39	.075	52	0	.000	52	0	.000	130	0	.000
Jan. ....	50	20	.040	50	0	.000	50	0	.000	125	0	.000
Feb. ....	46	4	.009	46	0	.000	46	0	.000	115	0	.000
Mar. ....	54	6	.011	54	0	.000	54	0	.000	135	0	.000
Apr. ....	52	2	.004	52	0	.000	52	0	.000	130	0	.000
May ....	48	2	.004	48	3	.006	48	0	.000	120	0	.000
June ....	52	0	.000	52	1	.002	52	0	.000	130	0	.000
July ....	52	0	.000	52	0	.000	50	0	.000	130	0	.000
Aug. ....	50	0	.000	50	3	.006	50	0	.000	125	0	.000
Sept. ....	50	29	.058	50	3	.006	50	0	.000	125	0	.000
For Year .....	604	164	.027	604	12	.002	602	0	.000	1510	0	.000

**TABLE 17**  
**WATER PURIFICATION WORKS**  
**BACTERIOLOGICAL EXAMINATION OF WATER IN VARIOUS**  
**BROOKS AND RESERVOIRS ON SCITUATE WATERSHED**  
**YEAR ENDED SEPTEMBER 30, 1954**

Monthly Analyses	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
<b>Bacteria Per Ml. 48 Hours on Agar at 20°C</b>													
Coventry Brook .....	8000	70	70	12	45	23	170	180	600	500	1700	200	964
Wilbur Brook .....	11,000	220	30	28	140	160	220	770	2000	450	1500	900	1451
Westconnaug Res. ....	7500	150	110	4	240	40	130	23	170	230	90	300	750
Barden Reservoir .....	300	80	60	45	90	45	65	27	65	55	120	100	88
Cork Brook .....	12,000	40	40	70	110	12	60	30	17	95	300	80	1071
Rush Brook .....	9000	270	18	55	130	35	130	520	800	80	2200	1000	1186
Huntinghouse Brook .....	17	470	220	190	3000	280	80	250	240	200	290	600	486
Harrisdale Brook .....	40	310	130	7	1800	270	80	60	220	170	250	100	286
Blanchard Brook .....	**	360	50	10	300	40	55	90	750	340	1200	500	336
Moswansicut Pond .....	18,000	180	15	17	50	110	30	40	260	1200	700	300	1742
Regulating Reservoir .....	10,000	220	70	35	110	30	190	410	190	900	1400	1000	1213
Quonapaug Brook .....	12,000	175	120	10	200	140	260	370	2500	1100	10,000	2000	2406
Hemlock Brook .....	750	190	90	40	250	20	35	55	70	260	150	100	167
Betty Pond Stream .....	**	220	130	9	380	230	35	350	600	750	3800	200	609
Spruce Brook .....	7000	90	140	20	40	60	180	450	500	800	320	500	842
<b>Bacteria Per Ml. 24 Hours on Agar at 37°C</b>													
Coventry Brook .....	130	37	12	8	8	10	50	28	90	160	210	300	87
Wilbur Brook .....	750	15	7	50	10	12	22	280	450	300	300	600	233
Westconnaug Res. ....	200	12	3	3	9	6	45	1	70	70	50	450	76
Barden Reservoir .....	350	45	5	11	14	5	19	7	45	30	70	60	55
Cork Brook .....	55	12	2	4	5	8	7	5	35	110	80	40	30
Rush Brook .....	1100	50	3	3	15	4	18	50	250	160	350	350	196
Huntinghouse Brook .....	9	42	13	4	7	9	10	37	290	70	130	30	54
Harrisdale Brook .....	12	25	7	10	1	6	9	10	130	190	160	150	59
Blanchard Brook .....	**	17	5	12	9	4	25	140	350	750	7000	40	759
Moswansicut Pond .....	1600	40	2	2	1	4	3	4	250	260	250	250	222
Regulating Reservoir .....	1800	35	2	9	7	5	200	4	260	220	750	900	349
Quonapaug Brook .....	950	18	4	3	14	3	30	15	900	280	1500	500	351
Hemlock Brook .....	800	10	13	4	4	8	3	9	45	70	30	80	90
Betty Pond Stream .....	**	27	5	6	20	10	6	60	230	450	1350	200	215
Spruce Brook .....	420	40	9	7	0	30	20	30	80	140	45	70	74
<b>B. Coli</b>													
<b>Index Per 100 Ml.</b>													
Coventry Brook .....	110†	25	0	13	6	0	6	0	70	110†	70	110†	.....
Wilbur Brook .....	110†	70	0	0	25	6	6	13	25	6	70	110†	.....
Westconnaug Res. ....	110†	25	0	0	70	0	13	6	110†	0	0	70	.....
Barden Reservoir .....	25	110†	6	25	6	70	6	0	25	6	0	25	.....
Cork Brook .....	70	70	6	25	6	0	25	0	0	0	0	0	.....
Rush Brook .....	110†	110†	6	6	6	0	25	25	25	70	110†	110†	.....
Huntinghouse Brook .....	70	110†	110†	13	110†	70	25	25	70	110†	70	70	.....
Harrisdale Brook .....	25	110†	70	13	13	0	25	70	0	13	70	70	.....
Blanchard Brook .....	**	25	110†	6	25	13	0	6	13	110†	110†	25	.....
Moswansicut Pond .....	110†	110†	70	6	0	0	6	25	6	70	25	70	.....
Regulating Reservoir .....	110†	110†	25	25	13	0	25	25	70	110†	13	110†	.....
Quonapaug Brook .....	110†	70	6	6	25	70	13	6	**	110†	110†	110†	.....
Hemlock Brook .....	25	70	0	70	70	0	6	0	110†	0	6	6	.....
Betty Pond Stream .....	**	70	0	0	13	0	0	0	25	13	25	70	.....
Spruce Brook .....	110†	13	6	0	0	0	6	25	25	110†	13	110†	.....

†Indicates Index of 110+  
 \*\*No Sample Obtained—Brook Dry.

**TABLE 18**  
**WATER PURIFICATION WORKS**  
**BACTERIOLOGICAL EXAMINATION OF WATER IN**  
**VARIOUS PARTS OF THE DISTRIBUTION SYSTEM**  
**YEAR ENDED SEPTEMBER 30, 1954**

Monthly Averages	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
<b>Bacteria Per Ml. 48 Hours on Agar at 20°C</b>													
Neutaconkanut Reservoir..	0	1	0	0	0	1	2	0	0	0	0	0	0
Wayland Ave., Cranston...	0	0	0	0	0	0	0	1	0	1	0	0	0
Westminster St., Olneyville	0	0	0	0	2	0	6	0	1	0	0	0	1
Budlong Road, Cranston...	4	0	1	22	1	0	2	0	0	0	0	0	2
Reservoir Ave., Cranston...	0	0	0	0	0	0	4	0	0	2	0	3	1
Post Road, Warwick.....	2	0	1	0	0	0	3	3	0	1	9	0	1
Biltmore Hotel .....	1	0	1	0	0	0	8	0	0	0	0	0	1
Crown Hotel .....	0	0	0	0	0	0	2	0	0	0	0	0	0
Sewer Maintenance Bldg...	1	0	167	1	0	0	5	1	0	1	0	0	15
Longview Reservoir .....	0	0	7	0	0	0	4	1	1	10	0	2	2
<b>Bacteria Per Ml. 24 Hours on Agar at 37°C</b>													
Neutaconkanut Reservoir..	0	3	2	2	1	5	0	0	1	1	3	3	2
Wayland Ave., Cranston...	19	0	0	0	0	10	1	13	0	0	1	0	4
Westminster St., Olneyville	0	1	0	4	0	0	0	8	2	3	0	3	2
Budlong Road, Cranston...	0	0	0	6	0	0	8	16	1	0	3	2	3
Reservoir Ave., Cranston...	6	0	3	3	0	0	0	0	0	3	4	6	2
Post Road, Warwick.....	1	1	2	10	5	4	4	1	0	4	3	0	3
Biltmore Hotel .....	1	2	6	8	84	9	3	2	0	0	2	0	10
Crown Hotel .....	1	1	9	2	0	10	11	5	1	2	1	0	3
Sewer Maintenance Bldg...	3	28	174	0	0	0	3	25	2	5	6	1	20
Longview Reservoir .....	0	3	0	2	0	2	1	2	2	15	7	1	3
<b>B. Coli Index Per Ml.</b>													
Neutaconkanut Reservoir..	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Wayland Ave., Cranston...	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Westminster St., Olneyville	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Budlong Road, Cranston...	.000	.000	.000	.000	.001	.000	.000	.000	.000	.000	.000	.000	.000
Reservoir Ave., Cranston...	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Post Road, Warwick.....	.000	.002	.000	.000	.002	.000	.005	.000	.000	.000	.001	.000	.001
Biltmore Hotel .....	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000
Crown Hotel .....	.000	.000	.000	.005	.000	.000	.000	.000	.000	.000	.000	.001	.000
Sewer Maintenance Bldg...	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Longview Reservoir .....	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000

**TABLE 19**  
**WATER PURIFICATION WORKS**  
**MINERAL ANALYSIS OF WATER—YEAR ENDED SEPT. 30, 1954**

Parts per Million	RAW WATER*					TAP WATER						
	1954				Avg.	1954				Avg.		
	1953 Oct.- Dec.	Jan.- Mar.	Apr.- June	July- Sept.		1953 Oct.- Dec.	Jan.- Mar.	Apr.- June	July- Sept.			
Aluminum.....	0.00	0.01	0.01	0.01	0.01	0.02	0.04	0.04	0.06	0.04		
Arsenic.....	0.00	.....	0.00	.....	0.00	0.00	.....	0.00	.....	0.00		
Calcium.....	2.43	3.08	2.87	3.13	2.88	6.70	9.71	8.98	9.97	8.84		
Chloride.....	2.73	2.50	2.03	2.20	2.36	2.73	2.47	2.47	2.63	2.56		
Copper.....	0.01	0.05	0.04	0.03	0.03	0.00	0.01	0.02	0.01	0.01		
Fluoride.....	0.20	0.23	0.23	0.23	0.22	1.14	1.17	1.04	0.97	1.08		
Hardness.....	10	10	9	9	9	28	28	27	28	28		
Iron.....	0.11	0.04	0.02	0.05	0.05	0.02	0.01	0.00	0.01	0.01		
Lead.....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Magnesium.....	0.76	0.74	0.60	0.70	0.70	0.66	0.74	0.60	0.50	0.62		
Manganese.....	0.04	0.02	0.01	0.07	0.03	0.00	0.00	0.00	0.01	0.00		
Phenolic Compounds ..	0.00	.....	.....	0.00	0.00	0.00	.....	.....	0.00	0.00		
Selenium.....	.....	0.0	.....	0.0	0.0	.....	0.0	.....	0.0	0.0		
Silica.....	3.50	5.00	4.50	5.00	4.50	3.50	4.50	4.50	5.00	4.37		
Sulphate.....	.....	6.94	.....	6.58	6.76	....	13.25	....	11.80	12.52		
Total Solids.....	28	27	34	30	30	41	47	56	54	50		
Loss On Ignition.....	15	14	20	21	18	16	17	30	28	23		
Total Alkalinity.....	4.53	4.13	3.90	4.13	4.17	14.93	13.17	13.57	14.23	13.97		
Phenolphthalein Alk. .	0.00	0.00	0.00	0.00	0.00	7.60	6.80	6.90	7.27	7.14		
Zinc.....	.....	0.0	.....	0.0	0.0	.....	0.0	.....	0.0	0.0		

\*Water from bottom of Scituate Reservoir as received at Purification Works.



TABLE 20

## WATER PURIFICATION WORKS

SANITARY CHEMICAL ANALYSIS (P.P.M.)—YEAR ENDED SEPT. 30, 1954

RAW WATER*											TAP WATER						
1953- 1954	Ammonia			Nitrites		Nitrates		Chlorides		Dissolved Oxygen			Total Solids	Loss on Ignition	1953- 1954		
	Free	Alb.	%	P.P.M.	% Sat.	P.P.M.	% Sat.	%	P.P.M.	%	P.P.M.	% Sat.					
Oct.	0.120	0.068	0.000	0.05	2.9	12.6	9.5	90.3	2.9	2.6	12.6	9.5	90.3	31	16	Oct.	
Nov.	0.020	0.056	0.001	0.07	2.5	10.5	10.5	91.7	2.5	2.4	12.8	94.8	91.7	31	18	Nov.	
Dec.	0.050	0.040	0.001	0.05	2.8	10.9	10.9	92.2	2.8	2.3	12.0	97.6	92.2	25	15	Dec.	
Jan.	0.030	0.046	0.001	0.02	2.5	..	..	..	2.5	2.6	12.0	97.6	92.2	29	14	Jan.	
Feb.	0.024	0.068	0.001	0.03	2.6	12.6	12.6	91.0	2.6	2.3	12.0	97.6	91.0	26	13	Feb.	
Mar.	0.012	0.072	0.000	0.02	2.4	12.8	12.8	94.8	2.4	2.4	12.8	94.8	94.8	27	15	Mar.	
Apr.	0.017	0.060	0.001	0.04	2.3	12.0	12.0	97.6	2.3	2.4	12.8	94.8	97.6	32	21	Apr.	
May	0.022	0.048	0.000	0.03	1.9	9.1	9.1	85.3	1.9	2.5	12.0	97.6	85.3	41	20	May	
June	..	..	0.001	0.01	1.9	7.3	7.3	67.4	1.9	2.5	12.0	97.6	67.4	30	18	June	
July	0.048	0.068	0.001	0.07	2.1	6.5	6.5	61.8	2.1	2.7	12.0	97.6	61.8	28	17	July	
Aug.	0.040	0.080	0.000	0.03	2.1	4.8	4.8	45.3	2.1	2.7	12.0	97.6	45.3	31	24	Aug.	
Sept.	0.036	0.100	0.000	0.02	2.4	8.1	8.1	83.0	2.4	2.7	12.0	97.6	83.0	30	22	Sept.	
Avg.	0.038	0.064	0.000	0.04	2.4	9.5	9.5	81.8	2.4	2.6	12.0	97.6	81.8	30	18	Avg.	

\*Water from bottom of Scituate Reservoir as received at Purification Works.

TABLE 21

## WATER PURIFICATION WORKS

LABORATORY EXAMINATIONS MADE DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1954

	SOURCE OF WATER TESTED	Frequency of Test or Examination	Number of Tests or Analyses Made During the Fiscal Year						
			Chemical	Bacteriological	Microscopical	Sanitary Chemical	Mineral	Miscellaneous	Total
I	BROOKS AND STREAMS ON WATERSHED Eleven Brooks and Two Streams.....	Monthly.....	1,071	1,284	..	..	..	..	2,355
II	SMALLER STORAGE RESERVOIRS ON WATERSHED Regulating Reservoir..... Westconaug Reservoir..... Barden Reservoir..... Moswansicut Pond.....	Monthly..... Monthly..... Monthly..... Monthly.....	84 84 84 84	103 96 93 97	.. .. .. ..	.. .. .. ..	.. .. .. ..	.. .. .. ..	187 180 177 181
III	SCITUATE RESERVOIR Surface Water..... Subsurface Water (See Purif. Wks.—Raw Water).....	Bi-Weekly..... ..... .....	208 .. ..	.. .. ..	26 .. ..	155 .. ..	.. .. ..	.. .. ..	389 .. ..
IV	PAWTUCKET RIVER—BELOW SCITUATE DAM Scituate Dam Meter Chamber..... Fiskeville, K. I..... Twelve other locations on Pawtucket River.....	Bi-Weekly..... Bi-Weekly..... Bi-Weekly..... .....	182 182 2,340 ..	.. .. .. ..	.. .. .. ..	155 155 2,112 ..	.. .. .. ..	.. .. .. ..	337 337 4,452 ..
V	WATER PURIFICATION WORKS Raw Water (from Bottom of Scit. Res.)..... Raw Water (from Bottom of Scit. Res.)..... Raw Water (from Bottom of Scit. Res.)..... ***Raw Water (from Bottom of Scit. Res.)..... Aerated Influent..... Mixer..... Settled..... Settled..... Settled..... Filtered..... Filtered..... Unchlorinated Effluent..... Unchlorinated Effluent..... Unchlorinated Effluent..... Chlorinated Effluent..... Raw Water (from Bottom of Scituate Reservoir)..... Unchlorinated Effluent.....	Daily..... Weekly..... Monthly..... Every 13 weeks..... Daily..... Daily..... Daily..... Weekly..... Monthly..... Daily..... Daily..... Daily..... Weekly..... Monthly..... Daily..... Daily at 3:00 P.M. Daily at 3:00 P.M.	3,306 .. .. .. 714 1,980 2,798 .. .. 1,071 3,138 .. .. 1,494 992 968	1,380 .. .. .. .. .. 1,226 .. .. .. 1,206 .. .. 1,742 1,096 971	.. 26 .. .. .. .. 26 .. .. .. .. 26 .. .. .. .. ..	1,424 52* 68** .. .. .. 52* 45** .. 45** 1,420 52* 23** 1,245 992 968	.. .. 34 .. .. .. .. .. .. .. .. .. .. .. .. .. ..	.. .. .. .. .. .. .. .. .. .. .. .. .. .. .. .. ..	6,110 78 68 34 714 1,980 4,024 78 45 1,071 45 5,764 78 23 4,481 3,080 2,907

Table 21 (Continued)

## WATER PURIFICATION WORKS

LABORATORY EXAMINATIONS MADE DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1954

SOURCE OF WATER TESTED		Frequency of Test or Examination	Number of Tests or Analyses Made During the Fiscal Year						
			Chemical	Bacteriological	Microscopical	Sanitary Chemical	Mineral	Miscellaneous	Total
VI	NEUTACONKANUT DISTRIBUTION RESERVOIR								
	Sample from nearby Tap.....	Daily.....	1,482	1,727	26	988	..	..	4,197
	Sample from nearby Tap.....	Bi-Weekly.....	..	..	..	..	..	..	26
VII	LONGVIEW DISTRIBUTION RESERVOIR								
	Sample from nearby Tap.....	Daily.....	1,488	1,730	26	992	..	..	4,210
	Sample from nearby Tap.....	Bi-Weekly.....	..	..	..	..	..	..	26
VIII	DISTRIBUTION SYSTEM								
	Water Supply Board Building Tap Water.....	Daily.....	2,413	2,114	26	906	..	..	5,433
	Water Supply Board Building Tap Water.....	Bi-Weekly.....	..	..	..	..	..	..	26
	Water Supply Board Building Tap Water.....	Monthly.....	..	..	..	78**	..	..	78
	***Water Supply Board Building Tap Water.....	Every 13 Weeks.....	..	..	..	..	34	..	34
	****Sectional Tests.....	Monthly.....	528	384	..	288	..	..	1,200
	Consumers' Complaints (61 during the year).....	..	625	183	..	282	..	..	1,090
	Sterilization of Newly Laid Mains.....	..	..	1,336	..	261	..	..	1,597
	†Sectional Tests.....	Daily.....	10,396	12,114	..	6,931	..	..	29,441
IX	MISCELLANEOUS TESTS								
	Coagulation Tests to Determine Chemical Dosages.....	..	..	..	..	..	..	555	555
	Analysis of Ferri-Floc used for Treatment.....	..	..	..	..	..	..	44	44
	Analysis of Quicklime used for Treatment.....	..	..	..	..	..	..	48	48
	Analysis of Sodium Silicofluoride used for Treatment.....	..	..	..	..	..	..	5	5
	Samples from Plant Filters.....	Daily.....	7,212	9,273	..	7,104	..	2,600	26,189
	Water, Filter Sand and Other Materials.....	..	300	1,113	..	348	..	371	2,132
	Totals.....	..	45,224	39,268	182	27,141	68	3,623	115,506

\*For Oxygen Consumed only.

\*\*Exclusive of Oxygen Consumed.

\*\*\*Composite of 13 Weekly Samples.

\*\*\*\*Samples from 8 Random Dwellings (location changed monthly).

†Samples from seven fixed locations.

**TABLE 22**  
**WATER DISTRIBUTION SYSTEM**  
**NEUTACONKANUT HIGH SERVICE PUMPING STATION**  
**OPERATING STATISTICS FOR YEAR ENDED SEPTEMBER 30, 1954**

1953- 1954	ELECTRICALLY-DRIVEN PUMPS										GASOLINE ENGINE-DRIVEN PUMP										Total Water Pumped Mil. Gals.	Fuel Oil Used For Heat- ing Gals.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
	No. 1—10" Pump 2700 GPM. TDH 90'					No. 2—12" Pump 3800 GPM. TDH 104'					Power Used*					No. 3—16" Pump 7500 GPM. TDH 80'																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Operated					Operated					Water Pumped					Operated							Gasoline Used					Oil Used																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	Days					Hours and Minutes					Mil. Gals.					Days							Hours and Minutes					Mil. Gals.					Days					Hours and Minutes					Mil. Gals.					Days					Hours and Minutes					Mil. Gals.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

\*Naragansett Electric Co. Power Rate G  
†Engine Test Run.

**TABLE 23**  
**WATER DISTRIBUTION SYSTEM**  
**BATH STREET HIGH SERVICE PUMPING STATION**  
**OPERATING STATISTICS FOR YEAR ENDED SEPTEMBER 30, 1934**

1933-1934	ELECTRICALLY-DRIVEN PUMPS										GASOLINE ENGINE-DRIVEN PUMPS										TOTAL WATER PUMPED		Fuel Oil Used for Heating — Gals.				
	Pump No. 1 2000 GPM. TDH 98'					Pump No. 2 2000 GPM. TDH 98'					Power Used*					Pump No. 3 2000 GPM. TDH 98'; 150 HP Sterling Engine					Pump No. 4 2000 GPM. TDH 98'; 150 HP Sterling Engine					Mil. Gals.	
	Operated					Operated					KWH	Cost	Operated					Operated									
	Water Pumped					Water Pumped							Hours and Minutes					Hours and Minutes									
	Days	Hours and Minutes	Mil. Gals.	Water Pumped	Days	Hours and Minutes	Mil. Gals.	Water Pumped	Days	Hours and Minutes			Mil. Gals.	Gaso-line Used — Gals.	Oil Used — Qts.	Days	Hours and Minutes	Mil. Gals.	Gaso-line Used — Gals.	Oil Used — Qts.	For Month	Avg. per Day					
Oct. . . . .	29	316-30	43.46	0	0	0	0	0	0	0	18,900	\$386.51	8-00	1.04	60	4.0	4	8-00	0.95	60	4.0	45.45	1.47	0			
Nov. . . . .	23	267-00	37.08	1	5-45	0.81	11,400	280.35	3	6-00	0.79	45	3.0	4	8-00	0.75	59	4.0	4	8-00	39.43	1.31	80				
Dec. . . . .	31	590-00	82.76	0	0	0	29,850	517.21	5	9-15	1.28	69	4.5	5	9-15	1.17	69	4.5	5	9-15	85.21	2.75	140				
Jan. . . . .	31	595-15	83.39	0	0	0	35,700	587.42	4	8-00	1.10	60	4.0	4	8-00	1.02	60	4.0	4	8-00	85.51	2.76	526				
Feb. . . . .	28	548-00	76.65	0	0	0	32,050	556.61	4	8-00	1.13	59	4.0	4	8-00	1.02	59	4.0	4	8-00	78.80	2.81	332				
Mar. . . . .	26	336-05	46.66	3	15-30	2.05	23,400	441.93	4	8-00	1.08	60	4.0	4	7-30	0.92	57	3.2	4	7-30	50.71	1.64	305				
Apr. . . . .	22	170-20	14.98	4	32-15	4.44	6,791	218.57	3	9-00	1.16	67	4.5	2	3-00	0.35	23	1.5	2	3-00	20.93	0.70	125				
May . . . . .	23	216-50	29.56	3	17-45	2.44	11,340	307.59	3	6-00	0.79	45	3.0	3	5-45	0.70	43	2.6	3	5-45	33.49	1.08	75				
June . . . . .	25	352-15	47.87	9	74-30	7.52	23,520	514.31	4	9-00	1.18	67	4.5	4	9-15	1.05	68	4.5	4	9-15	57.62	1.92	0				
July . . . . .	26	353-30	49.24	10	110-00	11.70	27,300	553.39	2	3-30	0.47	23	1.0	2	3-05	0.39	23	1.5	2	3-05	61.80	1.99	0				
Aug. . . . .	22	316-45	44.85	10	89-00	9.82	18,480	445.30	1	1-30	0.20	8	0.7	2	16-00	1.82	119	8.0	2	16-00	56.69	1.83	25				
Sept. . . . .	28	359-30	49.77	6	51-45	6.61	27,720	559.13	1	1-00	0.15	8	0.5	0	0	0	0	0	0	0	56.53	1.88	0				
Totals	314	4422-00	606.27	46	396-50	45.39	266,451	\$5,368.32	38	77-15	10.37	571	37.7	38	85-50	10.14	640	41.8	38	85-50	672.17	1.84	1608				

\*Naragansett Electric Co. Power Rate H.

**TABLE 24**  
**WATER DISTRIBUTION SYSTEM**  
**NEUTACONKANUT DISTRIBUTION RESERVOIR\***  
**OPERATING STATISTICS FOR YEAR ENDED SEPTEMBER 30, 1954**

1953- 1954	OPERATING CHARACTERISTICS DURING MONTH											
	7 A.M. Statistics on First Day of Month			Water Level			Storage—Mil. Gals.			Daily Water Level Fluctuation—Ft.		
	Water Level	Storage Mil. Gals.		Max.	Min.	Avg.†	Max.	Min.	Avg.†	Max.	Min.	Avg.
Oct. ....	225.90	40.16		226.48	222.77	226.00	41.18	34.66	40.34	3.41	1.32	2.38
Nov. ....	225.60	39.64		226.55	222.84	226.03	41.30	34.78	40.39	3.71	1.22	2.32
Dec. ....	225.52	39.50		226.44	223.02	225.87	41.11	35.10	40.11	3.39	1.54	2.37
Jan. ....	226.00	40.34		226.29	222.06	225.86	40.84	33.40	40.09	3.79	1.84	2.64
Feb. ....	225.94	40.23		226.32	222.28	225.88	40.90	33.79	40.13	3.45	1.46	2.58
Mar. ....	225.57	39.58		226.28	222.39	225.87	40.83	33.99	40.11	3.50	1.59	2.35
Apr. ....	225.85	40.08		226.29	223.28	225.89	40.84	35.55	40.15	2.76	0.69	2.00
May ....	226.16	40.62		226.63	222.36	226.01	41.45	33.93	40.36	3.28	1.58	2.34
June ....	225.82	40.02		226.39	222.15	226.02	41.02	33.56	40.37	4.24	0.92	2.37
July ....	225.72	39.85		226.57	222.54	226.16	41.34	34.25	40.62	3.85	0.84	2.11
Aug. ....	226.06	40.44		226.68	222.63	226.13	41.54	34.41	40.37	3.71	1.20	2.42
Sept. ....	226.60	41.39		226.72	222.34	226.09	41.61	33.90	40.30	4.00	0.88	2.12
For Year .....	—	—		226.72	222.06	225.98	41.61	33.40	40.31	4.24	0.69	2.33
										7.46	1.21	4.04

\*Storage capacity at overflow elevation of 227.00=42,090,000 gallons. †Average of 7 A.M. statistics.  
Note:—Water levels are elevations in feet above mean high water in Providence harbor.

**TABLE 25**  
**WATER DISTRIBUTION SYSTEM**  
**LONGVIEW DISTRIBUTION RESERVOIR\***  
**OPERATING STATISTICS FOR YEAR ENDED SEPTEMBER 30, 1954**

1953- 1954	OPERATING CHARACTERISTICS DURING MONTH											
	7 A.M. Statistics on First Day of Month			Water Level			Storage—Mil. Gals.			Daily Water Level Fluctuation—Ft.		
	Water Level	Storage Mil. Gals.		Max.	Min.	Avg.†	Max.	Min.	Avg.†	Max.	Min.	Avg.
Oct. ....	304.88	11.88		305.43	302.42	304.14	12.14	10.74	11.54	2.71	1.20	2.10
Nov. ....	304.29	11.61		305.03	302.15	304.21	11.95	10.62	11.57	2.37	1.00	1.75
Dec. ....	304.11	11.52		305.09	302.19	304.13	11.98	10.64	11.53	2.19	0.77	1.57
Jan. ....	304.80	11.85		305.20	302.61	304.40	12.03	10.83	11.66	2.35	1.31	1.70
Feb. ....	304.45	11.68		305.09	302.27	304.40	11.98	10.67	11.66	2.45	1.13	1.76
Mar. ....	304.33	11.58		305.00	302.59	304.46	11.94	10.82	11.69	2.35	1.11	1.47
Apr. ....	304.33	11.58		305.00	303.11	304.42	11.94	11.06	11.67	1.70	0.85	1.22
May ....	304.60	11.75		305.08	302.74	304.35	11.98	10.89	11.63	2.15	0.95	1.34
June ....	304.50	11.71		305.25	300.77	304.58	12.05	9.97	11.74	4.23	1.27	2.07
July ....	305.10	11.99		305.30	299.27	304.59	12.08	9.28	11.75	4.89	0.88	2.44
Aug. ....	304.83	11.86		305.28	301.97	304.49	12.07	10.54	11.70	3.12	1.23	2.02
Sept. ....	303.65	11.31		305.29	302.41	304.16	12.07	10.74	11.55	2.35	1.15	1.82
For Year .....	—	—		305.43	299.27	304.36	12.14	9.28	11.64	4.89	0.77	1.77
												0.83

\*Storage capacity at overflow elevation of 306.00—12,400,000 gallons. †Average of 7 A.M. statistics.  
Note:—Water levels are elevations in feet above mean high water in Providence harbor.

TABLE 26

WATER PIPE LAID, REMOVED, ADDED AND REPLACED  
YEAR ENDED SEPTEMBER 30, 1954

	PIPE LAID IN FEET (Including Pipe Replaced)				PIPE REMOVED IN FEET (Including Pipe Replaced)			
	6"	8"	12"	Totals	6"	8"	12"	Totals
Providence.....	5,371.58	273.11	82.64	5,727.33	6.00	98.13	82.64	186.77
Cranston.....	14,837.75	16,447.80	373.00	31,658.55	387.00	0	0	387.00
Johnston.....	2,183.16	911.75	0	3,094.91	0	0	0	0
North Providence.....	8,540.26	4,472.26	0	13,012.52	620.70	0	0	620.70
Pawtucket.....	0	0	0	0	0	0	0	0
Totals.....	30,932.75	22,104.92	455.64	53,493.31	1,013.70	98.13	82.64	1,194.47

	NET LENGTH IN FEET ADDED TO DISTRIBUTION SYSTEM				PIPE REPLACED IN FEET			
	6"	8"	12"	Totals	6"	8"	12"	Totals
Providence.....	+ 5,365.58	+ 174.98	0	+ 5,540.56	0	98.13	82.64	180.77
Cranston.....	+14,450.75	+16,447.80	+373.00	+31,271.55	387.00	0	0	387.00
Johnston.....	+ 2,183.16	+ 911.75	0	+ 3,094.91	0	0	0	0
North Providence.....	+ 7,919.56	+ 4,472.26	0	+12,391.82	620.70	0	0	620.70
Pawtucket.....	0	0	0	0	0	0	0	0
Totals.....	+29,919.05	+22,006.79	+373.00	+52,298.84	1,007.70	98.13	82.64	1,188.47



PUBLIC WATER MAINS IN USE ON SEPT. 30, 1954

\*High Pressure Fire Service in Providence not included.

**TABLE 28**

GATES IN USE ON SEPT. 30, 1954

City or Town	Stop Gates												Gates on Public Fire Hydrants				Gates on Unwater- ing Hydrants				Gates on Blowoffs				Total Gates in use at end of year
	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"	Total	4"	6"	8"	Total	6"	8"	12"	Total					
Providence .....	4848	1031	24	663	*262	23	68	34	8	1	10	*6972	0	433	1876	2309	2	14	1	4	*9301				
Cranston .....	1493	502	0	181	*10	0	11	14	6	10	3	*2230	1	571	0	572	3	5	2	3	*2815				
Johnston .....	230	241	0	19	3	0	0	0	0	0	1	394	0	177	12	189	0	0	0	2	585				
N. Providence ..	273	120	0	64	0	0	2	0	0	0	0	459	0	234	0	234	0	3	0	0	696				
Totals .....	6844	1794	24	927	275	23	81	48	14	11	14	*10055	1	1415	1888	3304	5	22	1	6	*13397				

Note: Above table includes all gates in the special high pressure fire system in Providence (126) and gates on Neutaconant Conduit and Scituate Aqueduct east of the Siphon Chamber.

\*Totals include 5-16" Rotary Plug Valves in Providence and 5-16" Rotary Plug Valves in Cranston.

**TABLE 29**  
**STATISTICS RELATIVE TO PRIVATE WATER PIPES**  
**YEAR ENDED SEPTEMBER 30, 1954**

CITY OR TOWN	Number of Private Pipes in the Ground				Number of Services on Private Pipes				
	At the Begin- ning of the Year	Installed During the Year	Discon- nected During the Year	At the End of the Year	At the Begin- ning of the Year	Installed During the Year	Removed During Year	Trans- ferred from Private Pipes to Public Mains	At the End of the Year
Providence	205	0	3	202	311	2	6	6	301
Cranston	104	0	11	93	218	1	5	17	197
Johnston	28	0	2	26	37	1	2	1	35
N. Providence	32	0	0	32	63	0	0	0	63
Totals	369	0	16	353	629	4	13	24	596

**TABLE 30**  
SERVICE PIPES INSTALLED, REMOVED, ETC., FOR YEAR ENDED SEPT. 30, 1954

CITY OR TOWN	INSTALLED			CUT-OFF OR REMOVED			REPLACED			REPAIRED		
	General		Fire Supply	General		Fire Supply	General		Fire Supply	General		Fire Supply
	Copper ¾"-2"	Cast Iron 4"-12"	Cast Iron 4"-6"	Lead or Copper ½"-1 ½"	Cast Iron 6"-8"	Cast Iron 4"	Lead or Copper ½"-2"	Cast Iron		Lead or Copper ½"-2"	Cast Iron 4"-16"	Cast Iron 4"-6"
Providence .....	360	8	16	50	3	2	26	0		44	4	3
Cranston .....	45	7	5	15	3	1	7	1		25	0	0
Johnston .....	111	0	1	7	0	0	4	0		2	0	0
North Providence	137	0	0	4	0	0	2	0		9	0	0
Pawtucket, . . . .	1	0	0	0	0	0	0	0		0	0	0
Totals .....	1068	15	22	76	6	3	39	1		80	4	3

Total number of services in the System as of Sept. 30, 1954—65,539.

TABLE 31

## METERED SERVICES INSTALLED, REOPENED, CLOSED AND IN USE AT END OF FISCAL YEAR

City or Town	METERED SERVICES PUT INTO USE FOR THE FIRST TIME			REOPENED OR RECONNECTED			CLOSED, CUT OFF OR REMOVED			NET CHANGE FOR THE YEAR IN TOTAL NUMBER OF METERED SERVICES IN USE				Total Number of Metered Services in Use on September 30, 1954			
	General Supply		Fire Supply	General Supply		Fire Supply	General Supply		Fire Supply	General Supply		Fire Supply	General and Fire Supplies Combined	General Supply		Fire Supply	General and Fire Supplies Combined
	Copper 3/4"-2"	Cast Iron 2"-12"	Cast Iron 4"-8"	Lead or Copper 1/2"-2"	Cast Iron 2"-6"	Cast Iron 4"-8"	Lead or Copper 1/2"-2"	Cast Iron 2"-8"	Cast Iron 4"-8"	Lead or Copper 1/2"-2"	Cast Iron 2"-12"	Cast Iron 4"-8"		Lead or Copper 1/2"-2"	Cast Iron 2"-12"	Cast Iron 4"-8"	
Providence .....	271	6	42	271	23	16	374	25	19	+168	+4	+39		36,392	1026	655	38,073
Cranston .....	463	6	6	74	3	0	78	3	4	+459	+6	+2		13,053	146(a)	61	13,260
Johnston .....	93	1	1	16	0	0	18	0	0	+91	+1	+1		2,214	19	6	2,239
North Providence ..	142	0	0	13	0	0	17	0	0	+138	0	0		2,538	32(b)	7	2,577
Pawtucket.....	1	0	0	0	0	0	0	0	0	+1	0	0		1	0	0	1
Totals .....	970	13	49	374	26	16	487	28	23	+857	+11	+42		54,198	1223	729	56,150

(a) Includes 12" service with 12" protectus meter and 12" service with 6" protectus meter supplying part of City of Warwick, 12" service with 12" x 4" venturi meter to State Institutions, and 12" service with 12" crest meter supplying Kent County Water Authority.

(b) Includes 12" service with 12" crest meter supplying East Smithfield Water Company.

Total Number of Services in Use on Sept. 30, 1954—56,567 (56,150 Metered; 417 Unmetered).

**TABLE 32**  
**UNMETERED SERVICES, CLOSED AND IN USE**  
**AT END OF FISCAL YEAR**

CITY or TOWN	CLOSED, CUT OFF REMOVED OR METERED				Total Number of Unmetered Services in Use on September 30, 1954			
	General Supply		Fire Supply	General and Fire Supplies Com- bined	General Supply		Fire Supply	General and Fire Supplies Combined
	Lead or Copper ½"- 1¾"	Cast Iron 2"-8"	Cast Iron 4"-8"		Lead or Copper ½"- 1¾"	Cast Iron 2"-8"	Cast Iron 4"-10"	
Providence .....	0	0	27	27	136	11	262	409
Cranston .....	0	0	1	1	0	0	5	5
Johnston .....	0	0	0	0	2	0	1	3
North Providence.	0	0	0	0	0	0	0	0
<b>Totals .....</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>138</b>	<b>11</b>	<b>268</b>	<b>417</b>

Total number of Services in Use on Sept. 30, 1954—55,567 (56,150 Metered; 417 Unmetered).

**TABLE 33**  
**PUBLIC FIRE HYDRANTS**

HYDRANT ACTIVITIES DURING YEAR ENDED SEPT. 30, 1954						
CITY OR TOWN	Providence		Cranston	Johnston	No. Prov.	Totals
New Post Hydrant Installations.....	18		22	0	6	46
Flush Hydrants replaced with Post Hydrants.....	*28		0	1	0	*29
Post Hydrants replaced.....	2		7	2	4	15
Flush Hydrants removed or abandoned.....	0		0	0	0	0

\*Includes 2 Hydrants in Special High Service Fire System.

**TABLE 34**

TOTAL PUBLIC HYDRANTS IN DISTRIBUTION SYSTEM ON SEPT 30, 1954**									
CITY OR TOWN	Providence*		Cranston		Johnston		No. Prov.		Totals in Providence, Cranston, Johnston & No. Prov.
TYPE OF HYDRANT	Flush	Post	Post		Flush	Post	Post		Flush & Post Combined
Number in System.....	2443	668	569		19	195	230		4124*

\*Includes 91 Flush Hydrants and 68 Post Hydrants in Special High Pressure Fire Service in Providence.

\*\*Hydrant statistics in the City of Warwick and the East Smithfield Water District are not included, as those distribution systems are not owned or maintained by the Providence Water Works.

**TABLE 35**  
**NUMBER, MAKE AND SIZE OF METERS ON ACTIVE SERVICES**  
**AS OF SEPTEMBER 30, 1954**

**PROVIDENCE**

MAKE	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	12"	16"	Total
Crown .....	290	91	34	126	35	10	6	.....	.....	.....	.....	.....	592
Empire .....	1,288	89	10	134	47	2	.....	.....	2	.....	.....	.....	1,572
Hersey .....	.....	.....	.....	3	4	3	15	74	9	.....	.....	.....	108
Thomson .....	10,988	1078	462	41	145	.....	.....	.....	.....	.....	.....	.....	12,714
Trident .....	18,712	1849	520	600	886	104	74	45	6	5	.....	.....	22,801
Venturi .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2
<b>TOTALS</b> .....	<b>31,278</b>	<b>3107</b>	<b>1026</b>	<b>904</b>	<b>1117</b>	<b>119</b>	<b>95</b>	<b>119</b>	<b>17</b>	<b>5</b>	<b>.....</b>	<b>2</b>	<b>37,789</b>

**CRANSTON**

MAKE	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	12"	16"	Total
Crown .....	19	3	4	4	.....	.....	.....	.....	.....	.....	.....	.....	30
Empire .....	233	7	3	10	5	.....	.....	.....	.....	.....	.....	.....	258
Hersey .....	.....	.....	.....	.....	.....	.....	.....	4	4	.....	.....	.....	8
Thomson .....	3,060	92	51	1	14	.....	.....	.....	.....	.....	.....	.....	3,218
Trident .....	9,053	342	83	86	87	3	8	10	3	*1	2	.....	9,678
Venturi .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
<b>TOTALS</b> .....	<b>12,365</b>	<b>444</b>	<b>141</b>	<b>101</b>	<b>106</b>	<b>3</b>	<b>8</b>	<b>14</b>	<b>7</b>	<b>1</b>	<b>3</b>	<b>.....</b>	<b>13,193</b>

\*10" Protectus supplying City of Warwick.

**JOHNSTON**

MAKE	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	12"	16"	Total
Crown .....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	2
Empire .....	1	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	3
Thomson .....	345	20	10	.....	2	.....	.....	.....	.....	.....	.....	.....	377
Trident .....	1,517	70	18	15	9	.....	.....	.....	*1	.....	.....	.....	1,630
<b>TOTALS</b> .....	<b>1,863</b>	<b>90</b>	<b>28</b>	<b>19</b>	<b>11</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>1</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>2,012</b>

\*8" Crest Meter in Dean Ave., Smithfield, supplying East Smithfield Water Co.

**NORTH PROVIDENCE**

MAKE	5/8"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"	10"	12"	16"	Total
Crown .....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Empire .....	5	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	6
Hersey .....	.....	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	.....	5
Thomson .....	509	16	10	1	1	.....	.....	.....	.....	.....	.....	.....	537
Trident .....	*1,854	100	19	13	8	2	2	1	.....	.....	**1	.....	2,000
<b>TOTALS</b> .....	<b>2,368</b>	<b>116</b>	<b>30</b>	<b>14</b>	<b>10</b>	<b>2</b>	<b>2</b>	<b>6</b>	<b>.....</b>	<b>.....</b>	<b>1</b>	<b>.....</b>	<b>2,549</b>

\*Seven in Pawtucket, just over North Providence line.

\*\*12" Crest Meter in Waterman St., (N. Prov.), supplying East Smithfield Water Co.



TABLE 36

## CONSUMPTION OF WATER — MILLION GALLONS

YEAR ENDED SEPTEMBER 30, 1954

1953- 1954	LOW SERVICE*				HIGH SERVICE†				TOTAL SERVICE*†				1953- 1954
	Max. Day	Min. Day	Avg. Day	Total	Max. Day	Min. Day	Avg. Day	Total	Max. Day	Min. Day	Avg. Day	Total	
Oct.	38.54	20.82	31.85	987.44	7.08	5.42	6.35	196.80	45.62	26.24	38.20	1,184.24	Oct.
Nov.	35.18	21.70	29.41	882.11	6.46	5.55	6.02	180.71	41.55	27.42	35.43	1,062.82	Nov.
Dec.	34.24	21.12	28.95	897.45	6.58	5.02	6.08	188.47	40.28	26.64	35.03	1,085.92	Dec.
Jan.	33.57	19.86	28.69	889.62	6.66	5.24	6.16	190.86	40.22	25.10	34.85	1,080.48	Jan.
Feb.	34.39	21.50	29.31	820.61	6.67	5.64	6.32	177.11	41.05	27.57	35.63	997.72	Feb.
Mar.	32.59	21.53	28.90	895.99	6.80	5.96	6.41	198.54	39.30	27.52	35.31	1,094.53	Mar.
Apr.	33.88	20.20	28.70	860.89	6.85	5.88	6.40	192.16	40.65	26.09	35.10	1,053.05	Apr.
May	34.35	20.94	28.52	884.01	7.36	5.90	6.53	202.59	41.71	26.96	35.05	1,086.60	May
June	54.60	23.39	37.66	1,129.94	10.24	5.86	7.43	222.89	64.84	29.89	45.09	1,352.83	June
July	57.06	24.08	37.80	1,172.00	11.50	5.25	7.47	231.48	68.56	29.33	45.27	1,403.48	July
Aug.	46.76	23.28	34.53	1,070.28	7.62	5.16	6.19	191.97	54.38	28.44	40.72	1,262.25	Aug.
Sept.	39.74	24.72	32.97	989.17	7.21	5.34	6.25	187.53	46.21	30.42	39.22	1,176.70	Sept.
For Year	57.06(a)	19.86(b)	31.45	11,479.51	11.50(c)	5.02(d)	6.47	2,361.11	68.56(e)	25.10(f)	37.92	13,840.62	For Year

(a) July 14; (b) Jan. 1

\*Includes water supplied to City of Warwick, Kent County Water Authority and to State Institutions.

†Includes water supplied to East Smithfield Water Co.

(c) July 14; (d) Dec. 27

(e) July 14; (f) Jan. 1

**TABLE 37**  
**WATER SOLD TO STATE INSTITUTIONS, AND CITY OF WARWICK**  
**YEAR ENDED SEPTEMBER 30, 1954**

1953-1954	STATE INSTITUTIONS						CITY OF WARWICK						
	S.S. 50,767 Sackanosset Rd. Cranston		S.S. 10,197 Pontiac Ave. Cranston		**S24,215A East St. Cranston		S.S. 47,269 Petta- consett Cranston		S.S. 47,475 Pawtuxet Bridge Warwick		**S.S. 61,515 Oaklawn Avenue Cranston		Avg. Gallons per Day
	12"x4" Venturi Meter	Gallons per Month	8" Tri-Comp Meter	Gallons per Month	8" Tri-Prot. Meter	Gallons per Month	10" Tri- Protectus Meter	Gallons per Month	6" Tri-Comp Meter	Gallons per Month	6" Tri- Protectus Meter	Gallons per Month	
Oct. . .	37,802,000		0	0	0	37,802,000	1,219,419	53,077,800	0	0	53,077,800	—	1,712,187
Nov. . .	41,695,000		0	0	0	41,695,000	1,389,833	51,135,800	0	0	51,135,800	—	1,704,526
Dec. . .	35,386,500		0	0	0	35,386,500	1,141,500	43,491,200	0	0	43,491,200	—	1,402,941
Jan. . .	36,839,500		0	0	0	36,839,500	1,188,370	47,298,700	0	0	47,298,700	—	1,525,764
Feb. . .	37,453,300		0	0	0	37,453,300	1,337,617	47,350,800	0	0	47,350,800	—	1,691,100
Mar. . .	34,302,700		0	0	0	34,302,700	1,106,538	44,873,800	0	0	44,873,800	—	1,447,541
Apr. . .	36,725,500		0	0	0	36,725,500	1,224,183	49,764,700	374,625	374,625	50,139,325	—	1,671,310
May. . .	38,148,500		0	0	0	38,148,500	1,230,596	56,143,900	1,088,925	1,088,925	57,232,825	—	1,846,220
June. . .	44,684,014		0	0	0	44,684,014	1,489,467	94,832,700	3,518,775	3,518,775	98,351,475	—	3,278,382
July. . .	37,157,000		0	—	—	37,157,000	1,198,612	92,128,700	3,451,350	3,451,350	95,580,050	—	3,083,227
Aug. . .	40,321,000		0	—	—	40,321,000	1,300,677	79,210,000	3,131,700	3,131,700	82,341,700	—	2,656,183
Sept. . .	29,209,000		0	—	—	29,209,000	973,633	50,190,000	1,851,975	1,851,975	52,788,975	747,000	1,759,632
For Year	449,724,014		0	0	0	449,724,014	1,232,120	709,498,100	13,417,350	13,417,350	723,662,450	747,000	1,982,636

\*Discontinued June 24, 1954.

\*\*Opened September 22, 1954.

TABLE 38

WATER SOLD TO EAST SMITHFIELD WATER COMPANY AND  
KENT COUNTY WATER AUTHORITY

FOR YEAR ENDED SEPT. 30, 1954

1953- 1954	EAST SMITHFIELD WATER CO.				KENT COUNTY WATER AUTH.			
	S.S. 51,198 Waterman St. No. Prov.	S.S. 52,403 Dean Ave. Smithfield	Total Gallons per Month	Avg. Gallons per Day	S.S. 58,935 *Oaklawn Ave. Cranston	S.S. 60,757 Purification Works Scituate	Total Gallons per Month	Avg. Gallons per Day
	12" Tri-Crest Meter	8" Tri-Crest Meter			12" Tri-Crest Meter	12" Venturi Meter		
	Gallons per Month	Gallons per Month			Gallons per Month	Gallons per Month		
Oct. ..	6,379,500	819,750	7,199,250	232,233	5,039,250	8,175,000	13,214,250	426,266
Nov. ..	6,396,750	819,000	7,215,750	240,525	5,162,250	7,933,000	13,095,250	436,508
Dec. ..	6,030,750	764,250	6,795,000	219,193	4,434,750	6,663,000	11,097,750	357,991
Jan. ..	6,582,750	888,000	7,470,750	240,991	4,782,750	6,589,000	11,371,750	366,830
Feb. ..	6,390,000	851,250	7,241,250	258,616	4,308,750	4,819,000	9,127,750	325,991
Mar. ..	6,246,750	849,000	7,095,750	228,895	3,432,750	3,488,000	6,920,750	223,250
Apr. ..	6,555,750	769,500	7,325,250	244,175	3,635,250	4,030,000	7,665,250	255,508
May ..	6,171,000	714,750	6,885,750	222,120	3,970,500	2,815,000	6,785,500	218,887
June ..	7,023,000	793,500	7,816,500	260,550	6,192,000	6,875,000	13,067,000	435,566
July ..	5,684,250	521,250	6,205,500	200,177	6,042,000	7,360,000	13,402,000	432,322
Aug. ..	6,693,000	447,000	7,140,000	230,322	5,205,000	3,272,000	8,477,000	273,451
Sept. ..	5,550,000	555,750	6,105,750	203,525	3,621,750	8,985,000	12,606,750	420,225
For Year	75,703,500	8,793,000	84,496,500	231,497	55,827,000	71,004,000	126,831,000	347,482

\*Temporary Supply opened on August 3, 1952.

**TABLE 39**  
**AVERAGE DAILY CONSUMPTION OF WATER PER MONTH**  
**IN MILLION GALLONS**

Year Ending Sept. 30	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Avg. for Year
1877.....	.....	.....	.....	2.27	2.26	1.84	2.25	2.53	2.94	2.91	2.76	3.01	2.53†
1878.....	2.61	2.22	2.30	2.16	2.15	2.20	2.32	2.85	2.89	3.88	3.12	3.17	2.66
1879.....	2.84	2.39	2.38	2.82	2.93	2.59	2.38	3.22	3.48	3.78	3.52	3.32	2.97
1880.....	3.38	2.89	2.97	2.94	2.86	2.90	2.96	3.68	5.05	4.18	3.92	3.82	3.46
1881.....	3.67	3.35	3.22	3.54	4.07	3.13	2.98	3.54	3.81	4.05	4.46	4.16	3.66
1882.....	3.92	3.60	3.38	3.30	3.27	3.06	3.05	3.24	4.02	4.69	5.09	3.84	3.70
1883.....	3.40	3.33	3.65	3.94	3.74	3.91	3.43	3.82	4.64	5.24	5.18	4.70	4.08
1884.....	3.81	3.67	3.58	4.24	3.87	3.90	3.43	3.79	4.70	4.38	4.06	4.82	4.02
1885.....	4.24	3.67	3.99	4.48	4.73	4.80	4.10	4.10	5.44	5.56	5.01	4.92	4.59
1886.....	4.37	4.20	4.71	4.82	4.75	4.83	4.33	4.53	4.93	6.02	4.88	4.94	4.78
1887.....	4.62	4.24	4.94	5.06	4.90	4.84	4.41	4.90	5.16	5.58	5.00	5.08	4.89
1888.....	4.80	4.40	5.10	5.44	5.79	5.39	4.86	4.84	6.17	6.51	5.87	5.32	5.37
1889.....	5.34	5.18	5.51	5.72	7.34	5.80	5.27	5.75	6.14	5.69	5.59	5.52	5.74
1890.....	5.41	5.17	6.14	6.34	6.79	6.28	6.84	6.60	6.90	8.11	7.13	6.72	6.54
1891.....	6.28	6.08	6.83	6.35	6.53	6.72	6.67	7.55	7.75	7.73	7.78	7.57	6.99
1892.....	7.53	7.32	7.69	7.65	7.83	7.62	7.27	6.77	8.37	9.30	9.11	8.63	7.92
1893.....	8.00	7.65	8.48	9.30	8.85	8.74	8.07	8.58	9.92	10.78	10.50	9.48	9.03
1894.....	8.79	7.85	8.61	9.11	9.07	9.09	8.73	9.97	11.28	12.39	10.76	10.22	9.66
1895.....	10.20	8.86	9.08	9.02	9.82	8.60	7.70	8.78	9.49	8.99	9.50	9.10	9.10
1896.....	8.15	8.19	9.56	10.19	8.79	8.74	8.60	9.26	9.64	9.93	9.70	8.83	9.13
1897.....	8.49	8.05	8.98	8.83	8.52	8.44	8.06	8.27	8.90	9.13	8.70	9.07	8.62
1898.....	8.76	8.29	8.63	8.56	9.09	8.68	8.38	8.35	10.04	10.10	9.44	9.84	9.01
1899.....	8.94	8.75	9.64	9.45	9.53	8.91	8.52	9.18	11.18	10.21	10.12	9.70	9.51
1900.....	9.15	9.27	9.53	9.81	9.49	9.66	9.23	8.59	10.48	12.11	10.95	11.71	10.00
1901.....	9.99	9.54	9.95	10.09	10.52	10.20	8.92	10.05	11.50	12.02	11.69	11.15	10.47
1902.....	10.91	10.70	11.02	11.65	11.00	10.92	10.52	10.48	11.85	12.09	11.97	11.66	11.23
1903.....	11.89	11.81	12.85	12.84	12.62	11.92	12.33	13.92	13.02	13.54	12.91	13.76	12.78
1904.....	13.09	13.89	13.49	14.29	14.58	13.42	12.07	12.72	13.94	14.21	13.18	13.85	13.56
1905.....	14.57	14.88	14.60	14.20	14.65	13.88	13.85	14.77	15.06	16.34	14.30	13.99	14.59
1906.....	13.73	14.96	14.63	15.00	15.07	14.77	14.49	15.01	15.69	15.08	15.74	16.06	15.02
1907.....	15.02	14.37	14.25	15.74	16.24	16.26	15.62	16.29	17.18	18.50	18.00	15.02	16.04
1908.....	15.34	15.13	15.34	15.46	16.07	15.21	14.53	14.67	16.63	16.77	15.42	15.62	15.57
1909.....	15.83	15.80	15.44	15.16	14.87	14.88	13.94	14.04	15.54	17.71	16.15	14.80	15.35
1910.....	14.76	14.66	15.28	15.62	15.65	15.22	14.74	14.72	15.53	17.13	15.95	15.61	15.40
1911.....	15.56	14.98	16.11	16.39	16.27	16.00	15.30	16.19	17.09	19.36	17.09	16.08	16.37
1912.....	16.29	16.49	16.44	18.12	18.14	17.16	16.39	16.70	17.32	20.54	17.62	17.06	17.36
1913.....	17.36	16.72	17.17	17.49	17.98	17.59	17.06	17.12	18.95	19.55	18.40	17.12	17.71
1914.....	16.76	16.87	17.27	17.83	18.52	17.60	16.99	17.43	20.24	17.62	17.09	18.51	17.73
1915.....	17.29	16.43	17.27	17.07	17.60	17.44	16.80	16.68	18.04	16.49	16.76	17.80	17.14
1916.....	16.90	17.03	17.79	18.16	18.47	18.57	17.43	17.57	17.82	17.90	16.58	18.76	17.75
1917.....	18.51	18.08	18.50	19.73	20.62	19.31	18.09	17.67	18.28	19.61	20.03	18.76	18.93
1918.....	18.62	18.71	20.64	23.82	22.98	23.07	22.43	22.31	21.85	22.23	21.50	20.63	21.56
1919.....	20.42	20.31	21.04	21.72	20.94	19.35	19.45	19.60	21.77	20.70	20.40	20.68	20.53
1920.....	20.62	20.18	21.64	23.80	23.16	23.03	20.67	20.45	20.98	21.06	21.58	21.89	21.59
1921.....	21.41	20.46	20.97	21.64	21.43	20.77	20.21	20.92	22.84	21.18	21.63	22.86	21.36
1922.....	22.84	22.16	22.18	24.14	23.64	22.01	21.64	21.49	22.18	21.91	22.11	22.53	22.40
1923.....	22.78	23.23	23.08	23.66	24.96	23.84	22.95	24.12	24.49	23.90	24.08	24.31	23.78
1924.....	24.68	24.09	23.33	24.19	24.58	23.44	23.51	23.28	24.10	25.11	22.48	22.51	23.78
1925.....	22.84	23.70	23.76	24.22	23.61	22.70	23.13	23.03	24.82	23.54	23.20	23.81	23.53
1926.....	23.41	22.47	23.29	23.95	24.12	24.25	23.36	22.80	24.16	24.80	23.94	23.53	23.67
1927.....	21.76	22.60	23.24	22.92	22.41	22.57	22.32	22.68	23.62	23.27	22.27	23.27	22.74
1928.....	23.37	22.99	22.39	23.04	22.80	23.21	22.79	23.83	23.05	24.31	26.69	25.38	23.65
1929.....	26.82	25.54	26.17	26.84	27.01	25.42	23.05	22.91	25.73	26.53	24.94	24.24	25.43
1930.....	23.83	24.24	24.29	23.85	24.88	23.34	23.38	25.15	26.85	26.81	25.95	27.45	25.00
1931.....	26.30	24.04	23.80	23.71	24.36	23.64	23.11	23.76	25.35	26.20	26.22	26.31	24.73
1932.....	25.36	23.42	23.82	23.20	23.23	22.99	22.72	23.47	25.27	25.34	25.16	24.59	24.05
1933.....	24.15	23.65	23.51	24.00	24.25	24.01	23.41	25.32	26.92	28.77	27.65	26.00	25.14
1934.....	24.89	24.43	25.04	25.55	28.05	26.38	24.78	25.78	27.95	31.00	28.77	26.39	26.58
1935.....	26.50	25.39	25.16	26.35	27.06	26.31	25.71	27.02	27.47	29.47	31.14	28.23	27.15
1936.....	29.45	28.03	27.42	27.97	28.73	26.44	25.75	27.02	30.27	30.23	30.79	29.23	28.44
1937.....	27.94	26.72	27.06	25.77	26.13	27.16	25.73	25.93	28.45	31.43	31.85	29.18	29.79
1938.....	27.84	26.42	25.57	25.11	24.67	24.38	23.56	24.56	27.13	26.34	28.82	28.34	26.07
1939.....	27.90	27.21	26.85	27.07	27.62	27.16	26.25	27.48	30.84	32.81	33.62	30.31	28.77
1940.....	30.12	28.96	28.26	28.74	28.06	27.23	25.77	26.15	28.49	30.10	31.57	28.96	28.54
1941.....	29.55	27.86	28.36	28.67	29.02	28.78	29.07	29.91	31.74	32.87	32.66	33.78	30.19
1942.....	32.74	31.44	31.84	31.34	31.21	29.84	29.18	29.76	31.34	32.13	32.14	32.11	31.26
1943.....	29.88	29.27	30.40	29.93	30.67	30.35	30.05	29.65	35.13	36.35	35.47	33.71	31.74
1944.....	31.87	31.25	32.35	32.29	32.52	32.95	31.51	34.27	36.80	39.10	40.60	35.43	34.26
1945.....	33.77	32.77	33.33	34.89	34.57	33.78	33.37	33.23	35.44	35.73	36.34	34.67	34.32
1946.....	32.74	32.27	33.21	34.01	33.69	33.80	33.64	33.59	36.70	40.70	35.92	36.69	34.75
1947.....	36.37	35.34	35.58	35.95	35.83	35.01	33.27	33.94	35.72	37.35	39.34	39.21	36.08
1948.....	38.91	36.19	35.55	34.84	37.31	36.92	36.15	33.95	36.90	39.33	41.55	39.76	37.28
1949.....	36.27	35.34	35.11	33.98	34.00	33.88	33.12	35.12	46.65	44.56	40.18	35.77	37.01
1950.....	34.61	35.94	34.51	33.92	34.34	34.71	33.39	34.90	40.27	43.27	41.40	38.24	36.64
1951.....	39.96	36.91	34.80	36.10	35.92	34.81	34.21	37.21	39.31	43.49	39.98	38.20	37.59
1952.....	36.92	34.79	33.63	34.20	34.59	33.98	33.98	34.33	41.21	54.79	40.66	40.11	37.78
1953.....	37.09	35.75	35.27	34.59	33.95	34.20	34.61	35.63	50.68	46.76	43.63	43.95	38.86
1954.....	38.20	35.43	35.03	34.85	35.63	35.31	35.10	35.05	45.09	45.27	40.72	39.22	37.92

†Average for 9 months

**TABLE 40**  
**FINANCIAL STATEMENT OF THE PROVIDENCE**  
**WATER SUPPLY BOARD FOR THE YEAR**  
**ENDED SEPT. 30, 1954**

**REVENUE**

Water Rents .....	†\$2,146,947.18
Hydrant Rental .....	72,407.36
Electric Power .....	19,901.24
Setting Meters .....	7,241.50
Repairing Meters .....	1,826.34
Rents from Non-Operating Property .....	1,325.12
Repairs to Water Services .....	1,157.60
Repairs to Distribution Mains .....	2,571.73
Repairs to Hydrants .....	451.36
Installation of New Fire Supplies .....	7,462.00
Installation of New Water Services .....	63,387.00
Installation of New Water Mains .....	94,390.40
Revolving Fund—Water Meters .....	8,615.58
Sale of Scrap Iron, Brass, Lead, Etc. ....	9,850.76
Sale of Lumber, Pulpwood, Etc. ....	837.19
Sale of Obsolete Equipment .....	10,577.98
Sundries. . . . .	704.22
Total Revenue .....	<u>\$2,449,654.56</u>

**DISBURSEMENTS**

Operating Expense:	
Salaries. . . . .	\$652,163.73
Services Other Than Personal .....	105,355.81
Materials and Supplies .....	176,098.49
Special Items .....	137.27
Capital Outlay .....	23,451.79
Other Structures and Improvements (Water Main Extensions) .....	<u>148,128.05</u>
Total Operating Expense .....	*\$1,105,335.14
Taxes. . . . .	207,951.94
Interest on Bonds .....	610,000.00
Employees' Retirement System .....	39,557.62
Depreciation and Extension Fund .....	250,000.00
Payable to Sinking Fund .....	** 236,809.86
Total Disbursements .....	<u>\$2,449,654.56</u>
Gross Water Rents .....	†\$2,217,631.14
Minus Refunds (Current Year) .....	70,531.92
Minus Refunds (Prior Year) .....	<u>152.04</u>
Net Water Rents .....	\$2,146,947.18

\*See Table 41 for detailed account of Operating Expense.

\*\*Subject to change due to anticipated discounts on Outstanding Commitments.

**TABLE 41**  
**WATER SUPPLY BOARD OPERATING EXPENSES**  
**FOR THE YEAR ENDED SEPT. 30, 1954**

**ADMINISTRATIVE**

Salaries:	
001 Officials . . . . .	\$18,587.56
Clerical—Chief Engineer's Office . . . . .	5,100.13
Clerical—Accounting . . . . .	31,922.34
Engineering . . . . .	49,456.90
Labor—General . . . . .	13,284.05
008 Sick Leave Payrolls . . . . .	2,899.00
009 Vacation Payrolls . . . . .	4,068.97
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Total . . . . .	\$125,318.95
Services Other Than Personal:	
109 Fees Not Otherwise Classified . . . . .	\$ 14.50
111 Telephone and Telegraph . . . . .	1,500.00
112 Postage, Freight and Express . . . . .	225.58
121 Printing, Binding and Reproduction Services . . . . .	1,928.25
122 Advertising . . . . .	384.40
131 Light and Power . . . . .	560.90
141 Repairs—Office Machinery . . . . .	188.36
142 Repairs—Automobiles . . . . .	239.24
150 Repairs—Structures and Improvements . . . . .	30.00
166 Rent . . . . .	7,250.00
181 Laundry and Cleaning . . . . .	53.00
183 Dues and Subscriptions . . . . .	40.00
199 Miscellaneous Services . . . . .	7,440.60
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Total . . . . .	\$19,854.83
Outstanding Commitments . . . . .	301.84
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Total—Services Other Than Personal . . . . .	\$ 20,156.67
Materials and Supplies:	
201 Stationery and Office Supplies . . . . .	\$ 985.27
211 Motor Fuel . . . . .	845.02
212 Lubricants . . . . .	91.50
213 Tires and Tubes . . . . .	162.64
214 Repair Parts and Supplies—Trucks and Autos . . . . .	181.70
231 Medical, Chemical and Laboratory Supplies . . . . .	11.17
241 Fuel . . . . .	1,470.00
244 Housekeeping Supplies . . . . .	61.54
259 Other Agricultural, Horticultural and Land-scaping Supplies . . . . .	73.47
266 Lumber and Hardware . . . . .	4.94
267 Paint and Painters' Supplies . . . . .	8.12
268 Plumbing and Electrical Supplies . . . . .	13.82
272 Valves and Fittings . . . . .	6.39
299 Miscellaneous Materials and Supplies . . . . .	43.79
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Total . . . . .	\$ 3,959.37
Outstanding Commitments . . . . .	82.14
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Total—Materials and Supplies . . . . .	\$ 4,041.51
Capital Outlay:	
501 Office Furniture, Machinery and Equipment . . . . .	\$ 1,458.95
502 Books, Maps and Charts . . . . .	50.00
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Total—Capital Outlay . . . . .	\$ 1,508.95
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Total—Administrative . . . . .	\$151,026.08

## SOURCE OF SUPPLY

### Hydro Electric Station:

Salaries:	
001 Labor—Operation . . . . .	\$ 5,105.74
Repairs—Structures and Improvements . . . . .	109.13
Repairs—Machinery and Equipment . . . . .	59.80
Total . . . . .	\$ 5,274.67
Services Other Than Personal:	
111 Telephone and Telegraph . . . . .	\$ 155.14
146 Repairs—Plant Equipment . . . . .	51.50
150 Repairs—Structures and Improvements . . . . .	145.70
151 Repairs—Machinery and Equipment . . . . .	9.00
Total . . . . .	\$ 361.34
Materials and Supplies:	
201 Stationery and Office Supplies . . . . .	\$ 222.87
202 Small Tools and Shop Supplies . . . . .	49.09
241 Fuel . . . . .	128.88
266 Lumber and Hardware . . . . .	21.40
268 Plumbing and Electrical Supplies . . . . .	503.65
Total . . . . .	\$ 925.89
Capital Outlay:	
511 Trucks and Autos . . . . .	\$ 1,009.34
Total . . . . .	\$ 1,009.34

### Water Purification Plant:

Salaries:	
001 Supervision . . . . .	\$15,295.20
Labor—Operation . . . . .	31,761.27
Technical . . . . .	18,866.90
Clerical—Laboratory . . . . .	1,278.90
Repairs—Structures and Improvements . . . . .	531.63
Repairs—Machinery and Equipment . . . . .	2,027.17
Repairs—Care of Grounds . . . . .	1,204.08
Repairs—Highways . . . . .	66.50
Total . . . . .	\$ 71,031.65
Services Other Than Personal:	
102 Expert Consultant and Other Service Fees . . . . .	\$ 21.00
111 Telephone and Telegraph . . . . .	1,011.80
112 Postage, Freight and Express . . . . .	89.89
116 Transportation of Persons—Other . . . . .	25.48
118 Travel Subsistence—Other . . . . .	12.28
141 Repairs—Office Machinery . . . . .	32.61
142 Repairs—Trucks and Autos . . . . .	254.37
146 Repairs—Plant Equipment . . . . .	939.02
151 Maintenance and Servicing . . . . .	307.66
152 Repairs—Highways and Highway Structures . . . . .	1,450.00
181 Laundry and Cleaning . . . . .	77.06
199 Miscellaneous Services . . . . .	244.50
Total . . . . .	\$ 4,465.67
Materials and Supplies:	
201 Stationery and Office Supplies . . . . .	\$ 343.77
202 Small Tools and Shop Supplies . . . . .	223.09
204 Wearing Apparel and Personal Supplies . . . . .	154.00
211 Motor Fuel . . . . .	576.07
212 Lubricants . . . . .	6.00
214 Repair Parts and Supplies—Trucks and Autos . . . . .	39.75

222	Repair Parts and Supplies—Plant Equipment	2,620.77	
229	Repair Parts and Supplies—Other Equipment	15.99	
231	Ferric Sulphate	30,542.65	
231	Lime	13,568.90	
231	Chlorine	2,940.00	
231	Sodium Silico Fluoride	16,109.94	
231	Miscellaneous Chemical Supplies	56.77	
231	Miscellaneous Laboratory Supplies	1,139.33	
241	Fuel	3,988.23	
244	Housekeeping Supplies	292.18	
252	Seeds, Fertilizer, Trees and Shrubs	117.86	
259	Other Agricultural, Horticultural, and Land-scaping Supplies	133.97	
262	Cement, Plaster and Related Products	44.58	
265	Fabricated Metal Products	330.53	
266	Lumber and Hardware	341.02	
267	Paint and Painters' Supplies	388.83	
268	Plumbing and Electrical Supplies	663.45	
271	Pipe	391.79	
272	Valves and Fittings	1,143.07	
299	Miscellaneous Materials and Supplies	780.19	
Total			\$ 76,952.73
Special Items:			
302	Liability Insurance	\$ 37.27	
Total			\$ 37.27
Capital Outlay:			
511	Trucks and Autos	\$ 1,009.34	
541	Medical, Surgical and Laboratory Equipment	1,556.00	
561	Shop and Plant Equipment	292.05	
Total			\$ 2,857.39
Scituate Reservoir:			
Salaries:			
001	Labor—Operation	\$ 3,251.57	
	Repairs—Care of Grounds	1,109.90	
	Repairs—Highways	225.58	
Total			\$ 4,587.05
Services Other Than Personal:			
111	Telephone and Telegraph	\$ 173.76	
142	Repairs—Trucks and Autos	296.32	
Total			\$ 470.08
Materials and Supplies:			
213	Tires and Tubes	\$ 369.44	
214	Repair Parts and Supplies—Trucks and Autos	11.92	
Total			\$ 381.36
Other Reservoirs:			
Salaries:			
001	Labor—Operation	\$ 3,419.82	
	Repairs—Structures and Improvements	153.92	
	Repairs—Care of Grounds	117.30	
Total			\$ 3,691.04
Services Other Than Personal:			
142	Repairs—Trucks and Autos	\$ 57.19	
Total			\$ 57.19



Materials and Supplies:	
214	Repair Parts and Supplies—Trucks and Autos \$ 8.16
266	Lumber and Hardware..... 15.88
<hr/>	
Total. . . . .	\$ 24.04

**Reforestation:**

Salaries:	
001	Supervision. . . . . \$ 4,606.50
	Labor—Operation. . . . . 1,084.90
	Repairs—Machinery and Equipment..... 568.90
	Repairs—Care of Grounds..... 11,555.05
	Repairs—Highways. . . . . 76.80
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Total. . . . .	\$ 17,892.15

Services Other Than Personal:	
102	Expert Consultant and Other Service Fees... \$ 42.00
111	Telephone and Telegraph..... 496.47
142	Repairs—Trucks and Autos..... 81.01
143	Repairs—Construction and Other Automotive
	Equipment. . . . . 22.00
199	Miscellaneous Services . . . . . 21.30
<hr/>	
Total. . . . .	\$ 662.78

Materials and Supplies:	
202	Small Tools and Shop Supplies..... \$ 57.22
204	Wearing Apparel and Personal Supplies..... 26.02
211	Motor Fuel . . . . . 558.38
214	Repair Parts and Supplies—Trucks and Autos 75.99
244	Housekeeping Supplies and Minor Equipment 17.00
252	Seeds, Fertilizer, Trees and Shrubs..... 390.00
259	Other Agricultural, Horticultural and Land-
	scaping Supplies . . . . . 226.27
267	Paint and Painters' Supplies..... 35.28
299	Miscellaneous Materials and Supplies..... 102.40
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Total. . . . .	\$ 1,488.56

Capital Outlay:	
571	Agricultural and Landscaping Equipment.... \$ 480.00
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Total. . . . .	\$ 480.00

**Real Estate:**

Salaries:	
001	Labor—Operation. . . . . \$ 5.32
	Repairs—Care of Grounds..... 58.05
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Total. . . . .	\$ 63.37

Materials and Supplies:	
266	Lumber and Hardware..... \$ 14.80
267	Paint and Painters' Supplies..... 15.09
<hr/>	
Total. . . . .	\$ 29.89

**General:**

Salaries:	
001	Clerical. . . . . \$ 861.30
	Labor—Operation. . . . . 7,273.43
	Repairs—Structures and Improvements..... 185.98
	Repairs—Machinery and Equipment..... 1,083.31
	Repairs—Care of Grounds..... 2,811.58
	Repairs—Highways. . . . . 524.60
	Repairs—Care of Grounds—Rockland Ceme-
	tery. . . . . 779.66
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Total. . . . .	\$ 13,519.86

008	Sick Leave Payrolls.....	2,533.80
009	Vacation Payrolls .....	3,570.16
Services Other Than Personal:		
102	Expert Consultant and Other Service Fees.. \$	3.00
109	Fees Not Otherwise Classified.....	26.00
112	Postage, Freight and Express.....	18.11
142	Repairs—Trucks and Autos.....	342.55
149	Repairs—Other Equipment .....	20.97
199	Miscellaneous Services .....	199.10
Total. ....		\$ 609.73
Materials and Supplies:		
201	Stationery and Office Supplies..... \$	41.80
202	Small Tools and Shop Supplies.....	257.32
204	Wearing Apparel and Personal Supplies.....	58.21
212	Lubricants. ....	34.85
213	Tires and Tubes.....	430.35
214	Repair Parts and Supplies—Trucks and Autos	132.86
241	Fuel. ....	338.81
244	Housekeeping Supplies and Minor Equipment	13.72
252	Seeds, Fertilizer, Trees and Shrubs.....	42.10
259	Other Agricultural, Horticultural and Land- scaping Supplies .....	52.68
265	Fabricated Metal Products.....	74.09
266	Lumber and Hardware.....	172.94
267	Paint and Painters' Supplies.....	13.10
268	Plumbing and Electrical Supplies.....	83.14
299	Miscellaneous Materials and Supplies.....	58.12
Total. ....		\$ 1,804.09
Outstanding Commitments—Services Other Than Per- sonal. ....		460.60
Outstanding Commitments—Materials and Supplies..		2,236.06
Total—Source of Supply .....		\$217,477.76

#### TRANSMISSION AND DISTRIBUTION

##### Pumping Station:

Salaries:		
001	Labor—Operation. ....	\$13,691.58
	Repairs—Machinery and Equipment.....	195.40
Total. ....		\$ 13,886.98
Services Other Than Personal:		
111	Telephone and Telegraph.....	\$ 373.66
131	Light and Power.....	15,656.74
146	Repairs—Plant Equipment .....	615.96
199	Miscellaneous Services .....	15.00
Total. ....		\$ 16,661.36
Materials and Supplies:		
201	Stationery and Office Supplies..... \$	147.02
211	Motor Fuel .....	483.18
212	Lubricants. ....	33.32
214	Repair Parts and Supplies—Trucks and Autos	11.75
222	Repair Parts and Supplies—Plant Equipment	317.52
241	Fuel. ....	589.43
244	Housekeeping Supplies .....	10.09
265	Fabricated Metal Products.....	40.18
268	Plumbing and Electrical Supplies.....	207.49
271	Pipe. ....	62.72
272	Valves and Fittings.....	160.33
Total. ....		\$ 2,063.03

# Pipe Lines:

## Salaries:

001	Supervision. . . . .	\$11,527.40
	Clerical. . . . .	5,615.77
	Labor—Operation. . . . .	84,546.20
	Repairs—Structures and Improvements. . . . .	39.51
	Repairs—Trucks and Autos. . . . .	10,190.58
	Repairs—Care of Grounds. . . . .	6,348.57
	Repairs—Highway Construction. . . . .	3,376.23
	Repairs—Transmission Mains. . . . .	761.85
	Repairs—Distribution Mains. . . . .	14,685.44
	Repairs—Gates and Valves. . . . .	5,260.95
	Repairs—Hydrants. . . . .	8,416.61
	Repairs—Services. . . . .	14,712.68
	Repairs—Meters (Emergency). . . . .	211.05
	New Work—Distribution Mains. . . . .	1,697.59
	New Work—Gates and Valves. . . . .	691.52
	New Work—Hydrants. . . . .	6,334.76
	New Work—Services. . . . .	45,874.49
	New Work—Meters (Emergency). . . . .	63.03
	Retirement Work—Hydrants. . . . .	187.94
	Retirement Work—Services. . . . .	731.38
Total. . . . .		\$221,273.55

## Services Other Than Personal:

102	Expert Consultant and Other Service Fees. . . . .	\$ 196.00
109	Fees Not Otherwise Classified. . . . .	1,037.00
111	Telephone and Telegraph. . . . .	2,707.10
112	Postage, Freight and Express. . . . .	58.41
131	Light and Power. . . . .	2,497.28
141	Repairs—Office Machinery. . . . .	20.19
142	Repairs—Trucks and Autos. . . . .	1,778.58
143	Repairs—Construction and Other Automotive Equipment. . . . .	185.10
153	Repairs—Street Openings. . . . .	15,041.40
163	Rental of Other Equipment. . . . .	88.00
165	Rental of Land. . . . .	10.00
166	Rent. . . . .	1,897.78
199	Miscellaneous Services. . . . .	1,010.46
Total. . . . .		\$ 26,527.30

## Materials and Supplies:

201	Stationery and Office Supplies. . . . .	\$ 493.61
202	Small Tools and Shop Supplies. . . . .	1,088.56
204	Wearing Apparel and Personal Supplies. . . . .	237.64
211	Motor Fuel. . . . .	3,633.70
212	Lubricants. . . . .	102.17
213	Tires and Tubes. . . . .	699.40
214	Repair Parts and Supplies—Trucks and Autos. . . . .	1,933.50
229	Repair Parts and Supplies—Other Equipment. . . . .	59.34
241	Fuel. . . . .	3,348.31
244	Housekeeping Supplies and Minor Equipment. . . . .	132.42
252	Seeds, Fertilizer, Trees and Shrubs. . . . .	125.00
259	Other Agricultural, Horticultural and Landscaping Supplies. . . . .	65.12
261	Gravel, Sand and Stone. . . . .	123.94
262	Cement, Plaster and Related Products. . . . .	154.58
265	Fabricated Metal Products. . . . .	259.70
266	Lumber and Hardware. . . . .	992.33
267	Paint and Painters' Supplies. . . . .	290.30
268	Plumbing and Electrical Supplies. . . . .	1,040.45
271	Pipe—Cast Iron. . . . .	1,108.00
271	Pipe—Service. . . . .	6,947.91
271	Pipe—Other. . . . .	252.70
272	Hydrant, Valves and Fittings. . . . .	41,385.87
272	Gates and Valves. . . . .	2,033.75
299	Miscellaneous Materials and Supplies. . . . .	510.75
Total. . . . .		\$ 67,019.05

<b>Special Items:</b>	
361 Expenses for Special Ceremonies.....	\$ 100.00
Total. ....	\$ 100.00
<b>Capital Outlay:</b>	
512 Trucks and Tractors.....	\$ 8,563.71
521 Construction and Engineering Equipment.....	532.66
561 Shop and Plant Equipment.....	273.30
Total. ....	\$ 9,369.67
<b>Other Structures and Improvements:</b>	
721 New Main Extensions.....	\$142,357.02
Total. ....	\$142,357.02
<b>Distribution Reservoirs:</b>	
<b>Services Other Than Personal:</b>	
111 Telephone and Telegraph.....	\$ 213.00
131 Light and Power.....	27.00
Total. ....	\$ 240.00
<b>Materials and Supplies:</b>	
265 Fabricated Metal Products.....	\$ 16.40
Total. ....	\$ 16.40
<b>General:</b>	
<b>Salaries:</b>	
001 Labor—Operation.....	\$12,283.21
Repairs—Trucks and Autos.....	1,679.37
008 Sick Leave Payroll.....	8,599.71
009 Vacation Payroll.....	7,900.16
Total. ....	\$ 30,462.45
<b>Services Other Than Personal:</b>	
146 Repairs—Plant Equipment.....	\$ 18.75
149 Repairs—Other Equipment.....	7.50
199 Miscellaneous Services.....	123.68
Total. ....	\$ 149.93
<b>Materials and Supplies:</b>	
244 Housekeeping Supplies and Minor Equipment	\$ 6.86
259 Other Agricultural, Horticultural and Land- scaping Supplies.....	4.65
261 Gravel, Sand and Stone.....	83.06
262 Cement, Plaster and Related Products.....	30.62
265 Fabricated Metal Products.....	144.21
268 Plumbing and Electrical Supplies.....	97.61
272 Valves and Fittings.....	6.77
Total. ....	\$ 373.78
<b>Outstanding Commitments—Services Other Than Per- sonal. ....</b>	
	190.50
<b>Outstanding Commitments—Materials and Supplies.....</b>	
	1,221.82
<b>Outstanding Commitments—New Main Extensions.....</b>	
	5,771.03
<b>Total—Transmission and Distribution.....</b>	
	\$537,683.87

## METERING

### Salaries:

001	Supervision.....	\$10,753.11
	Clerical.....	42,526.08
	Labor—Operation.....	33,341.50
	Repairing Meters.....	11,863.71
	Removing and Setting Meters.....	14,194.44
	Testing Meters.....	3,522.02
	General Operation.....	12,267.12
008	Sick Leave Payrolls.....	5,372.85
009	Vacation Payrolls.....	5,217.22

Total.....\$139,058.05

### Services Other Than Personal:

102	Expert Consultant and Other Service Fees... \$	6.00
109	Fees Not Otherwise Classified.....	22.00
111	Telephone and Telegraph.....	1,780.00
112	Postage, Freight and Express.....	596.49
116	Transportation of Persons—Carfares.....	738.10
118	Travel Subsistence—Other.....	9.00
121	Printing, Binding and Reproduction Services.....	39.00
131	Light and Power.....	900.00
141	Repairs—Office Machinery, Furniture and Furnishings.....	775.28
142	Repairs—Trucks and Autos.....	1,241.52
151	Maintenance and Servicing.....	91.55
166	Rent.....	7,250.00
199	Miscellaneous Services.....	20,791.22

Total.....\$ 34,240.16

### Materials and Supplies:

201	Stationery and Office Supplies.....	\$ 2,360.15
202	Small Tools and Shop Supplies.....	429.35
204	Wearing Apparel and Personal Supplies.....	175.47
211	Motor Fuel.....	1,373.32
212	Lubricants.....	268.94
213	Tires and Tubes.....	61.58
214	Repair Parts and Supplies—Trucks and Autos.....	380.25
231	Medical, Chemical and Laboratory Supplies..	95.66
241	Fuel.....	1,764.00
244	Housekeeping Supplies and Minor Equipment.....	312.48
265	Fabricated Metal Products.....	17.15
267	Paint and Painters' Supplies.....	102.22
268	Plumbing and Electrical Supplies.....	288.86
272	Valves and Fittings.....	552.84
274	Meter Parts.....	9,104.57
299	Miscellaneous Materials and Supplies.....	98.50

Total.....\$ 17,385.34

### Capital Outlay:

501	Office Furniture, Machinery and Equipment. \$	2,081.58
512	Trucks and Autos.....	6,144.86

Total.....\$ 8,226.44

Outstanding Commitments—Services Other Than Per-

sonal.....102.50

Outstanding Commitments—Materials and Supplies.....134.94

Total—Metering.....\$199,147.43

TOTAL—OPERATING EXPENSE.....\$1,105,335.14

**TABLE 42**  
STATEMENT OF REVENUE—ESTIMATED AND ACTUAL  
FOR THE YEAR ENDED SEPTEMBER 30, 1954

Account	Estimated Revenue	Actual Revenue
Water Rents .....	\$2,070,000.00	\$2,146,947.18
Hydrant Rental .....	70,000.00	72,407.36
Electricity. ....	24,000.00	19,901.24
Stores Account (Meters).....	2,500.00	8,615.58
Repairing and Setting Meters.....	6,000.00	9,067.84
Fire Supplies and Miscellaneous Repairs	5,000.00	11,642.69
New Service Installations.....	50,000.00	63,387.00
New Main Extensions.....	150,000.00	94,390.40
Rentals. ....	1,500.00	1,325.12
Other miscellaneous Receipts.....	10,000.00	21,970.15
<b>Total.....</b>	<b>\$2,389,000.00</b>	<b>\$2,449,654.56</b>

**TABLE 43**  
SUMMARY OF ANNUAL WATER WORKS REVENUES  
1930-1954

Fiscal Years Ended Sept. 30	Receipts From Sale of Water	Misc. Receipts	Total
1930.....	\$1,384,369.54	\$218,844.87	\$1,603,214.41
1931.....	1,414,836.00	237,172.64	1,652,008.64
1932.....	1,375,450.77	223,058.31	1,598,509.08
1933.....	1,345,444.69	212,066.79	1,557,511.48
1934.....	1,387,876.73	184,133.47	1,572,010.20
1935.....	1,409,269.47	237,518.68	1,646,788.15
1936.....	1,427,881.10	265,357.71	1,693,238.81
1937.....	1,429,107.08	229,317.39	1,721,424.47
1938.....	1,426,986.49	106,359.70	1,533,346.19
1939.....	1,491,918.63	124,901.37	1,616,820.00
1940.....	1,551,917.24	115,540.98	1,667,458.22
1941.....	1,615,351.79	114,960.58	1,730,312.37
1942.....	1,679,058.50	103,368.22	1,782,426.72
1943.....	1,629,268.35	86,580.98	1,715,849.33
1944.....	1,761,016.12	87,946.71	1,848,962.83
1945.....	1,812,311.82	99,271.44	1,911,583.26
1946.....	1,808,993.17	123,247.90	1,932,241.07
1947.....	1,877,471.18	124,372.47	2,001,843.65
1948.....	2,005,242.58	222,419.41	2,227,661.99
1949.....	2,031,633.37	229,317.72	2,260,951.09
1950.....	2,082,814.82	199,061.80	2,281,876.62
1951.....	2,078,209.84	214,868.70	2,293,078.54
1952.....	2,053,427.76	322,761.07	2,376,188.83
1953.....	2,093,625.85	343,477.23	2,437,103.08
1954.....	2,146,947.18	302,707.38	2,449,654.56

**TABLE 44**

STATEMENT OF WATER WORKS  
DEPRECIATION AND EXTENSION FUND

	Investment	Cash	Due From Other Funds	Total
Balance Sept. 30, 1953.....	\$787,000.00	\$93,548.65	\$300,000.00	\$1,180,548.65
Increase During Year Ended Sept. 30, 1954.....		804,482.50		
Disbursements During Year Ended Sept. 30, 1954.....	486,000.00	990,000.00	300,000.00	
Accounts Receivable Year Ended Sept. 30, 1954.....			250,000.00	
Balance Sept. 30, 1954.....	\$301,000.00	\$ 8,031.15	\$250,000.00	\$ 559,031.15

**TABLE 45**

STATEMENT OF WATER WORKS  
DEPOSIT AND REFUND ACCOUNT

Cash Balance Sept. 30, 1954.....	\$59,007.97	
Receipts for Year Ended Sept. 30, 1954.....	NIL	
Total Available .....		\$59,007.97
Disbursements for Year Ended Sept. 30, 1954.....	\$14,934.11	
Accounts Payable for Year Ended Sept. 30, 1954.....	NIL	
Total Deductions .....		14,934.11
Cash Balance Sept. 30, 1954.....		\$44,073.86

TABLE 46

STATEMENT OF WATER SUPPLY BOARD BONDS OUTSTANDING  
AND SINKING FUND REQUIREMENTS ON A 3% BASIS  
AS OF SEPTEMBER 30, 1954

Bonds Payable from Sinking Fund	Rate of Int. %	Year of		Bonds		Sinking Fund Requirements On a 3% Basis
		Issue	Maturity	Issued	Outstanding	
Water Supply .....	4	1916	1956	\$1,000,000.00	\$1,000,000.00	\$ 924,098.04
" " .....	4½	1922	1962	1,000,000.00	1,000,000.00	710,237.76
" " .....	4	1922	1962	2,000,000.00	2,000,000.00	1,410,030.86
" " .....	4	1932	1962	1,000,000.00	1,000,000.00	646,674.47
" " .....	4	1922	1962	2,500,000.00	2,500,000.00	1,699,333.46
" " .....	4½	1924	1964	2,000,000.00	2,000,000.00	1,287,165.01
" " .....	4	1924	1964	1,500,000.00	1,500,000.00	926,551.29
" " .....	4	1925	1965	2,500,000.00	2,500,000.00	1,510,518.49
" " .....	4	1928	1968	1,500,000.00	1,500,000.00	784,082.46
Total Water Supply Debt and Sinking Fund Requirement .....					\$15,000,000.00	\$9,898,691.84
Sinking Fund Assets Allocated to Water Supply debt per City Controller's Report on Sinking Fund Sept. 30, 1954 (Includes \$236,809.86* Water Operating Balance for Year Ended Sept. 30, 1954 plus Prior Year Adjustments of \$8,477.28 or a total of \$245,287.14) .....						\$9,944,000.84
Amount in Excess of Requirements on 3% Basis .....						\$ 45,309.00

\*Subject to change due to anticipated discounts on Outstanding Commitments, see Table No. 41.

TABLE 47

A SUMMARY OF INVENTORIES OF PERSONAL PROPERTY  
AT SEPTEMBER 30, 1954

ADMINISTRATIVE: .....	\$ 24,795.77
SOURCE OF SUPPLY:	
Hydro Electric Station .....	\$ 10,731.84
Purification Works .....	28,672.84
Laboratory. ....	14,078.71
General. ....	9,660.23
	63,143.62
TRANSMISSION AND DISTRIBUTION:	
Pipe Lines .....	\$171,375.65
Pumping Stations .....	664.17
Distribution Reservoirs .....	170.12
Garage. ....	7,177.12
	179,387.06
METERING: .....	84,358.77
SUPPLIES: .....	2,762.56
Total Personal Property Inventory .....	\$354,447.78



**TABLE 48**

**STATEMENT OF NORTHWESTERLY FORCE MAIN  
CONSTRUCTION ACCOUNT**

**FOR THE YEAR ENDED SEPT. 30, 1954**

Transferred from Depreciation and Extension Fund.....	\$730,000.00
Disbursements Sept. 30, 1954.....	\$130,796.57
Outstanding Commitments Sept. 30, 1954.....	407,696.65
<b>Total Disbursements .....</b>	<b>538,493.22</b>
Cash Balance Sept. 30, 1954.....	\$191,506.78

**TABLE 49**

**STATEMENT OF STORES REVOLVING FUND**

**FOR THE YEAR ENDED SEPT. 30, 1954**

Cash Balance Sept. 30, 1953.....	\$ 10,000.00
Outstanding Commitments Sept. 30, 1953.....	28,825.20
Receipts—Oct. 1, 1953 to Sept. 30, 1954.....	83,996.85
<b>Total Available .....</b>	<b>\$122,822.05</b>
Disbursements Sept. 30, 1954.....	\$ 73,735.90
Outstanding Commitments Sept. 30, 1954.....	30,470.57
Transferred as Income to General Fund.....	8,615.58
<b>Total Disbursements .....</b>	<b>112,822.05</b>
Cash Balance Sept. 30, 1954.....	\$ 10,000.00

**TABLE 50**

**STATEMENT OF ACADEMY AVENUE BUILDING  
ACCOUNT**

**FOR THE YEAR ENDED SEPT. 30, 1954**

Transferred from Depreciation and Extension Fund.....	\$400,000.00
Disbursements Sept. 30, 1954.....	\$315,499.73
Outstanding Commitments Sept. 30, 1954.....	79,723.95
<b>Total Disbursements .....</b>	<b>395,223.68</b>
Cash Balance Sept. 30, 1954.....	\$ 4,776.32

**TABLE 51**

**REBUILDING FILTERS AND METERING FACILI-  
TIES AT THE WATER PURIFICATION WORKS**

**FOR THE YEAR ENDED SEPT. 30, 1954**

Transferred from Depreciation and Extension Fund.....	\$110,000.00
Disbursements Sept. 30, 1954.....	\$98,707.01
Outstanding Commitments Sept. 30, 1954.....	8,692.00
<b>Total Disbursements .....</b>	<b>107,399.01</b>
Cash Balance Sept. 30, 1954.....	\$ 2,600.99

TABLE 52

WATER WORKS PROPERTY IN THE VARIOUS CITIES AND TOWNS  
(VALUATION AS OF DECEMBER 31, 1953)

LOCATION OF PROPERTY	LAND AREA (Acres)	VALUATIONS						Tax
		DECLARED			*Assessed			
		Land	Bldgs. & Imp.	Total	Land	Bldgs. & Imp.	Total	
City of Providence.....	3.03	\$ 19,840.00	\$ 84,200.00	\$ 104,040.00	\$ 19,840.00	\$ 84,200.00	\$ 104,040.00	..... 5.50
City of Warwick.....	0.06	160.00	0	160.00	200.00	0	200.00	\$ 26,933.40
City of Cranston.....	79.43	12,630.00	885,000.00	897,630.00	12,780.00	885,000.00	897,780.00	2,180.00
Town of Foster.....	1,936.04	30,560.00	2,600.00	33,160.00	109,000.00	0	109,000.00	..... 11.48
Town of Glocester.....	73.30	11,020.00	0	11,020.00	11,020.00	0	11,020.00	7,782.38
Town of Johnston.....	103.13	35,310.00	268,500.00	303,810.00	38,495.00	292,670.00	331,165.00	4,795.00
Town of North Providence.....	8.58	20,720.00	154,280.00	175,000.00	175,000.00	0	175,000.00	183,330.00
Town of Scituate.....	13,182.24	577,150.00	6,212,850.00	6,790,000.00	607,000.00	6,183,000.00	6,790,000.00	.....
Total Real Estate.....	15,385.81	\$707,390.00	\$ 7,607,430.00	\$ 8,314,820.00	\$973,335.00	\$7,444,870.00	\$8,418,205.00	\$225,290.76
Water Distribution System.....	.....	.....	7,558,025.59	7,558,025.59	.....	.....	.....	.....
Total.....	15,385.81	\$707,390.00	\$15,165,455.59	\$15,872,845.59	\$973,335.00	\$7,444,870.00	\$8,418,205.00	\$225,290.76

\*Cranston—Total Buildings and Improvements \$1,035,000.00 (\$150,000.00 exempt).

\*Scituate—Buildings and Improvements \$6,176,000.00; Tangible Personal \$7,000.00. Valuations as per agreement dated June 9, 1951.

\*North Providence—Valuation as per agreement dated March 3, 1953.

**TABLE 53**  
**SUMMARY OF STATISTICS**  
**PROVIDENCE WATER SUPPLY BOARD**  
**FOR THE YEAR ENDED SEPT. 30, 1954**

In form recommended by the New England Water Works Association

PROVIDENCE*	PROVIDENCE	RHODE ISLAND
(City or Town)	(County)	(State)

**GENERAL STATISTICS**

Population of Providence (1950 Federal Census) .....	248,674
Estimated population supplied in suburbs .....	**123,300
Total population supplied .....	371,974
Date of Construction .....	1870-76; 1915-28; 1935; 1938-40
By whom owned .....	City of Providence
Source of Supply .....	Surface water collected in Scituate Reservoir and five smaller reservoirs on north branch of Pawtuxet River.
Available Storage Capacity of six impounding reservoirs .....	39,746 m. g.
Mode of supply .....	82.9% by gravity; 17.1% by pumping

**STATISTICS OF CONSUMPTION OF WATER**

1. Estimated total population to date .....	
2. Estimated population on lines of pipe .....	
3. Estimated population supplied .....	371,974
4. Total consumption for the year, gallons .....	13,840,620.00
5. Passed through meters, gallons .....	12,946,563,700
6. Percentage of consumption metered .....	93.5%
7. Average daily consumption, gallons .....	37,920,000
8. Gallons per day to each inhabitant .....	
9. Gallons per day to each consumer .....	101.9
10. Gallons per day to each tap .....	670
11. Cost of supplying water, per million gallons, based on total maintenance .....	\$79.86
12. Cost of supplying water, per million gallons, total maintenance plus fixed charges .....	159.88

**FILTRATION**

1. Type of filters .....	Rapid Sand
2. Number of filter units .....	14
3. Capacity of filter plant .....	14 units @ 7.5=105 m.g.d.
4. Chemicals used .....	Ferri-Floc, Quicklime, Chlorine and Sod. Silicofluoride
5. Total water filtered during the year, gallons .....	13,952,503,000
6. Average quantity filtered per day, gallons .....	38,226,000
7. Total filtered water delivered to the distribution system during the year, gallons .....	13,840,789,000

\*Supplying Providence and portions of Cranston, Johnston, North Providence, Warwick, and Smithfield.  
 \*\*Does not include population supplied through Kent County Water Authority.

**TABLE 53—Continued**

SUMMARY OF STATISTICS

PROVIDENCE WATER SUPPLY BOARD

FOR THE YEAR ENDED SEPT. 30, 1954

STATISTICS RELATING TO DISTRIBUTING SYSTEM  
MAINS\*

1. Kind of Pipe	Cement Asbestos, Cast Iron, Steel and Concrete
2. Sizes	From 6 to 66 inches
3. Extended during year (net)	52,298.84 feet
4. Discontinued during year	6.0 feet
5. Total now in use	696.24 miles
6. Cost of repairs per mile	.....
7. Number of leaks per mile	0.13
8. Length of pipes less than 6 inches in diameter	0
9. Number of hydrants added during year	44
10. Number of hydrants now in use	3,965
11. Number of gates added during year	155
12. Number of stop gates now in use	9,929
13. Number of stop gates smaller than 6 inches	0
14. Number of blow-offs	.....
15. Range of pressure on mains	14 to 95 pounds

HIGH PRESSURE FIRE SERVICE

Kind of Pipe	Cast Iron
Sizes	6, 8, 12, 16 and 24 inches
Extended during year	0
Discontinued during year	0
Total now in use	12.71 miles
Hydrants added during year	0
Hydrants now in use	159
Stop gates added	0
Stop gates now in use	126
Number of blow-offs	0
Range of pressure on mains	94 to 130 pounds

SERVICES

16. Kind of pipe	lead, copper and cast iron
17. Size	½ in. to 16 inches
18. Extended, feet	.....
19. Discontinued, feet	.....
20. Total now in use, miles	.....
21. Number of service taps added during year	1,105
22. Number now in use	56,567
23. Average length of services, feet	.....
24. Average cost of service for year	.....
25. Number of meters added	828
26. Number of meters now in use	55,550
27. Percentage of services metered	99.3
28. Percentage of receipts from metered water	.....
29. Number of motors and elevators added	0
30. Number of elevators now in use	.....

\*Not including high pressure fire service.