18

EXECUTIVE DEPARTMENT
ROBERT W. HEALY
City Manager

RICHARD C. ROSSI
DEPUTY CITY MANAGER

CITY OF CAMBRIDGE

CAMBRIDGE, MASSACHUSETTS 02139
TEL. 498-9011

April 28, 1986

To the Honorable, the City Council:

The following are my detailed recommendations for pay-as-you-go capital expenditures and bond issues for the Water Department for the years FY87-FY91. All improvement projects will be funded from water receipts:

FY87	$ 1,000,000
FY88	1,000,000
FY89	1,000,000
FY90	6,500,000
FY91	6,000,000
Five-year total	$15,500,000

In FY90, a $6,000,000 bond issue is planned to finance the first phase of the installation of a permanent aluminum cover and membrane liner at Payson Park Reservoir. A second bond issue of $5,000,000 is planned in FY91 to finance a complete renovation of the raw water intake pumping station at Fresh Pond which pumps water from the reservoir into the Water Treatment Plant.

It is estimated that my water rate increase recommendations: FY87, $0.13; FY88, $0.03; FY89, $0.03; FY90, $0.03; and FY91, $0.11 will provide an annual reserve of $300,000 which protects the integrity of the annual pay-as-you-go projects program by providing an annual sum for unplanned projects of an emergency nature. This schedule of water rate increases will also cover the anticipated escalation of normal operating expenses, including salaries, chemicals, utilities, etc.

This recommendation for capital project planning represents a balanced program for upgrading the water system, that being the incorporation of the recommendations from the Water Department with financial projections which result in a reasonable and affordable water rate increase.

A detailed list of the projects scheduled for FY87 through FY91 follows:

WATER DEPARTMENT CAPITAL IMPROVEMENT PROGRAM-FISCAL YEARS 1987 thru 1991

First Year - FY87

A. Replace High Lift Pump & Motor No. 2 - $100,000

This work will consist of installing a new High Lift Pump & Motor unit (14 mil.gal/day; 600 H.P.) to replace existing equipment installed in 1952. A similar project in 1983 that replaced Pump & Motor Unit No. 1 for $90,000 saved $30,000 in electrical expenses during its first year of operation because of improved hydraulic and electrical efficiencies. (Note: the High Lift Pump Station pumps treated water from the Clear Well at the Water Treatment Plant to elevated storage at Payson Park Reservoir in Belmont).

B. Rehabilitate Rapid Sand Filters & Backwash System - $150,000

This work will consist of extensive improvements to the Filter Backwash Water System and replacement of filtration media in three or four existing rapid sand filters. In addition to the rehabilitation of several filters, the scope of work will also include the installation of new return pumps to recycle filter backwash effluent to the head works of the W.T.P.; and repainting of the existing 165,000 gallon backwash water storage tank, which was installed as original equipment in 1922. (Note: The Water Department is presently under an administrative order from the U. S. Environmental Protection Agency to discontinue the discharge of filter backwash effluent into Fresh Pond).

C. Chemical Feed System Conversion - $200,000

The purpose of this project is to replace the existing corrosion control chemical sodium hydroxide with either lime or potassium hydroxide. The "pH" of raw water in the supply reservoirs and process water in the W.T.P. ranges from 6.8 to 7.0 which is considered acidic and corrosive. The "pH" of the process water can be raised to levels of 8.1 to 8.4 which is considered alkaline or non-corrosive by adding hydroxide ions. The sodium hydroxide chemical used by the Water Department to raise "pH" has been effective as a corrosion control additive, but it unfortunately contains elemental sodium which is a suspected source of hypertension for some people. (Note: Sodium may become a regulated contaminant under the proposed revised E.P.A. Drinking Water Regulations).

D. Planning & Design Phase of Sludge Disposal Process - $50,000

The Water Department is presently under an administrative order from the E.P.A. to discontinue the discharge of alum sludge into Fresh Pond. The three options available for complying are 1) direct discharge into the Massachusetts Water Resources Authority (M.W.R.A.) wastewater collection system, 2) mechanical dewatering on-site at the W.T.P.; and 3) freeze-drying lagoons at Kingsley Park. Alternative No. 1 is the preferred choice of the Water Department. In the event that the M.W.R.A. refuses to accept this chemical pre-treatment sludge, the Water Department will have to implement one of the other two options. This project will be the planning and design phase of the overall solution.

E. 1986/87 Water Main Construction - $500,000

Because of the advancing age of many sections of the water distribution system and the increasing frequency of water main breaks, commencing in Fiscal Year 1987, the Water Department will replace about one-mile of pipe line on an annual basis. The criteria used to establish a priority list of pipe lines to be replaced are as follows:

1) The age of the water main is more than 100 years
2) The existing pipe is undersized hydraulically
3) The existing pipe does not have a cement mortar lining
4) The replacement water main can be installed in advance of street re-construction.

Water main replacement work included in the fiscal year 1987 program is listed below:

Location	Limits or Work	Length (Feet)	Composite Age-(Years)	Existing Size(in.)	Proposed Size(in.)
Norfolk St.	Broadway-Bishop Allen Dr.	1,400	115	6	8
Charles St.	Third St.-Sixth St.	1,100	105	6	8
Sparks St.	Brattle St.-Mt. Auburn St.	1,100	104	6	12
Mass. Ave.	Columbus-Alewife	200	91	6	12
Hollis St.	Mass. Ave.-Rindge Ave.	800	113	6	8
Hubbard Ave.	Walden St.-Raymond St.	700	113	6	8
	TOTAL LENGTH:	5,300			

The new water mains in Norfolk, Charles and Sparks Streets will be installed in the summer of 1986 ahead of the roadway reconstruction projects included in the City Street and Sidewalk Program.

Second Year - FY88

F. Replace High Lift Pump & Motor No. 3 - $150,000

This project will complete the rehabilitation of all mechanical systems in the High Lift Pump Station of the Water Treatment Plant. The new equipment will be a variable speed drive pump and motor unit, sized to operate in parallel with either one of the constant speed pump and motor units installed in 1984 and early 1987.

G. Rehabilitate Rapid Sand Filters - $150,000

This project will be a continuation of the work started in fiscal year 1987. A minimum of three filters will be reconditioned.

Second Year FY88
(Continued)

H. Payson Park Toe Drain - $70,000

The construction of this project will alleviate a chronic leakage problem on the south side of the dam at Cushing Avenue. The scope of work will consist of an underdrain at the toe of the slope to relieve leakage through the side slope that has caused an erosion problem and potential dam failure.

I. Chlorine Piping System - $40,000

This work will consist of a complete replacement of the chlorine piping system at the Water Treatment Plant for safety purposes. This system was last overhauled in 1969.

J. Earth Dam Safety Analysis - $40,000

This project will evaluate the structural integrity of the two earth dams at Stony Brook and Hobbs Brook Reservoirs. This survey work is required by the U. S. Army Corps of Engineers.

K. Stony Brook Gate House Rehabilitation - $50,000

This project consists of restoration of the Gate House superstructure at Stony Brook Reservoir in Waltham. The scope of work will include masonary improvements, new windows and roof, and building weatherization.

L. 1987/88 Water Main Construction - $500,000

This work will be a continuation of the water distribution system improvements started in fiscal year 1987. New water main construction will be co-ordinated with the next portion of the City Street and Sidewalk Program.

Fourth Year - FY90

R. Payson Park Reservoir Cover & Liner - $6,000,000

Operational considerations dictate that this project must be constructed in two phases, which are essentially the North Basin and the South Basin. A $6,000,000 bond issue is scheduled in FY90 to finance Phase One of this project.

S. 1989/90 Water Main Construction Program - $500,000

This project will be a continuation of the one-mile each year replacement program of the Water Department.

Fifth Year - FY91

T. Raw Water Intake Pump Station - $5,000,000

A $5,000,000 bond issue is scheduled for FY91 to finance the construction of a new intake pump station at Fresh Pond to replace original equipment installed in 1922 and 1932. This facility will pump water from Fresh Pond into the head works of the Water Treatment Plant.

U. Water Treatment Plant Improvements - $300,000

This project will include electrical and instrumentation improvements to finalize the co-ordination of all the work completed in the Water Treatment Plant outlined above. Some portions of the electrical system date back to the early 1950's and should be upgraded for code conformance.

V. Site Work Improvements @ Reservoirs - $200,000

This project will continue the Water Department policy of site work improvements at Hobbs Brook, Stony Brook and Fresh Pond Reservoirs. Specific improvements may include fencing, roadway maintenance, dam maintenance, erosion control and forestry work.

Third Year - FY89

M. Pipe Gallery Improvements - $200,000

This work will be concentrated in the existing filter pipe gallery in the Water Treatment Plant. Much of the existing pipe is original material installed in 1922. The actual replacement work will involve a change-out of valve operators, control appurtenances and pipe supports.

N. Rehabilitate Rapid Sand Filters - $200,000

This project will be a continuation of the work started in fiscal year 1987 and carried forward in fiscal year 1988. A minimum of four filters will be reconditioned.

O. Hobbs Brook & Stony Brook Reservoir Improvements

This project will consist of site work restoration and structural modifications to the dams as required by the earth dam safety evaluation conducted in the preceding year.

P. Building Repairs @ Water Treatment Plant - $50,000

The scope of this project will include a new roof, window replacements, and general weatherization improvements.

Q. 1988/89 Water Main Construction - $500,000

This project will be a continuation of water distribution system improvements started in fiscal year 1987 and carried forward in fiscal year 1988. The Water Department will continue to target one mile each year as a realistic replacement goal.

Fifth Year-FY91
(Continued)

W. 1990/91 Water Main Construction Program - $500,000

This project will be a continuation of the one-mile each year replacement program of the Water Department.

Summary

The Water Department is tasked with the responsibility of furnishing the most important public health product provided by any public agency. The health and welfare of all our residents and customers, and the fire protection of homes and businesses is dependent every day on the integrity of the Water Department, which is a public utility regulated by State and Federal Laws.

The reliable operation of the Water Department can only be assured through the responsible acknowledgement of its real cost and the establishment of a realistic rate structure, that allows for reinvestment through capital improvements. The five-year program outlined above provides a fiscally sound approach for maintaining the goals and objectives of the Water Department.

Respectfully submitted,

Robert W. Healy
City Manager

Agenda Item No. 18 F-157

Re: detailed recommendations for pay-as-you-go capital expenditures & bond issues for the Water Dept. for the years FY87-FY91.

In City Council,

April 28, 1986

Referred to Committee on Finance

copy to Councillor Dandy Chair Finance Committee 5/2/86