REPORT

OF

WM. E. WORTHEN,

CIVIL ENGINEER,

ON THE

PRESENT CONDITION

OF THE

WATER DEPARTMENT

OF LONG ISLAND CITY,

AND RECOMMENDATIONS AND PLANS FOR MAKING THE WORKS SELF-SUSTAINING, WITH ACTION OF THE BOARD OF WATER COMMISSIONERS THEREON.

———o———

LONG ISLAND CITY:
PRINTED AT THE STAR OFFICE.

1877.

REPORT

OF

WM. E. WORTHEN,

CIVIL ENGINEER,

ON THE

PRESENT CONDITION

OF THE

WATER DEPARTMENT

OF LONG ISLAND CITY,

AND RECOMMENDATIONS AND PLANS FOR MAKING THE WORKS SELF-SUSTAINING, WITH ACTION OF THE BOARD OF WATER COMMISSIONERS THEREON.

LONG ISLAND CITY:
PRINTED AT THE STAR OFFICE.

1877.

REPORT.

To the Board of Water Commissioners of Long Island City:

Agreeably to the resolution of your Board, adopted Feb. 24th, I have entered upon the examination of the "present state of the Water Department," and herewith present the result of the examination, together with my views "as to the best means of making the Water Department self-sustaining with the least burden to any," with general plans for the enlargement and extension of the water supply and distribution, and suggestions for the practical details of management.

THE CHARACTER AND EXTENT OF THE PRESENT WATER SUPPLY.

About three years since I was appointed Chief Engineer of your Works, and, in my first report, recommended the present location of the Pump, Well and Engine House; a recommendation adopted unanimously by the Water Board.

About two years ago the water was first introduced into the mains, and the works went into successful operation. Of the kind of water supplied, it may be unnecessary to say anything, except it has been found by consumers to be superior to the Croton or Ridgewood for both domestic and industrial purposes. Of the quantity supplied, in my report of 1875, (June),

I estimated that 465,000 gallons could be furnished daily, without drawing the water in the well below the ten feet level, and, that a rate of 1,000 gallons per minute could be maintained for 4 hours, drawing upon the reserve in the well. As a means of comparison of the results absolutely obtained, with the estimate, a profile has been made of the quantity pumped daily, and of the height of the water in the well, from January 1st, 1876, to January 1st, 1877, and it is herewith submitted.

It will be seen that the average daily supply, throughout this year, has been from 450,000 to 500,000 gallons, and notably, that, from September 12th to September 30th, inclusive, the average daily supply was 600,000 gallons, and that the level of the water in the well was never below 9 feet, and its average above 11 feet; and it is safe to conclude that the absolute supply to the city has been in excess of the estimated capacity.

CONDITION OF THE PLANT.

The machinery of the engine house has been kept in thorough repair, and some useful appliances added since I left your works. The power and capacity of boilers and pumping engines are sufficient to deliver, in their usual working order, a much larger supply than contemplated, for some years, for domestic and industrial purposes, and, at the same time there is an extra power available for fire purposes within reach of the mains, by which the whole reserve water of the main and tributary wells may be drawn and delivered under fire pressure wherever temporarily required.

Owing to the want of funds and the unfinished condition of the streets, especially in the First Ward, I necessarily left, on my retirement from office as Chief Engineer of your Works, Feb. 2d, 1876, the original plan of mains unfinished.

The whole distribution from Engine House to Thomson avenue, was dependent on temporary 10 inch main. There was a long gap on Jackson avenue and the supply of almost all the First Ward was through a 6 inch main. A 16 inch main, as originally contemplated, has since been laid through Vandam street to Thomson avenue. The gap in the 10 inch main on Jackson avenue has been filled, various other services have been strengthened, and some mains extended.

The total of mains now laid is reported as follows :

4 inch pipe	450 feet.
6 inch pipe	38,090 feet.
8 inch pipe	18,880 feet.
10 inch pipe	12,620 feet.
12 inch pipe	1,930 feet.
16 inch pipe	3,980 feet.
Total	75,950 feet.

Hydrants, 200.

THE FINANCIAL CONDITION.

Full statements of receipts and disbursements, debts and assets of the Department, have been furnished me by your bookkeeper, of which I herewith present a summary, in view of a practical suggestion of "the best means of making the Water Department self-sustaining with the least burthen to any."

The first appropriation for a water supply, authorized in 1871, was	$300,000
The second in 1875, was	50,000
Total of bonds authorized and issued	$350,000
Floating debt	$26,698 46
Assets of uncollected taxes	23,341 83

EXPENSES FOR THE COMING YEAR.

Interest on $350,000 bonds at 7 per cent. .	$24,500 00
Total expenses of maintenance of works, repair of plant, wages, fuel, oil, &c., at engine house, supervision, clerk hire, rent and stationery, I estimate at.....	14,000 00
Total expenses.....	$38,500 00
Estimated income in full from all sources.	33,589 49
Deficit (even if all water rates are paid). .	$ 4,910 51

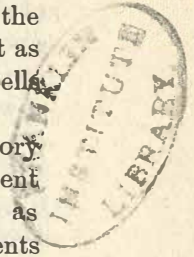
From the above brief summary it will be seen that the Works cannot be made self-supporting without an increase of income.

Now the income cannot be increased but in two ways; by the raising of the water rates, or by the extension of the mains, and an increase in the number of paying water rates. The first is not practicable. The rates are now somewhat higher than those of New York, and equal to those of Brooklyn, and it should be the aim to furnish water to the inhabitants of your city at as low a rate as possible, consistent with the self-support of the Department. Good water delivered into premises under a head of 50 feet to 60 feet, at moderate rates, with provision of ample temporary head for fire purposes, should induce an increase of population and industries, and an enhancement of the value of real estate. I can only, therefore, recommend an extension of your mains—a new suction main for the extension of the supply, and an extension of the mains for the distribution.

In the location of the pump well, it was in contemplation, as shown by my report and adopted by the Board, to lay a suction main, northerly and easterly from the well, through available streets, and extending the same from time to time according to the demand for water, till the underground flow of water from the

Gosman farm, and probably Train's Meadow, in the end, might be availed of.

For the present it would be sufficient to extend the suction main from the well through Vandam street as far as at present graded, with some five pipe wells connected therewith.



For an estimate of the extension of the distributory mains, I have supplemented the plan of the present distribution by mains in such streets and avenues as I think would be called for, either by the residents on them, or by the necessities of extension, for the more uniform distribution, in places already provided, or to be provided with water.

For the purposes of this report it may not be necessary to give in detail either the sizes or positions of the mains estimated, as the necessities or demands of residents might, in some measure, modify the requirments for immediate construction, or alter locations. The plotting in of the mains with the best advice that I have been able to get in the matter, shows that 85,000 feet of mains, with 180 hydrants, might be laid during the present year, with advantage to the city and income to the Water Department.

ESTIMATE OF COST OF PROPOSED EXTENSION.

1,200 feet 16 inch suction main with 5 pipe wells	$ 6,000
85,000 feet distributing mains of various diameters, with 180 hydrants	83,000
Engineering and contingencies	11,000
Total	$100,000

ESTIMATE OF INCOME AND EXPENSE AFTER THE EXTENSION OF THE WORKS.

The full estimated income of the Works for the ensuing year has been already given, based on the the water rates of the last year, at $33,589.49.

The total length of pipes now laid is 75,950 feet. It is proposed to more than double this, but in view of that, although the rates on lots will be in nearly direct proportion to the increase in the length of mains, still the increased number of water takers and of water required will be in a very much less ratio.

I estimate the annual revenue.....		$55,000 00
Int. on $350,000 old bonds, $100,000 new..	$31,500 00	
Total expense of maintenance and supervision	15,000 00	
	$46,500 00	
Net income.....		$ 8,500 00

It has never been a question with me but that your Works might be made self-sustaining, and an extension of mains was urged before my resignation of the office of Chief Engineer. It should be now promptly done, for the prices of materal and labor are unprecedentedly low, and the earlier the date it is done, the sooner will the Works be self-sustaining.

At various times I have recommended to the consideration of the Water Board the advantages that would be derived from the construction of a High Service Reservoir of 3,000,000 to 5,000,000 gallons on the high grounds, easterly from the engine house, the construction of dwelling houses for the engineers and firemen near the Works, and the construction of a telegraph from various parts of the city to engine house. Without being absolutely necessary, all these would add to capacity, efficiency and economy of maintenance of the Works, and should be provided for as soon as may be.

Before closing my report there are some suggestions that I would offer on the modification of your present water rates. In many cities there is a tax on fire hydrants paid from the tax levy; here is a recognized value of Water Works in the reduction of insurance

and of risk from fire, but the application of this tax is very unequal.

In small cities, like yours, where the hydrant tax has been assessed, there are many large estates, not within reach of the mains, which are yet heavily taxed for Works which are no use to them. Recognizing the value of Water Works as reducing the risk of extended conflagrations, I would suggest whether an insurance tax of, say, 1-10 of one per cent. might not be laid on the assessed value of all buildings within 500 feet of mains, and the amount of this tax be offset by a reduction of low rates, as it will be no object to make the total amount much in excess of interest on bonds and running expenses. I would not advise the reduction of the present charge for water by meter. Twenty cents (20c.) per 1,000 gallons—one cent per 50 gallons of water delivered within the premises and at any story—would seem a small enough charge to place abundance of water within the means of every one. The use of meters should be encouraged; it provides an equitable means of charge; it prevents waste of water, which is of no use to any, and which, to Water Works like yours, where the supply is limited, may be injurious to every one.

Could meters be universally adopted, your whole supply utilized, and the gallons delivered be paid for at 20 cents per 1,000 gallons, no other tax would be necessary; but, could this be done, I should rather recommend reduction of rates than charge by meters only, as there are benefits conferred upon lots and buildings by water mains contiguous to them, which should be assessed on them,

Respectfully submited,

WM. E. WORTHEN.

ACTION OF THE COMMISSIONERS.

At a special meeting of the Board of Water Commissioners of Long Island City, held at their office on Wednesday, the 28th day of March, 1877; present, Hon. Henry S. DeBevoise, Mayor; William E. Pearse, City Judge; Francis McNena, Commissioner of Public Works; and William H. Williams, Commissioner; the following preamble and resolutions were unanimously adopted:

WHEREAS, The following resolution was unanimously adopted by the Board of Water Commissioners on the 24th day of February last:

RESOLVED, That William E. Worthen, Esq., the former Consulting Engineer of the Board, be and he hereby is requested to examine into the present state of the Water Department, and present his views to the Board in writing at his earliest convenience, as to the best means of making the Water Department self-sustaining with the least burthen to any, and that he accompany his report with such general plans for for the enlargement and extension of the water supply and distribution, and such suggestions for the

practical details of management as in his judgment may be for the best interests of the Department.

AND WHEREAS, Pursuant to the request contained in such resolution, the foregoing report has been received from Mr. Worthen and carefully considered by the Board:

RESOLVED, That the recommendations and suggestions contained in said report, and each of them, be and the same hereby are approved and adopted by the Board.

RESOLVED, That the necessities of the Water Department and the wants of the people of our city absolutely demand and require the extension of the Water Works as recommended in said report, and that it is the unanimous opinion of this Board, after careful and mature deliberation, that such extension will render the Water Department self-sustaining, and entirely relieve the city from raising any portion of the interest on the water debt by general tax.

RESOLVED, That application be made to the Legisture at its present session to authorize the Mayor and Common Council to issue $100,000 additional water bonds, and also to authorize the Water Board, subject to the approval of the Common Council, to reduce the existing lot rates and to modify the established building rates in accordance with the recommendations of said report.

RESOLVED, That a copy of the foregoing preamble and resolutions (including the said resolution of Feb-

ruary 24th, and the said report of Mr. Worthen,) be printed, and that a copy thereof be furnished by the clerk to the Hon. L. Bradford Prince, Senator, and the Hon. George E. Bulmer, Member of Assembly, representing this Senatorial and Assembly District, respectively.

[Extract from the minutes.]

B. D. PENFIELD, Clerk.