

STATE OF NEW YORK

SIXTH ANNUAL REPORT

OF THE

Conservation Commission

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WATER SUPPLY APPLICATION NO. 197

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter
of the
Application of the VILLAGE OF LEWISTON,
Niagara County, N. Y. to the Conservation
Commission of the State of New York for
the approval of its project and plans for
the furnishing of a water supply system for
said village. } Decision.

Application filed September 8, 1915.
Hearing held in Lewiston, October 5, 1915.
Decision, December 1, 1915.
Approved.

George V. Carter, acting on behalf and in the name of the village of Lewiston, of which he is the president, on September 2, 1915, made application to this Commission for its approval of the acquisition by said village of a water supply and of lands for a water supply system and of plans for such a system therein. This petition was filed in the office of the Conservation Commission September 8, 1915. On October 5, 1915, the Commission caused the site of the proposed works and the proposed source of water supply to be inspected by one of its engineers.

After due notice published in the *Niagara Falls Gazette* and *Niagara Falls Journal*, a hearing was held on this petition in the Village Hall in the village of Lewiston at 10:30 o'clock in the forenoon of October 5, 1915. At this hearing the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments for the project, as shown by the minutes. The petitioner appeared by the Hon. John O. Chapin, its attorney. No objections were filed and no one appeared in opposition.

It is proposed to install a municipally owned and operated water supply system in the village of Lewiston and to supply it with filtered and sterilized water from Niagara river. On the right bank of that stream, close to the southerly boundary of the village, a timber framed and stone filled intake crib is to be sunk in the river and connected by 100 feet of 10-inch cast-iron pipe with the low lift pumping station. All water is to be pumped by two centrifugal pumps of 250 gallons per minute capacity each, installed in the low lift pumping station. One of these pumps is to be run by an electric motor, the other by an oil engine. Only one unit is to be installed at the present time. The low lift pumps discharge into the sedimentation basin of the proposed filter plant. From the clear water well of this plant the water will be taken by two 225 gallon per minute triplex plunger pumps, one operated by an electric motor and one by an oil engine installed in the filter building. But one of these units is to be put in at the present time. These high lift pumps are to force the water through the distribution system and into a

riveted steel standpipe, 20 feet in diameter, 85 feet high and holding 200,000 gallons. It is to be located in the southeast corner of the village, part way up the Niagara escarpment, at such an elevation that the flow line thereof will be 330 feet higher than the surface of the river and 200 feet higher than the general ground level of the village.

A distribution system, consisting of about 29,000 feet of 4-inch, 6-inch, 8-inch and 10-inch diameter cast-iron pipe is to be laid in the majority of the built up streets of the village. To these pipes 47 double nozzle fire hydrants are to be attached.

A mechanical gravity filter, with a maximum rated capacity of 275,000 gallons per day, is to be installed to purify the water pumped from the Niagara river. This plant is to contain a sedimentation basin, two filter units, each of 48 square feet area, an 1800 cubic foot clear water basin, rate controllers, loss of head gages, clear water well gage, suitable apparatus for the feeding of sulphate of alumina and hypochlorite of lime into the water, and wash water pumps. Designs for this plant are to be submitted with the bids.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing and the report of its engineers, it appears as follows:

Lewiston is an incorporated village in Niagara county, situated on the right bank of the Niagara river just below the escarpment at the mouth of the gorge. This village was reincorporated under the General Village Law in January, 1904. By the last census the population of Lewiston was 713 and it is now estimated at about 750. By the last roll the assessed valuation of taxable property within this village was \$327,456; the village has no bonds or other certificate of indebtedness outstanding.

At present there is no public water supply system in the village of Lewiston. Water for domestic purposes and drinking is obtained from private wells and cisterns. The well water is very hard and water from both these sources is liable to pollution. No adequate provision exists for fighting fire in this village and the danger from conflagration is great.

On June 18, 1915, by resolution duly adopted, the Board of Trustees of the village of Lewiston called a special election to vote on a proposition to bond the village in the amount of \$39,000 for the purpose of installing this water supply system. Said special election was duly held on July 6, 1915, and the proposition carried in the affirmative by a substantial majority. Thereafter the making of this petition to the Conservation Commission and the verification thereof by the Village President was authorized by resolution of the Board of Trustees at a meeting held August 16, 1915.

Niagara river, one of the principal streams of this continent, will furnish a most abundant supply of water, although the construction of intake works in this turbulent stream will be somewhat difficult and the existence of such structures will be continually threatened by ice jams.

As a source of potable water Niagara river, with a few exceptions, is probably the worst in the State of New York. At this point it has been recently grossly polluted with the unpurified sewage from Niagara Falls, the Tonawandas, LaSalle and Buffalo, and, by the passage over the falls and through the rapids, this sewage has been thoroughly mixed with the entire body of water. Without the most elaborate and careful purification, the use

of this water for domestic purposes could not be permitted, nor, after the installation of the latest and best apparatus for the purification of this water, could the sanitary condition of this water supply be considered safe, unless careful, intelligent and skillful operation of the filter plant is at all times maintained. That any failure in the filter equipment, or any lack of care, or any mistake in the operation of the plant will inevitably result in disease and death among the inhabitants of this village is amply shown by the terrible typhoid epidemic which raged unchecked for many years in the city of Niagara Falls at the time when unpurified Niagara river water was being furnished to the inhabitants of that city.

Detailed plans for the proposed filtration plant must be submitted to this Commission before work is started and the work must be entirely and completely constructed in accordance therewith. In addition to the various requirements of the specifications, as set forth by the village engineer, it will be required that the sedimentation basin have a capacity equivalent to not less than two hours' detention at the normal rate of filtration and that a meter be installed to measure the rate of filtration. This duration of the coagulation period has been shown by the experience at Niagara Falls to be required. Without a meter it is impossible intelligently to operate such a filtration plant.

The best and most expensive filtration plant which the ingenuity of man can devise cannot operate itself and, unless skilled supervision is provided for this plant, it will fail of its purpose and this failure will inevitably result in the death of some of the inhabitants of Lewiston. This Commission will require constant application of suitable quantities of sulphate of alumina, or other satisfactory coagulating compounds, to the raw water as it enters the sedimentation basin and of hypochlorite of lime, liquid chlorine or other satisfactory sterilizing substance to the filtered water. In addition the village authorities must employ an intelligent person to operate this system and they will be required to employ the services of a consulting chemist or water analyst, expert in filter operation, to supervise in a general way the operation of this plant and to advise the local superintendent as to the quantities of the various chemicals to be used and such other precautions as it may be necessary to take to obtain a safe and satisfactory effluent. It will be required that bacteriological and other analyses be made of raw and filtered water at regular intervals, sufficiently close to give reasonable insight into the efficiency of the purification processes employed.

It is estimated that this entire system can be installed at a cost not exceeding \$39,000 and this estimate at the present time appears to be reasonable.

The intake crib is said to be located at a point where the river freezes over smoothly, so that interference from anchor ice need not be feared. It is also stated that the ice gorge, which sometimes attains such tremendous proportions under the bridge just above this point, has never extended to this particular area. If this gorge should form about the intake, it would, in all probability, be destroyed, no matter on what lines or of what material it might be constructed. If this occurs a new one must be built. The low lift pumping station appears to be in a position where it will not be endangered by ice. This system will give fair fire protection over the greater part of the

village when the standpipe is full. On account of the recent rise in the price of cast-iron pipe, it will be impossible, without the appropriation of a greater sum of money, to put pipes in all of the built up streets of the village. The remainder of the works, in so far as they are shown by the plans and specifications submitted, will be safe and adequate. It will be required that complete plans and specifications for the filter plant, pumping stations and other structures, for which such have not already been filed, be submitted for approval before any work is started.

Two small parcels of land are to be taken, one for the standpipe and one on which to erect the two pumping stations; the majority of the distributing piping is to be laid in public streets and roads.

No convenient alternative source of supply appears to exist and apparently, if this village is to have water at all, it must be obtained from the grossly polluted Niagara river and dependence must be placed upon the vigilance of the filter operative force to preserve the health of the community. Negotiations were had with the Western New York Water Company of Niagara Falls, with a view to the purchase of water from that company, but it was found that the cost of such an arrangement would be prohibitive. From a sanitary standpoint such an arrangement would be greatly to the advantage of the village, as the water company not only has an excellent filter plant but is sufficiently large constantly to employ the services of a competent chemist to run the plant and keep watch of the degree of purification attained, thus resulting in the high efficiency and greater security for the consumers of the water than will probably be possible to obtain in Lewiston.

The carrying out of this project will have no influence upon the water supply interests of any other municipal or civil division of this State, or the inhabitants thereof.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and for the proper filtration of such additional supply.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be

modified and that the work done thereunder be subject to the following conditions:

1. All the work proposed in this application shall be completely constructed in accordance with the general plans as hereby revised and in strict accordance with detailed plans and specifications for all structures which shall have been submitted to and approved by this Commission before work on such structures is begun.

2. All water pumped by this village from Niagara river shall be purified by filtration and sterilization to the satisfaction of this Commission before being delivered to any municipality, corporation or individual for any purpose whatsoever.

3. Designs for the proposed filter plant must, before construction work is started, receive the formal approval of this Commission. These designs, in addition to the requirements made by the specifications which have been filed with this application, must provide for a sedimentation basin having a capacity equivalent to not less than two hours flow at the normal capacity of the proposed filters and the amount of water passing through these filters must be measured by a satisfactory meter.

4. Provision must be made for intelligent supervision of the operation of these filters. The local operatives must be men of intelligence, who must have been carefully instructed in their duties. A water analyst and filter operative of broad experience must be retained by the village in a general supervisory capacity to instruct, guide and direct the local operatives. Bacteriological and other analyses of raw and filtered water must be made at regular intervals, sufficiently short to afford satisfactory evidence of the results obtained from the operation of the plant.

5. In no case shall the village of Lewiston be permitted to pump water at a rate exceeding the capacity of filter beds actually in use, computed on the basis of two gallons of water per minute per square foot of such bed.

6. After these works have been constructed they shall be inspected by and be subject to the approval of this Commission and such works shall not be operated until permit to do so has been issued by this Commission, as provided by section 523 of the Conservation Law.

Wherefore, the Conservation Commission does hereby approve the said application of the village of Lewiston as thus modified.

IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the Deputy Commissioner and has caused its official seal to be affixed hereto and has [L. S.] filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany this 1st day of December, 1915.

CONSERVATION COMMISSION,

A. MACDONALD,

Deputy Commissioner.

Attest: J. J. FARRELL,

Assistant Secretary to Commission.