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Point St. Charles Filtration Works, Montreal

Results of First Year's Operation—Output from Start Slightly Over Full Rated Capacity—Efficiencies During Last Nine Months from 96.2% to 99.1% Without Chlorination, and from 98.1% to 99.8% With Chlorination

DURING the twelve months ended June 30th, 1919, constituting the first year's operation, the Point St. Charles filtration works, Montreal, averaged 50.3 million gallons daily of filtered water. This is slightly more than the full rated capacity, the plant having been designed for a nominal daily output of 50 million gallons.

Montreal's requirements have grown to such an extent that the output of this municipally-owned plant was insufficient, despite the fact that thousands of consumers are supplied by another plant (owned by the Montreal Water & Power Co.); therefore an average of 12.8 million gallons of raw river water was added daily to the 50.3 million gallons of filtered water, and the mixture was effectively chlorinated.

The accompanying table gives the results of the daily chemical analyses, averaged for each month. July, 1918, was the first month after operation commenced for which complete data of all laboratory tests are available, the months of April, May and June, 1918, having been required for regulating the plant and correcting intake troubles due to frazil. In this first month of actually complete operation, with a raw water count of 530, the pre-filters showed 87.9% bacterial efficiency, and the final filters, 95.3%. The filtered water was mixed with 16.1 million gallons of raw water, and the mixture was chlorinated, the final bacteria count of the water as delivered to the mains showing 93.7% removal.

The bacteria-removal figures vary considerably until the end of September, 1918, at which time the plant appears to have been "tuned up" to an average condition or efficiency.

From October, 1918, to June, 1919, both months inclusive, the final filter bacterial efficiency ranged from a minimum of 96.2% in June, 1919, to a maximum of 99.1% in May, 1919. The bacteria-removal of the combined raw and filtered water (after chlorination) ranged, in the same period, from a minimum of 98.1% in October, 1918, to a maximum of 99.8% in April, 1919.

The plant has both a shore intake and a mid-stream intake situated about two miles above the Lachine Rapids of the St. Lawrence River. From an entrance gate chamber which receives the supply from both intakes, a concrete conduit, 8.5 ft. in diameter, formerly conveyed the water to the low level pumping station, from which it was pumped through the distributing mains to the city's reservoirs.

For many years the excessive number of cases of and deaths from typhoid fever had demonstrated to Montreal's

citizens the necessity of improving the quality of the water used for domestic purposes. The increasing pollution of the water supply, due to the discharge of sewage and other impurities from towns within the drainage area above the intakes, is indicated by Fig. No. 8, which shows graphically the total number of deaths, and the death rate per 100,000 population, from typhoid fever for a long period of years.

During the late fall and winter of 1909-1910, a severe epidemic of typhoid fever prevailed in Montreal and its suburbs, and occasioned 203 deaths between October 1st,

1909, and March 1st, 1910. The necessity for prompt action was recognized by the city officials, and the chlorination of the municipal water supply was started February 8th, 1910, and has been regularly continued to the present time.

Hering & Fuller, consulting engineers, New York City, were instructed April 4th, 1910, to report on the best means of securing an improved water supply. These engineers submitted their report July 2nd, 1910, and recommended filtration of the St. Lawrence River water. Their recommendation was adopted and they were engaged to co-operate with the late Major Georges Janin, then city engineer, in preparing plans and specifications and in supervising the construction of the works.

A 9 ft. concrete conduit, connected to the 8.5 ft. main supply conduit previously mentioned as having supplied the low level station, brings the untreated St. Lawrence River water to the filtration pumping station. The purpose

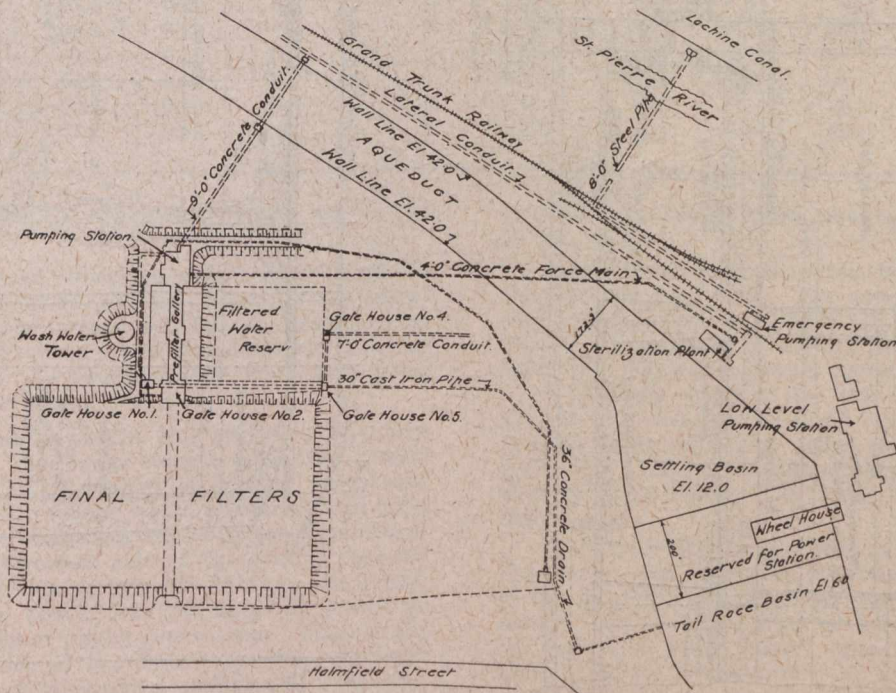


FIG. NO. 1—GENERAL PLAN OF FILTRATION WORKS