

Fig. 1.-General Plan of Storage Area.

sity for filtering this water at any time. It pronounces this source as one of the finest supplies in the world.

The method of collecting and storing the water is as follows, according to the report Fig. 2 illustrates the plan herewith described:—

There are four lakes which form a chain stretching approximately north and south. Commencing at the north is Mitchell Lake, a small lake which discharges through a narrow gorge at its outlet into a channel which finds its way into the Gatineau. This lake has a surface area of 0.7 square miles, and the water level in Sept. was 5²³ feet above datum. It receives the entire discharge of Thirty-One Mile and Pemichangaw, and a narrow rocky gorge, already referred to, forms an admirable site for a dam.

The next in the chain towards Ottawa is Thirty-One Mile Lake, which is about 18 miles in length, with a water area of 18 square miles, the water level this summer being about 530 feet above datum. Immediately to the south, and separated by a narrow neck of land, lies Pemichangaw, with a water area of 6 square miles and a length of about 5 miles, the water level this summer being about 552 feet above datum. Crossing the height of land to the south-west of Pemichangaw we come to Long Lake, having a length of about 1¹/₄ miles, and a water area of about one-quarter of a square mile. The distance between Pemichangaw and Long Lake is about 3,000 feet, and the water surface of Long Lake is 561 feet above datum.

It is proposed to tunnel through the ridge between Pemichangaw and Long Lake, and by means of the dam at the outlet of Mitchell Lake to bring all the lakes to one level, namely, 570 feet above datum, and to start the aqueduct to Ottawa from the south end of Long Lake. This would mean raising Mitchell Lake 47 feet, Thirty-One Mile Lake 40 feet, and Pemichangaw Lake 18 feet.

The contour surveys to determine the top water area at this level are not yet completed, but the total when brought to this uniform level of 570 feet above datum will increase to about 35 square miles in area. One foot difference in level of a water surface having an area of 35 square miles represents about six thousand one hundred million gallons, and 18 inches would give a year's storage of a daily flow of 25,000,000 gallon, 3 feet would give sufficient storage for 50,000,000 gallons per diem, and 4 feet 6 inches sufficient for 75,000,000 gallons per diem. The maximum variation in water level would, therefore, be small.

The dam at Mitchell's Lake would be designed ⁵⁰ as to overflow at a height of 570 feet, the total content of masonry to this level being estimated at about 9,100 eubic yards.

It has already been stated that the dam would be constructed so as to raise the level of the lake to 570 feet above datum, which means that Thirty-One Mile Lake would have to rise 40 feet, and Pemichangaw 18 feet. Owing to the enormous area of Thirty-One Mile Lake it would take five or six years before this lake would rise even to the level of Pemichangaw, that is 22 feet, and ten or twelve years before it reached the final level of 570 above datum. It is obvious that the scheme should be so laid out as to enable water to be brought forward to Ottawa as soon as the aqueduct and service reservoir can be completed, which can be effected in the following manner:—

Pemichangaw and Long Lake have a total drainage area of about $41\frac{1}{2}$ square miles, and would yield on the basis of a runoff of 13.6 inches about $22\frac{1}{2}$ million