

The horse-power at extreme low water for 14 hours per day would therefore be:

$$P = .001892 \times 142,251 \times 25.2 \\ = 6779 \text{ horse-power.}$$

The head of water from tail race,  $h$ , has been assumed to average the same as for constant flow.

The actual horse power which can be realized by water motors may be taken at .83 of the theoretical horse-power.

The actual horse-power of the Assiniboine, therefore, at lowest water, for day of 14 hours, is 5,626.

The above power could be increased and maintained at 10,000 actual horse-power by constructing a canal from Lake Manitoba to the Assiniboine at Baie St. Paul. The canal should be capable of delivering 150,000 cubic feet of water per minute. If found desirable to reduce the head in the reservoir more than an average of two (2) feet during the day, a smaller canal would answer the purpose.

#### **Canal from Lake Manitoba to the Assiniboine River at Baie St. Paul.**

From the sketch plan and profile of the country between Lake Manitoba and the Assiniboine it will be seen that low water in Lake Manitoba is 14.05 feet higher than low water in the Assiniboine at Baie St. Paul, and that the distance between the lake and river is by the traverse line 17 miles.

The ridge shown at station 540 can be avoided by keeping a short distance to the west, and it would be necessary to extend the canal works further into the lake than the end of the survey line as shown on plan, so that the total length of the canal would be about 18 miles.

The valley of Long Lake shown on plan is a natural canal, and with a small expenditure might be used for about one-third the distance between the lake and the river.

A canal, to deliver 150,000 cubic feet of water per minute, at a velocity of two and one-half (2.5) feet per second, would require a water area of one thousand square feet, a mean hydraulic depth of seven and five-tenths (7.5), and an inclination of .00012.

The surveys show that the above conditions can be fulfilled without any unusual difficulty or expenditure.

The soil throughout consists of clay, sand and gravel. Good building stone can be procured on Lake Manitoba,