this basis the cost of operation, including labor and materials, has been estimated at $1,300 per year.

Table 1.—Cost of Sewage Disposal Plant for Amherstberg, Ont.

Item.	Unit Price.	Cost.	Total Cost.
1,240 feet of 10-inch sewer	* $2.00	$2,480	
580 feet of 12-inch sewer	*2.20	1,276	
700 feet of outfall sewer	*2 00	1,400	
Diversion chambers and tide gates		600	
			$5,756
Pumping station:			
Buildings and pump well		2,000	
Machinery and piping		2,300	
			4,300
Treatment plant, including Imhoff tank, sludge bed, grit chamber, and disinfection apparatus	†2.25		6,750
Land			250
Total			17,056

* Per foot. † Per capita.

Table 2 shows the annual charge which results from the estimate given in Table 1.

Table 2.—First Cost and Annual Charges of Sewage Disposal Plant, for Amherstberg, Ont.

	Interceptors and other structures.	Machinery.	Land.	Total.
First cost	$14,506	$2,300	$250	$17,056.00
Interest at 4½ per cent	653	104	11	768.00
Amortization	*81	†230		311.00
Fixed charges	734	334	11	1,079.00
Operation charge				1,300.00
Total annual charge				2,379.00
Annual charge per capita				.79

* 50-year life. † 10 per cent. allowance for amortization and repairs.

TWO METHODS OF REGULATING RAINY LAKE.

(Continued from page 28.)

Rainy Lake and on Lakes Namakan, Kabetogama, Sand Point, Crane, and Little Vermilion. Reconnaisance examination was also made of other secondary storage lakes on the watershed.

As has been pointed out, the storage capacity required for the greatest practical equalization of flow from the viewpoint of the regulation of the levels of the Lake of the Woods is already available. With respect, however, to the relative advantages of variously storing water on the other lakes of the Upper Rainy watershed, it may be said that fuller detailed study will embrace this phase of the subject.

The results which would have been obtained during the years 1892 to 1914, from the two methods of regulation of the Upper Rainy reservoirs, as previously discussed, and with either 100 or 150 billion cubic feet of total available storage capacity, may briefly be summarized as follows:—

1. From the standpoint of the power interests at International Falls and Fort Frances, method of regulation B would have resulted in an average of 1,968 more horse-power being available than under Method A.

2. An aggregate storage capacity of 100 billion cubic feet is all that need be provided on the Upper Rainy watershed if these reservoirs are to be regulated according to method of regulation B.

3. Under method of regulation A, with 100 billion cubic feet of available storage capacity on Rainy Lake and the lakes above Kettle Falls, Rainy Lake would have been full more than 85 per cent. of the time, whereas under method of regulation B it would have been full only about 40 per cent. of the time. These facts may be seen by referring to the frequency curves, Fig. 1.

4. From the viewpoint of damage to riparian owners on Rainy Lake, method of regulation B would have been more advantageous because the average level of the lake would have been about two feet lower and the high level would have prevailed only half as long.

5. The following rates of outflow would have prevailed:—

	Minimum Outflow	Maximum Outflow	Average Utilizable Outflow
UNDER METHOD A	c.f.s.	c.f.s	c.f.s.
With 100 billion cu. ft. storage	5835	31241	7614
With 150 billion cu. ft. storage	6710	28237	7883
UNDER METHOD B			
With 100 billion cu. ft. storage	3500	27651	9029
With 150 billion cu. ft. storage	4230	27651	9276

6. Under Method B, throughout all seasons but one in twenty-two years, a greater ordinary flow would have been available between May 1st and October 1st, for navigation on the Rainy River below the International Falls-Fort Frances dam than under Method A. After July 1st, during that one year, the flow would have fallen to about 3,500 c.f.s., which is less than is required for satisfactory navigation of the river.

7. For about nine months during the extreme low-water period, 4,000 less horse-power would have been available under Method B than under Method A; that is to say, if continuous power is needed, the capacity of the auxiliary power plant under Method B would require to be 4,000 horse-power larger than under Method A.

[NOTE:—The third of this series of articles covering the report made by Engineers White and Meyer will appear in the next issue of *The Canadian Engineer*, and will deal with the regulation of levels and outflow of the Lake of the Woods and with the outflow capacity required under various methods of regulation.—EDITOR.]

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