irrigated on the Frenchman, all below this reservoir. The 8,000 odd new acres estimated to be served from Cypress Lake also lie below the Fifty Mile reservoir, so together our study provides water for a little more than the estimated acreage. The water for the 8,000 odd acres is to be held in the Cypress Lake reservoir, because it is cheaper to provide the storage there than in the Fifty Mile.

To sum up, then, for Battle Creek and Frenchman River, we are dealing with a total irrigable area of 45,708 acres. On Battle Creek, water can be stored for 5,231 acres now developed and 2,000 new acres for $16 per acre. There are still 3,475 acres above the reservoir and 185 acres on tributaries below, which cannot benefit directly by the reservoir. On Frenchman River there are 5,422 acres now developed and 8,878 new acres for which water can be stored at $16. There are an additional 15,122 new acres which can be served by reservoir water at $21 per acre. There are still 2,494 acres above the reservoirs and 2,901 acres of tributaries below which cannot be directly benefited. That is, 80 per cent. of the irrigable land can be provided with reservoir water and 20 per cent. cannot be so provided. While the irrigable acres above the reservoirs and on the tributaries could not benefit directly by the reservoirs they probably could do so indirectly by paying a certain percentage of the cost of the reservoir and thus buying all the low-water flow which could be used by them in lieu of flood waters stored and which could be equally well used by the irrigators below the reservoirs.

The Middle Creek reservoir was also completely surveyed in 1913 and all the necessary data for estimating the capacity and cost is available. While it is feasible to divert water from Middle Creek into Battle Creek and thence into Cypress Lake reservoir there would be no object in this since the reservoir site on Middle Creek is large enough to store all the water available and control it for use below on the same creek.

The most recent study of supply and demand conditions for this reservoir, based on the actual stream records for 1911 to 1916, adopts a reservoir capacity of 15,000 acre-feet as the most desirable and which is sufficient to control the total supply available which occurred during these years.

The cost of this reservoir is estimated at $66,458, making the cost per acre-foot stored $4.43. The total area which could be served is 3,130 acres, which comprises 1,530 acres now developed and 1,600 new acres out of the area which it has been estimated can be irrigated and lie below the reservoir. Based on 3,130 irrigable acres, the cost of this development is $21.23 per acre. Considering the whole of Middle Creek, there is an additional irrigable area of 1,271 acres lying above the reservoir and 97 acres on tributaries below which cannot be served from the reservoir. In addition to this, 792 acres of irrigable land will be flooded out by the reservoir.

It is to be noted again that in the study made as above, all the additional uncontrolled flow in the creek below the reservoir is assumed to be utilized, as it occurs naturally and mostly in the early spring. The percentage of the total supply which would have had to be used in this way in the study made would average 68 per cent.

There are no difficult engineering features in connection with this reservoir, but viewed from an economic standpoint there are two bad features in the high absorption losses from such a shallow reservoir, and the fact that so much irrigable land has to be flooded and its productive value therefore permanently ruined.

We estimate absorption losses of at least 3 acre-feet per acre of water surface in the reservoir. The duty on the land is estimated at 1.5 acre-feet, so that for every acre of water surface in the reservoir we lose enough water to irrigate two acres of land below. The water surface in this reservoir would be about 1,000 acres, so that in order to save water enough to irrigate the 3,000 odd acres below, we are forced into losing water enough to irrigate 2,000 acres. There is no way of overcoming this loss if we try to store water over from year to year, which it is necessary to do in order to provide the maximum conservation of water.

Then again, in order to benefit 3,130 irrigable acres below we have to destroy 792 irrigable acres in the reservoir site. That is to say, that for every four acres benefited, we have to destroy one acre. If we adopt the viewpoint that we have plenty of land out here in the West, there seems to be no objection to this, but when we consider that the whole proposition is one for the reclamation of, and added productivity to, certain lands for the benefit of not only the few people owning the lands improved, but for the benefit of the whole community, it is difficult to justify the destruction of such a high ratio of equally good land in the reservoir.

We will now consider Maple Creek watershed, on which we have investigated the four reservoir sites noted above. The first two reservoirs have small capacities of 1,954 acre-feet and 418 acre-feet. Their cost of development would be rather high also, $12.62 and $16.70, respectively per acre-foot stored, so that probably they will not be developed until after the latter two, which appear to be more favorable sites.

Downie Lake reservoir is the cheapest of any that we have investigated in the Cypress Hills, having an available capacity of 4,200 acre-feet, at an estimated cost of $1.50 per acre-foot stored.

We have no direct stream records of the supply available for this reservoir, but our estimations, based on records for 1911 to 1916, indicate that the reservoir could be fully filled in three years and only about half filled the other three, so that there probably is not the water available to store over from one year to another.

Maple Creek reservoir No. 9 was surveyed recently and the cost taken out for a reservoir capacity of 3,200 acre-feet. This capacity would not be nearly great enough to store all the water that is available from Maple and Gap Creeks, and a further tentative study has been made, based on raising the dam 5 feet, which would increase the capacity to about 6,230 acre-feet and the cost to about $57,640 or $9.25 per acre-foot stored. In either case the reservoir is not big enough to store all the water available and it would not be large enough to store water over from year to year.

Considering Downie reservoir and No. 9 together, there are 5,086 irrigable acres now developed below them. On the basis of using these reservoirs to store the spring freshets for use later on the same year only, and figuring absorption losses for two or three months, each year we might, by using the larger capacity for No. 9, have available there about 5,400 acre-feet and in Downie about 2,000 acre-feet. This total of 7,400 would store enough to provide practically a full duty of 1.5 acre-feet for the irrigable land between and assessing the total cost of $64,240 against 5,158 acres would amount to $12.45 per acre.

Discussing the watershed again in a general way, we have four reservoirs, with a maximum capacity of 12,802