

the prism of lift of lock No. 75, of which, in the face of a probable deficiency of water. I find, with surprise, the lift to be established at 10 feet, the maximum in use upon the canal.

Lockage water required for the assumed trade.

$100 \times 15 \times 10 \times 120 = 1,800,000$ cubic feet per day, or 1,250 cubic feet per minute.

Consequently, with such a trade, the wants of the canal from Cumberland to the South Branch, would require, to satisfy every cause of consumption, the following uniform supply of water:

	Cubic feet.
Per minute for lockage, at 120 locks full per day	1,250
Per minute for all other sources of loss upon $19\frac{1}{2}$ miles, at 100 cubic feet per mile and per minute	1,950
	<hr/>
Demand of the canal per minute	3,200
Supply of running water entering the Cumberland dam in the driest seasons (as before stated) per minute	1,392
	<hr/>
Deficiency per minute, during extreme droughts	1,808

It is proper to remark that we are dealing with extremes in this connection; for in ordinary seasons I doubt not that the supply of water at Cumberland will be enough to enable a moderate use of the canal, as low down as the South Branch. It is only in droughts that it would so completely fail to supply the trade. And if it be asked how, upon such occasions, this prodigious dry weather deficiency is to be made up? the answer is, only by reservoirs upon Evitt's or Wills' creek, or both: for to introduce Evitt's creek as an ordinary feeder, whereby 432 cubic feet per minute might possibly be added to the supply, would not reach the root of the evil, and would still, in dry weather, leave a large deficiency unprovided for.

It would however be prudent policy to defer the construction of any of these auxiliary works, until, by the opening of the canal, its exact consumption (clear of lockage) can be ascertained by actual experiment.

The probable deficiency of water in the North Branch at Cumberland, to supply the consumption of the canal and the lockage of the trade upon $19\frac{1}{2}$ miles, or in dry seasons even the consumption alone upon that length of canal, indicates most clearly that unless the traffic upon this work is to be left like