CJR:MBG

C J. Reid 1966

(10)

P.W. 15/2

DUNEDIN
13 October 1966

The District Commissioner of Works,
DUNEDIN.

IDA VALLEY IRRIGATION SCHEME.

References: (a) Ida Valley Irrigation, 2 December 1955 (report by J.D. Watt).
(b) Ida Valley Irrigation Scheme: Increased supply utilising Hopes Creek, 17 August 1965 (report by M.E. Bell)
(c) Ida Valley Irrigation Scheme: Hopes Creek Diversion. Addendum to report of 17.8.65 (M.E. Bell 24 August 1965)

1. HOPES CREEK TO LAKE ROXBURGH:

1.1. This is the scheme involving a small dam in Hopes Cr. and tunnel to Roxburgh reservoir as detailed in reference (a). Prices were adjusted in reference (c) to give a capital cost (on index 250) of £515,500.

1.2. Cost of tunnelling has been looked at again with particular reference to figures in N.Z. Engineering (21:7 July 1966) and N.Z.I.E. Handbook of Cost Information. It is difficult to assess a rate for tunnel excavation, particularly with the variation possible in schist rock, and to give any idea of how much temporary or permanent lining would be required. On this latter point J.D. Watt states that allowance for 3000 ft of 9 inch concrete lining is a reasonable assumption in this class of country, and this will be accepted here. From the Cost Handbook £10 per cu. yd seems a fairly average cost for tunnel excavation, the cost rising to £16 in difficult conditions (on cost index 270). Accepting a figure of £13, the excavation rate is calculated as £22 per foot. For unreinforced concrete lining a figure of £10 per cu. yd is accepted giving a cost of £30 per foot.

1.3. Looking at the estimate as a whole, it is observed that the concrete quantities for the dam seem rather low and it is proposed to increase this to 900 cu. yd. To provide access to the site approximately 7 miles of access road would be required, this to take trucks during construction. A rate of £1000 per mile is accepted, this to allow for a certain amount of metalling, and an additional £1000 for culverts and stream crossings.

1.4. Estimate:-

Driving tunnel 7'0" x 6' section 16,000ft at £22	£352,000
Lining tunnel 3000 ft allowed at £30	90,000
Dam and intake excavation	1,500
Dam and intake concrete 900 cu. yd at £34	17,000
Access roading 7 miles at £1000	7,000
Culverts etc.	1,000
Accommodation	8,000
Supervision and contingencies 10%	47,600
	£523,900

DUNEDIN
13.10.66

The District Commissioner of Works,
DUNEDIN.

MA VALLEY IRRIGATION SCHEME.

2. CHANNEL AND TUNNEL SCHEME:

2.1 It would be possible to bring water from Hopes Ck to Manuherekia burn one of two ways around the ridge or across the 2640 ft saddle between the two catchments. In the first case a very long length of race in difficult country (over 30 miles) is involved, and in both cases the intake in Hopes Ck would be over 2000 ft. At 2500 ft there is only some 600 day heads, annual average, not sufficient to make up the present deficit in the scheme.

2.2 There are various combinations of race and tunnel available, for instance 14 miles of race with a 5300 ft tunnel. However it is not possible to bring the intake low enough in Hopes Creek to pick up any more water than the 600 day-heads mentioned above.

2.3 Another alternative of providing a dam in Hopes Ck partly to lift the water level and partly as storage has also been examined. The best site seems to be just downstream of the Upper Tunnel Scheme Dam where a 140 ft high structure would provide an intake at 2500 ft and storage to 2580 ft. The cost of the dam alone would be over £500,000.

3. DEFICIT AND LOSS OF WATER:

3.1 The water requirement of the scheme to provide full quota is 10,750 day-heads per season at the farmers' turnouts. Losses amount to some 15 to 20% meaning that about 13,000 day-heads are required from storage. The two dams have provided on average annual 11,000 day-heads over the 15 year period 1950 to 1965, leaving a 2,000 day-head deficit to be made up from Hopes Creek. The tunnel scheme would have provided an annual average of about 3,500 day-heads over the above period, the race supply scheme possibilities with less than 600 day-heads available is thus of very little use.

3.2 Alexandra has provided the following figures showing water offered to the irrigators at the beginning of each season and the percentage actually used during the season:-

Season	% of quota	% of quota Used.
1957/58	100%	[illegible]
1958/59	100%	93.3%
1959/60	100%	96.4%
1960/61	75%	50%
1961/62	100%	80.9%
1962/63	100%	88.6%
1963/64	75%	73.6%
1964/65	75%	65.5%
1965/66	100%	83.9%

3.3 The percentage of full quota available at the beginning of each season is calculated on the basis of a requirement of 11,000 day-heads from storage, the storage available in the Manuherekia burn and Poolburn Dams and the likely inflow (based on average gain) through the following year. The required water at the farmers' turnouts to provide a full quota is 10,750 day-heads.

DUNEDIN
14.10.66

The District Commissioner of Works,
DUNEDIN.

3.4 Adding to the above figures, in the above nine irrigation seasons a total of 91,115 day-heads was drawn from storage in the dams, an annual average of 10,124 day-heads. From 1.9.57, when water in storage amounted to 23,000 day-heads, to 1.9.66 amount in water in reserve decreased by 4,595 day-heads. Thus over the nine year period, which included the very wet 1957/58 season, net inflow to the dams amounted to 86,520 day-heads, an annual average of 9,613. If the 1957/58 year is ignored the eight year period has an annual seasonal draw off of 10,704 day-heads and an average net inflow of 9,090 day-heads.

3.5 It should be noted also that a 50% rebate is allowed irrigators on the value of water not used on their quota.

C.J. Reid

C.J. Reid
E.O.W.
DUNEDIN.
14.10.66