

Ministry of Works
DUNEDIN
24 August 1965

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The District Commissioner of Works,
Ministry of Works,
DUNEDIN.

IDA VALLEY IRRIGATION: HOPES CK. DIVERSION
ADDENDUM TO REPORT OF 17.8.65

The following additional aspects are discussed:-

1. Costs

1.1 The capital cost of the Upper Tunnel works is taken from the Watt Report of 1956 with prices adjusted to present day levels. Broken down to main items this is:-

Driving tunnel 16,000 ft. 7'6" x 6'	£386,000
Lining tunnel - allow 3000 ft.	68,500
Accommodation (site)	8,000
Access	6,700
Dam and intake, excavation	1,300
" " " concrete 400 c.yd.	13,000
Supervision and contingencies	32,000
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	£515,500
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A renewal fund for this work can be based only on the dam and concrete work and a period of say 90 years, the greater bulk of the cost being in permanent work, i.e., no renewal period. The renewal contribution is assessed at £100 per annum.

1.2 The existing schemes of Ida Valley and Galloway were built (1912-1923) for £317,898. The proportional cost of the scheme areas that are now dependent on Manorburn and Poolburn dams, and that will benefit by any increased supply is assessed at £292,500.

1.3 From recent years figures, the operating and maintenance costs for Ida Valley and part of the Galloway system can be taken as £15,000. The addition of the Hopes Ck. diversion to the scheme will cause no increase in this figure.

1.4 From 1954 to date major renewals on the existing schemes have totalled £42,390. For the following assessment, one quarter of the annual renewal expenditure is taken as £1200.

1.5 For the above estimated costs and on present irrigation policy, the charge to the irrigator would thus be:-

Existing work - Interest on <u>£292,500</u> at 3%	=	£2190
Quarter cost of major renewals	=	1200
New work - Interest on <u>£515,500</u> at 4%	=	6120
Renewal fund £81,500 at 0.12%	=	100
Operation and maintenance at present rate	=	15000
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Total per annum		£24610
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On the existing irrigated area of 12,337 acres (Ida Valley)
plus 1494 acres (Galloway)
a total of 13,831 acres

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24.8.65

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is equivalent to 35/7 per acre per annum, for the 18 inch quota.

The additional thousand acres mentioned in the report are within the confines of the present irrigated area and distribution costs would be low. If they are added to the total above, the cost per acre would drop to 33/2, however it is most unlikely that they would receive the full quota each year.

1.6 From the point of view of capital expenditure, the proposal amounts to spending £37.3 per acre to raise the water allocation from say 15 inches to 18 inches.

2. Hopes Ck. Dam and Tunnel Design.

2.1 Pertinent level information is:-

Crest level Hopes Ck. dam	2452'	Ht. of dam	37'
" " Manorburn dam	2448'	Ht. of dam	88'
I.L. tunnel intake	2415'	" "	" "

This means that tunnel intake is at Hopes Ck. bed level and could have up to 35' head buildup in flood conditions, which if the Manorburn is low could give a flow of 150 cusecs. With no end effects and 1:1000 gradient normal flow is about 30 cusecs. With both dams full, i.e. only 4' head difference, 35 cusecs could flow.

2.2 During the 15 years of record the Hopes Ck. flow exceeded 100 cusecs 68 days (or parts of a day) and of this total, 41 instances occurred in the very wet 1957/1958 years. 200 cusecs was exceeded 13 times of which 15 were in 1957 and 1958. It can be thus seen that very few flows will not be able to be accommodated by the tunnel. In the report spillage was allowed as 400 dayheads (100 cusecs for 4 days p.a.). (para.2.3) - this is possibly a little pessimistic, but it is thought better to err on the safe side for water availability aspect.

2.3 The Lower Manorburn dam has Hopes Ck. and Little Valley Ck. as its main suppliers. By midway through the irrigation season the Little Valley contribution is negligible as most of its content is taken up in private rights upstream, hence the dam is dependent on Hopes Ck. and others. The area served however is small, and the Irrigation Superintendent at Alexandria estimates that the most that would ever be wanted from the Hopes Ck diversion dam in any season would be 600 dayheads - this has been allowed in the report (para.2.3), also erring on the safe side.

2.4 Other losses (evaporation, seepage) were allowed at 170d.h. to make the average annual contribution from Hopes Ck. 3,500 dayheads. With the total available water average of 4,670 d.h. being slightly inflated by the 1957/58 season, the figure of 3,500 is thought reasonable.


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