15/20

...ey Sluicing Claim

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DADE/9001/D445/76a -
15/20
DUNEDIN REGIONAL OFFICE

Little Valley Sluicing Claim

15/20

B./McK. 15/20

DUNEDIN,

9th November, 1920.

Ida Valley Irrigation; Supplementing Manorburn water from Hope's Creek and Little Valley Catchment.

The Engineer-in-Chief,
Public Works Department,
WELLINGTON.

No reply has yet been sent you to your 28/137 of 25th October, 1918. The matter was referred to Mr. Marks, and on 2nd December, 1918, he replied as follows:-

"The matter of using a tunnel in conjunction with a dam to divert Hope's Creek in the Manorburn Dam was given consideration when recently investigating the matter, but the dividing ridge is very broad on the top, sloping down easily on both sides until near the creeks, where the slopes are more or less precipitous. It can quite easily be seen that a moderate height of Dam will not shorten the tunnel much.

The narrowest place on the ridge is at the point marked 2609 feet. This is where Mr. Campbell surveyed a tunnel line in April last, the length being 166½ chains at 2448 level. At 2500 feet level at this place the tunnel would be about 80 chains long, and at 2525 feet about 66 chains long. I enclose herewith a tracing of portion of the land plan showing the positions of some of the creeks in this locality corrected, and have marked thereon the approximate position of the 2500 feet and 2525 feet levels on either side of the ridge.

As regards a cutting through the top of the ridge, anything say 20 feet deep would be fairly long, probably about 20 chains, and the expense of this would not appear to be justified by the short length of race saved at the intake; as, at the intake of the race line shewn green, the creek is rising rapidly.

In connection with the flow of Hope's Creek as explained in my previous memo. I contend that rainfall records are of very little use for obtaining the flow during the irrigation season as a great deal depends on the amount of snow stored. Therefore I do not think much would be proved by using rainfall records at Paerau, but consider my method of working from the actual gain in Manorburn Dam the nearest result available. In the period October 1917 to March, 1918, from which I worked, the results deduced were as follows:-

Calculated Flow of Hope's Ck. above red race line (about 32 sq. miles).

Average during	October, 1917.	35.2	cusecs.
" "	November "	20/5	"
" "	December. "	39.3	"
" "	January 1918.	29.1	"
" "	February "	4.8	"
" "	March "	29.1	"
"	Oct. 1917/Mar. 1918.	26.6	"

Ida Valley Irrigation: Supplementing Manorburn water from Hope's Creek and Little Valley Catchment.

This was presumed to be a maximum season, and consequently 33% was deducted making the average for an average season 17 cusecs. The reason for so doing was that it was known to be an abnormal season (if not of rainfall over the whole year) at least of run off during the period concerned. It may not have been quite a maximum period of run off but it was considered so to be on the safe side.

By the same argument the minimum flow in an average season would be 4.8, less 33%, equals 3.2 cusecs.

Following this on, it would show that in the driest season the minimum flow might be down to 2 heads, but I very much doubt that it would get so low.

It is therefore quite probable that the Engineer-in-Chief saw the creek flowing only 5 or 6 cusecs. There is no reliable information available as to the actual measurements. I would point out that this scheme should not be considered as one without storage. It is proposed to use it in conjunction with Manorburn Dam, using all water available from Hope's Creek first and conserving the Manorburn water by just so much as is available from Hope's Creek. In this way, it would appear to me that all of Hope's Creek water, during the irrigation season, can be regarded as useful. That is, by bringing in Hope's Creek in a summer race, the water available for irrigation could be increased by 17 heads and an area of extra land requiring water equal to 17 heads constantly over the irrigation season could be added to the scheme. There might be a big demand on Manorburn Dam for a short time, while Hope's Creek would be low, but early and late in the season Manorburn Dam would only be required to contribute a moderate quantity which would compensate. With the enormous surplus storage capacity of Manorburn Dam, I consider it would be capable of providing sufficient water in the event of a succession of dry seasons, as in wet seasons almost all the water could at times be secured from Hope's Creek, thus allowing Manorburn water to be stored for such a contingency. Also there is always the possibility of increasing the storage capacity of Manorburn Dam if necessary."

Encl. A copy of tracing referred to is enclosed.

I have lately been over this gruund. The increased cost of work of all classes affects the development of Ida Valley Scheme, as, unfortunately, the charges for water in Ida Valley are definitely fixed by agreement at a rate determined long before the cost of work began to rise so rapidly.

The following Manorburn rainfall records are available to date:-

1917.	36.28
1918.	21.70
1919.	26.45
1920.	13.05 to 1st October.

These results so far, support assumption in my memorandum of 21st October, 1918, that rainfall for season 1917-1918 was at least 50% over average.

I think the very unfavourable shape of the gathering ground above green and brown race lines shown in litho. forwarded on 21st October, 1918, together with fact that a 50 cusec race, with necessary weirs, and spillways, must be estimated at £2,000 per mile, and the fact that any material enlargement of Manor-

Ida Valley Irrigation: Supplementing Manorburn water from Hope's Creek and Little Valley Catchment.

burn catchment area necessitates expense of raising height of Manorburn Dam, puts these green and brown areas out of question. In any case, it would not do to carry them any further than to catch West branch of Hope's Creek.

The tunnel proposed through the 2609 saddle is out of question on account of the high joint expense of dam in Hope's Creek and long diverting tunnel, to which should be added cost of raising Manorburn Dam.

The summer water race (red) appears to offer the best field for development to supplement Manorburn, and I think that, as convenient, further investigation should be made: This investigation to consist of pegging the race line and the taking of weekly readings during irrigation season of flow in Hope's Creek over weir situated near proposed intake.

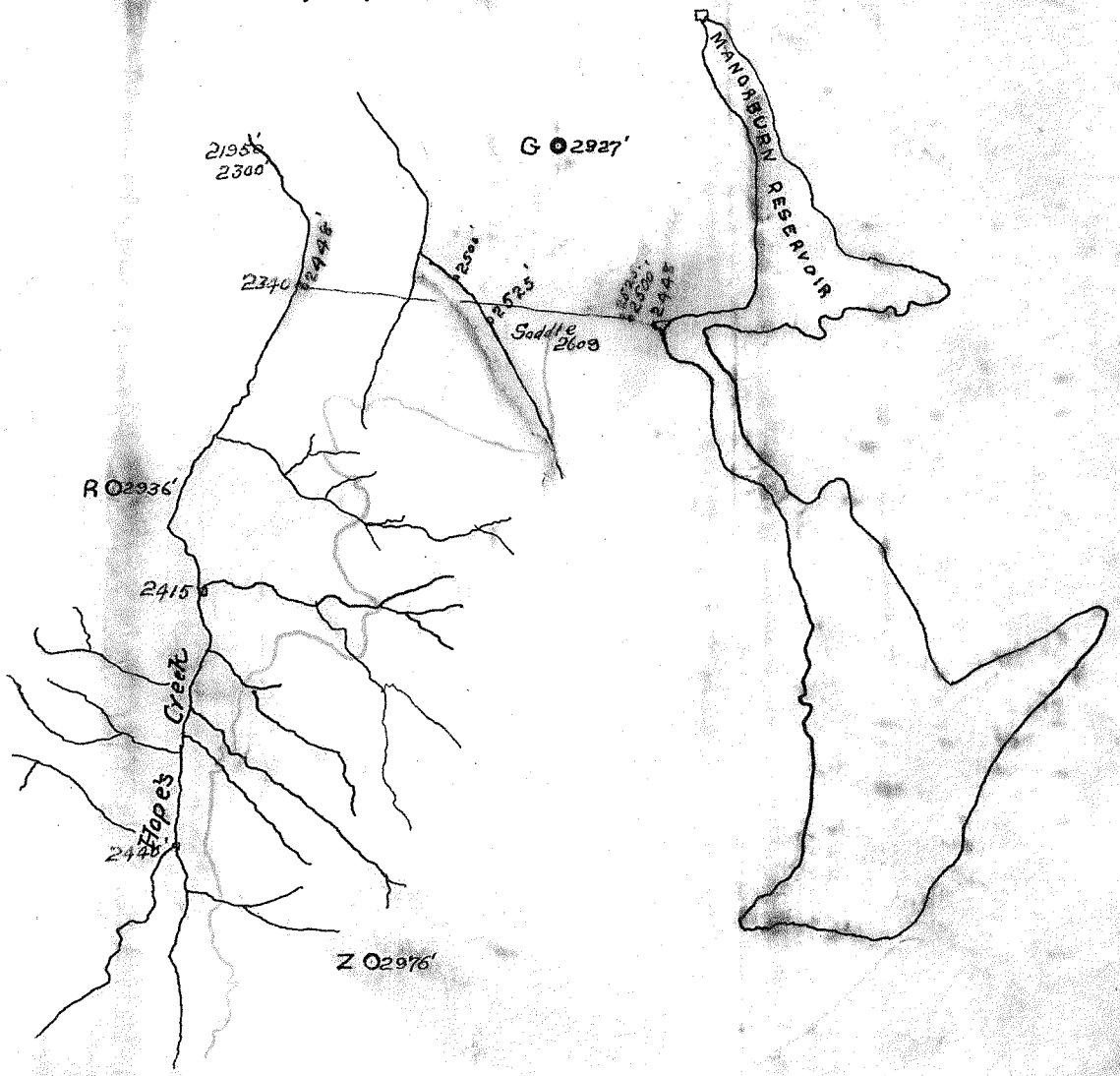
There is no urgency about work, but it should be undertaken as opportunity offers.

A. J. BAKER.
District Engineer.

Encl.

Plan Showing Correction of Heights in Hope's Creek & Correction of Position of Creeks.

Scale 80 Chains to 1 Inch.



W.T.C.

R/O'N

30th October,1918

LITTLE VALLEY SLUICING CLAIM

J.R MARKS Esq.,

PUBLIC WORKS

WELLINGTON

The Engineer-in-chief writes as follows:-

" Replying to yours of the 21stinst., No.15.20 dealing with the question of diverting the waters of the various creeks into the Manorburn Dam,you do not appear to have considered the possibility of obtaining a tunnel of reasonable length by putting a dam of moderate height in Hope's Creek; for instance,near where you show aheight of 2415 ft. it seems as though a dam raising the water to a height of ,say, 2500 ft. would materially shorten the tunnel into the big dam.

There is quite a possibility,of course,that the position of Hope's Creek is not very accurately shown and it may result in being closer than you reckon on. I doubt whether the average flow of 17 cusecs from Hope's Creek is likely to be realised by the construction of a 50 cusec race from Hope's Creek to the Bonanza Intake,as this would provide no means for storing the water when the flow is large, and when the water was most wanted it is quite likely that there will not be more than 5 or 6 cusecs,and possibly the creek might be actually dry.

I would like to know whether you have any reliable information as to the minimum flow in Hope's Creek? About nine years ago,I saw it where the road crosses it down at the Yards,about opposite Trig EE, and my recollection of it,is that it was then only about five cusecs.

Your green line apparently was laid off with the idea of crossing through the saddle at 2609 ft. but supposing you allowed for a fairly deep cutting or a short tunnel at this point, and for a small dam,it might be possible,without very much work,to take the water in from thepoint marked 2440 ft, just at the junction of the east and West branches of Hope's Creek.

It seems as though these various possibilities require to be further looked into,and I would be glad if you would make some more investigations on the lines I have indicated. It is doubtful whether much can be done in the way of bringing in the Little Valley Creeks, unless after a dam was built,at,say,2440 ft. in Hope's Creek,a race may be run from the top of that to bring in some of this water.

As to the last year having been 50% above the average,I should think that you might take the rainfall at Paerau for the number of years that it hasbeen kept,as a fair indication of the extent to which last year was above or below the average.

To get the real value of a diverting scheme without storage, you would require to consider the driest year yet recorded and discount this to a certain extent."

Please reply on the points raised

C. J. McKENZIE
DISTRICT ENGINEER

R./P. 15/20.

21st October, 1918.

Little Valley Sluicing Claim.

Engineer-in-Chief,

P.W., Wellington.

In reply to your 28/137 of the 4th inst. in reference to the possibilities of diverting Hope's Creek and Little Valley Creek into the Manorburn, I forward herewith a litho showing alternative lines of races for that purpose.

The levels were taken by aneroid barometers, one being kept at the dam and being observed throughout the day for correction of the observations at the various points. From these levels the race lines have been sketched in.

There are no narrow saddles between Hope's Creek and the Manorburn Reservoir suitable for tunnelling, the ridge being too broad. The race would therefore require to pass over the top of the ridge which means that Hope's Creek and Little Valley Creek must be picked up at rather high levels to divert them actually into the dam. Two possible races for this purpose are indicated on the litho, green and brown, respectively and their respective catchment areas also tabulated thereon.

An inspection of the litho will show that the catchment areas of these races are so small that they could not be expected to deliver much water in summer, while they are so high that it would be difficult to keep them open in winter on account of snow drifts and freezing. If either of these were to be adopted it would require to be of large dimensions to carry the winter water for the short time when the thaw sets in. Considering this,

with their lengths, the cost would appear to be prohibitive. Therefore, it does not appear feasible to divertany of these creeks into the Manorburn Dam for storage purposes, but a more favourable course appears to be to pick them up lower down by the race shown red on the litho, and divert them into the Manorburn immediately above the intake of the main Bonanza Race. By this method the winter water would be lost but summer water would considerably augment the supply from Manorburn Dam during the irrigation season.

The quantity of water which might thus be brought into usefulness has been arrived at as follows:-

It is practically impossible to arrive at anything by using the rainfall records alone on account of the storage caused by snows:

Figures have been arrived at from the actual gain in the Manorburn Dam month by month, adding thereto the amount lost by evaporation over the lake surface and thus obtaining the actual run-off. The evaporation on the lake surface has been taken as 61 per cent of the actual evaporation measured by the gauge at the Dam.

In the absence of records over a number of years, the irrigation season October 1917 to March 1918 inclusive has been taken as a basis, which it would appear reasonable to assume to be a season of maximum rainfall. Presuming the maximum rainfall of this season to be 50 per cent above the average, the following results are obtainable for an average year.

Name of Ck.	Average discharge over irrigation season with average rainfall allowing for loss in races.	Length of Race.	Maximum daily discharge during a season of maximum rainfall.	Approximate estimated cost of races, etc.
	Cusecs.	Miles.	Cusecs.	
Hope's Creek	17	9	50	£13,500.
E. Branch Little Valley Ck.	5	11	18	
W. Branch Little Valley Ck.	5	3	15	£18,500.
TOTAL	27	23	83	£32,000.

Note:- Estimated cost for Little Valley Creeks includes cost of enlarging Hope's Creek Race from 50 cusecs to 83 cusecs.

The country through which this summer race would have to be constructed is not unreasonably rough and appears to be free from tendency to slips.

Apart from any of the creeks already referred to, it would appear that an additional 6½ sq. miles of good catchment area, being a portion of the head of the Teviot River, could be added to Manorburn Dam by constructing a race about 4 miles long shown by the dotted Burnt Sienna line. This would deprive Lake Onslow of portion of its catchment area, but from what I can gather it could very well be spared. A water race has at one time been in existence over a saddle draining portion of this area into the Manorburn and it is quite evident that it could be extended somewhat as shown. The difficulty would of course have to be faced of keeping the race open in winter.

C. J. McKENZIE

DISTRICT ENGINEER.