

G.—With regard to this question it is probable that by purchasing some of the riparian rights along Nelson Creek that it would increase the extent of ground that could be worked by the race, but I hardly think the increased revenue would justify the purchase. The rights that would in any way effect the increased revenue would be as follows:—

NAMES.	No. OF ACRES.	AMOUNT.	TITLE.	REMARKS.
Drennan Bros.	50	£2,500	Freehold	The estimate is at £50 per acre, but no doubt it could be purchased privately for a much less sum.
Do.	100	5,000	Leasehold	
J. Kennedy	50	2,500	„	
H. Mitchell	30	1,500	„	
Total	230	£11,500	—	—

If the whole of these rights were purchased, it would increase the area of ground that the race commands to the extent of about 100 acres, but it is questionable if much of this increased area would pay for working.

Having now gone into details on the several schemes, viz. :—

- 1st. The reconstruction of bridges.
- 2nd. The deviation *via* Callaghan's Creek.
- 3rd. The deviation to Ahaura River.

They can be summarised as follows :—

First.—The reconstruction of bridges and flumes from the head works to peg, 6 miles 46 chains at Wilson's Creek, will cost, say, taking the mean of ordinary and heartwood timber, £8,600; and from Wilson's Creek to the end of the race, £18,900. This shows in any case it would not be advisable to rebuild the bridges and flumes below Wilson's Creek, as a deviation *via* Callaghan's to the end of race could be constructed for £11,600, and be made of a permanent character.

Second.—The deviation, *via* Callaghan's Creek, will cost £20,200, including the reconstruction of bridges and flumes from the head works to Wilson's Creek.

With regard to this deviation, the ground now commanded by the race and the ground in the vicinity of Callaghan's Creek has to be taken conjointly; but at the same time the principal portion of the ground that the race at present commands, will be worked before it will be necessary to reconstruct the bridges, and, therefore, it would be only the remaining portion that would require to be added on to the extent of ground in Callaghan's, which may be set down at about 25 acres. This would increase the total area of probable ground that would be worked by deviation, *via* Callaghan's, to 175 acres, which would employ about 70 men for 13 years. The gross revenue from sales of water sufficient to work this area of ground would be about £44,000, and the maintenance for 13 years would be about £22,000: this leaves £22,000 against the £20,200 that it takes to construct. The amount of gold that probably would be produced by working this area, would be about 87,500 ounces, representing a value of £334,687.

Third.—The deviation to Ahaura River will cost £20,800, including rebuilding the bridges and flumes from the head works to Wilson's Creek, and to take the quantity of ground at one-half what is estimated, viz., 500 acres, it would employ 70 men for 35 years. The gross revenue from sales of water for working this area of ground would be about £125,000, and the expenditure on maintenance during the period about £70,000, which would leave £55,000, or reimbursement of capital with 5 per cent. interest. The probable yield of gold from this area would be about 250,000 ounces, representing a value of £956,250.

I would, therefore, recommend that the bridges and flumes be upheld as long as possible by ordinary maintenance, which will work out the principal portion of the ground that the race commands about Nelson Creek, and, say in two years' time, to commence to construct the race from Wilson's Creek to Ahaura River. This would allow two years to construct the race and sufficient time to open up the ground, so as to be in full working order before a total collapse of the present bridges and flumes took place.

In conclusion, it may be well to add, that the nature of the ground through which the tunnels in both routes would have to be constructed in, is of soft sandstone and soft old-man reef, of sufficiently hard a nature to stand without timber.

HENRY A. GORDON,
Assistant Engineer.

P.S.—There is at present a population of about sixteen men on Callaghan's Creek, and thirty-five men on the Ahaura Watershed that the race will command, who are reported to be making at the latter place from £5 to £10 per week per man; but the present water supply is very poor, being available only during rain, and for a short time after rain.

H. A. G.