calculation would stand thus:—Number of stamp heads now at work, say 460; increace of 25 per cent, 115; and as these will presumably be worked on poorer ground than the average, say one-half or ¾ ounce per ton; thus 115 stamps at 4 tons per week gives 460 tons, yielding at ¾ ounces = 345 ounces of gold, which at 2s. per ounce, average duty, will give £39 10s. per week.

Then, of these 460 stamps about 400 are worked by steam, and most probably would be worked by water when the supply was brought in; these, with 115 heads of increase added, total 515, at the rate of 10s. per head per week (one half of the cost of steam power) would give a rent per week of £257 10s., to which add the increase of gold duty, £39 10s., making a total per week of £297 as income—amounting to £15,444 in the year (not reckoning another probable source of income on the high level scheme, viz., the conveyance of timber along the race, from the Kauri Ranges, for the use of the mines.

This estimate of income would be reduced say 20 per cent for management and repairs, leaving £12,356 per annum.

In the absence of any levels or measurements, I have not yet attempted to make an estimate of the cost of any scheme of water supply, but the above figures may be sufficient to shew that there is every probability that a well planned scheme for the supply of water would be reproductive, and that it will be worth while to have a careful survey of the ground made, and an estimate formed of the probable cost of the work, say on two lines of level—one at 500, and one at 100 feet of elevation—so that the costs of the two might be compared.

Economy of expenditure would point to the choice of the lower line, but it would not supply directly the higher claims in the different creeks: these would, however, even with a low level supply, be in a better position to work profitably after the introduction of a cheaper crushing power, even if the cost of carriage to the machine should not be reduced.

It may be asked whether those who now have steam power will be at all inclined to lay it aside, and adopt water power instead. This, I think, may be answered in the affirmative, not only on account of the immediate saving in coals and wages of engineers, but in the heavy repairs—now required in the boilers, which last but a short time on account of the prejudicial nature of the water employed in working them, —and in the long stoppages caused by their repair.

I may now say a few words on the tramways which have been constructed on the various creeks a a total cost of about £31,000, the aggregate length being about 6¼ miles.

The facilities afforded by these for taking the materials to be crushed down to the batteries on a lower level appear not to be so great as was evidently expected and intended, and they are comparatively speaking little used, as the owners of the higher, and especially the poorer claims, complain that the charge for carriage—varying from 6s. to 7s. 6d. per ton—added to that of crushing—viz., 14s. to 15s. per ton—is too great to allowthem to work their claims at any profit. It will be seen that should the high water supply scheme be carried out, the expenditure incurred on the tramways will be almost entirely thrown away, as regards those portions of them below the level of the race, and that they will then be merely required and used as walking tracks.

Before concluding, I may describe generally the schemes already reported on for the supply of water to Grahamstown and Shortland. The first is that of the Provincial Engineer, for conveying water from one of the principal branches of the Kaueranga, a distance of about 8½ miles; supply estimated at about 210 cubic feet per minute; height of reservoir, 173 feet above sea level; 11-inch pipes; estimated cost, £20,000. This was not intended to supply any of the mines.

The second is that reported on by the Assistant-Engineer. Water to be taken from the Waikiekie, about 3 miles; reservoir, 228 feet above sea level; pipes, 4 inches diameter; intended simply as a town supply; estimate, not including cost of distributing through town, about £3,000.

In the event of the high level supply being carried out it might at first be made only to the nearest point at which a tolerably good supply could be obtained, say 20 heads, and on proving successful might be extended so as to increase the supply as the demand arose; the race in this case should be so constructed as to be capable of being enlarged as the supply was increased. Judging from the steep and porous character of the ground generally, it appears that it will be necessary to construct a flume, say of timber, the entire length, as so much loss by leakage would result by the use of a ditch cut in the hill sides.

As regards the proposed survey, I think it highly probable that the natives will not allow it to be proceeded with at present.

I have, &c.,
JOHN BLACKETT,
Acting Engineer-in-Chief.

The Hon. W. Gisborne, Minister for Public Works, Wellington.

P.S.—I enclose a tracing of the Thames Gold Field, shewing workings and line of proposed water supply, tramways, batteries, &c., &c.

No. 5.

His Honor T. B. GILLIES to Hon. Mr. GISBORNE.

SIR,— Superintendent's Office, Auckland, 21st February, 1871.

I have the honor to acknowledge with thanks the receipt of your letter, dated the 13th inst., transmitting copy of report by the Acting Engineer-in-Chief, as to the construction of water works at the Thames Gold Field.

I have, &c.,
THOS. B. GILLIES,
Superintendent.

The Hon the Colonial Secretary, Wellington.