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PARLIAMENT OF TASMANIA.

MOUNT CAMERON WATER SUPPLY:

REPORTS BY G. J. BURKE, C.E.

Presented to both Houses of Parliament by His Excellency's Command.

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Office of Mines, Hobart, 3rd September, 1886.

SIR,

I HAVE the honor to transmit the following Reports of Mr. G. J. Burke, C.E., upon the schemes for the supply of water to the Mount Cameron District :—

1. Report on the detailed estimate for the completion of the Mount Cameron Hydraulic Tin Mining Company's Race.

2. Memo. on the alternative of constructing a new Race instead of purchasing the above Race.

I have the honor to be,
Sir,
Your very obedient Servant,

F. BELSTEAD, *Secretary of Mines.*

The Honorable the Minister of Lands and Works.

REPORT on the Detailed Estimate for the Completion of the Mount Cameron Hydraulic Tin Mining Company's Water Race.

The present estimate is based on the result of a detailed survey for which orders were given by the Hon. the Minister for Lands and Works in February last. In my preliminary Report on the scheme (Parliamentary Paper No. 105, Session 1885), I gave a general outline of its leading features. Some of these particulars I shall repeat, in order to make this Report complete in itself.

This race was started by the Company, who had acquired a water-right from the Great Mussel Roe River, with the intention of conveying this water to the tin-bearing country in the vicinity of Gladstone, as far north as the district known as the Aberfoyle; the length of race required for this purpose being about 33 miles. The Company failed to carry out the scheme in its entirety, and only a middle length of the main race was completed, having a length of about 12½ miles. The upper length of about 5 miles to tap the Great Mussel Roe River, and the lower length of about 15 miles to carry the water to the Aberfoyle, were never started owing to want of funds. The race as constructed has a carrying capacity of 53 "sluice-heads"; but as its present supply is only derived from one of the affluents of the main river, known as the Little Mussel Roe, which, though a perennial stream, only brings down a small supply, the race has never more than a small fraction of its total capacity flowing. I have seen the race many times at various seasons, and its discharge varied from 6 to 9 "sluice-heads."

The completed portion of the race, and the southern extension up to the Great Mussel Roe River, were laid out by Mr. Alexander Clerke, C.E., acting on behalf of the Company. The line laid out by me for the southern extension follows closely that of Mr. Clerke, but is considerably shorter, as I preferred crossing some of the larger creeks lower down than the points selected by him, thus effecting a saving in distance, but necessitating higher fluming. The difference in length of the two lines is a little over a mile. I have already stated in my former Report the careful manner in which, in my opinion, Mr. Clerke did this work.

The Southern extension as previously reported presents no difficulty in construction; though, as I anticipated, the rocky nature of the country and the numerous creeks crossed necessitates a

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large amount of fluming, and nearly half the total length of this section is estimated for as fluming of various classes,—boxes on tressels crossing the creeks and boxing on logs laid on the ground in places where cutting in rock, always granite, would otherwise have to be resorted to. 2¼ miles of fluming is estimated for in a total length of 5m. 800ft. A masonry weir has been provided for at the intake, and a tunnel 85ft. in length round the left flank of the weir will carry the water into the channel. At the mouth of this tunnel a sluice-gate will be required to regulate the supply during floods, and to cut it off altogether when repairs are needed. The present estimate for this section is somewhat less than my former rough estimate, £3928 instead of £4650.

As stated in my former Report, and in my evidence before the Select Committee last year, the great question in connection with this race, is that of the level at which the two great heads in the watershed immediately north of the tail of the present race should be crossed. I pointed out that this matter should receive the most careful attention, and expressed a strong hope that fluming of moderate height would effect the desired object. This hope has, I regret to say, not been realised, and I found that lines run at lower levels with the object of diminishing the height and length of the flumes would entail very heavy cutting lower down, an increased length of race, and would shut out a considerable extent of tin-bearing country. My rough estimate for this Northern extension, assuming that low fluming would meet the requirements of the case, was £5250, and I further estimated, as stated before the Select Committee, that £4500 extra would be necessary in case high fluming had to be resorted to. The total of the present estimate for the high level is £11,213. Taking the whole of the works on both sections, the rough estimate compares with the detailed one as follows:—

	£
Rough estimate for low-level race	9900
Add fluming for high-level	4500
Total	14,400
Total of detailed estimate	15,143
Excess	£743

Excepting the high fluming, the whole of the work on the Northern extension is of the simplest and most inexpensive character. A more easy line of country for race-cutting is hardly possible—no deep creeks or drainage channels, the surface soil easily excavated, and an ample supply of material for constructing the necessary works, although from the mountainous character of the country the line of race is very tortuous. The Hon. the Minister for Lands and Works had an opportunity during his recent visit to the district of seeing how well adapted are its physical features for dam construction along the route of the race, and how extensively these natural advantages have been availed of by the miners. Such being the case, not a drop of water would be wasted, as all that flowing during the night could be impounded for use during working hours.

With the exception of the weir at the intake, which should be built in cement masonry or concrete, all the other structures, flumes and falls, would be constructed wholly of timber, which is abundant in the district. The flumes have been designed to combine efficiency with economy, and except for the boxing, no sawn timber will be required. The tressels will be formed by round straight spars, diagonally braced, with longitudinal stringers connecting each pair, all being securely fixed together with iron through-bolts. The tressels for the fluming across the deepest parts of the depressions have been designed of extra strength and stiffness to obviate any chance of injury from vibration during high winds, and the trussing to support the boxes made of strength far in excess of present requirements as a provision for future decay of the material, which is much more rapid in the supports to a water channel than in those of an ordinary bridge.

During the period I was engaged in laying out the line of race I received every possible assistance from Mr. James Brown, the Company's manager, who placed his time at my disposal, and whose intimate knowledge of the locality was of the greatest service to me. On many occasions Mr. Brown saved me much trouble by drawing my attention to features of the country that I would otherwise only have found out after considerable trouble. The value of such assistance can only be understood by an engineer who has to explore a broken and bushed country.

G. J. BURKE, *M. Inst. C.E.*

Hobart, 2nd September, 1886.

EXTENSION of Mount Cameron Hydraulic Company's Race.—Quantities of Work on each Two Miles of Section.

NORTHERN EXTENSION.

Distance.	*Flumes over 50 ft. high.*	*Flumes between 20 ft. and 50 ft. high.*	*Flumes below 20 ft. high.*	*Excavation.*	*Falls.*
Miles.	Lineal feet.	Lineal feet.	Lineal feet.	Cubic yards.	No.
0–2	1970	3698	1737	1392	...
2–4	...	2280	3476	2113	...
4–6	...	...	516	8567	...
6–8	...	...	411	5306	10
8–10	...	...	620	4663	...
10–12	...	...	...	4602	...
12–14	...	...	...	4394	3
14–15¾	...	...	656	3159	8
TOTALS	1970	5978	7416	34,196	21

SOUTHERN EXTENSION.

Distance.	*Flumes for Main Creeks.*	*Flumes for Minor Creeks.*	*Flumes, Surface.*	*Excavation.*	*Falls.*
Miles.	Feet.	Feet.	Feet.	Cubic yards.	No.
0–2	...	420	4300	2598	1
2–4	293	353	4100	2514	...
4–5 800 ft.	836	...	1600	1617	...
	1129	773	10,000	6729	1

ESTIMATE.

	Description of Work.	*Quantity.*	*Rate.*	*Amount.*
				£ s. d.
Northern Extension.	Flumes over 50 feet high	1970 feet	22*s.* per foot	2167 0 0
	Flumes between 20 ft. and 50 ft. high	5978 feet	15*s.* per foot	4483 10 0
	Flumes below 20 feet high	7416 feet	8*s.* per foot	2966 8 0
	Excavation	34,196 yards	9*d.* per cubic yard	1282 7 0
	Falls	21	£15 each	315 0 0
Southern Extension.	Heading round flank of weir.....	65 cubic yards	£3 per yard	195 0 0
	Weir, masonry in cement	25 cubic yards	£4 per yard	100 0 0
	Sluice-gate above weir	...	...	50 0 0
	Flumes for main creeks	1129 lineal feet	15*s.* per foot	846 15 0
	Flumes for minor creeks	773 lineal feet	10*s.* per foot	386 10 0
	Flumes, surface	10,000 lineal feet	4*s.* per foot	2000 0 0
	Excavation	6729 cubic yards	1*s.* per cubic yard	336 9 0
	Falls	1	£15	15 0 0
	Total for works	...	...	15,143 19 0
	Engineering and supervision	...	...	750 0 0
	TOTAL ESTIMATE	...	...	£15,893 19 0

G. J. BURKE, *M. Inst. C.E.*

Hobart, 2nd September, 1886.

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MEMO. on the alternative of constructing an entirely new Race instead of purchasing the present Property of the Mount Cameron Company.

As I have already stated, there is no objection to, nor difficulty in, constructing a new channel should such be considered the more desirable course. It should be taken at a different level so as to avoid interference with the present race, and by carrying it about 30 feet higher a length of about three miles would be saved, avoiding the present long detour round the "Brown Hill," a spur from the main range, with a saddle that could be cut through with the proposed increase of level. The construction of a new race would have certain advantages,—increased capacity, say, for 75 sluice-heads, about 50 per cent. more than that of the present channel; a better class of fluming, requiring less cost in maintenance than that now erected. On the other hand the cost would be greater, and the present race would be practically useless, which seems a pity, seeing that on the whole it is well adapted for its purpose. The offer to purchase for £7000 I have always considered very liberal; and taking into account the long length of fluming which, originally not well constructed, will be more expensive to maintain, and must be more quickly renewed than new work, and considering the facts that a new race presents no difficulty in construction, and that this alternative is generally favoured by those interested in the scheme, I think that in any future negotiations a very substantial reduction in the purchase money might be made, and that the present owners ought to consider themselves fortunate in disposing of a property, useless to them, for a price much less than that previously agreed upon. The Company's operations were conducted in a most unbusiness-like and wasteful manner: they did a positive injury to mining by holding for years the monopoly of a valuable water-right, of whose advantages they were unable to avail themselves—shutting out others who might have been better able to do so. Under the circumstances I think the Company would not be unwise enough to reject an offer to purchase at a much lower price than that previously named; and, on the other hand, if a substantial reduction is made, I think Government would do well to purchase, as the size of the race would be sufficient to work the upper country, and if the low-level race to the Aberfoyle is found practicable, not a drop of the ordinary flow of the Mussel Roe would be wasted.

G. J. BURKE, *M. Inst. C.E.*

Hobart, 1*st September*, 1886.

WILLIAM THOMAS STRUTT,
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