

(No. 92.)



1879.

---

TASMANIA.

LEGISLATIVE COUNCIL.

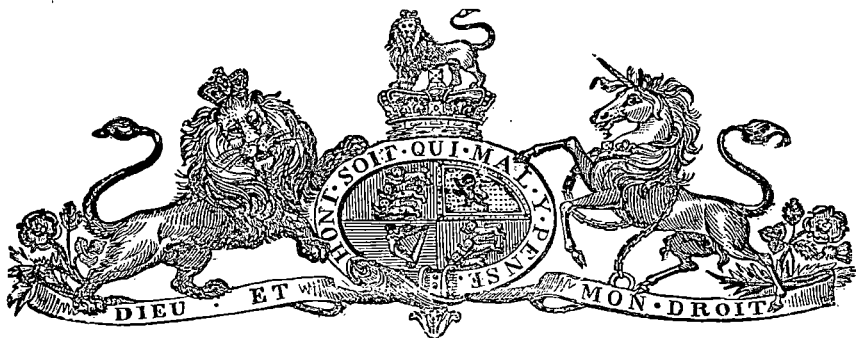
---

**HOBART TOWN CORPORATION LOAN:**

PAPERS RELATING TO.

---

Laid upon the Table by Mr. Chapman, and ordered by the Council to be printed,  
March 3, 1880.



*Town Hall, 3rd March, 1880.*

SIR,

"THE Bill to enable the Municipal Council of the City of Hobart Town to consolidate certain Loans; and for that purpose, and for the purpose of improving the said City, to borrow any sums of money not exceeding £150,000."

On behalf of the Municipal Council I have the honor to request that, on the occasion of the above Bill coming before the Legislative Council, you will kindly take charge of the same through its various stages, when I hope it will receive your valuable support.

I have the honor to be,  
Sir,

Your obedient Servant,

W. H. BURGESS, *Mayor of the City of Hobart Town.*

*The Hon. THOMAS D. CHAPMAN.*

A duplicate and corrected copy of "Proposed method, and reasons for expenditure of £57,000, &c." accompanies this.

---

*PROPOSED method of, and reasons for, expenditure of Loan of extra £57,000 asked for by the Hobart Town Corporation under the provisions of the Bill now before the Legislature.*

The Council purpose expending the above-named sum of £57,000, by applying £30,000 to the completion of their present Water Scheme, and the balance, £27,000, for the sewerage of the City.

The detail of the Expenditure on Water Works cannot be placed before you in a clearer manner than by the perusal of the following extracts from various Reports which have been approved of by the Council, and confirmed by that most eminent Hydraulic Engineer, Mr. William Clark, C.E. :—

The cost of the removal and re-construction of the present dam is estimated at £7000. Mr. Clark, in alluding to the  $4\frac{1}{2}$  miles of stoneware pipes and wooden troughing now in existence, states :—" From what I saw of the wooden troughing, and bearing in mind the time it has been in use, it will be advisable now to consider the entire reconstruction of the aqueduct, the masonry portion excepted; Mr. Christopher-son informs me that he proposes to replace the wooden troughing with stone, and the stoneware pipe, which is a source of trouble, with iron pipes;" and further, Mr. Clark says that "the present aqueduct having been in use for so long a period will (except in particular spots, bridges, &c.) afford a reliable site for the masonry construction; the exceptional cases will require rubble walling, for which the material is everywhere present; and the bridges, which are at present of timber, should now be constructed of masonry in a most permanent form."

Mr. Clark also agrees with me as to the absolute necessity for laying a second 10-inch main between the main storage reservoir and the *Marquis of Hastings*. The following is an extract, bearing upon the subject, from that gentleman's report :—" Below the valve house at the reservoir to the *Marquis of Hastings* reservoir, a distance of one mile 79 chains, with a fall of 90 feet, a 10-inch pipe is at present laid: this is insufficient to bring down the full quantity—two million gallons per day. For this purpose I would recommend that an additional 10-inch pipe be laid between the places, which will be amply sufficient, and in the event of repairs, &c. being required to one of the pipes, the other one would be available; without this convenience, it would be desirable also to enlarge the service reservoir at the *Marquis of Hastings*."

On account of the very bad condition of the existing timber troughing, a commencement should be made, at as early a date as possible, to complete the masonry aqueduct. This portion of the work is estimated to cost £3500.

The stoneware pipes should be taken up and replaced with cast-iron pipes, at an estimated cost of £10,166.

The Council are particularly desirous that the work mentioned in the last three paragraphs should be proceeded with without delay, as, owing to the failing condition of the troughing and pipes, not less than 17½ per cent. of the present supply is lost to the City, as will be seen by the following extract from Report:—

“I found the following to be the quantity of water actually entering the conduit at the under-mentioned points; viz.—

At St. Crispin's Well the water entered the stoneware pipes at the rate of.....	310,277	gallons per 24 hours
At the 2nd Gully along the line.....	246,205	ditto
At the 3rd Gully along the line.....	84,815	ditto
At Long Creek.....	140,500	ditto
At Fork Creek, into wooden troughing.....	337,950	ditto
At Brown's River, into wooden troughing.....	130,759	ditto

Total quantity of water entering the stoneware pipes and troughing .....	1,250,506	ditto
--	-----------	-------

The total quantity of water actually discharged into the upper valve house was at the rate of 1,032,400 gallons every 24 hours, thus showing a loss of 218,106 gallons. Nearly the whole of this great loss of water is due to the imperfect condition of the earthenware pipes, and also to the rotten state of the timber troughing.”

The Health Officer of Hobart Town, Dr. E. S. Hall, in several of his Reports, has attributed the improvement in health to the improved Water Supply which ensued after the new works were completed, in 1861, more especially regarding death from Diarrhoea and Dysentery. Previously, deaths from these diseases had been much greater in proportion to population in Hobart Town than in the country districts, but since that, the case has been reversed. Again, Dr. Hall, in his Climate and Vital Statistics of Tasmania, 1872, pages 23 and 24, writes as follows:—“Next to pure air, nothing promotes the health of a community more than an abundant supply of pure water. Hobart Sanitary Statistics, as well as those of Launceston, have furnished undoubted proofs of this from the improvement of the quantity and quality of the water supply for some years past. Bowel complaints in the four years 1857, '8, '9, 60, caused 206 deaths in the Hobart Town Registration District, or a yearly average of 51½. In the four years 1868, '69, '70, and 71, they have caused only 146 deaths, or annual average of 36½. There has been, I believe, much the same proportionate diminution of deaths from bowel complaints in Launceston since the improved water supply came into operation there. The rural districts, however, have not enjoyed a similar lessening of the death rate from these diseases.” “I have already referred to the small number of deaths from bowel complaints in Hobart, which, I believe, to be mainly consequent on the improved water supply.”

#### PROPOSED Scheme of Works, and Estimate thereof:—

	£	s.	d.
The reconstruction of the present storage reservoir.....	7000	0	0
The laying of an additional 10-inch main between the storage reservoir and the Marquis of Hastings.....	4160	0	0
The completion of masonry aqueduct in lieu of the present wooden troughing, which has decayed.....	3500	0	0
The taking up of the stoneware pipes laid between St. Crispin's Well and Fork Creek, a distance of 4½ miles, and relaying same with cast-iron pipes of the following dimensions, and at the following cost for each section, viz. :—			
From St. Crispin's Well towards Fork Creek, one mile of 8-inch cast-iron piping, at a cost of .....	2754	0	0
From thence 1½ miles 9-inch piping, at a cost of.....	3060	0	0
And to Fork Creek, 1½ miles of 10-inch piping, at a cost of.....	4352	0	0
Iron pipes from St. Crispin's Well to two Creeks.....	770	0	0
	10,936	0	0
Contingencies .....	4404	0	0
Total .....	£30,000	0	0

With the remaining £27,000 it is proposed to clear the lower end of the Hobart Town Rivulet, where the silt has accumulated, from Campbell-street down to the river, and to pave the bed of the Creek from Campbell-street as far up as Barrack or Molle-street. It is also proposed to erect one or two flushing gates.

It would be impossible to attach too much importance to the necessity of the above work, as may be witnessed from the unfavourable remarks made by several Honorable Members of the Legislature during the present session, and by many visitors from the other colonies, as to the offensive state of the Creek, and its injurious effects on the health of the citizens. It must also be well known to Honorable Members that an influential deputation of citizens waited upon the Mayor, urging him to take immediate steps to remedy the evil.

With regard to the ability of the Corporation to pay the interest on the loan, it may be observed, that at the present time the sum of £5250 is paid annually for interest, as against £7600, which latter sum (including £100 for expense of remittance, &c.) will be required, thus making a difference of £2350 to be provided for; but it must be borne in mind that during the last three years there has been annually a surplus of rates of at least £1700 in the Water Account alone, which has been expended on the construction of permanent works. When the proposed Scheme of Works is completed, the above sum of £1700 will be available for the payment of interest, leaving only £650 to be provided for; and this sum, it is believed, will be fully met by the increased revenue which will be derived from the supply of water to a very large number of persons in the city and suburbs, whose applications both for domestic purposes and for garden taps have been hitherto refused owing to the insufficient quantity, and by the saving in the constant repairs which are now rendered necessary, owing to the faulty condition of the works in their present state.

*Town Hall, 1st March, 1880.*

---

THE Waterworks Committee beg to submit the Report of Mr. William Clark, Civil Engineer, upon the improvement and maintaining the supply of Water in the City of Hobart Town, in accordance with the Resolution of the Council of the 11th instant.

W. H. BURGESS, *Mayor, Chairman.*  
18. 2. 78.

---

*Hobart Town, January 13th, 1878.*

GENTLEMEN,

IN conformity with your request that I should report on the measures which are proposed for improving and maintaining the supply of water to the City, I have the honor to inform you that, with the Director of Waterworks, Mr. Christopherson, on the 12th instant I inspected the present Reservoir on the Sandy Bay Rivulet, and the site where it is proposed to construct another dam for the purpose of storage.

The first dam was intended to form a Reservoir which would impound 40 million gallons. The proposed dam, if carried out, will, I am informed, impound double that quantity, by an embankment 700 feet in extreme length, and 63 feet high above the bed of the creek.

The present dam appears to have failed soon after the Reservoir was filled, attributable, in all probability, to the insufficient depth of the puddle trench. The laying of the outlet pipe under the deepest part of the embankment without protection, in the first instance, and the subsequent timbered tunnel through it, were, I conceive, both errors in construction likely to lead to failure.

The City now chiefly depends upon its supply of water from the streams flowing from the south and east sides of Mount Wellington. These streams are estimated by Mr. Christopherson to yield an aggregate quantity amounting to 800,000 gallons per day during the driest periods; and it is now proposed, with the aid of both Reservoirs, to arrange for a supply equal to two million gallons per day, or about double the present consumption.

The storage of 120 million gallons, with the daily flow of 800,000 gallons, will therefore be sufficient to give 100 days supply, at two million gallons per day, during the driest period, and will—in a climate where long droughts are unusual, and where the cost of constructing Reservoirs is considerable—I consider be sufficient, and probably will be all that is required for many years to come.

The quantity coming from the hills during storms is very large, and requires only storage area to give any quantity likely to be required in the future.

The construction of additional Reservoir when necessary is all that will be required; the source of supply may, I consider, be confidently relied upon.

The present Director of Waterworks, warned by the previous failure, is taking the proper means to secure the proposed work from failure by a careful examination of the site of the embankment. I find it to be composed, on both sides of the gully, of a very hard metamorphic rock; but the creek at an earlier period was deeper and wider than at present, and it has been partly filled with other deposits. A shaft has been sunk to a depth of 42 feet below the present level of the creek, and discovers what appears to be the bed rock, similar to that which forms the sides of the valley. This is through a mixture of shale, or what is termed "mud rock" (which it would be unsafe to trust as impervious), and it is partly through drift consisting of gritty material with pebbles. This is what I observed from the bottom of the shaft. The rock at the bottom will form a good foundation, and it found to be continuous the puddle wall of the dam may be commenced thereon with perfect safety. To prove this Mr. Christopherson intends to drive headings along its surface. Its continuity being thus proved, by taking off the fissured portion of the surface rock, and stopping it down to the depth required, a perfectly reliable work may be constructed; and I would advise that the side be adopted.

On the successful completion of the new dam it is proposed to remove the old one and to clear its site completely, when, after a preliminary examination, as in the present case, to ascertain the necessary depth

of the puddle trench, it will be reconstructed. As to the propriety of this I quite concur; and I may here remark that the measures adopted by Mr. Christopherson appear to be well considered and judicious, and I should have confidence in his judgment and experience, and that he will successfully complete the work which, after due enquiry, he may recommend.

The drawings of the outlet works for the proposed reservoir I have seen; they are to be constructed in the solid rock, and appear to have been well and carefully considered. An additional inlet to the tower from the reservoir at a higher level, and a 'by-wash' valve for the lower one, not shown but probably intended, is the only addition which appears to me to be desirable.

I accompanied Mr. Christopherson over a considerable portion of the aqueduct channel which begins at the receiving house near the present and proposed reservoir.

This channel is capable of carrying  $5\frac{1}{2}$  millions of gallons in 24 hours; it commences with  $\frac{1}{4}$  mile of open stone aqueduct, which is in good condition.

Proceeding upwards,  $2\frac{1}{4}$  miles of wooden troughs are laid having a sectional area of 1 square foot; this has been in use 16 or 17 years, and from its upper end to St. Crispin's Well  $4\frac{1}{2}$  miles of 9-inch stone-ware pipe were laid a few years since to increase the supply.

This aqueduct in its course receives the flow from six different streams, and on the 17th Dec. 1877 this flow in the aggregate was reported to be  $1\frac{1}{4}$  million gallons; but 1,032,000 only arrived at the receiving-house,—218,000 gallons being lost, or nearly  $\frac{1}{5}$ th of the entire quantity.

From what I saw of the wooden trough, and bearing in mind the time it has been in use, it will be advisable now to consider the entire reconstruction of the aqueduct, the masonry portion excepted. Mr. Christopherson informs me that he proposes to replace the wooden troughing with stone, and the stone-ware pipe, which is a source of trouble, with iron pipes.

The country through which the wooden troughing is laid contains stone suitable for building the aqueduct, the only materials requiring cartage being sand and cement. A channel capable of carrying  $5\frac{1}{2}$  million gallons per day, it is estimated, may be constructed for a little under £3000 per mile; and a 9-inch iron pipe may be laid for something less than £2000 per mile in place of the present stoneware pipes.

The proposal is to cover the stone aqueduct with the 2-inch planking from the old wooden trough, and as this decays, the future covering should be slate, stone, or whatever permanent material may be the most suitable or economic.

The present aqueduct having been in use for so long a period will (except in particular spots, bridges, &c.,) afford a reliable site for the masonry construction; the exceptional cases will require rubble levelling, for which the material is everywhere present; and the bridges, which at present are of timber, should now be constructed of masonry in a more permanent form.

Below the valve-house at the Reservoir to the *Marquis of Hastings* service Reservoir, a distance of 1 mile 70 chains, with a fall of 90 feet, a 10-inch pipe is at present laid. This is insufficient to bring down the full quantity—2 million gallons—per day. For this purpose I would recommend that an additional 10-inch pipe be laid between the two places, which will be amply sufficient, and in the event of repairs being required to one of the pipes the other one would be available; without this convenience it would be desirable also to enlarge the service Reservoir at *Marquis of Hastings*. It will also enable a supply to be given with greater pressure to portions of the city at a higher level than can be given from the Reservoir.

I have yet to notice the by-wash or waste weir from the Reservoir.

The area drained into the present and proposed Dam is 400 acres. No rain gauge appears to be kept in the hills to assist the necessary calculation of the size of weir required. Mr. Constable Moore in charge of the Reservoir informed me that during 16 years the present by-wash and channel has been able to take the whole of the storm water; it is about 20 feet wide and 5 feet deep. In the absence, therefore, of any other information, it would seem to be sufficient to allow the present by-wash to continue. The channel is carried along the entire length of the present reservoir up to the site of the proposed dam, and will afford the means of discharging storm water when it is muddy, without disturbing the purity of the water in the lower reservoir.

The nature of the gathering ground, extending over 4000 acres reserved for the Water Supply, insures a considerable amount of purity and freedom from mud, &c. An arrangement should, however, be made to keep out branches of trees and rubbish of this character from the reservoir.

Your obedient Servant,

W. CLARK.

To the Right Worshipful the Mayor and Aldermen of the City.

---

*SUMMARY of due Dates of Corporation Mortgages.*

	£	
1 April, 1880 .....	100	at 6 per cent.
8 April, 1880 .....	400	6 per cent.
1 October, 1880 .....	400	Ditto.
1 October, 1880 .....	600	5 per cent.
1 April, 1883 .....	500	Ditto.
1 April, 1883 .....	600	6 per cent.
1 October, 1883 .....	650	Ditto.
1 April, 1884 .....	6400	Ditto.
1 October, 1884 .....	3000	Ditto.
14 March, 1885 .....	2000	Ditto.
1 April, 1885 .....	3950	Ditto.
1 October, 1885 .....	2275	Ditto.
1 April, 1886 .....	1000	5 per cent.
1 October, 1886 .....	3650	6 per cent.
1 April, 1887 .....	500	5 per cent.
1 October, 1887 .....	750	6 per cent.
1 October, 1887 .....	250	5 per cent.
1 April, 1888 .....	61	6 per cent.
1 April, 1888 .....	6800	5 per cent.
1 October, 1888 .....	3900	Ditto.
1 April, 1889 .....	9300	Ditto.
1 October, 1889 .....	2000	Ditto.
1 April, 1890 .....	1300	Ditto.
1 July, 1890 .....	1200	Ditto.
1 October, 1890 .....	1000	Ditto.
1 April, 1891 .....	900	Ditto.
1 October, 1891 .....	1100	Ditto.
1 April, 1892 .....	6700	Ditto.
1 October, 1892 .....	4590	Ditto.
1 April, 1893 .....	1570	Ditto.
1 October, 1893 .....	2580	Ditto.
1 April, 1894 .....	100	Ditto.
	<u>£70,126</u>	

ON MUNICIPAL RATES.		
	£	
10 April, 1880.....	500	at 6 per cent.
24 April, 1880.....	100	Ditto.
19 June, 1880 .....	600	Ditto.
31 July, 1880 .....	200	Ditto.
18 Sept. 1880 .....	100	Ditto.
1 October, 1880 .....	100	Ditto.
1 April, 1881 .....	100	Ditto.
1 October, 1882 .....	2600	Ditto.
1 April, 1884 .....	1000	Ditto.
1 April, 1885 .....	300	Ditto.
1 October, 1886 .....	500	5 per cent.
1 April, 1891 .....	600	Ditto.
1 October, 1891 .....	1700	Ditto.
1 April, 1892 .....	7600	Ditto.
1 October, 1892 .....	190	Ditto.
1 October, 1893 .....	60	Ditto.
1 October, 1894 .....	3250	Ditto.
	<u>£19,500</u>	
RECAPITULATION.		
	£13,900	at 5 per cent.
	5600	6 per cent.
	<u>£19,500</u>	
Available, £3500.		

W. H. SMITH, *Accountant.*  
20 *January*, 1880.