

1920.

NEW ZEALAND.

MAEREWHENUA RIVER

(REPORT OF RIVERS COMMISSION ON).

Presented to both Houses of the General Assembly by Command of His Excellency.

REPORT.

To His Excellency the Right Honourable Arthur William de Brito Savile, Earl of Liverpool, Member of His Majesty's Most Honourable Privy Council, Knight Grand Cross of the Most Distinguished Order of Saint Michael and Saint George, Knight Grand Cross of the Most Excellent Order of the British Empire, Member of the Royal Victorian Order, Knight of Grace of the Order of Saint John of Jerusalem, Governor-General and Commander-in-Chief in and over His Majesty's Dominion of New Zealand and its Dependencies.

MAY IT PLEASE YOUR EXCELLENCY,—

Your Commission, dated the 8th April, 1919, directed us to inquire into certain matters in respect of the Clutha, Orari, Rangitata, Waimakariri, Ashley, and Maerewhenua Rivers. The time within which we were required to furnish our report was extended by Warrant under the hand of Your Excellency, dated 3rd November, 1919, to 7th February, 1920. The present report deals only with the Maerewhenua River; the reports upon the remaining rivers will be presented to Your Excellency in due course when the requisite data have been collected.

Your Excellency's Commission directed us, in respect of each river, —

- “(1.) To inquire into the cause or causes of the silting-up of the channel, the flooding of the adjacent lands by the said river, the erosion of its banks, and the damage to the surrounding country;
- “(2.) To ascertain the nature and extent of the damage done to the lands adjacent to the said river, and what area of land is affected by such floods or erosion, or both, and whether it is practicable at reasonable expense to prevent such flooding or erosion, or both, either wholly or partially;
- “(3.) To ascertain the best method of providing for the control of the said river and its tributaries so as to safeguard the lands affected, and to provide for the effective control and improvement of the said river and its banks;
- “(4.) To ascertain the nature and extent of any drainage-works that may be required, and the best method of carrying out such works;
- “(5.) (a.) To furnish estimates of the cost of such remedial measures as you may recommend should be taken for the effective control and improvement of the said river and its banks;
- “(b.) To report what area or areas of land should be constituted a district in respect of which a rate may be levied to secure and pay the interest on and provide a fund for the repayment of any loan that may be raised to carry out any river-improvement works which you may recommend should be undertaken;

“(c.) To report your opinion as to what matters, if any, should be adjusted by legislation; and

“(d.) Generally, to report your opinion on all matters arising out of or touching the premises, including the question as to whether or not one or more competent authorities shall be appointed to control the whole or any portion of the said river and what statutory powers should be possessed by such authority.”

Your Commission also required us to report separately in respect of each river.

INVESTIGATIONS MADE.

Sittings, Evidence, and Inspections.—Your Commissioners met in Dunedin, and proceeded to Oamaru on the 30th June, 1919, where a duly advertised sitting was held the same evening, at which sworn evidence was received from six witnesses representing the Oamaru Borough Council and the Waitaki County Council. On the following day the Commission proceeded to Duntroon, and inspected the river from its confluence with the Waitaki River to a point above Livingstone.

In addition to examining the river and its general surroundings, the Commission inspected and examined the sluicing claims on the Livingstone and Maere-whenua diggings, and that portion of the Oamaru Borough Council's water-race affected by the questions submitted to us.

On the same evening the Commission held a sitting in the Duntroon School-house and examined a further nine witnesses, representative of the mining interests, the lands affected, the Oamaru Borough water-race management, and the Waitaki County Council.

Mining.—Your Commissioners found that the mining operations in the district, although fairly extensive in the past, have now become considerably reduced. Nevertheless it is clear that mining operations of greater or less magnitude are likely to be carried on for a further twenty-five years. The detritus from the mining claims has filled up many of the side gullies, and comes down the Maere-whenua to its confluence with the Waitaki River, filling up its bed to a considerable extent. The prejudicial effects of this detritus are particularly noticeable near the town of Duntroon, where the waterway is considerably restricted by the present road-and-railway bridge, the piers of which are also not placed in such a way as to be favourable to the free flow of the water.

As regards the mining operations, your Commissioners are of opinion that nothing can be done to stop the gradual travel down the river of the mining detritus, and that, even though the mining operations were to be immediately suspended, this would not mitigate the trouble for very many years to come. Further, a certain number of miners are at present making their livelihood on the goldfield in this locality, to whom it would be a very great hardship if future mining operations were vetoed. The amount of gold being won is, however, not sufficient in quantity to justify our recommending any contribution towards the cost of remedial measures being demanded from this source; but the General Government, having been responsible for the proclamation of the river as a sludge-channel for the deposit of mining-tailings under the Mining Act, cannot escape liability to provide a substantial sum towards the cost of the works recommended hereinafter by your Commissioners.

Damage above Duntroon.—Although a certain amount of damage is being done to the lands abutting on the river above Duntroon, your Commissioners do not consider that the interests involved are of sufficient importance to justify them in recommending the provision of special remedial works. The endeavours of the County Council to protect their roads in the vicinity are all that can reasonably be expected.

Surveys.—Your Commissioners had the necessary surveys made, and met at a later date in Wellington to complete their investigations and formulate their report, and now beg respectfully to submit their findings on the various heads in the order of reference, as follows:—

REFERENCE NO. 1.

To inquire into the cause or causes of the silting-up of the channel, the flooding of the adjacent lands by the said river, the erosion of its banks, and the damage to the surrounding country.

This is due to the enormous quantity of debris coming down from the mining claims at Maerewhenua and Livingstone, aggravated by the constriction due to the road-and-railway bridge, and the obstruction caused by the growth of gorse and other exotic vegetation in the river-bed.

REFERENCE NO. 2.

To ascertain the nature and extent of the damage done to the lands adjacent to the said river, and what area of land is affected by such floods or erosion, or both, and whether it is practicable at reasonable expense to prevent such flooding or erosion, or both, either wholly or partially.

The damage is of a manifold nature :

(a.) The floods cause damage to the Oamaru Borough water-race, which damage threatens, as time goes on, to become greater. When the river overflows its banks the town supply is cut off, and the local requirements have to be met by water stored in the Oamaru service reservoir, which is adequate only for a few days' supply under modern conditions. Even if all power-users were cut off, the reservoir would then only be adequate for about twenty days' supply.

(b.) The country roads are breached and overflowed, and traffic through the district is interrupted.

(c.) The railway-line is damaged by water overflowing it, and in the event of a very large flood the railway-bank would undoubtedly also be breached and traffic cut off. On one occasion in the past the entire railway-bridge was carried away.

(d.) The land abutting on the river below the road-and-railway bridge, and between its confluence with the Waitaki and a point some miles down-stream, is overflowed, and any crop growing thereon is damaged, if not destroyed. The fear of this occurring has been detrimental in preventing land being used for agriculture which might have been so used. The fear of floods, even when they do not occur, also depreciates the selling-value of the land. The particular kind of silt delivered by this river, coming as it does from mining operations at Livingstone and Maerewhenua, is detrimental to the land.

The area of land affected is 2,000 acres.

Your Commissioners consider it practicable to wholly prevent the flooding and erosion at reasonable expense.

REFERENCE NO. 3.

To ascertain the best method of providing for the control of the said river and its tributaries so as to safeguard the lands affected, and to provide for the effective control and improvement of the said river and its banks.

The works recommended by your Commissioners are shown on plans marked 1, 2, and 3, hereto attached, and consist generally of—

(a.) The lengthening of the combined road-and-railway bridge, and the removal of its present approaches (both road and railway) back to an alignment which will give a clear waterway of approximately 10 chains in width, as indicated on plan, agreeing thus with the river-bed as it now exists where not constricted by artificial works. In order to obtain this lengthening of the bridge your Commissioners recommend the relocation of the railway on the line indicated, which will give an improved running-line. In this connection your Commissioners must emphatically insist that the piers of the new bridge be set approximately parallel to the general run of the current. A great deal of the trouble with the present bridge is undoubtedly caused by the fact that its piers are square to the railway-line, and not parallel to the general flow of the stream.

(b.) From the ends of the lengthened bridge, levees must be carried down on each side of the river to its confluence with the Waitaki, and on the right bank

up-stream to connect with the existing stop-bank, as shown. These levees will require protection at one or two points, where the set of the current impinges dangerously upon them. It is possible that further protection may be required as years go by and the points of attack shift, in common with the usual behaviour of shingle rivers. The levees should be enclosed entirely within rabbit-proof fences. The fences on the river-side should have willow, poplar, or other tenacious and quick-growing trees used in their construction, and the land between the fences and the levees should be adequately planted with similar vegetation. The levees themselves should be grassed. At the extreme lower end of the right-bank levee, where it passes over the Oamaru Borough water-race, and for 300 ft. below same down the right bank of the Waitaki, stone protection composed of fairly heavy blocks from the limestone cliffs adjacent should be placed, to guard against the erosion which is taking place where the Maerewhenua current joins that of the Waitaki.

(c.) All the river-bed, from the upper end of the works to the confluence with the Waitaki, and within the stop-banks, should be entirely cleared of vegetation, and kept in that condition.

(d.) The roads approaching the east end of the bridge from Maerewhenua and Oamaru must be led in by reasonable grades and alignment to the new bridge, and the same must be done with the road on the western side.

(e.) All the roads and railway-line no longer in use should be closed, and the money obtained from the sale of the land thereby released should be used to compensate the owners of the land which may have to be acquired by the Crown for the new road and railway.

(f.) The road leading up the Maerewhenua on the right bank, which is now flooded, must be regraded, commencing from the top of the existing stop-bank and rising from there at a grade not flatter than the average grade of the river, until it connects with the high ground a short distance up-stream. Whether this raising is carried out on the present alignment, or by removing the road over against the cliff, is a matter for investigation and decision by the engineer actually carrying out the works.

REFERENCE No. 4.

To ascertain the nature and extent of any drainage-works that may be required, and the best method of carrying out such works.

Your Commissioners do not consider that any drainage-works are required in connection with this problem.

REFERENCE No. 5.

(a.) To furnish estimates of the cost of such remedial measures as you may recommend should be taken for the effective control and improvement of the said river and its banks.

Your Commissioners estimate the cost of the works recommended above at £18,000, made up as follows:—

	£
Stop-banks	1,800
Fencing stop-banks	1,000
Clearing river-bed	400
New railway-bridge (less value of old bridge, dismantled) ..	10,000
New railway-banks, platelaying, pulling up old line, connecting track	1,300
Removal of old banks, regrading roads, and bridge approaches	600
Protection, willow-planting, and rock-work	500
	<hr/>
	£15,600
Cost of financing, interest, legal expenses, supervision, and contingencies, 15 per cent. (say)	2,400
	<hr/>
	£18,000

MAEREWHENUA RIVER.

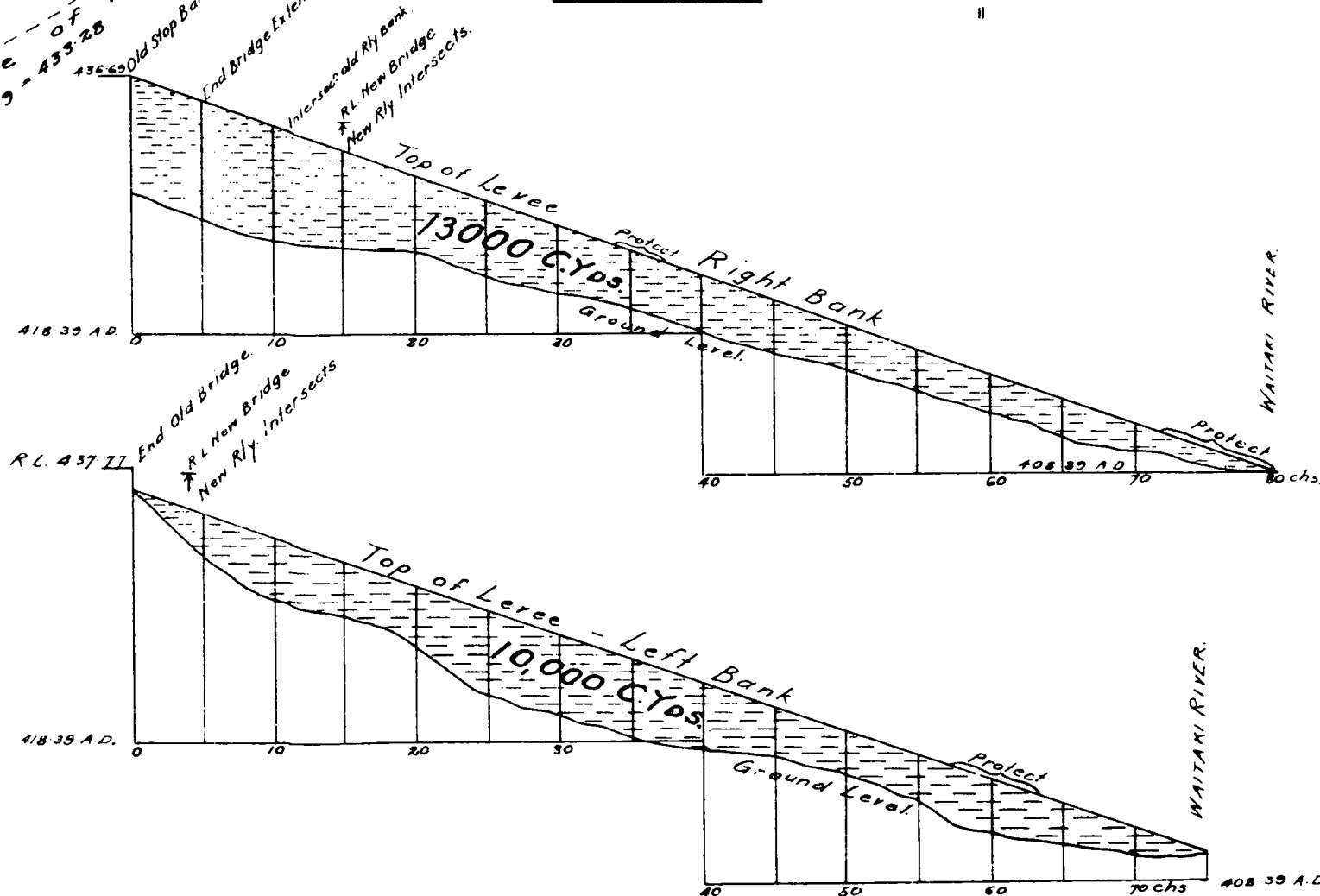
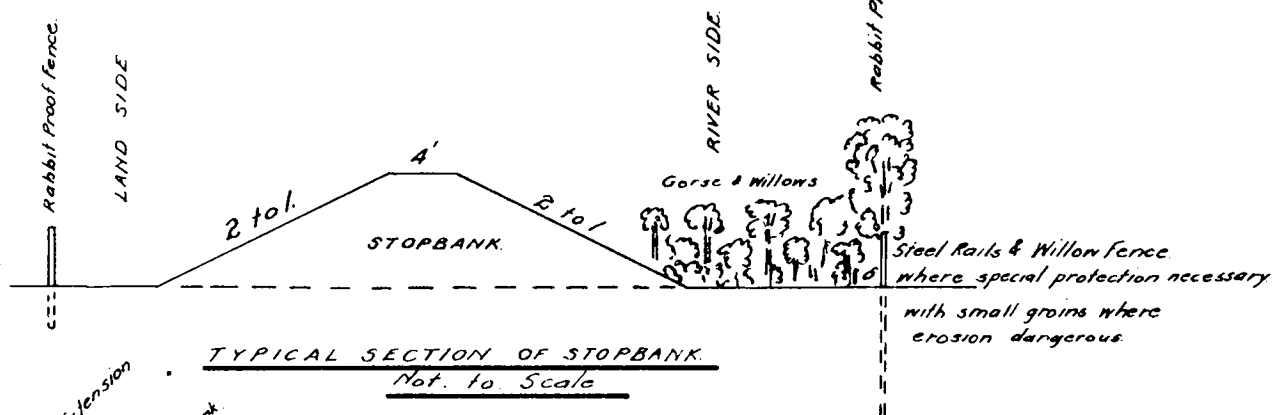
Plan Showing Proposed Works

Scales

Horizontal 0 10 20 30 chains

Vertical 0 10 20 30 feet

Shaded portion of Riverbed
between Lerees to be cleared
of Gorse and Willows and
cleaned up.



- (b.) *To report what area or areas of land should be constituted a district in respect of which a rate may be levied to secure and pay the interest on and provide a fund for the repayment of any loan that may be raised to carry out any river-improvement works which you may recommend should be undertaken.*

Your Commissioners are of opinion that the cost of the works should be a charge against the various interests concerned, in the following proportions :—

New Zealand Government Railways			
Department	..	..	Four-tenths.
Waitaki County Council	..	..	Twelve one-hundredths.
Oamaru Borough Council	..	..	Eighteen one-hundredths.
Land injuriously affected	..	..	One-tenth.
General Government	..	..	Two-tenths.

Should the total cost of the works exceed the £18,000 indicated above, then any further sum should be paid by the five interests represented above, in the same proportions.

For the purposes of this allocation we consider—

(i.) *Lands injuriously affected.*—All the land bounded on the north by the Waitaki River, on the south by the foot of the hills which approximately parallel the main road and the Kurow Branch Railway, on the east by a line running at right angles to the Kurow Branch Railway from the above-mentioned terraces to the Waitaki River and running through Black Point Railway-station, and on the west by a line extending similarly from the centre of the Duntroon Railway-station to the river and at right angles to the railway-line (but excluding any land held by the Railway Department, or by the Oamaru Borough Council within these limits for the purpose of its water-race), should be the district in respect of which a rate may be levied to secure and pay the interest on and provide a fund for the repayment of one-tenth of the total cost of the works above mentioned.

The Commission contemplates rating on a graduated scale, the Classification Commissioners classifying in a non-ratepaying class all such lands within the above limits which are considered as deriving no benefit from the proposed works.

(ii.) *Waitaki County Council.*—The whole of the Waitaki County should be the district in respect of which a rate may be levied to secure and pay the interest on and provide a fund for the repayment of twelve one-hundredths of the cost of the works above mentioned.

(iii.) *Oamaru Borough Council.*—The whole of the Borough of Oamaru should be the district in respect of which a rate may be levied to secure and pay the interest on and provide a fund for the repayment of eighteen one-hundredths of the total cost of the works above mentioned.

- (c.) *To report your opinion as to what matters, if any, should be adjusted by legislation.*

Your Commissioners consider that the whole of their findings, as set forth in this report, should be enacted in special legislation, to be called the Maerewhenua River Improvement Act.

- (d.) *Generally, to report your opinion on all matters arising out of or touching the premises, including the question as to whether or not one or more competent authorities shall be appointed to control the whole or any portion of the said river, and what statutory powers should be possessed by such authority.*

Your Commissioners beg to submit the following recommendations under this heading :—

(i.) All the land on which the stop-banks are erected, and all the land between the stop-banks from a point 20 chains above the proposed new road-and-railway bridge down to the junction of the Maerewhenua and Waitaki Rivers, with the exception of the new railway reserve, should be vested in the Waitaki County Council, which should be constituted a River Board, as the controlling authority for the maintenance of the works.

With regard to the carrying-out of the works, your Commissioners consider that the procedure should be that each of the interests indicated above viz., the New Zealand Government Railway Department, the Waitaki County Council, the Oamaru Borough Council, the owners of the land injuriously affected, and the General Government shall raise and deposit in a special fund to the credit of the Secretary to the Treasury, in a bank to be approved by him, the sums representing their respective proportions of the cost of the works. The Secretary to the Treasury shall pay to the persons controlling the carrying-out of the works, monthly or, as may be demanded, at longer intervals, the value of the work done, upon the certificate of an officer to be approved by him. The Railway Department shall first proceed to erect the new bridge and divert the railway-line, making the road approaches within their own land up to the limits of their boundaries. The Waitaki County Council shall then proceed with the balance of the works, diverting the roads over the new bridge, removing the old obstructing approaches down to adjacent ground-level, building the stop-banks, fencing, clearing, &c. When the roads have been diverted over the new bridge the Railway Department shall dismantle and remove the existing bridge, which shall become their property.

(ii.) Your Commissioners consider that 1 per cent. of the amount of the shares assessed in paragraph (iii) following, other than those of the Railway Department and the General Government, should be set aside annually and invested as an insurance fund, from which shall be met the cost of repairing or paying for any damage (other than to the works outlined under this scheme) which may occur by reason of a possible failure of the works.

This is a somewhat novel suggestion, and merits some explanation. It is recognized that no works of man can afford complete immunity. While your Commissioners consider that their recommendations will enable any flood such as has been experienced hitherto to be safely passed, nevertheless failure might occur by reason of faulty maintenance, a flood of unprecedented magnitude, sudden erosion due to a change of direction of current during a flood, or other cause. Should such failure occur certain of those intended to be protected will suffer much greater damage than others, and it is to recompense them for this, and to make the sacrifice equitable, that the insurance fund is recommended.

The moneys for this insurance fund shall be collected by the Waitaki County Council, and paid annually on the 31st March to the Public Trustee for investment at the current rate. On the receipt of claims the Public Trustee shall have an investigation made by a Stipendiary Magistrate assisted by two assessors to be selected by the Stipendiary Magistrate, preferably one a civil engineer and the other a farmer. The Stipendiary Magistrate shall call such evidence and take such steps as he considers necessary, and advise the Public Trustee as to the amount to be paid out in respect of each claim, and the Public Trustee shall make the disbursements accordingly.

In the event of damage being done greater than the amount of money in the fund, then the claims shall be paid *pro rata* from the amount available in the fund, and such payments shall extinguish all liability then existing. In other words, no claims shall be carried forward as a charge against other moneys to be accumulated.

(iii.) *Maintenance of Works.* The annual charges to the district are estimated as follows:

	£
Maintenance, labour, and material	76
Interest and sinking fund, 6 per cent. on £7,200, being £18,000 less £7,200 Railway Department's interest and £3,600 Government's contribution	432
Insurance at 1 per cent. on various interests—	£ s. d.
Waitaki County Council (£2,160)	21 12 0
Oamaru Borough Council (£3,240)	32 8 0
Lands affected (£1,800)	18 0 0
	72
	£580

This sum of £580 represents the estimated annual charges on the scheme, exclusive of interest and sinking fund on the amounts to be found by the Railway Department and the General Government.

(iv.) The previously mentioned sum of £72 shall be provided by the Waitaki County Council, the Oamaru Borough Council, and the district described in clause (i) under reference (5) (b), in the following proportions :—

Waitaki County Council	..	..	..	Six-twentieths.
Oamaru Borough Council	..	..	..	Nine-twentieths.
District described in clause (i) under reference				
No. (5) (b)	..	..	..	Five-twentieths.

(v.) Your Commissioners recommend that the Waitaki County Council shall be constituted a River Board to carry out and maintain the works recommended to be done by them. The Railway Department shall construct the new bridge and railway-line recommended, and also the levees, fencing, and clearing, within their boundaries, and shall maintain same out of Railway revenue.

The Waitaki County Council shall adequately maintain the works to the satisfaction of a joint committee consisting of the Waitaki County Engineer, the Oamaru Borough Engineer, the District Railway Engineer, and the Commissioner of Crown Lands, who shall meet on the ground and inspect the works at least once in every twelve months. The cost of such maintenance, estimated at £76 per year, shall be collected by the Waitaki County Council annually from the interests affected, in the following proportions :—

Waitaki County Council	..	..	..	Six-twentieths.
Oamaru Borough Council	..	..	..	Nine-twentieths.
District described in clause (i) under reference				
No. 5 (b)	..	..	..	Five-twentieths.

This our report, which has been unanimously adopted, we have the honour to respectfully submit for the consideration of Your Excellency, together with the transcript of the evidence taken by us in the course of our investigations, and the following plans illustrating the works recommended by us :

Plan No. 1 : Plan and longitudinal section of river.

Plan No. 2 : Cross-sections of river.

Plan No. 3 : Plan of river showing proposed improvements, enlarged sketch of portion of river adjacent to bridge, longitudinal section of proposed stop-banks, and typical cross-section of stop-banks.

Given under our hands and seals, this 4th day of December, 1919.

F. W. FURKERT, Chairman.

ASHLEY J. HUNTER, } Commissioners.
F. C. HAY, }

Approximate Cost of Paper.—Preparation, not given; printing 540 (copies and map), £13 10s.

By Authority : MARCUS F. MARKS, Government Printer, Wellington.—1920.

Price 9d.]

