

SESSION II.  
1923.  
NEW ZEALAND.

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DEPARTMENT OF LANDS AND SURVEY.

# RANGITAIKI LAND DRAINAGE.

REPORT FOR THE YEAR ENDED 31st MARCH, 1923, TOGETHER WITH STATEMENT  
OF ACCOUNTS.

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*Presented to both Houses of the General Assembly pursuant to Section 10 of the Rangitaiki Land Drainage Act, 1910.*

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SIR,—

Department of Lands and Survey, Wellington, 5th June, 1923.

I have the honour to submit herewith the report upon drainage operations in the Rangitaiki Plains for the year ended 31st March, 1922, pursuant to the provisions of the Rangitaiki Land Drainage Act, 1910.

As in the case of Hauraki Plains reclamation operations, a much greater amount of spoil was dredged during the year than in the preceding period, or about 14 per cent. The use of bigger, better, and more dredges has justified their cost, and will enable the fertile plains between the Whakatane and Tarawera Rivers to be completely drained in a shorter time than would otherwise be the case.

The accompanying statement of cash transactions and balance-sheet shows the financial transactions for the year, and the position of the account as at the 31st March last. A plan showing operations is attached.

The Hon. D. H. Guthrie, Minister of Lands.

I have, &c.,

J. B. THOMPSON, Under-Secretary.

## REPORT OF CHIEF DRAINAGE ENGINEER.

SIR,—

In accordance with the provisions of the Rangitaiki Land Drainage Act, 1910, I have the honour to submit my report for the year ended 31st March, 1923.

Marked progress has been made during the period over all works, and a corresponding improvement is noticeable in the general development of the country affected. The dredging plant has been working at full capacity and has got through a creditable amount of work. Generally the district is going ahead rapidly, and a great future is predicted for this first-class area of land. A tendency to subdivide is noticeable, smaller holdings being sufficiently productive with the more intensive cultivation permissible. Dairying is becoming popular throughout the district, and the Tarawera Factory returns for the year ending 31st March were 300 tons cheese, and the amount paid to suppliers £28,000, an increase of £7,000 over last year's payments. The Rangitaiki Factory turned out 553½ tons of butter and paid out £78,100, an increase of £36,100 over last year's payments.

The works are now being rapidly pushed on towards completion, a great deal of the operations now in hand being final improvements to existing work. The dredging in hand will be practically all completed during the coming period, and thenceforth the work will mostly consist of minor maintenance.

*Rainfall.*—The total rainfall for the year was 42.29 in., the wettest month being January, 1923, with a fall of 5.74 in., and the driest July, 1922, fall 0.44 in. The average rainfall for the past five years was 46.89 in.

## EASTERN DISTRICT.

All drains in this district have been periodically cleaned, and in some cases deepened, during the year, and are all in very fair order. The Eastern drain, from the Kopeopeo Canal southwards, was thoroughly cleaned and deepened, and is working well. The extra fall obtained through the operation of No. 17 dredge (Monighan) in the Orini Stream and deviations has been taken up in the Kopua drain, and a commencement made with Lawson's drain. The surrounding country, which is of the finest land in the district, has benefited materially, and a much larger area has been cropped than previously. A hand-drain was run from the Te Rahu outfall to the White-pine Bush to deviate the water from the Waioho Stream, and as soon as the country consolidates sufficiently the Bay City dredge will be shifted across to widen and deepen this. The Priestman dredge working in the Kopeopeo deviation deepening, and the work done by the Monighan dredges in the Te Rahu, Mangaroa, and Whakaire Canal, have enabled fall to be taken up throughout the drains emptying into these cuts.

## WESTERN DISTRICT.

A wonderful improvement is noticeable in the country between the Rangitaiki River and the Omeheu. This is due to the operations of Priestman dredge in the Omeheu Canal, enabling the fall to be taken up in all the smaller outlet drains emptying into this outfall. A gang is at present employed in taking up the extra depth obtainable in the Adjunct drain, and when this is completed this area will be in fair order. The other outfall drains here have been kept in good order and deepened where necessary. On completion of deviation in Tarawera River, extra depth was taken up in the Tumurenui drain, a big improvement being noticeable. The Awakaponga and Collins drain required constant attention during the year owing to the abnormal growth of weeds. When the Priestman dredge which is starting on the Awakaponga Canal has completed the cut the maintenance work here will be considerably lightened. The Awarua and other outfalls on this side of Tarawera have required a fair amount of maintaining, but generally material improvement is expected with the completion of Awakaponga Canal. A flood-gate was erected at the old mouth of the Rangitaiki River, and this is working well, the water-level inside having been lowered averagely 18 in. A start was made with a boulder groyne to straighten the mouth of the Tarawera River where it has deviated from the old channel in the sandhills, and when this is completed and the outlet confined to a straight channel it is hoped that the full benefits will be derived from the flood-gate on the old Rangitaiki River.

## DREDGES.

Altogether seven dredges, comprising four Priestman, two Monighan drag-lines, and one Bay City walking-dredge have been continuously employed on the works. A total of 540,802 cubic yards was lifted during the period, covering a distance of 1,990 chains. Nearly all the repair work for these plants has been done in our own workshops and smithy at Thornton, and this has greatly lessened the delay experienced when work had to be sent out of the district, and also the cost of the repairs.

No. 3 Priestman dredge, one of the original purchases, is still in good order, but the pontoon will need replacing very shortly. During the period this dredge worked down Reid's Central drain deepening, then westwards along Kopeopeo outfall and back down Kopeopeo outfall deviation. The machine has now come up to the Kopeopeo outfall again, and after going a short way up the Western drain will work eastwards along that outfall. This will practically complete the dredging programme for this plant. A total of 107,742 cubic yards was excavated during the year.

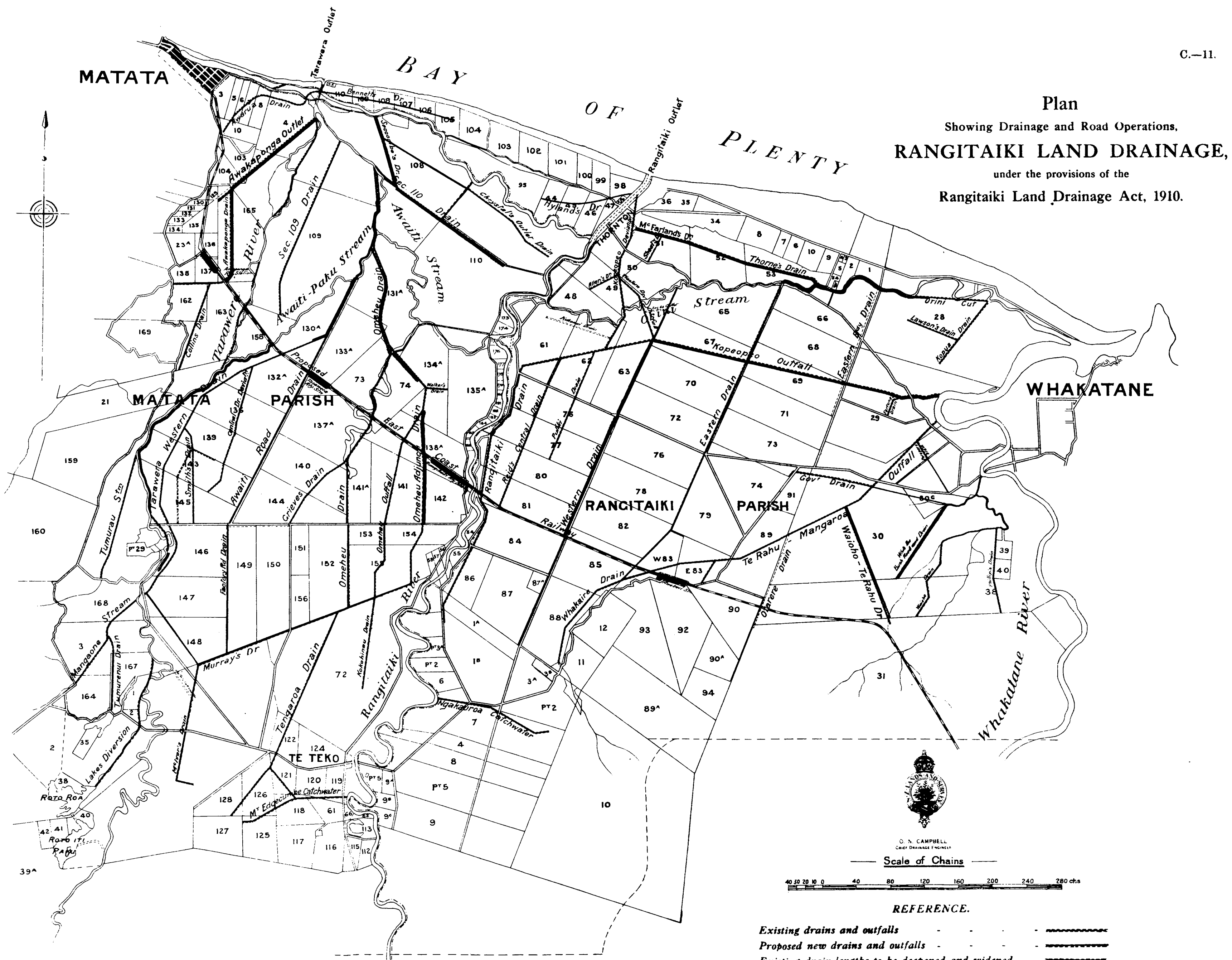
No. 4 Priestman dredge, on the Omeheu Canal, has been doing good work, a distance of 359 chains being dredged and 82,319 yards of spoil lifted. At the beginning of the period the dredge was working up to connect with Tengaroa drain, which she reached in July. The machine is now working downstream, and will continue through to the flood-gate on Tarawera River.

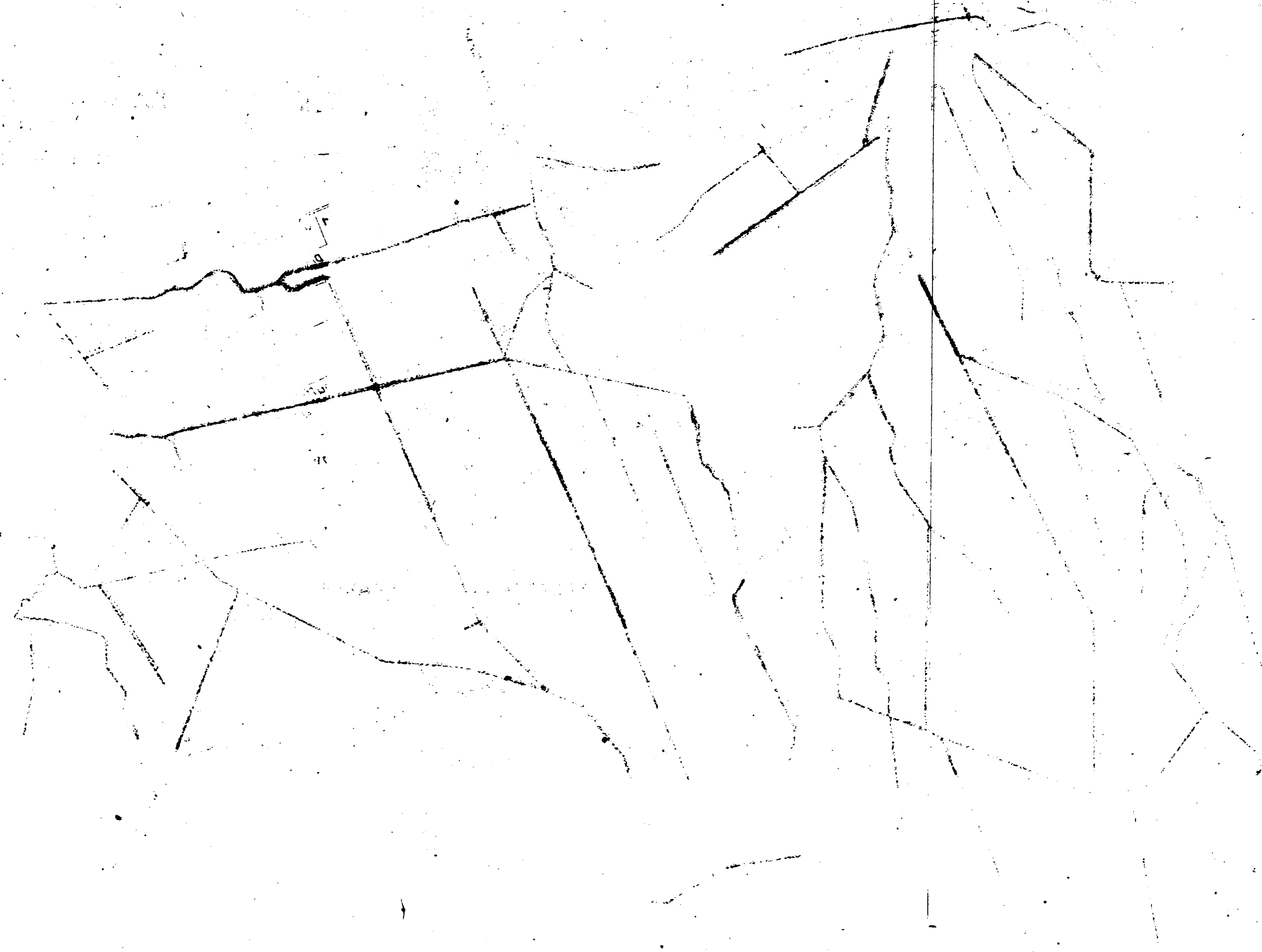
No. 8 Priestman dredge has been employed on the Tarawera River taking off bends and building a stop-bank on the eastern bank to prevent flooding. During the period a total of 119 chains was covered, and 48,584 yards lifted, and deposited to form a stop-bank.

No. 9 Priestman dredge completed dredging in Section 109 drain early in the period, and after working down was put on to build a channel through the Koheka Lagoon, a distance of 30 chains. This necessitated the wattling of both banks of proposed cut and the formation of banks behind wattling, the main difficulty encountered being the obtaining of spoil to form banks. This work was completed late in the year, and a splendid job made of same. The dredge was then thoroughly overhauled preparatory to commencing work on the Awakaponga outfall and drain, of which at the end of the period she had completed 10 chains. A total of 87,835 yards of spoil were lifted, covering a distance of 264 chains.

No. 17 Monighan dredge commenced working at the Whakatane River end of the Te Rahu Canal, completed a distance of 74 chains, and was then moved across country to the mouth of the Orini Stream, when work was commenced on the widening and deepening of this stream and its deviations. A distance of 117 chains has been covered to date. Altogether during the period a total of 191 chains was dredged and 76,088 yards of spoil were lifted.

No. 18 Monighan dredge commenced working on the Te Rahu Canal, widening and deepening, and worked up the Mangaroa Canal, then down and up the Whakaire Canal, where the machine finished up late in the period. The dredge is now being moved down to the eastern end of Kopeopeo outfall to deepen this westwards until it connects up with Priestman No. 3. The Mangaroa, Whakaire, and Te Rahu Canals are now in splendid order, and no further trouble is expected from this quarter. Altogether the dredge covered a distance of 222 chains, lifting 56,487 cubic yards.





Bay City No. 21 dredge continued up the Tarawera Western drain to its southern end, and was then moved down to commence deepening from the railway northwards. The dredge is now doing splendid work, and will continue down the Awaiti Road drain to connect up with Priestman No. 4, when it will be railed to the head of the Waioho—Te Rahu deviation. During the period a total of 81,747 yards was lifted, covering a distance of 332 chains.

The following table shows the total amount excavated, with the cost per cubic yard, for the past ten years :—

	Cubic Yards.	Cost per Cubic Yard.		Cubic Yards.	Cost per Cubic Yard.
1913-14 .. ..	272,370	3·07d.	1918-19 .. ..	229,659	5·70d.
1914-15 .. ..	268,760	3·48d.	1919-20 .. ..	176,672	6·62d.
1915-16 .. ..	224,740	4·54d.	1920-21 .. ..	215,768	8·82d.
1916-17 .. ..	261,751	4·36d.	1921-22 .. ..	473,994	6·68d.
1917-18 .. ..	320,614	3·72d.	1922-23 .. ..	540,802	8·13d.

#### ROADWORK.

Very little roadwork has been done during the period under review. The Omeheu Road formation was continued from the end of Gow's Road to the railway, this section being practically completed at the end of year, and this will be continued from the railway to Cross Road. This will be an inestimable boon to the settlers in this district, saving, as it will, a considerable detour. Section 110 road has required surfacing at intervals owing to subsidence, and spoil for this was obtained from the Rangitaiki River bank. The approaches to the railway-road bridge across the Tarawera were formed during the period.

#### BRIDGES.

Two bridges gangs have been constantly employed over all portions of the district erecting bridges over dredge-cuts and main drains. Nine new pile bridges (30 ft. span) were erected, eight were dismantled and re-erected to allow passage of dredges, and thirty-six sill bridges of varying widths were placed.

#### STOP-BANKS.

The temporary stop-banks on the Tarawera River have been kept in good repair, and although in one or two places the river broke through no great damage was done. The erection of the permanent stop-banks is well in hand.

#### DRAINS IN OPERATION.

The total length of drains in operation to date is as follows : Dredge cuts, 46 miles 12 chains ; main outlet drains, 99 miles 66 chains ; and road-drains, 28 miles 60 chains.

#### ROADS OPENED.

The total length of roads opened is 108 miles.

#### WORKSHOPS.

A great deal of repairs is now done in the Thornton Workshop for the seven dredges in operation, and the small expenditure in establishing smithy has been found well justified. In addition all ironwork for bridges and general repair work is done locally.

#### BUILDINGS.

All buildings in connection with works have been kept in good order, and repaired from time to time as required.

#### ROLLING-STOCK.

The Thornycroft lorry has been in constant use, and has saved a considerable amount in haulage, &c., doing most of the cartage of coal and supplies for dredges. It has lately been employed carting boulders for the Tarawera River groyne, and consequently much of its usual work has had to be curtailed.

#### PLANT AND MACHINERY.

No additions have been made under this heading, and plant still consists of four Priestman dredges, one Bay City walking land-dipper, two Monighan walking drag-line excavators, four coal-punts, three oil-launches, one towing-barge, and seven small boats and punts.

#### SUMMARY OF WORK DONE.

	M.	ch.	Cub. yd.
New drains .. ..	5	66	37,495
Widening and deepening .. ..	35	20	120,550
Cleaning drains .. ..	73	00	..
Surfacing roads .. ..	1	20	..
Road-formation .. ..	0	75	..
Fencing .. ..	16	3	..
Spoil dredged .. ..	24	70	540,802
Levels taken .. ..	117	26	..
Survey traverses .. ..	28	00	..

Pile bridges, 9 ; sill bridges, 36 ; flood-gate, 1.

## PROPOSED WORKS.

Completion Tarawera Western and Awaite Road drains by Bay City dredge; completion Omeheu outfall; redredging Section 110 outfall, Seccombe's drain, and old Rangitaiki to flood-gate; completion Orini River dredging to Eastern drain; dredging Te Rahu—White-pine Bush outfall; completion Awakaponga outlet to railway; stop-banking Tarawera River to railway; redredging Kopeopeo outfall; and general development and maintenance work.

## WORKS EXPENDITURE.

The total amount expended during the year on plant, tools, supplies, wages, &c., was £47,538. Day labour, including wages of dredge crews, amounted to £21,637, piecework contracts to £7,260, and hire of teams to £1,524.

## GENERAL.

The local office at Thornton was busily engaged during the year. All vouchers for payment of wages, contract, and team hire are prepared at this office, and payment effected through the Imprest Account at Whakatane. All vouchers for payment of supplies, &c., are finally passed through the controlling office in Auckland, where the books recording the total expenditure are kept.

The local officer in charge is Mr. J. H. Treseder, Land Drainage Engineer.

I have, &c.,

O. N. CAMPBELL,

The Under-Secretary for Lands, Wellington.

Chief Drainage Engineer.

## RANGITAIKI LAND DRAINAGE ACCOUNT.

## RECEIPTS AND PAYMENTS ACCOUNT FOR YEAR ENDED 31ST MARCH, 1923.

<i>Receipts.</i>		£	s.	d.	<i>Payments.</i>		£	s.	d.
Cash in Public Account, 1st April, 1922..		2,369	11	1	Drainage - works, stop-banks, clearing channels, and other expenditure incidental to drainage operations		33,767	4	7
Debentures issued under Rangitaiki Land Drainage Amendment Act, 1913, and Finance Act, 1921-22 .. ..		60,900	0	^	Management expenses .. ..		1,590	13	11
"Thirds" and "fourths" .. ..		7	7	6	Travelling-expenses .. ..		65	7	1
Rents .. ..		111	3	0	Legal expenses .. ..		121	2	3
Rates—					Plant and machinery .. ..		467	7	8
1917-18 .. ..	£	33	10	9	Loose tools .. ..		73	1	10
1918-19 .. ..		88	19	10	Material and stores .. ..		5,684	14	1
1919-20 .. ..		105	1	11	Fuel .. ..		5,204	18	7
1920-21 .. ..		1,041	7	11	Rates refunded .. ..		72	7	2
1921-22 .. ..		3,094	5	4	Interest on debentures .. ..		15,943	15	3
1922-23 .. ..		138	15	8	Charges and expenses of raising loans ..		8	0	0
		4,502	1	5	Cash in Public Account, 31st March, 1923		4,891	10	7
		£67,890	3	0			£67,890	3	0

## REVENUE ACCOUNT FOR YEAR ENDED 31ST MARCH, 1923.

<i>Dr.</i>	£	s.	d.	<i>Cr.</i>	£	s.	d.
To Interest on debentures .. ..	16,744	4	9	By Proportion of rates .. ..	15,854	8	1
Charges and expenses of raising loans ..	8	0	0	Rents .. ..	117	7	0
Head Office administration expenses ..	50	0	0	"Thirds" .. ..	7	7	6
Rates written off .. ..	95	19	9	Interest on investments .. ..	40	13	6
				Balance transferred to Drainage-works Account .. ..	878	8	5
	£16,898	4	6		£16,898	4	6

## BALANCE-SHEET AS AT 31ST MARCH, 1923.

<i>Liabilities.</i>	£	s.	d.	<i>Assets.</i>	£	s.	d.
Loan Account .. ..	420,900	0	0	Drainage-works—Expenditure in connection therewith, including wages, supplies, administration and engineering expenses, and depreciation of plant	368,533	11	6
Loan Redemption Account .. ..	16,441	12	3	Plant and machinery .. ..	32,767	15	10
Unpaid purchase-money—Sundry Natives	410	3	1	Loose tools .. ..	684	13	0
Suspense Account .. ..	68	8	11	Live-stock .. ..	156	16	0
Sundry creditors .. ..	3,966	5	0	Buildings .. ..	1,501	5	6
Interest on debentures unpaid .. ..	4,081	4	10	Material and stores .. ..	994	17	5
				Fuel .. ..	357	12	0
				Investments—Public Trust Office ..	904	5	4
				Land for Settlements Account ..	20	0	0
				Sundry debtors, for rates .. ..	35,027	8	11
				Sundry debtors, for rents .. ..	6	4	0
				Sundry debtors, miscellaneous ..	21	14	0
				Cash in the Public Account, 31st March, 1923 .. ..	4,891	10	7
	£445,867	14	1		£445,867	14	1

J. B. THOMPSON, Under-Secretary.

J. H. O'DONNELL, Chief Accountant.

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