

1915.
NEW ZEALAND.

RANGITAIKI LAND DRAINAGE:

REPORT FOR THE YEAR ENDED 31st MARCH, 1915; TOGETHER WITH STATEMENT
OF ACCOUNTS.

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

SIR,—

Department of Lands and Survey, Wellington, 1st June, 1915.

I have the honour to submit herewith the report upon drainage operations in the Rangitaiki Plains for the year ended 31st March, 1915, pursuant to the provisions of the Rangitaiki Land Drainage Act, 1910.

I have quite lately visited the district and inspected the various works already completed and those now in hand. With my previous knowledge of the country I was more than gratified to witness the transformation that has been effected by the drainage operations. The bulk of the land is now completely unwatered, and everywhere is to be seen active signs of farming, &c.

The Rangitaiki River diversion has proved to be all that could be wished for, and I anticipate that considerable shipping will enter same in the future. An active policy of prosecution of all works is carried out, and will be continued.

It would be difficult to estimate the far-reaching benefits to the Dominion that must ensue from the very successful reclamation of this vast swamp land now made fertile and reproductive.

The expenditure to date has been as follows:—

					£	s.	d.
For the year ended 31st March, 1912	...	...	...	...	12,140	0	0
" " 1913	...	...	...	...	15,203	0	0
" " 1914	...	...	...	...	17,873	3	6
" " 1915	...	...	...	...	15,990	2	8
Total	...	...	...	...	£61,206	6	2

In the attached report of the Chief Drainage Engineer (Mr. J. B. Thompson) is set forth details of the operations carried out under his direction during the year.

On account of my early retirement from the control of the Department of Lands and Survey, having now reached the age-limit, this will be my final annual report on these operations, and I wish to place on record my highest appreciation of the able manner in which the work from its inception up to the present time has been carried out and administered from the financial, professional, and settlement standpoints. This result is primarily due to the far-seeing forethought and businesslike supervision exercised by the Engineer in charge (Mr. J. B. Thompson) and his Assistant Engineer (Mr. Owen N. Campbell). What struck me more than anything else in going through the works now in progress was the unspoken evidence that from the officers in charge

down to the humblest toiler all seemed to work as one man; the agitator and labour difficulties are alike unknown, the apparent goal of every group of workers being to carry out the various works well and at the lowest monetary cost. The area affected by the scheme amounts, in round figures, to 87,000 acres, and a low estimate of the rise in value of the land over and above the cost of drainage is at least £1,000,000.

The accompanying statement of accounts shows the expenditure for the year.

I have, &c.,

JAMES MACKENZIE, Under-Secretary.

The Right Hon. W. F. Massey, P.C., Minister of Lands, Wellington.

STATEMENT OF ACCOUNTS (AS REQUIRED BY SECTION 10 OF THE RANGITAIKI LAND DRAINAGE ACT, 1910) FOR THE YEAR ENDED 31ST MARCH, 1915.

<i>Receipts.</i>				<i>Expenditure.</i>			
	£	s. d.	£	s. d.		£	s. d.
1914—April 1st.					1915—March 31st.		
To Balance—Cash in Public Account			1,835	13 10	By Expenditure—		
1915—March 31st.					New works by contract and day-labour	11,871	7 4
Debentures raised under the Rangitaiki Land Drainage Amendment Acts, 1913, and 1914	12,000	0 0			Purchase, equipment, and maintenance of dredges	3,416	13 7
Amendment Act, 1913..	5,000	0 0			Travelling allowances and expenses, camp allowance, and general administration expenses	284	0 7
			17,000	0 0	Interest paid into Consolidated Fund on account of debentures	417	10 8
“Thirds,” &c., received under section 9 of the Rangitaiki Land Drainage Act, 1910			79	14 8	New Zealand Loans Act, 1908, charges and expenses		0 10 6
State Advances Amendment Act, 1914, section 3			105	12 6	Balance—Cash in Public Account	3,030	18 4
			<u>£19,021</u>	<u>1 0</u>		<u>£19,021</u>	<u>1 0</u>

Loan Account.

	£	s. d.	£	s. d.
1915—March 31st.				
To Balance	62,000	0 0	By Loan transferred from State Advances Department to Treasury under section 2, State Advances Amendment Act, 1914	45,000 0 0
			Debentures raised under Rangitaiki Land Drainage Amendment Act, 1913	5,000 0 0
			Ditto, 1913 and 1914	12,000 0 0
				<u>17,000 0 0</u>
			<u>£62,000</u>	<u>0 0</u>

[NOTE.—The figures represent the actual amounts charged up in the Treasury books, including commitments brought down from the previous year, but do not include all commitments entered into at 31st March, 1915, as several of these had not been brought to charge at that date.]

REPORT BY CHIEF DRAINAGE ENGINEER.

SIR,—

I have the honour, in accordance with the provisions of the Rangitaiki Land Drainage Act, 1910, to report on the various services performed during the past financial year.

The completion of this year's work marks the turning-point in these drainage operations—no succeeding year will see a greater reclamation than has been brought about during this one under review. New works have been actively pushed on, and existing ones improved and maintained, much to the advantage of the area. At a moderate estimate, 75 per cent. of the total area is now permanently free from flood-waters and workable at all seasons, though in places drains will still require deepening before it can be said to be permanently drained, and the balance is sufficiently unwatered to warrant subdivisional drainage, clearing, fencing, &c., being undertaken by the various owners.

Of the major works, the diversion of the Rangitaiki River and the excavation of the Te Rahu—Mangaroa outfall have been completed; the straightening of the Tarawera River and the dredging of the Awaiti and Omeheu Streams are well on to completion; and the dredging of the Kopepeo outfall has been commenced, leaving the construction of the Awakaponga outlet only yet untouched. This I hope to have in hand within the next few months, when the Awaiti and Omeheu works will be complete.

Of the minor works, some sixty-odd miles of main outlet drains are now in operation, though a considerable mileage of this will still require deepening, leaving a balance of approximately nine miles still to be constructed to complete the scheme.

The area is consequently prospering, and already adding its quota to the products of the Dominion. Land-values are advancing rapidly, and, despite the present war-conditions, there is a keen demand for the land, of which there is very little offering. The settlers are generally a prosperous community, and abreast of our works with their subdivisional drainage and improvements. There are, however, a few cases where a good deal more progress could profitably be made than is the case at the present time, due, I presume, partly to overcautiousness and financing difficulties, and chiefly to the land being held in such large areas.

As yet the bulk of the area is in surface-sown grasses only, and it will necessarily be years before it is all turned over and laid down in permanent pasture and crops. Such being the case, and considering the present ruling prices for fat stock, it naturally follows that cattle-fattening is the principal industry, and it is surprising the fattening properties of this rough pasture. Country that one would naturally term store-cattle country is here turning off finished beef, while at the same time undergoing the "crushing" process. During this year it is estimated that five thousand head of fat bullocks have been taken off, and I have not the slightest doubt but that this will be doubled during this coming year. This being so, and Auckland being the nearest market, it is only natural that freezing-works are being vigorously discussed by the settlers. There is not only great expense in landing the stock in the Auckland markets, but also the great wastage that necessarily follows the four to six days the stock are on the roads. This area alone, independent of the surrounding country, is now producing sufficient to put freezing-works on a payable basis, and I feel sure that the near future will see these works an assured fact. Milking is, as yet, not being resorted to to any great extent, and will not be until the country is more closely settled. The cheese-factory at Te Teko is well established, and is drawing its supplies entirely from within the area, and the butter-factories at Whakatane and Matata are also drawing considerable supplies from the district. The land is, as stated above, yet held in large areas by prosperous settlers who have no occasion to resort to milking with its ties and present labour difficulties; and with adjacent harbour-improvements under way, the construction of the East Coast Railway approaching, and altogether such a promising future ahead of the district, settlers are not inclined to subdivide their properties, holding on for maximum values. Until these large holdings are subdivided into small areas and closely settled the district must, to a very great extent, be held back.

At the present time the drainage is much in advance of the roading, and consequently the want of roads is now becoming a serious factor; but now that a definite roading policy has been decided upon and financed, the work will be pushed on vigorously during the coming year.

DREDGERS.

Throughout the past year the three dredgers have been busily engaged in completing the major works, which, as stated above, are now well advanced. During the summer months double shifts have been worked on both the Priestman dredgers, and this, though slightly increasing the price per yard of material shifted, is much more than compensated for by the time so saved in bringing in the country and rendering it productive.

During the year a total of 268,760 cubic yards of spoil was excavated, at a total cost of £3,901 10s. 6d., or an average cost of 3'48d. per yard. This includes all charges, wages, supplies, repairs, &c.

A great deal of this dredging, with the exception of the Tarawera River, was difficult work, necessitating the blasting and removing of a considerable amount of submerged timber, and dealing with an exceptional quantity of fine sandy deposit, difficult of handling with this class of plant. However, difficult and varied as the dredging has been, the costs speak volumes for the all-round efficiency of the Priestman dredgers and their suitability for this class of work.

RANGITAIKI RIVER DIVERSION.

As mentioned in my last report, we took these works over from the contractors in March, 1913, and, realizing the importance of the undertaking—the key to the successful drainage of the whole area—pushed the work on with all expedition, and completed it in May, 1914. Despite the many contrary opinions expressed as to the feasibility of the work, the result has been most successful, and quite up to expectations. Flood-level at the intake has been reduced by between 9 ft. and 10 ft., and lowest summer level by 4 ft., and the old channel between the intake and Matata is practically dry.

The river is still scouring, and consequently lowering, and it will be several years before the maximum benefit of the work is attained. At the intake, a mile and a quarter from the open coast, the rise and fall of the average tide is yet only 6 in., and this is water backed up only, no salt water entering the river whatever; so that, seeing there is an average tide rise and fall on the coast of 4 ft. 6 in., it is evident there is yet a considerable lowering to be attained.

The mouth of the diversion on the sea-coast has as yet shown no tendency to wander, and, though we are not directly interested in the navigability of the port, it is pleasing to note that it is workable by auxiliary scows drawing up to at least 5 ft. and carrying up to 100 tons of cargo.

A free ferry has been erected, and is maintained by the Department across the diversion.

Priestman dredge No. 4, which was engaged on this work, was safely towed round the coast to Matata, where it has since been engaged on the Awaitei and Omeheu Streams dredging.

TARAWERA RIVER DREDGING.

A great deal of the country in the vicinity of this river is particularly low lying, and allows a very narrow margin for successful drainage. The work has been carefully planned so as to give the maximum of fall available, and results have been quite satisfactory. The work is being carried out by the Hammond bucket dredge, and a distance of 3 miles 15 chains has now been completed. During this year some 93,970 cubic yards has been excavated, and already the river has been lowered by 3 ft. 3 in. No attempt, however, is being made to actually deepen and so lower the river by dredging; only sufficient dredging is being done to give the river a more direct and regular flow by the cutting-off of bends and the general straightening of its course. This, it is considered, will give the river the necessary power to scour itself out, and so lower its bed sufficiently for all drainage purposes without further dredging.

UPPER TARAWERA RIVER.

Owing to the large quantities of pumice and volcanic ash carried by this river from its upper end it must always have a big surface grade, the grade being regulated by the amount of material to be carried.

In the Upper Tarawera River the diversion through the lakes has been most successful. The old river-bed is now high and dry, and the new course has already scoured itself out sufficiently to carry the water (except perhaps during abnormal flood periods) without overflowing its banks. This has also a very beneficial effect on the river below the diversion.

The year's expenditure on this work was out of special vote, and amounted to £160 14s. 6d.

TE RAHU—MANGAROA OUTFALL.

This work, commenced in April, 1913, was completed in January last. This work now cuts off all the hill water from the south-east, which, in conjunction with the flood overflow from the Rangitaiki River, was formerly responsible for the water-logged nature of the eastern half of the swamp, and gives it a direct outlet into the Whakatane River. The latter portion of this outlet, completed during this year (123 chains in length), is located in hard sandy country containing a large amount of timber, and was difficult and consequently slow dredging. However, it is now complete and in good order, and will improve when flushed out by a flood. Two permanent bridges have been erected across this outfall at the main road crossings.

Priestman dredge No. 3, which executed this work, has been transferred to work on the Kopepeo outfall.

AWAITEI AND OMEHEU STREAMS DREDGING.

This work is now well on to completion, and I am hoping to see it finished in about two months' time, when Priestman dredge No. 4 will be transferred to work on the Awakaponga Stream outlet. A distance of 257 chains, comprising the removal of 81,340 cubic yards of spoil, has been dealt with, the greater portion of this being the clearing-out of the Awaitei Stream, which has been made use of where economically possible.

The work is now located in rising ground in the vicinity of the Omeheu Stream, where a good deal of submerged timber is being met with, and thus causing delay; but for this, the work would now have been complete.

KOPEPEO OUTFALL.

The dredging of this outfall is now well in hand, and a distance of 22 chains has been completed. The first half-mile or so is located in an old watercourse running through high country—too high to permit of the free working of the "chutes." To overcome this a dam and spillway has had to be erected at the mouth of the cut, so that with the raised water-level they can now be made full use of. It will take the best part of two years to complete this outfall.

MAIN OUTLET DRAINS.

At the present time there are, excluding all dredged outfalls and road drains, 60 miles 13 chains of main outlet drains in operation, and of this, 9 miles 50 chains have been completed during the present year. Dredged cuts and river-diversions make up another 15 miles 65 chains, making a total of 75 miles 78 chains of artificial waterways in operation to date.

Our scheme provides for all necessary drainage with the exception of the subdivisional work required on each individual section, which is being carried out by the various owners themselves. A distance of 11 miles 44 chains has been cleaned and deepened during the year, and all drains will be put in good order before the winter sets in. From now on there will be a considerable expenditure under the head of "Maintenance," and especially so for the next two or three years until the drains form their "skin" and new works cease.

ROAD-FORMATION.

This year's expenditure on road-formation works has all been provided out of special vote, and amounted to £1,173 9s. 8d. A distance of 6 miles 24 chains has been completed during the year, making a total of 29 miles 21 chains constructed to date. A further distance of 11 miles is well in hand, and, though there has been a good deal of expenditure on this in clearing, culverting, &c., no portion of it is yet actually formed.

A definite policy has now been decided on, and, as stated before, will during the coming year be pushed on with all expedition. Roads will be bridged and culverted and made passable for stock purposes. This traffic will settle the country, and simplify and cheapen the actual formation which will follow as conditions permit.

Considering that this is reclaimed swamp country we are somewhat fortunate in that the roading will be a comparatively easy matter, and will be completed without any construction difficulties. For the most part the land contains just enough sand and grit to make passable roads, even without the use of metal.

FENCING.

The fencing of the main outfall is well up to date. The year's expenditure under this head was £787 11s. 7d., and the distance completed 10 miles 64 chains.

BRIDGES.

Two three-span pile bridges have been erected during the year across the Te Rahu—Mangaroa outfall at the main-road crossings, in each case necessitating the erection of temporary bridges to keep the road open for traffic.

Five single-span sill bridges have also been erected in connection with the general roading scheme.

FLOATING PLANT.

This plant consists of two Priestman dredgers, one Hammond bucket dredge, one suction-dredge (incomplete), two ferry pontoons, one snagging-barge, two coal-barges, two oil-launches, and sundry small punts, boats, &c.—all, with the exception of one ferry pontoon and the suction-dredge pontoon, being in first-class order and in constant use. One oil-launch has since last report been temporarily transferred to the Waihi Swamp to facilitate the engineering surveys of that area, but this will be returned shortly.

BUILDINGS.

The total number of buildings on the works, including quarters, stores, workshops, &c., is seventeen. All are in good order, and sufficient for the purposes.

SURVEYS.

During the greater portion of the year a survey party has been busily engaged on the necessary land and engineering surveys required by the works. These, principally engineering surveys, are well up to date.

SUMMARY OF WORKS PERFORMED.

During the year the following works have been carried out:—		Cubic Yards.
Excavation by wheel-scoop teams	... ..	12,980
Excavation of canals, &c., by dredgers	... ..	268,760
		M. ch.
New outlet drains	... ..	9 50
Deepening and cleaning drains	... ..	11 44
Roads formed	... ..	6 24
Fencing erected	... ..	10 64
Pile bridges erected	... ..	2
Sill bridges erected	... ..	5
Ferry pontoon built	... ..	1

General maintenance and improvement of existing works was prosecuted, together with many minor services too numerous to mention in detail.

WORKS EXPENDITURE FOR YEAR.

On account of piecemeal contracts and day-labour of all descriptions upon drainage operations the sum of £11,935 8s. 8d. was paid out of local imprest. In connection with road-construction and river-bank protection, out of special votes, the sum of £1,324 4s. 2d. was paid out of imprest.

PRINCIPAL WORKS PROPOSED FOR NEXT YEAR.

The following works will be actively prosecuted:—

- (1.) Completion of Omehu and Awaiti Streams dredging.
- (2.) Continuance of Kopeopeo outfall and Tarawera River dredging.
- (3.) Commencement of Awakaponga Stream dredging.
- (4.) Vigorous prosecution of general roading scheme.
- (5.) Maintenance and deepening of existing outlet drains.
- (6.) Continuance of construction of new outlet drains.
- (7.) Continuance of fencing of main outfalls.

GENERAL.

The books in connection with the works are kept at the Thames office. Many roads and engineering surveys, plans and tracings were made.

The Land Drainage Engineer, Mr. O. N. Campbell, who is in local charge of the works, has, as usual, spared no pains to expedite and ensure success of all works under my control, and my thanks are due to him for his assiduous attention and resource in all matters. Mr. G. Tuck, foreman dredgemaster, and his assistants are also deserving of commendation for the conduct of work in their hands.

The accompanying plan shows the present and proposed state of works.

I have, &c.,

J. B. THOMPSON.

Chief Drainage Engineer.

James Mackenzie, Esq., I.S.O., Under-Secretary, Department of Lands and Survey.

Approximate Cost of Paper.—Preparation, not given; printing (1,050 copies, including plan and illustrations), £27 10s.

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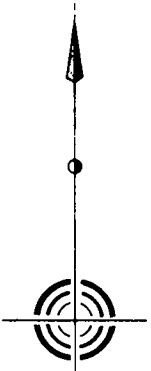
Price 6d.]

MATATA

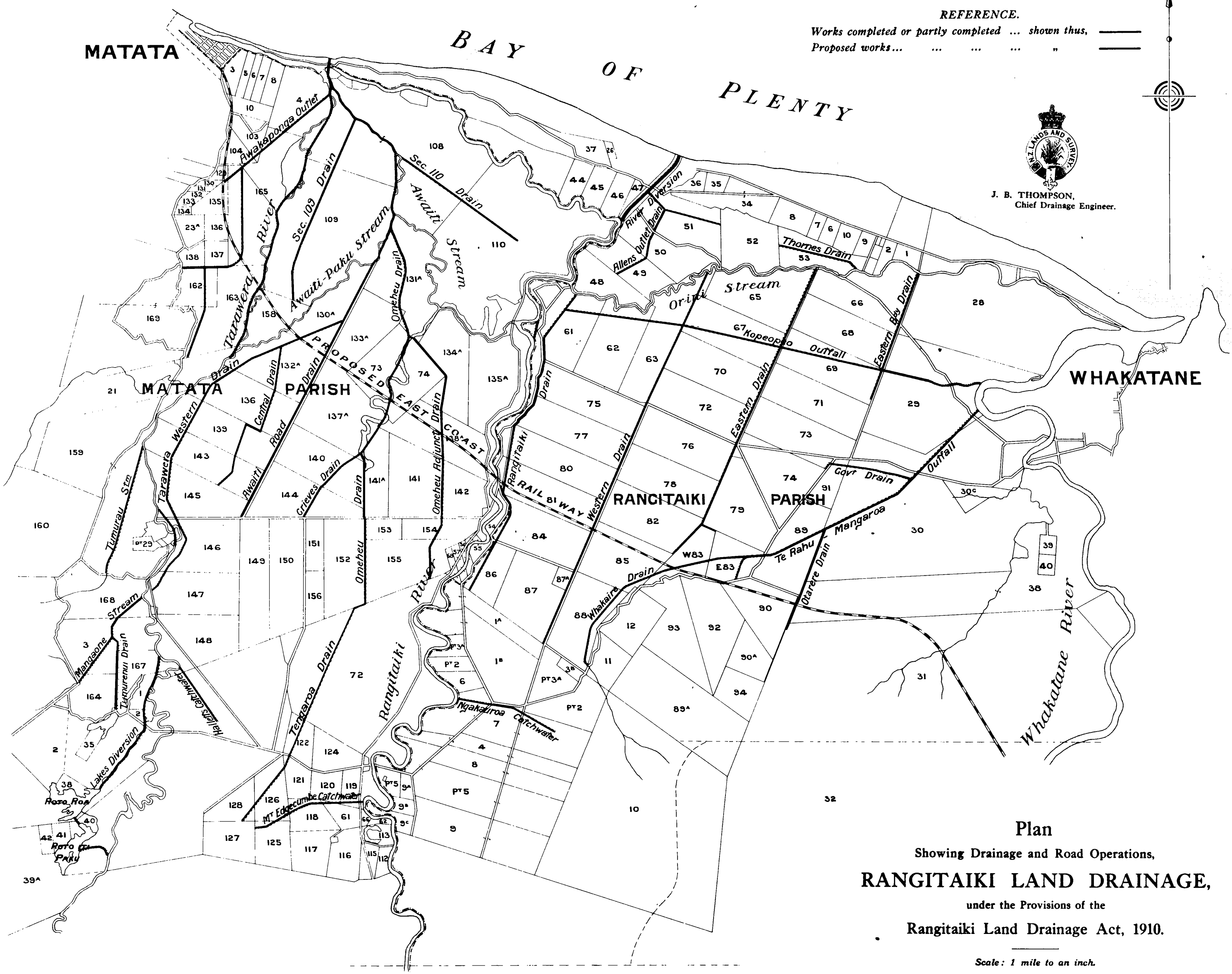
BAY OF PLENTY

REFERENCE.

Works completed or partly completed ... shown thus, ———
Proposed works... .. "



J. B. THOMPSON,
Chief Drainage Engineer.



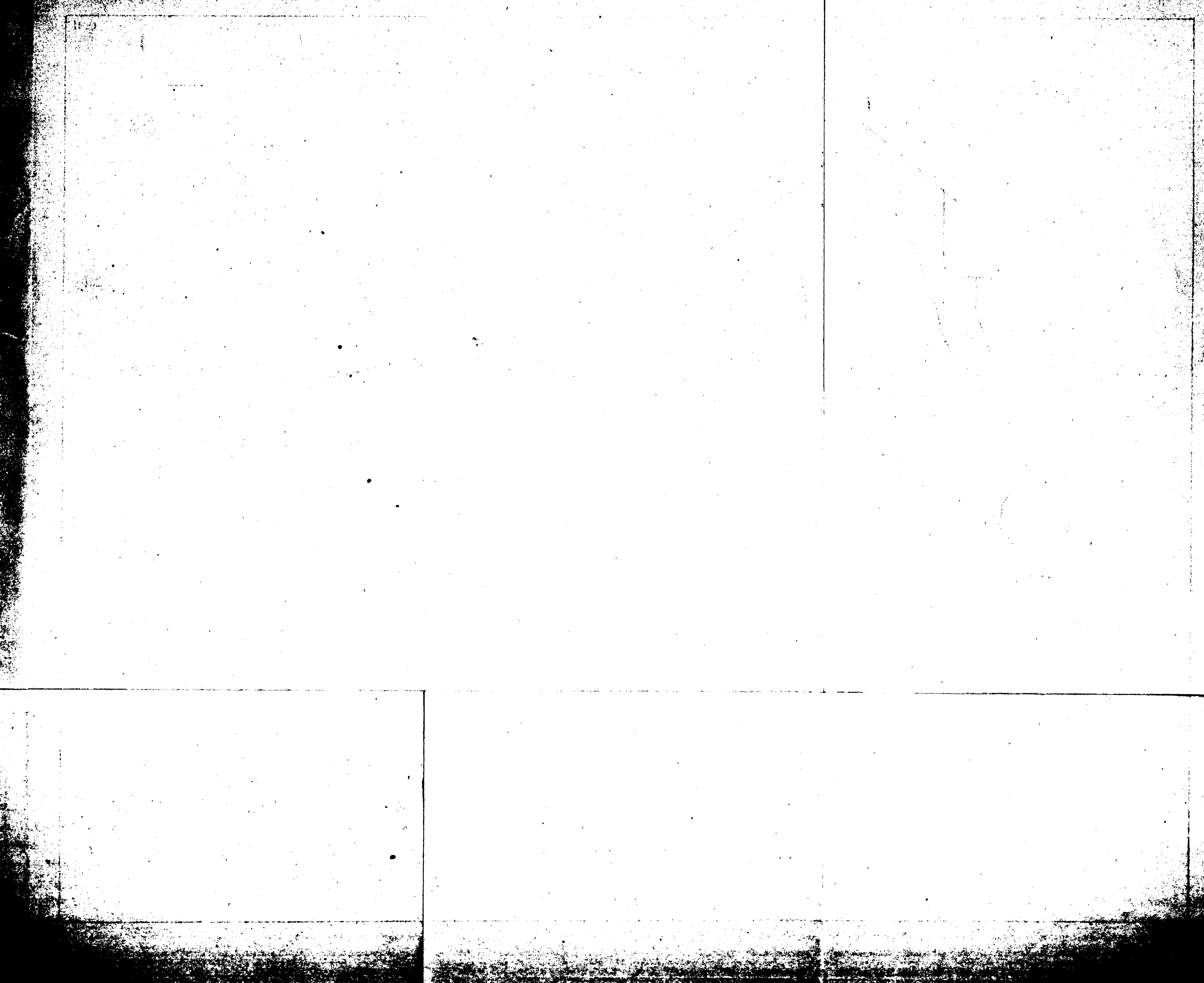
WHAKATANE

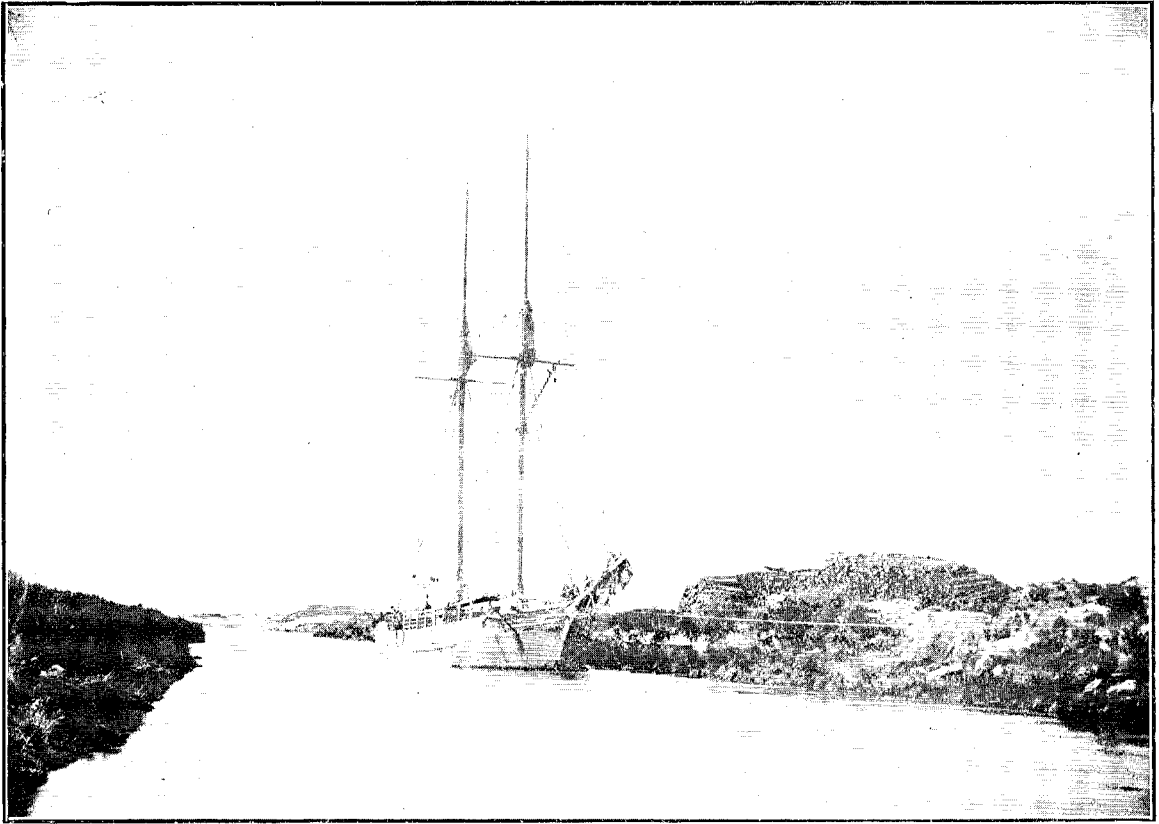
Plan

Showing Drainage and Road Operations,
RANGITAIKI LAND DRAINAGE,

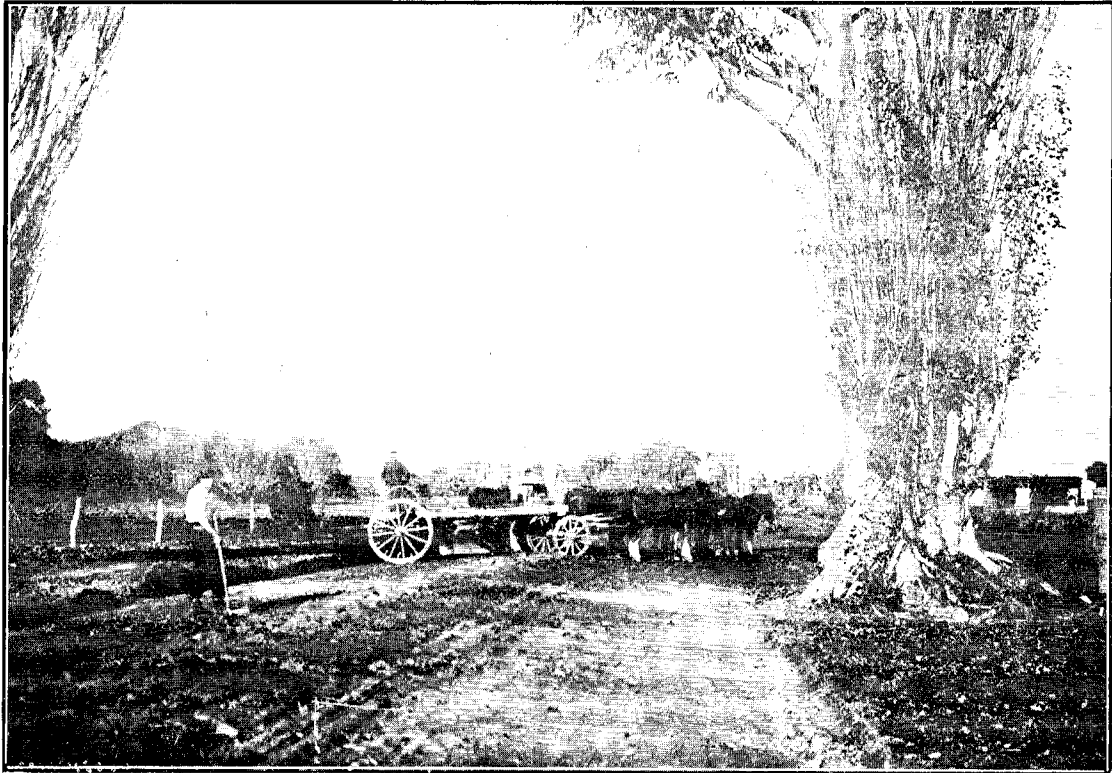
under the Provisions of the
Rangitaiki Land Drainage Act, 1910.

Scale: 1 mile to an inch.

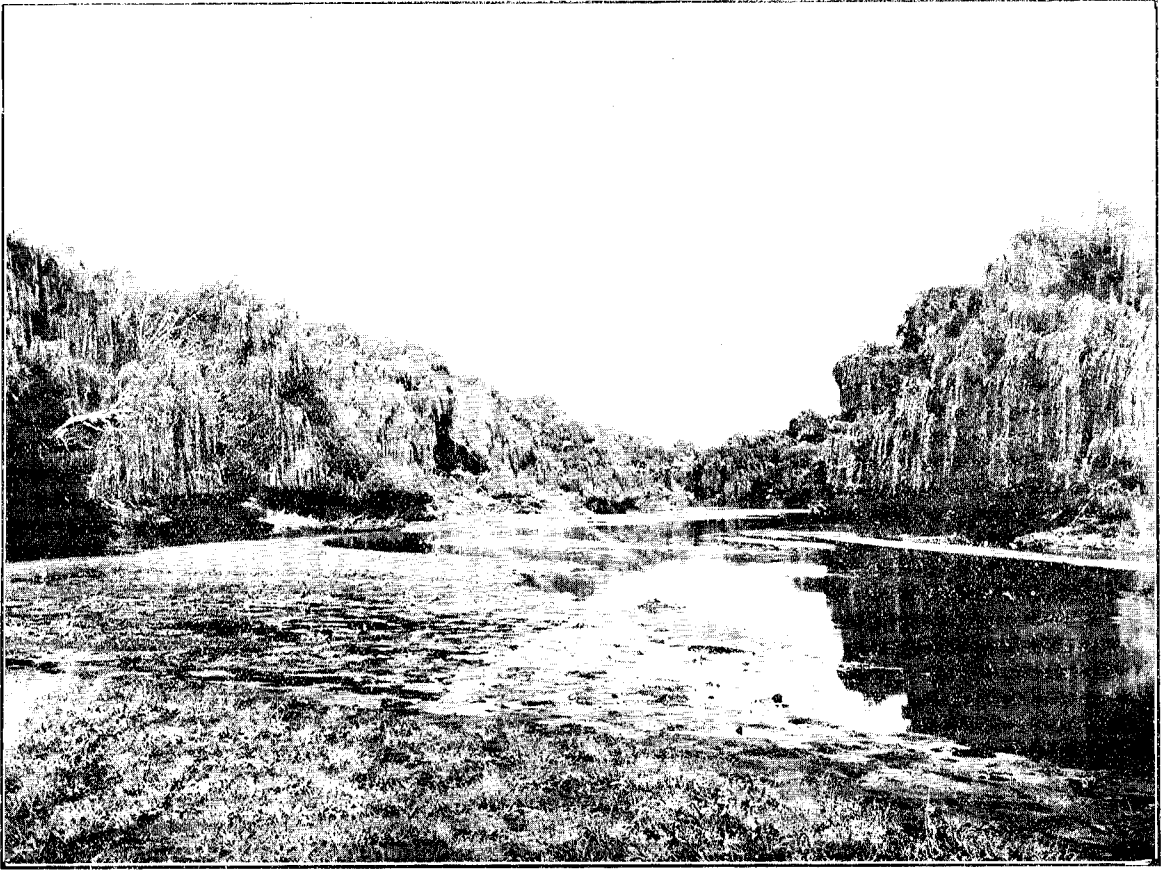




VESSEL LANDING MATERIALS IN RIVER DIVERSION.



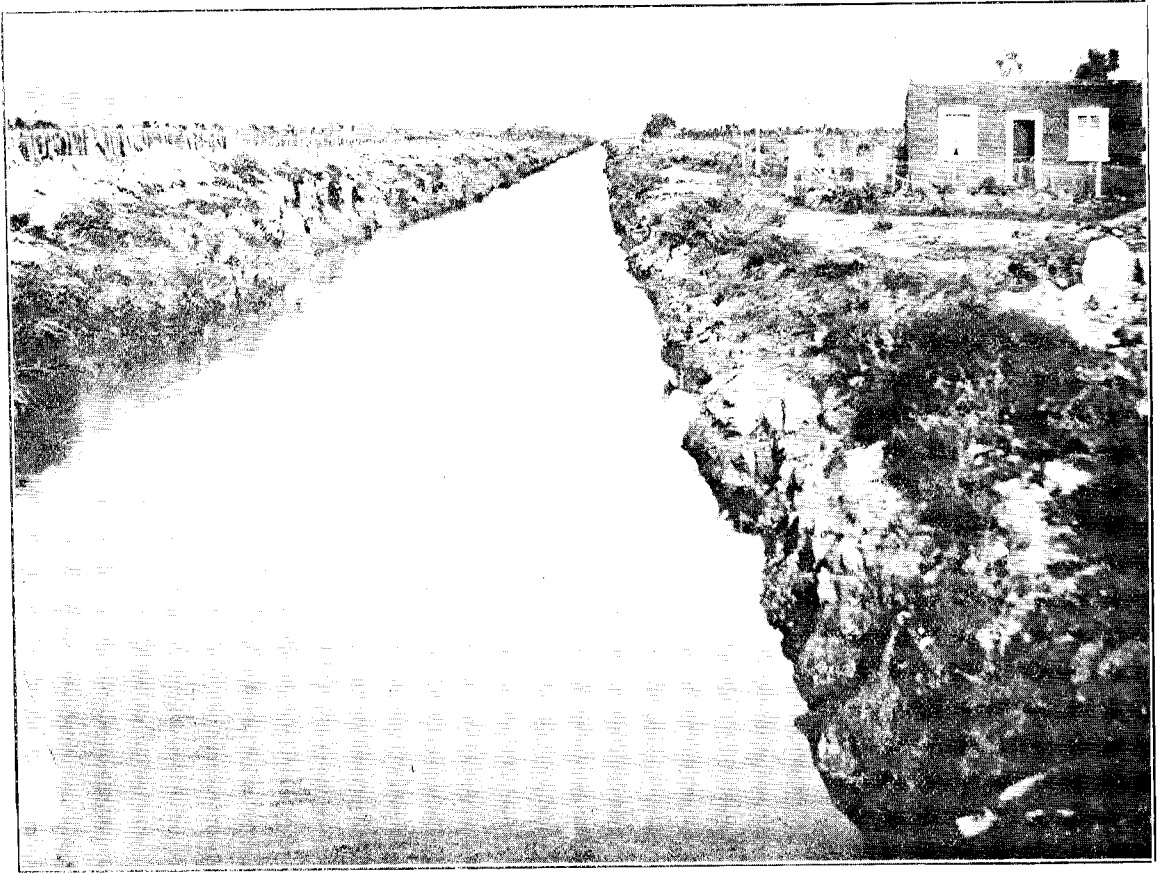
ROAD-CONSTRUCTION.



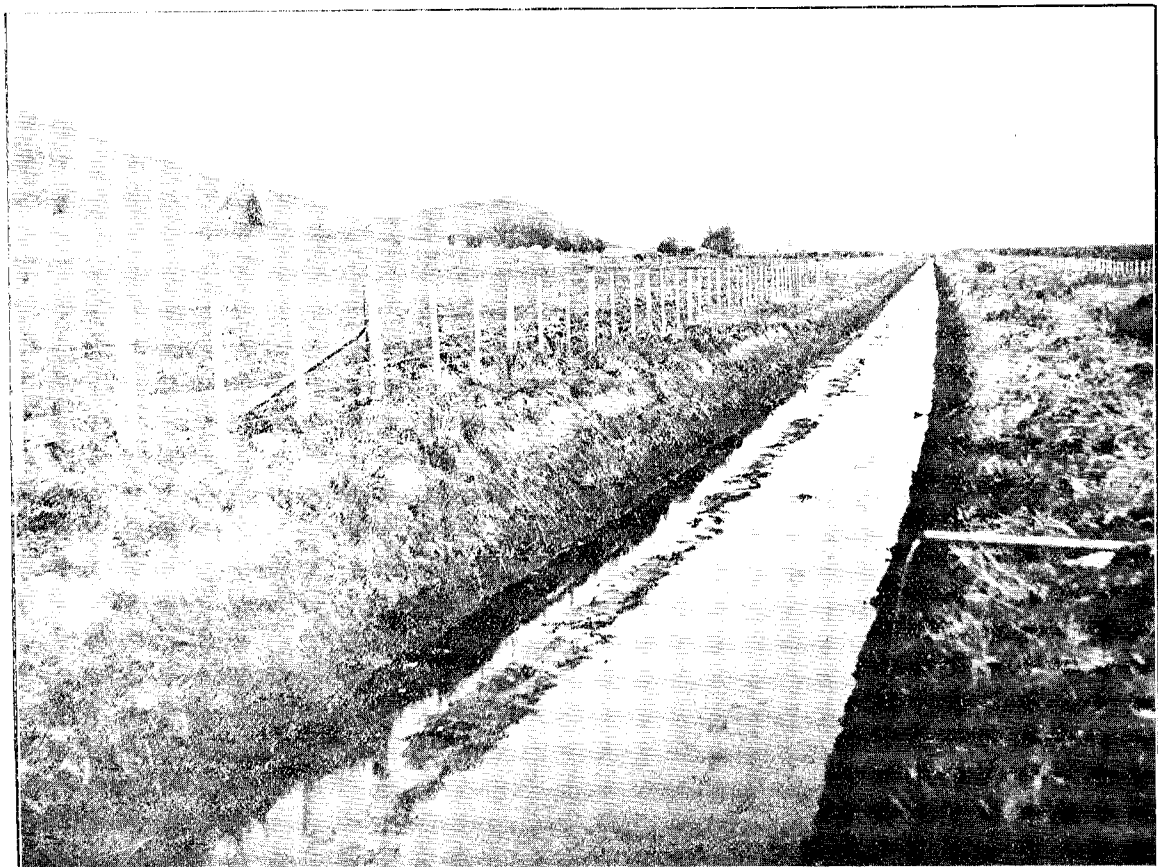
THE OLD BED OF THE RANGITAIKI RIVER.



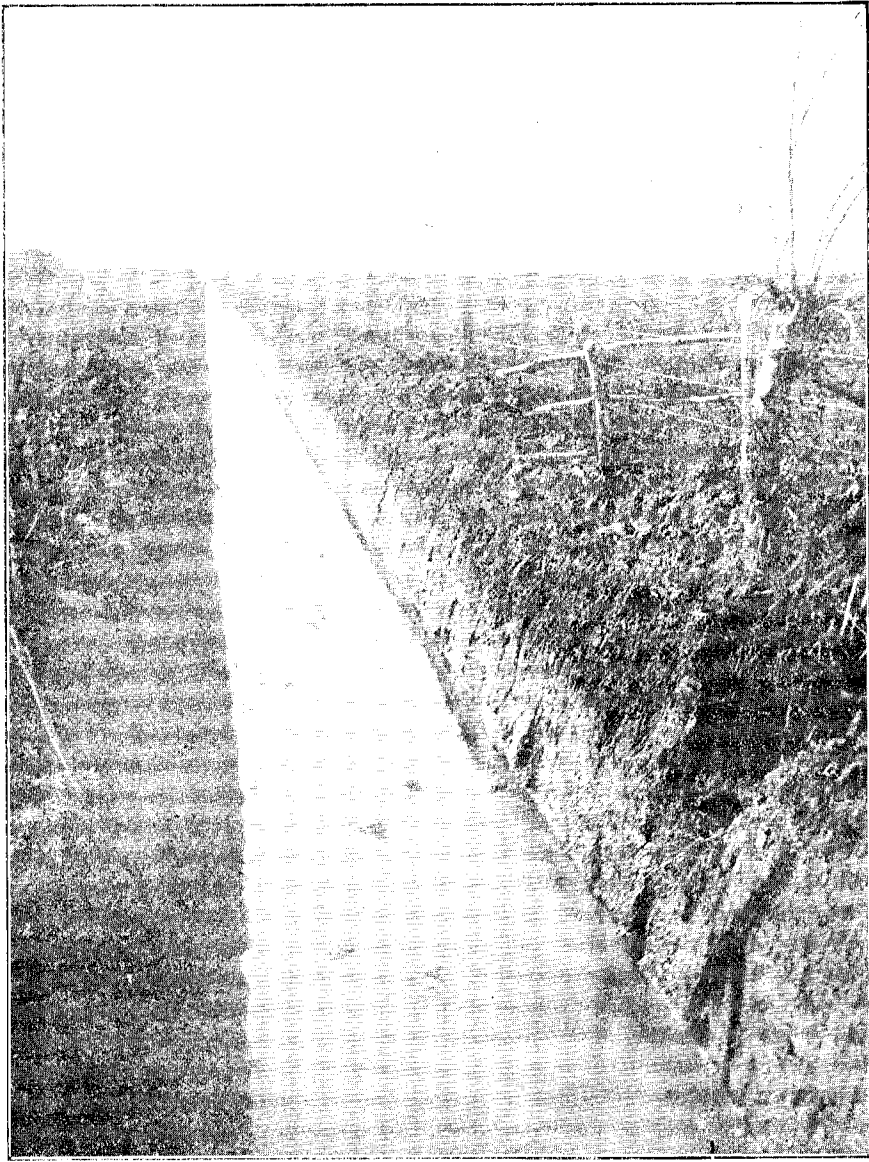
WHEEL SCOOPS AT WORK ON OMEHU OUTFALL.



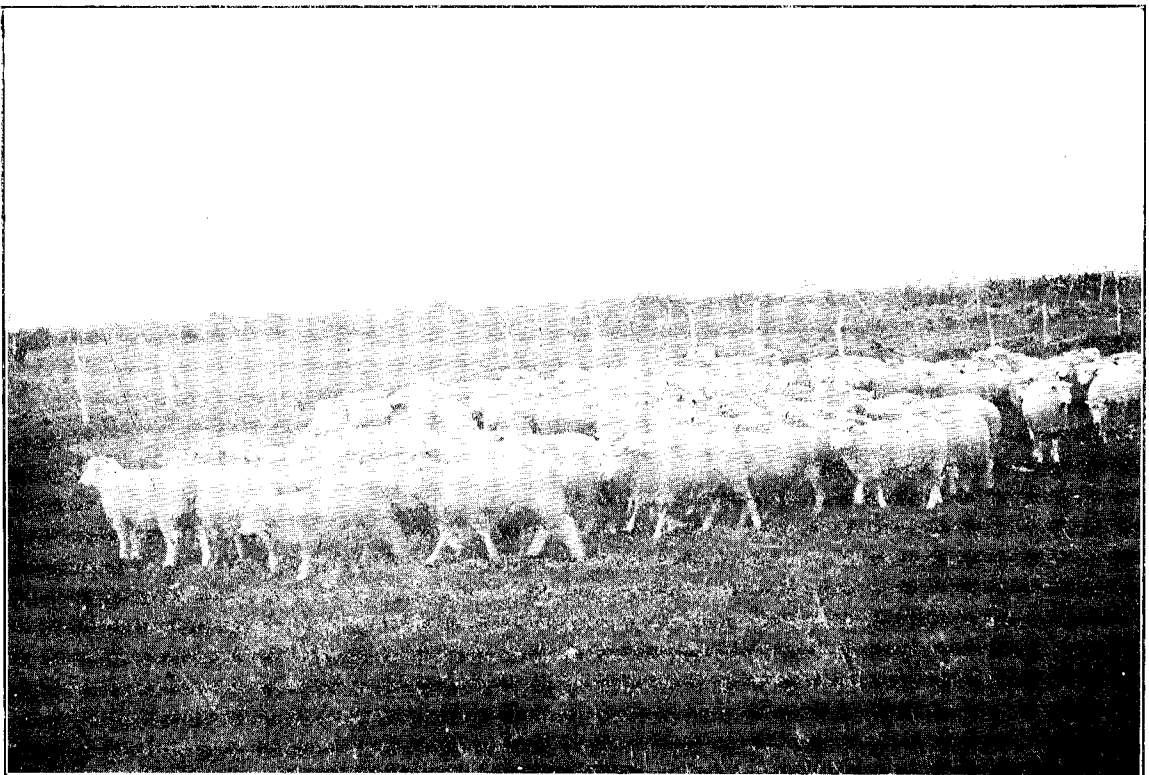
TE RAHE - MANGAROA OUTFALL.



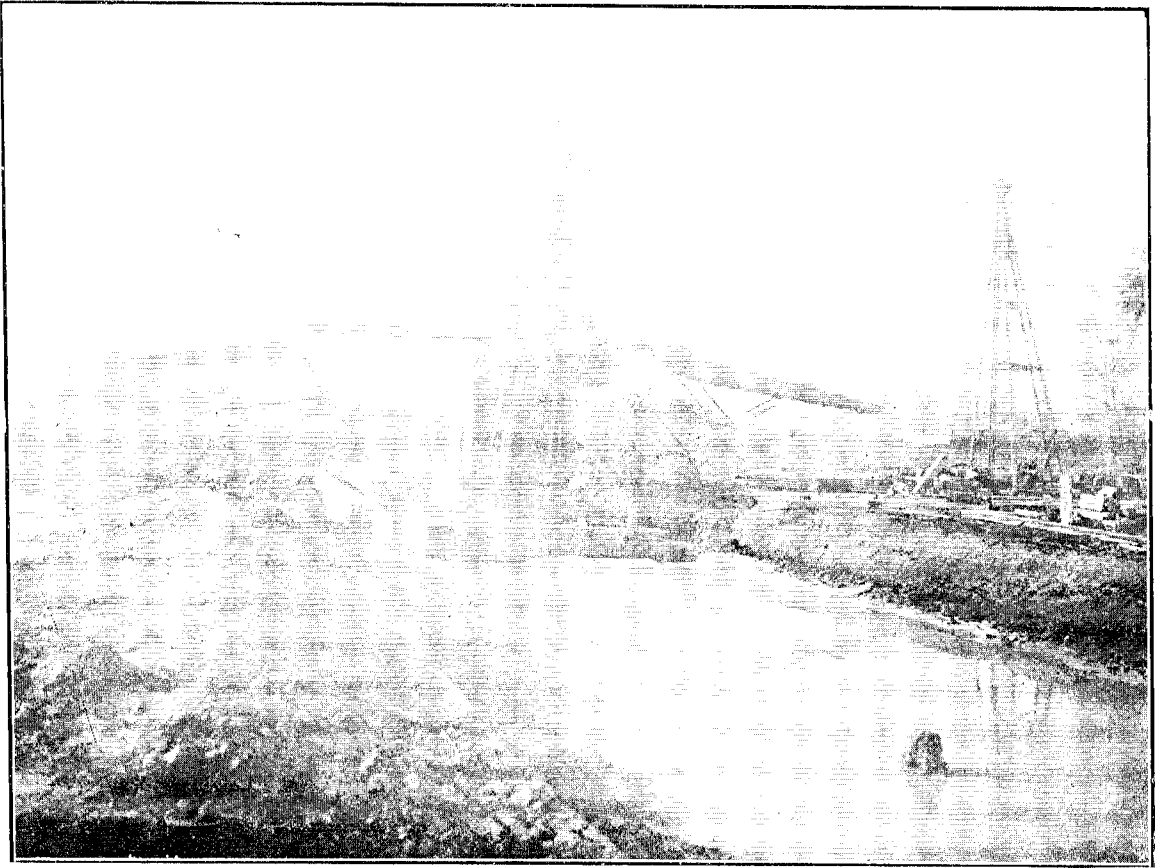
WHAKAIRE OUTFALL.



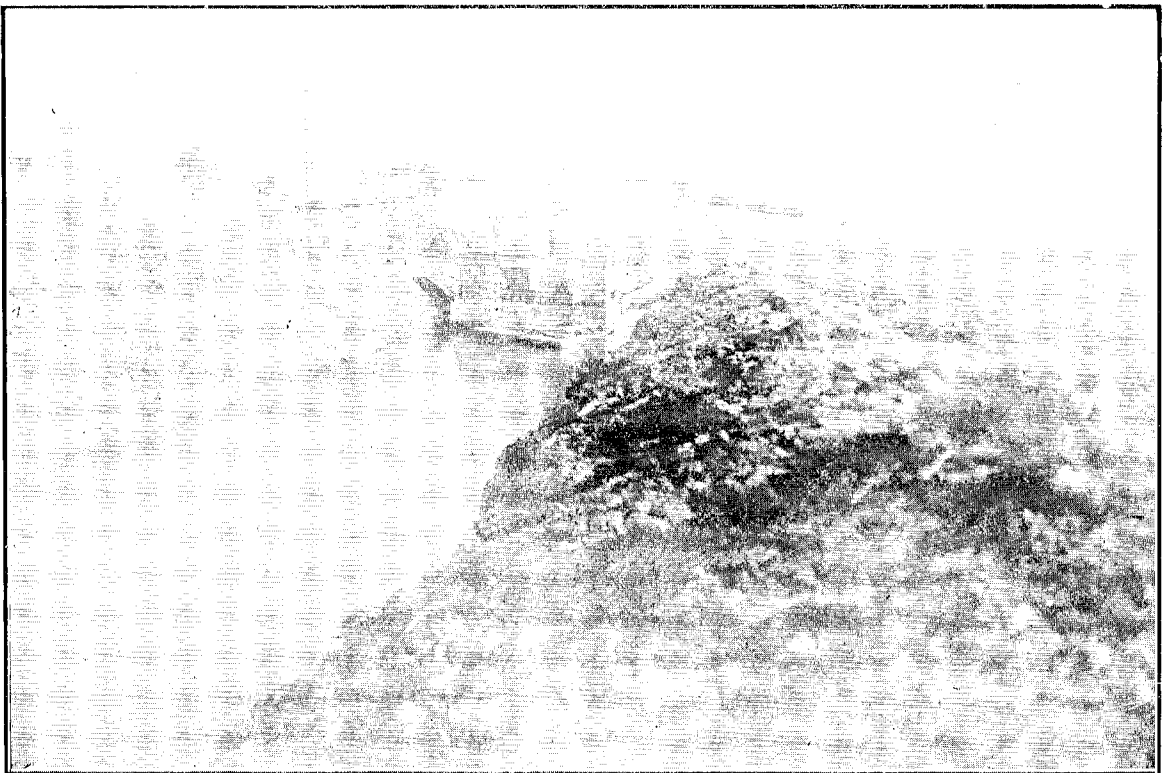
VIEW OF RANGITAHI DRAIN.



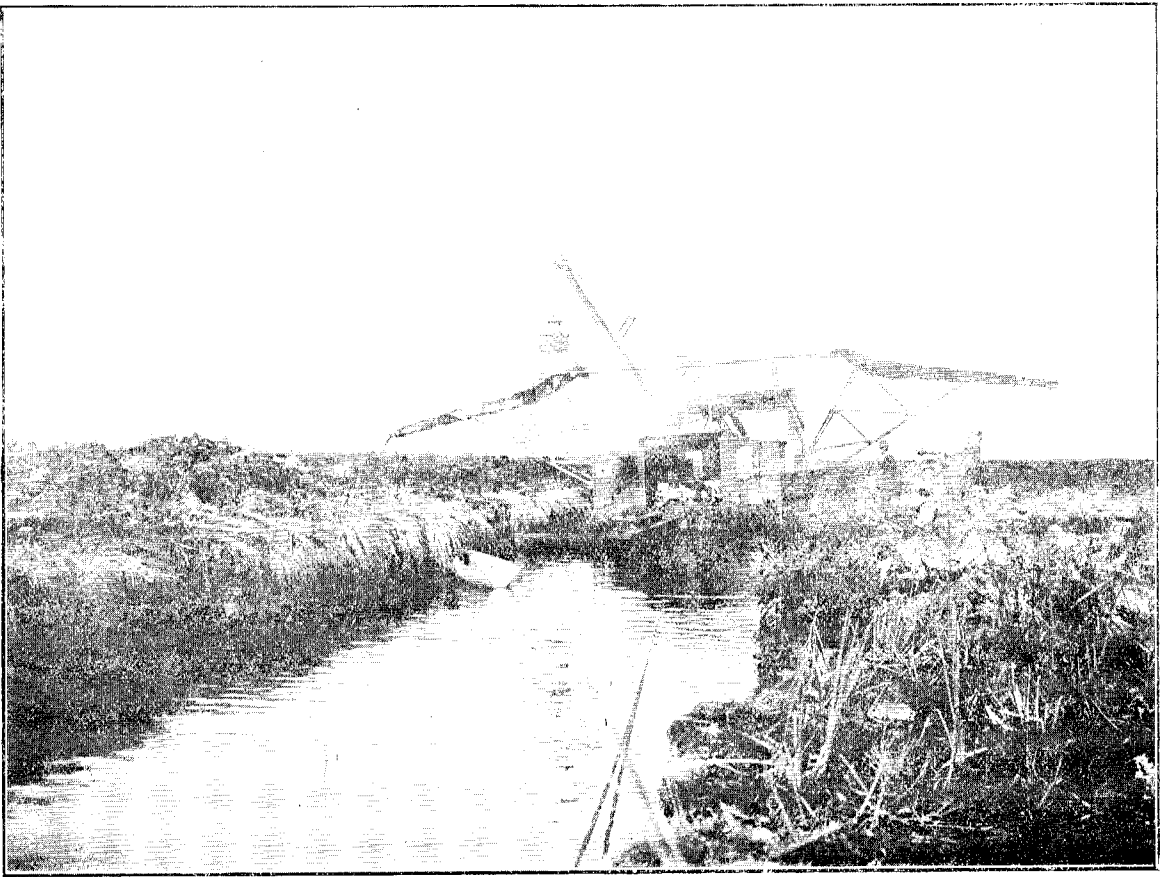
FAT SHEEP ON MR. MURRAY'S FARM.



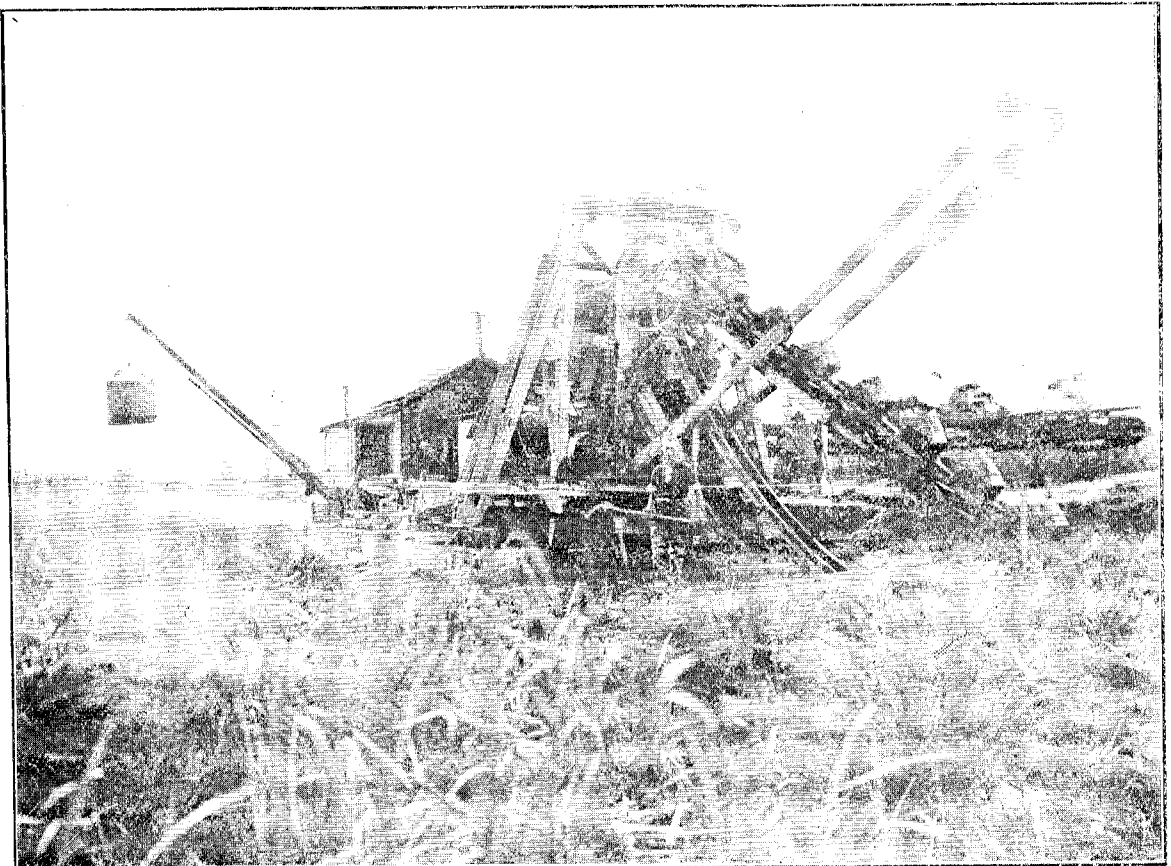
NO. 1 DREDGE EXCAVATING KOPEPEO OUTFALL.



NO. 1 DREDGE EXCAVATING KOPEPEO OUTFALL.



NO. 3 DREDGE EXCAVATING OMAHI OUTFALL.



HAMMOND BUCKET DREDGE, TARAWERA RIVER.