

SESSION II.
1921.
NEW ZEALAND.

DEPARTMENT OF LANDS AND SURVEY:
DRAINAGE OPERATIONS IN HAURAKI PLAINS.

REPORT FOR THE YEAR ENDED 31ST MARCH, 1921, TOGETHER WITH STATEMENT
OF ACCOUNTS.

*Presented to both Houses of the General Assembly pursuant to Section 10 of the Hauraki Plains
Act, 1908.*

SIR,—

Department of Lands and Survey, Wellington, 10th June, 1921.

I have the honour to submit herewith the report on the drainage operations in the Hauraki Plains for the past year, in accordance with the provisions of the Hauraki Plains Act, 1908.

The total area thrown open for selection in previous years was 40,391 acres, valued at £281,950. During the past year the area was 1,775 acres, valued at £25,680, whilst it is hoped that 4,500 acres, valued at £60,000, will be opened.

The detailed report of the Chief Drainage Engineer is attached, together with a statement of accounts and balance-sheet. These disclose a very satisfactory state of affairs, and show that the reclamation of the old Piako Swamp by the State has been more than justified.

I have, &c.,

T. N. BRODRICK, Under-Secretary.

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

REPORT OF CHIEF DRAINAGE ENGINEER.

SIR,—

I have the honour to submit the annual report on the operations carried out on the Hauraki Plains in connection with the land-drainage scheme for the year ended 31st March, 1921. It will be noticed by the detailed schedule that a very large amount of work has been accomplished during the year.

The value of the stock-sales held at Ngatea, Waitakaruru, and Patetonga yards was £79,496. The cheese-production for the three factories on the plains amount to 1,745,252 lb., while the butter produced at Kopu Factory totalled 1,420,879 lb. A very important acquisition to the plains is an up-to-date butter-factory, which was constructed at Ngatea during the past year.

The amount of tonnage carried to the Piako River by the two steamship companies trading direct to Auckland was approximately 6,560 tons, in addition to which the trade between Thames and the plains comprised some 741 tons of general cargo, 284,000 superficial feet of timber, and 12,000 bricks.

With the advent of the new types of machinery lately acquired in America it will be possible to greatly expedite development of the undrained area. Much of the present expenditure will not come to profit for some time, this being obviously unavoidable, as it is quite impossible and impracticable to unduly force swamp areas of this nature. The principle of "cut-and-come" system is well recognized by those who have to deal with swamp lands so wet and deep as those of Hauraki. After viewing similar lands in America, the results achieved at Hauraki are very satisfying, and the conclusion is formed that Hauraki cannot be beaten for fertility and productiveness. Nothing was seen to equal the alluvial area of Hauraki.

Time is the essence of successful drainage of deep swamp areas, and it would not be out of place here to refer to the many doubts expressed by certain laymen some years back as to the wisdom and practicability of undertaking this project. These doubts have been thoroughly exploded. It was realized that this area would have to be nursed and coaxed if the settlers were to make good, and that our operations would have to cover all the functions of a local authority as regards public utilities. The provisions of the Hauraki Plains Act did not provide for the metalling of roads, it being considered that special-rating areas would cover this matter. Although up to last year Hauraki Plains formed portions of two counties, yet no county funds were expended therein. It was recognized that without metal or gravel roads the settlers could not possibly succeed, and direct assistance by way of grants has resulted in the metalling of forty-eight miles of roadway in the

plains. This covers the most closely populated area thereof. It is not possible at the present stage to metal the peat roads, as they are slowly consolidating, and receiving skins of clay spoil from time to time.

The various public utilities supplied are necessary, and have been appreciated.

The difficulties of quickly bringing into condition for settlement areas of peat are ever increasing. It is quite the simplest portion of the work to excavate the outfalls and laterals. These immediately cause shrinkage in the adjoining lands, and have to be followed up from season to season to obtain freeboard and lower the general water-table. Then, it is impracticable to place settlers on areas merely served by bare peat roads, and these must be fascined and spoiled. The spoil is won, if possible, from the drains, upon clay being bottomed therein. If there is no chance of this being done, then it has to be conveyed distances involving from three- to four-mile leads. Necessarily this all takes time, and represents capital not yet brought to profit.

The foregoing remarks as to drainage difficulties are equally appropriate to all similar Government projects, and will not be referred to in the various other parliamentary reports, as Hauraki Plains represents quite the largest undertaking in hand presenting special peat features.

DREDGES.

The No. 1 dredge is still engaged on the Waitoa Canal, which has been completed for a total distance of 205 chains, 38 chains having been completed during the year. The total amount of spoil shifted was 42,115 cubic yards. The exceptionally dry weather experienced during the year made it difficult to keep sufficient water for floating and keeping the dredge supplied with coal.

The No. 2 dredge completed the Waitakaruru Canal and the trimming-up of banks and bottom. The dredge was then placed in the Waitakaruru Stream, and worked down from the wharf to the Maukoro Canal, widening and deepening the stream, and connecting same with the Maukoro Canal by a short cut at Preston's. The dredge is now working in the Maukoro-Waitakaruru Canal, and is widening and deepening same southwards. This end of the canal will be shortly reached, when the dredge will continue on with whole-cut work. The spoil from this work will be utilized in constructing the road to the soldiers' sections adjoining, while from a drainage point of view this canal will exercise a most beneficial effect on the land between the canal and the hills, which has always been difficult to efficiently drain. The total amount of spoil shifted was 62,800 cubic yards.

The No. 6 dredge, which is now in good order, is continuing the construction of the Awaitei Canal. The dredge was taken off this work for some months in order to widen and deepen the Patetonga Canal. The total amount of spoil shifted was 53,930 cubic yards.

These machines only worked one eight-hour shift per day, as it was not possible to obtain coal-supplies to run extra shifts.

The following table shows the amount of spoil dredged and cost per cubic yard for the past nine years :—

					Cubic Yards.	Cost per Cubic Yard.
1912-13	..	..	..	..	131,902	3·25d.
1913-14	..	..	..	..	147,740	3·20d.
1914-15	..	..	..	..	176,196	2·67d.
1915-16	..	..	..	..	146,905	3·35d.
1916-17	..	..	..	..	161,674	3·40d.
1917-18	..	..	..	..	130,664	2·53d.
1918-19	..	..	..	..	125,196	4·87d.
1919-20	..	..	..	..	138,310	6·90d.
1920-21	..	..	..	..	158,865	7·42d.

Increased cost of wages, coal, repairs, and supplies is reflected in dredging-costs.

AWAITI BLOCK.

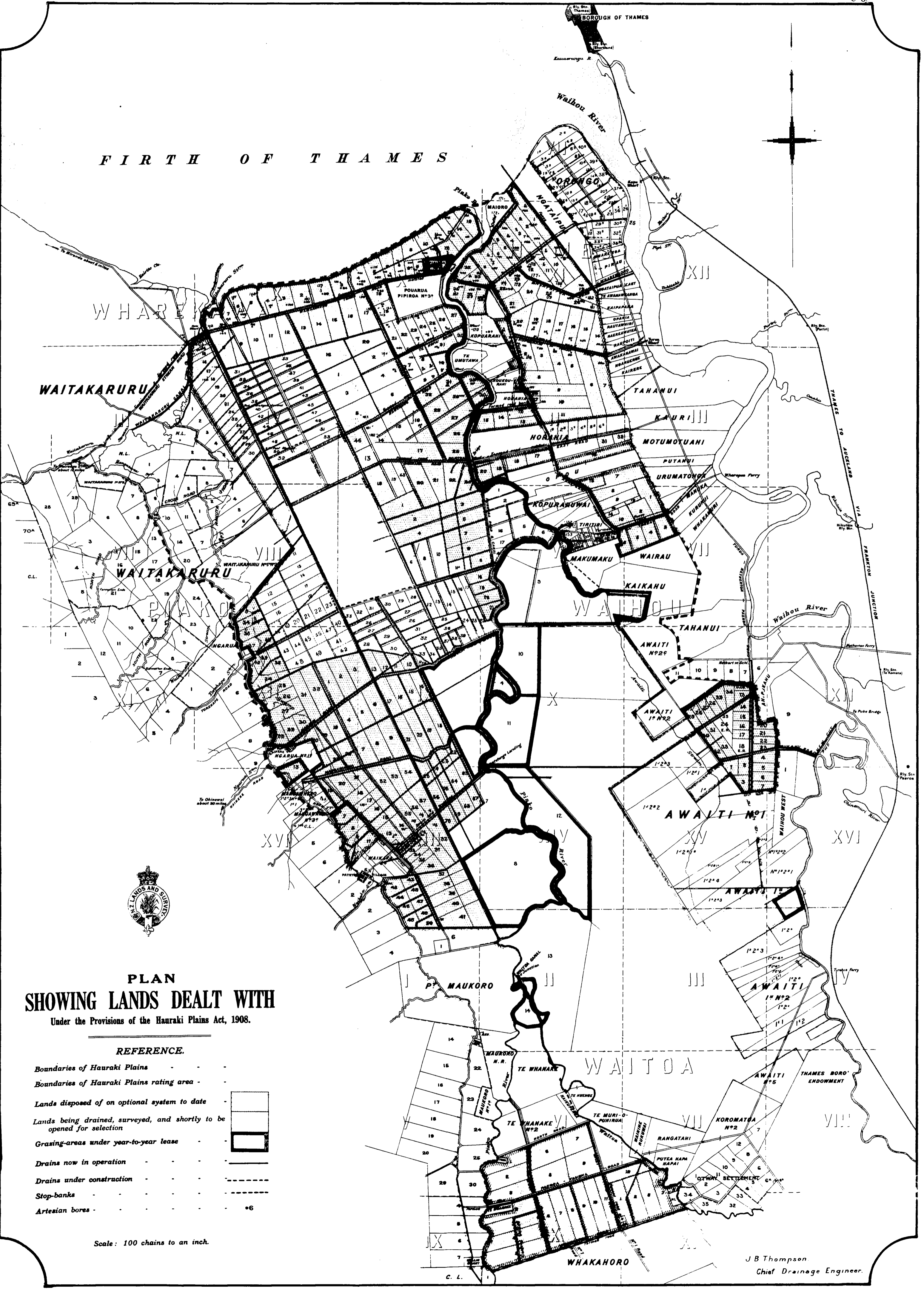
The usual maintenance of drains in the above block was carried out, while grading-work on the roads was extensively undertaken during the year, and all the clay roads kept in a good state of repair. The main Awaitei Road was also cleared of stumps along its southern portion. In the main Awaitei outfall drain, rickers procured from adjacent bush were driven in the sides of the drain in order to arrest the fraying of the banks, and the result has been very successful. A great handicap to the drain-work and stability of this main drain is the want of a flood-gate to the Waihou River, but this will no doubt be soon constructed in connection with the Waihou and Ohinemuri Rivers improvement scheme.

The metalling of the Awaitei Road was continued, and 85 chains completed during the year, making a total of 125 chains. In addition to this the county portion of the road, from the junction of the Paeroa Road to the Hauraki Plains boundary, was also metalled by this Department, the distance being 42 chains. This work was to have been done by the Ohinemuri County Council out of loan-moneys raised by the settlers (£300) and subsidy by Public Works Department (£300), but owing to the inability of the Council to obtain the metal the work was undertaken by the Department. Several new culverts were constructed, and the works generally kept in good order.

CENTRAL DISTRICT.

The work in this district consisted principally of maintenance. The remetalling of the Kerepeehi-Wharepoa Road (county portion) was completed, 17 chains being laid down during the year, making a total of 35 chains. The remetalling of this road from the Hauraki Plains eastern boundary towards Kerepeehi was proceeded with and 80 chains completed. The formation of the new Puhanga-Torehape Road was attained by drain spoil for 35 chains at the Puhanga end, and 40 chains constructed at Torehape end by clay carted from pit.

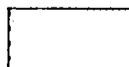
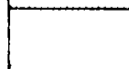



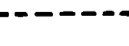

FIRTH OF THAMES



PLAN SHOWING LANDS DEALT WITH

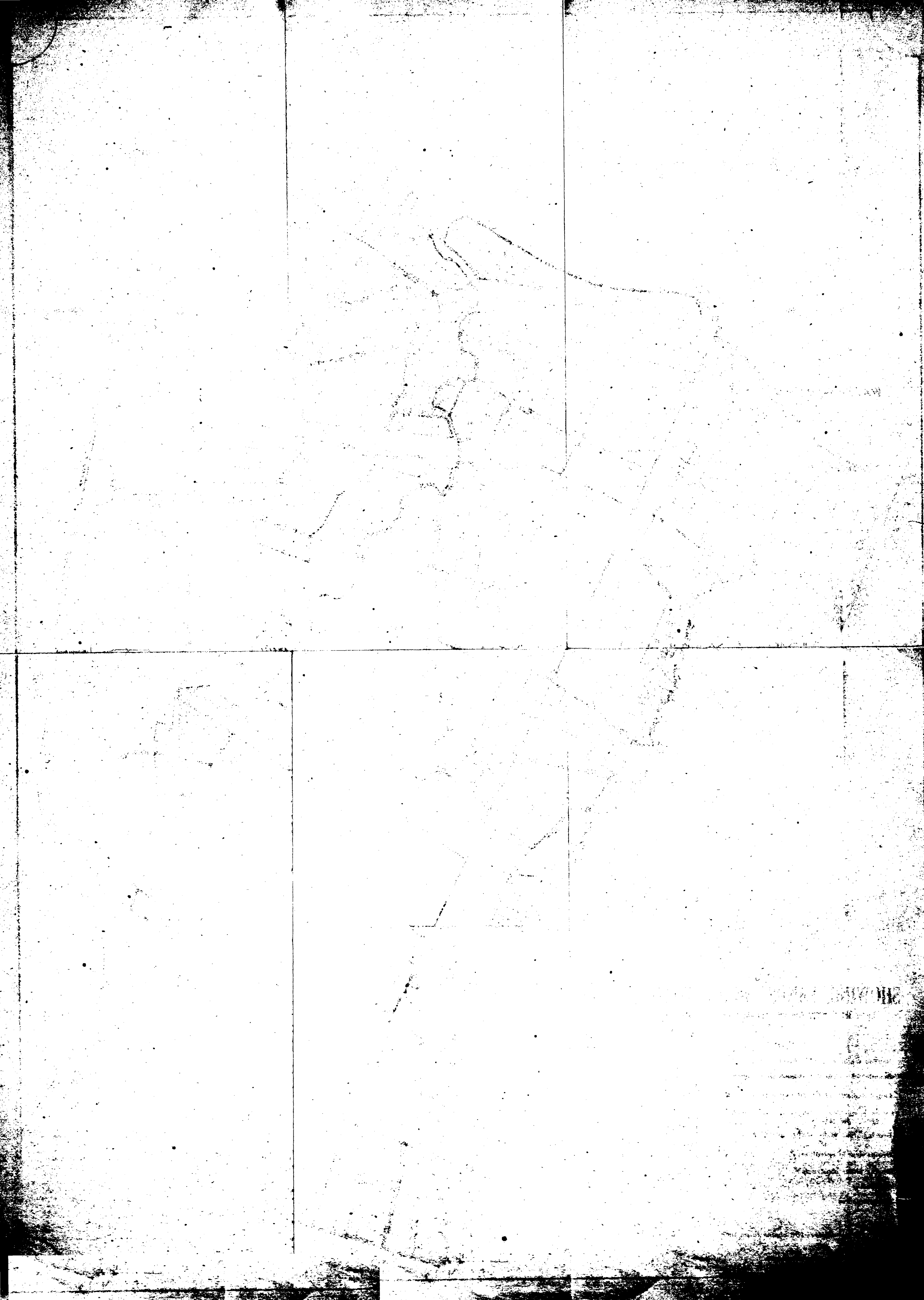
Under the Provisions of the Hauraki Plains Act, 1908.

REFERENCE.

- Boundaries of Hauraki Plains - - - - -
- Boundaries of Hauraki Plains rating area - - - - -
- Lands disposed of on optional system to date 
- Lands being drained, surveyed, and shortly to be opened for selection 
- Grazing-areas under year-to-year lease 
- Drains now in operation - - - - - 
- Drains under construction - - - - - 
- Stop-banks - - - - - 
- Artesian bores - - - - -  6

Scale: 100 chains to an inch.

J B Thompson
Chief Drainage Engineer.



The clay roads in the district were all graded, and the road along west side of Piako River from Puhanga Canal to Ngarua Wharf was considerably raised by plough-and-scoop work in order to prevent any encroachment on the soldiers' sections by the river in flood-time. From Kerepeehi northwards the Piako River has been cleared of willows along its banks where these were a menace to navigation.

PATETONGA DISTRICT.

The carting of spoil for the construction of the Ngarua Road was continued and the peat portion linked up, thus completing the formed clay road from Ngatea to Patetonga. Owing to the settlement of the clay filling put down the previous year on the Ngarua Road it was necessary to lay down another skin from the end of the Ngarua Canal to the western boundary of Section 30. The clay construction of the Mangawhero Road was also continued, and 80 chains completed, while 85 chains received another coating of clay. On the Patetonga Road 75 chains was recoated, and on all of these roads a solid bed of clay has now been laid down. Several new drains were constructed, and the usual maintenance work carried out. The relaying of the tram-line was completed, and a start made with the oil locomotive in hauling the trucks, although some alterations will have to be made before the locomotive takes up full running. The freights received during the year amounted to £542 13s. 6d.

TAHUNA DISTRICT.

The roads in this district have received special attention during the year, new spoil formation for a distance of 65 chains being completed, while 310 chains received another coat. The drains have all been kept in good order, while the main drain along the Whakahoro Road to the Piako River was considerably widened and deepened, and new concrete flood-gate arranged for same. This drain should now deal with the water from the Waitoa district and cut off same from the Crown block.

PIPIROA DISTRICT.

The metalling of the Horahia Road was carried out from the 37-chain mark, and completed to the eastern end of road—a distance of 53 chains, or a total for the road of 90 chains. The metalling was carried on from Horahia Road along the Kerepeehi-Kopuarahi Road to the north and south respectively for a distance of 90 chains. This road will shortly be completed, completing the through metalled road from Kerepeehi to Kopuarahi. The Turua-Kopuarahi Road was scarified and freshened up with new metal and rolled. The stop-bank along Piako River was raised in several places and repaired, and the general maintenance of roads and drains attended to.

WAITAKARURU DISTRICT.

The construction of new drains in the above district was considerable, these being principally in connection with the soldiers' settlements, and general development work. A temporary road leading to the soldiers' sections was formed alongside the canal. Twenty-five chains of footpath was laid down to the Waitakaruru School. The formation of the access road to the soldiers' sections at Torehape was completed. With the exception of a gap of about a mile in the Pipiroa-Ngatea Road, Waitakaruru is now linked up by metalled road with Wharepoa Ferry and the Thames-Paeroa Road.

Motor traffic has been exceptionally heavy on the plains roads during the past year, and the road through Waitakaruru and Maramarua Valley to Auckland was constantly in use by motorists.

METALLING ROADS.

A considerably increased supply of metal was received during the past year, 7 miles 55 chains of roads being metalled. Repairs to several metalled roads were effected, a fairly large amount of metal being used for this purpose. A White "Good Roads" truck was purchased during the year for use in connection with the metalling of roads. Reports indicate that the truck is working satisfactorily, and the saving of time and labour in delivering metal will fully justify the initial expenditure. During one month alone it covered a distance of 358 miles.

The total length of roads metalled or gravelled is now 48 miles.

The following is a schedule of roads metalled and remetalled during the year:—

	Metalled. M. ch.	Remetalled. M. ch.
Waitakaruru-Pipiroa Road	1 0	1 75
Horahia Road	0 47	..
Netherton-Awaiti Road	1 47	..
Kerepeehi-Wharepoa Road (remetalling) .. .. .	..	1 0
Kerepeehi-Kopuarahi Road	1 13	..
Patetonga Road	0 33	..

The roads which it is proposed to metal during the year 1921-22 are Kerepeehi-Kopuarahi (continuation); stop-bank road, Ngatea; completion Pipiroa-Ngatea Road and Orchard East Road.

BUILDINGS.

The foreman's cottage at Awaiti was remodelled, and the four-roomed cottage at Pipiroa was transferred and re-erected at Kerepeehi. A 30 ft. by 21 ft. building was purchased at Ngatea, and turned into workers' quarters. Several sheds and huts had roofs renewed with corrugated iron, while all buildings were painted and overhauled generally. Two overhead stagings were constructed at Kerepeehi, and one each at Ngatea and Netherton, for the unloading of metal-carriers. A wheeled hut was built to accommodate the men working the boring plant.

The number of buildings (excluding wharf-sheds) is now—Houses and small cottages, 15; quarters (staff and workmen), 2; double huts, 13; single huts, 18; sheds, 22; total, 70.

One new wharf and shed was constructed at Ngatea, on the western side of the Piako River and abreast of the new butter-factory, the dimensions being—wharf, 50 ft. by 12 ft.; approach, 30 ft. by 10 ft.; shed, 24 ft. by 18 ft. The Horahia Wharf was braced and generally strengthened for the discharge of road-metal. The wharf and shed on the canal at Waitakaruru was dismantled, and will be re-erected at the junction of the canal and Waitakaruru Stream. The number of wharves at the present time is fifteen.

FLOATING PLANT.

During the year several additions were made to this plant. A new oil-launch ("Waiomo") was purchased, dimensions of which are as follows: Length, 27 ft.; beam, 8 ft. 6 in. She has a 20-horse-power heavy-duty Zealandia engine. One new metal punt was built on contract; dimensions, 60 ft. by 18 ft. by 3 ft. 5 in. The floating plant now stands as follows: One steamer, seven oil-launches, four metal pontoons, three general-service punts, two coal-punts, three dredges.

The oil launches "Moehau" and "Pipiroa" are at present out of commission.

During the coming year the plant will be increased by the addition of one walking-dipper dredge and other machines which were purchased in America during my recent visit.

ARTESIAN BORING PLANT.

The number of bores sunk during the year was eighteen, making a total of 183 to date. The value of the year's operations was £842 18s. 11d., giving a total expenditure to date of £5,209 4s. 5d., practically the whole of which is recoverable. The sum of £614 13s. 1d. was received by the Receiver of Land Revenue during the year. A schedule of bores sunk is attached hereto.

DRAINS IN OPERATION.

New drains of a total length of 39 miles 48 chains were constructed during the year, making a total of 483 miles 32 chains of drains constructed on the Hauraki Plains to date.

METAL.

The total amount of metal received was 17,358 cubic yards (Kauaeranga, 4,833; other, 12,525).

WORKS PERFORMED DURING THE YEAR.

<i>Drains.</i>		M. ch.	M. ch.
By piecework contract:—			
Cleaning drains	.. .. .	98 55	
Widening and deepening drains (29,207 yards spoil removed)	.. .. .	34 59	
Constructing new drains	.. .. .	37 9	
		—————	170 43
By day labour:—			
Cleaning drains	.. .. .	101 12	
Widening and deepening drains (13,008 yards spoil removed)	.. .. .	15 75	
Constructing new drains	.. .. .	2 39	
		—————	119 46
<i>Stop-banks.</i>			
Stop-banks repaired	.. .. .		1 15
<i>Roads.</i>			
New peat roads clayed	} (45,330 cubic yards spoil)		2 41
Reclaying roads			8 55
New roads formed	.. .. .		5 36
Grading and disking roads	.. .. .		14 15
Gravelling roads	.. .. .		0 40
Metalling roads	.. .. .		4 20
Remetalling roads	.. .. .		2 75
Erecting fences	.. .. .		1 47
		—————	40 9
<i>Dredges.</i>			
Spoil excavated by No. 1 dredge	.. .. .		Cubic Yards. 42,115
„ No. 2 „	.. .. .		62,820
„ No. 6 „	.. .. .		53,930
			—————
Total	.. .. .		158,865

Reinforced-concrete Flood-gates and Culverts.

ROAD-CULVERTS.

Size.	Number.	Length.
3 ft. (Monier pipes)	6	192 ft.
2 ft. 6 in. (Monier pipes)	2	64 ft.
2 ft. (Monier pipes)	2	56 ft.

FLOOD-GATES.

3 ft. (Monier pipes):	8	204 ft.
2 ft. 6 in. (Monier pipes)	2	44 ft.
4 ft. by 4 ft. (Monier pipes)	2	38 ft.

A new single-span bridge (41 ft. by 15 ft.) was built across the Ngarua Stream at Kaihere, and at Patetonga concrete retaining face walls were erected at the concrete bridge-culvert over the Patetonga Stream.

FLAX LEASES.

Four areas, totalling 2,010 acres, were surveyed during the year, and three of these were disposed of, but unfortunately most of the standing flax on these areas perished in a disastrous fire in February last. Apart from this a good deal of cutting has been done, the revenue received during the year being £1,176 10s. 3d.

AREA THROWN OPEN DURING YEAR.

Some twenty sections, comprising an area of 1,775 acres and valued at £25,680, were opened during the year, and selected by discharged soldiers. During the ensuing year it is expected that about 4,500 acres will be offered, of an approximate value of £60,000.

VALUATIONS.

The total area thrown open for selection to date is 42,166 acres, which is valued at £307,630 for selection purposes.

GRAZING-AREAS.

The total area held under temporary grazing lease is now 6,124 acres, divided into seven sections. The annual revenue produced by these is £450.

WORKS EXPENDITURE FOR THE YEAR.

The total amount expended during the year on the area (not including special votes) was £70,836 7s. 10d. The sum of £72,875 3s. 4d. was paid out of local imprest in payment of Hauraki Plains expenditure and special votes, the principal of the latter being the metalling and maintenance votes. Day labour amounted to £23,031 13s. 6d., piecework contracts to £27,751 11s. 1d., and team-hire to £339 8s. 2d.

FUTURE PROPOSALS.

The principal works (apart from road-metalling) to be carried out in the future are as follows:—

- (1.) Continuation of Waitoa River dredging.
- (2.) Continuation of Waitakaruru—Maukoro Canal.
- (3.) Continuation of Awaiti Canal.
- (4.) Establishment of depot at Kerepechi.
- (5.) New areas for settlement.
- (6.) Concrete bridges, flood-gates, and culverts.
- (7.) New wharves.
- (8.) General development work.

GENERAL.

The books in connection with the works are kept in the Auckland Office, where all vouchers for wages, contracts, supplies, and general purposes are prepared. The local office is situated at Kerepechi.

The local officer in charge is Mr. R. S. Logan, Land Drainage Engineer, under whose supervision development work has been carried on energetically.

I have, &c.,

J. B. THOMPSON,

Chief Drainage Engineer.

The Under-Secretary for Lands, Wellington.

SCHEDULE OF ARTESIAN BORES, 1920-21.

Bore No.	Section.	Block.	Survey District.	Total Depth (Feet).	Running Flow (Gallons per Hour).
166	30	I	Waihou ..	279	100 (about)
167	36	X	Thames ..	400	300
168	33	X	" ..	401	400
169	Eastern portion 19	XI	" ..	302	400
170	3B 2A	..	Kopuarahi ..	156	2,500
171	Maioira No. 2	XI	Thames ..	384	800
172	"	XI	" ..	250	600
173	23	XI	" ..	231	400
174	23	XI	" ..	231	400
175	2	II	Waihou ..	162	600 (pumping)
176	2	II	" ..	161	600 "
177	12	XI	Thames ..	248	600 "
178	12	XI	" ..	382	800
179	25	XI	" ..	248	500
180	26	XI	" ..	397	400
181	26	XI	" ..	331	400
182	26	XI	" ..	264	400
183	11	XI	" ..	213	400 (pumping)

HAURAKI PLAINS SETTLEMENT ACCOUNT.

Statement of Transactions during the Year ended 31st March, 1921.

Receipts.			Payments.		
	£	s. d.		£	s. d.
Balance forward at 1st April, 1920 ..	2,332	11 2	Drainage-works, stop-banks, clearing channels, and other expenditure incidental to conducting drainage operations, material, supplies, &c. ..	57,196	4 3
Debentures issued—Hauraki Plains Amendment Act, 1913 ..	54,000	0 0	Erection of buildings ..	819	1 0
Cash sales ..	19,404	19 4	Machinery and plant ..	3,807	0 3
Rents ..	13,106	14 1	Loose tools ..	143	1 6
Artesian bores—			Artesian wells, cost of sinking ..	857	6 11
Repayment of advances ..	552	5 10	Compensation for land acquired in connection with drainage-works ..	333	8 2
Interest ..	62	7 3	Stores, fuel, &c. ..	7,213	5 2
Miscellaneous receipts—	£	s. d.	Management and engineering expenses ..	1,936	4 3
Tram freights ..	514	1 6	Travelling-expenses ..	326	15 5
Rent of huts ..	6	18 9	Interest on debentures ..	8,053	10 3
Grazing fees ..	67	2 2	Balance ..	9,378	2 11
Flax sales ..	11	0 0			
Timber royalties ..	1	0 0			
Grass-seed ..	5	0 0			
		605 2 5			
	£90,064	0 1		£90,064	0 1

Revenue Account for the Year ended 31st March, 1921.

Dr.			Cr.		
	£	s. d.		£	s. d.
To Interest on debentures issued under Local Bodies' Loans Act, 1908 ..	1,240	0 0	By Rents accrued during the year ..	14,178	4 11
Interest on debentures issued under Hauraki Plains Amendment Act, 1913 ..	10,693	17 10	Interest earned—		
Rebate of rent ..	905	18 2	Investments ..	106	12 5
Artesian Wells Account—Amounts written off where bores not effective ..	58	6 2	Outstanding accounts ..	64	19 2
Net revenue for year carried down ..	2,077	17 6		171	11 7
			Freights ..	535	2 3
			Rent of huts ..	6	18 9
			Grazing fees ..	67	2 2
			Flax ..	11	0 0
			Timber royalty ..	1	0 0
			Grass-seed ..	5	0 0
				14,975	19 8
	14,975	19 8			
To Balance ..	28,402	12 10	By Balance forward from previous year ..	26,324	15 4
			Net revenue as above ..	2,077	17 6
	£28,402	12 10		£28,402	12 10

Balance-sheet as at 31st March, 1921.

Liabilities.			Assets.				
	£	s. d.		£	s. d.	£	s. d.
Debentures—			Improved lands handed over to Land Board for settlement ..	308,150	0 0		
Local Bodies' Loans Act, 1908 ..	31,000	0 0	Less cash sales ..	61,372	13 9		
Hauraki Plains Amendment Act, 1913 ..	239,000	0 0				246,777	6 3
Public Works Fund—Expenditure under Land-improvement vote ..	5,070	0 0	Unimproved lands not yet disposed of ..			22,385	0 0
Consolidated Fund—Interest on debentures issued under Local Bodies' Loans Act, 1908 ..	17,773	10 2	Improvements adjoining Crown lands ..			7,710	0 0
Interest accrued but unpaid ..	2,640	7 7	Works in progress—Expenditure on lands in process of reclamation ..			46,744	7 3
Hauraki Plains—Land set apart under the Act ..	45,000	0 0	Artesian wells—				
Rents paid in advance ..	674	5 0	Hauraki Plains Crown tenants ..	1,736	6 2		
Suspense Account ..	126	5 6	Adjoining Crown lands ..	169	13 8		
Revenue Account ..	28,402	12 10				1,905	19 10
			Buildings—Wharf-sheds, cottages, huts, houses, &c. ..			4,399	5 0
			Machinery, plant, tools, and stores ..			25,025	6 3
			Sundry debtors, rent, interest, &c. ..			2,493	6 10
			Investments—Public Trustee ..			2,176	5 6
			Consolidated Fund—Interest on investments ..			692	1 3
			Cash in hand ..			9,378	2 11
	£369,687	1 1				£369,687	1 1

3rd September, 1921.

J. H. O'DONNELL, Chief Accountant.
T. N. BRODRICK, Under-Secretary.

Approximate Cost of Paper.—Preparation, not given; printing (650 copies, including plans), £30.

By Authority: MARCUS F. MARKS, Government Printer, Wellington.—1921.

Price 1s. 3d.]