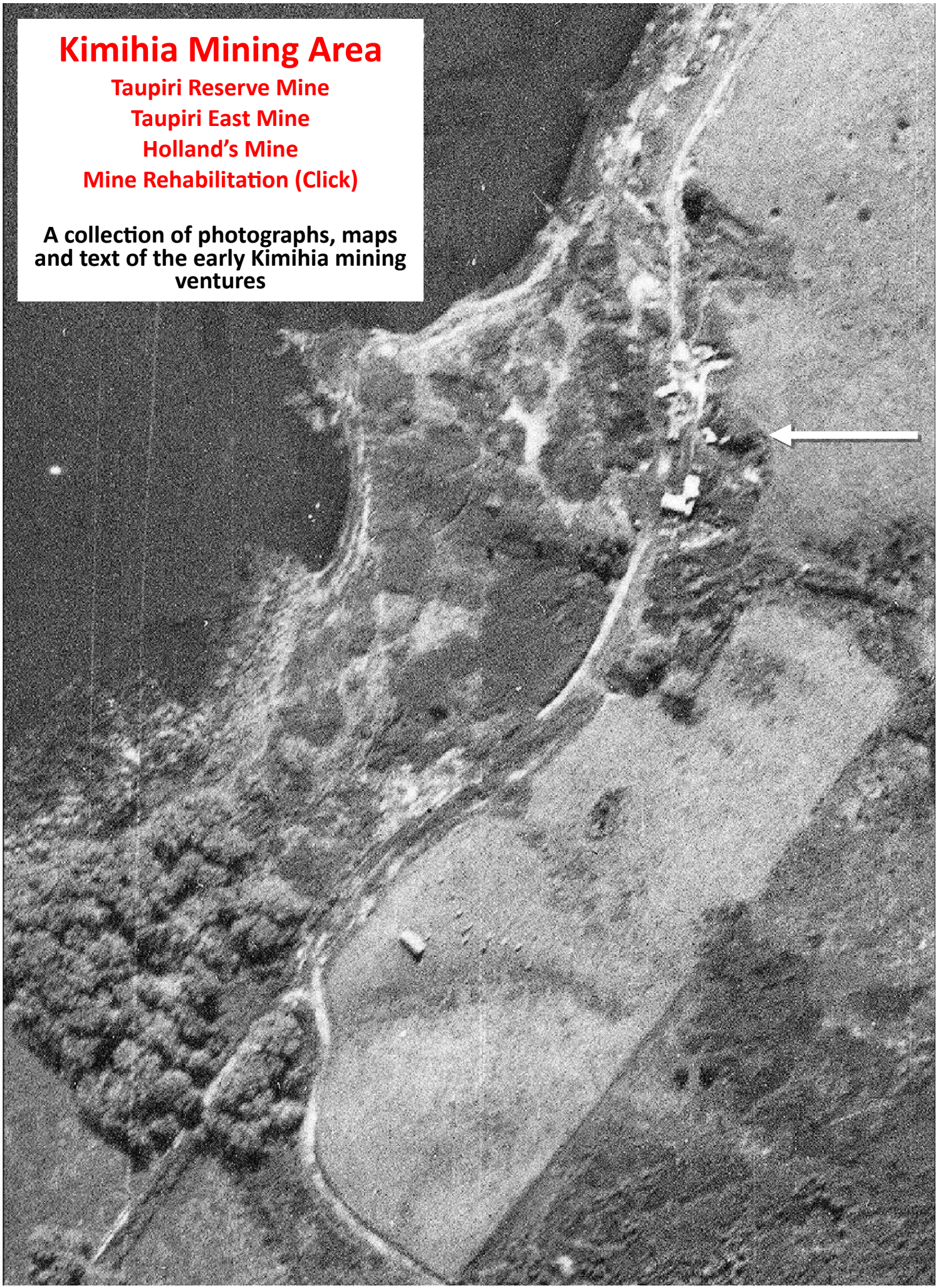
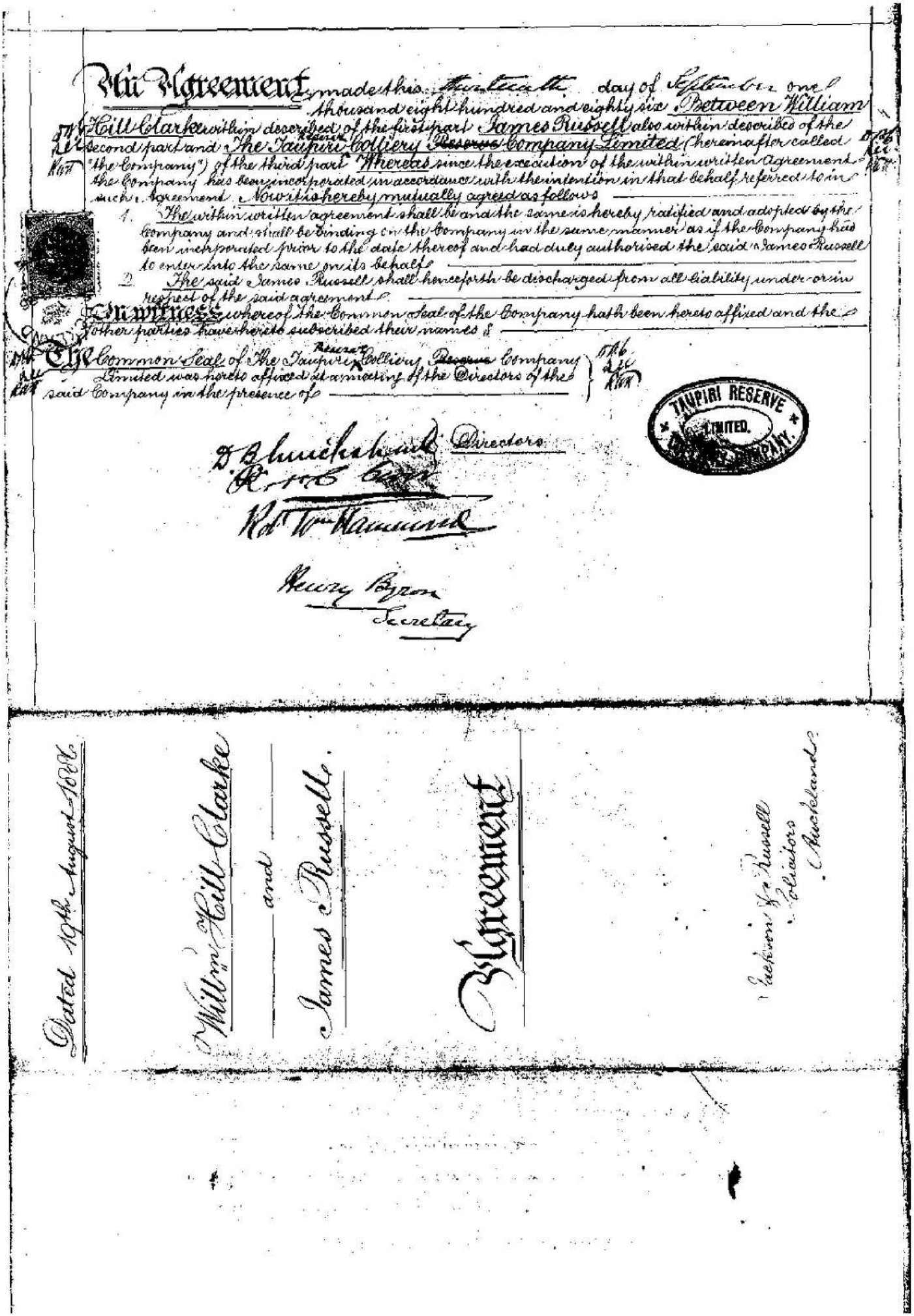
Kimihia Mining Area

Taupiri Reserve Mine
Taupiri East Mine
Holland's Mine
Mine Rehabilitation (Click)

A collection of photographs, maps and text of the early Kimihia mining ventures



A 1941 view of the underground mine pithead on the southern shore of Lake Kimihia with the rail access coming from Huntly (traversing from the bottom left of the image, north-east towards the pithead, which is arrowed).



This Agreement made this thirteenth day of September one thousand eight hundred and eighty six Between William Hill Clarke within described of the first part James Russell also within described of the second part and The Taupiri Colliery Reserve Company Limited (hereinafter called "the Company") of the third part Whereas since the execution of the within written Agreement the Company has been incorporated in accordance with the intention in that behalf referred to in such Agreement Now it is hereby mutually agreed as follows

1. The within written agreement shall be and the same is hereby ratified and adopted by the Company and shall be binding on the Company in the same manner as if the Company had been incorporated prior to the date thereof and had duly authorised the said James Russell to enter into the same on its behalf
2. The said James Russell shall henceforth be discharged from all liability under or in respect of the said agreement

In witness whereof the Common Seal of the Company hath been hereto affixed and the other parties have hereto subscribed their names

The Common Seal of The Taupiri Colliery Reserve Company Limited was hereto affixed at a meeting of the Directors of the said Company in the presence of

TAUPIRI RESERVE LIMITED. COLLIERY COMPANY.

D. Bluck Chairman Directors

R. Wm Clark

Robt Wm Hammond

Henry Byron Secretary

Dated 13th August 1886

Wm Hill Clarke

and

James Russell.

Agreement

Lee from Messrs Russell Solicitors Auckland

Documents giving the Taupiri Reserve Colliery Company authorization to mine at Kimihia.
Dated 13th September 1886.

3873

FIVE SHILLINGS

This Agreement

made the nineteenth day of August one thousand eight hundred and eighty six **Between** William Hill Clarke of Auckland in the Provincial District of Auckland in New Zealand Surveyor hereinafter called "the Vendor" of the one part and James Russell of Auckland aforesaid Solicitor on behalf of the Company hereinafter mentioned of the other part **Whereas** the Vendor is the Owner of the leasehold premises hereinafter described and has expended considerable sums of money thereon in boring for coal and prospecting the mineral veins and deposits thereon **And whereas** a Company is about to be formed under the Companies Act 1882 having for its objects amongst other things the acquisition of the said leasehold property and working of the same and carrying on the business of Colliery Proprietors and Miners thereon **And** whereas the Memorandum and Articles of Association of the Company have with the privity of the Vendor been already prepared **And whereas** the nominal capital of the Company is to be Twenty five thousand pounds divided into Twenty five thousand shares of One pound each **And whereas** by the said Articles of Association it is provided that the Directors of the Company should immediately after the incorporation thereof adopt on behalf of the Company and carry into effect an Agreement therein referred to being these presents **Now it is hereby agreed** as follows:—

1. **The** Vendor shall sell and the Company shall purchase the leasehold hereditaments described in the Schedule hereto for the unexpired residue of a term of fourteen years therein granted by the Deed of Lease specified in the same Schedule subject to the rent reserved by the said Deed of Lease and the covenants and conditions therein contained and on the Lessees part to be observed and performed.

2. **The** consideration for the said sale shall be the sum of Three thousand five hundred pounds which should be paid and satisfied as follows namely by the Allotment to the Vendor or his nominee or nominees of Five thousand shares in the Company paid up to ten shillings on each share.

3. The said Seven thousand shares shall be numbered in the books of the Company 1 to 7000 inclusive. The title of the Vendor to the said leasehold hereditaments shall commence with the said Deed of Lease and the Company shall not call for the production of or investigate or make any objection or requisition in respect of the title of the Lessors or the right to grant the lease and the production of a receipt for the last payment of rent which shall have accrued due under the said Deed of Lease previously to the completion of the purchase shall be accepted by the Company as conclusive evidence that all the covenants and conditions in the lease have been performed and observed up to the completion of the purchase. ——

4. The Company shall on or before the thirtieth day of September one thousand eight hundred and eighty six allot the said seven thousand shares as hereinbefore provided. ——

5. Upon such allotment as aforesaid being made the Vendor shall at the expense of the Company execute and do all such assurances and things as may reasonably be required for vesting in the Company the said premises agreed to be hereby sold and giving to it the full benefit of this Agreement. ——

6. The possession of the said premises shall be retained by the Vendor up to the said thirtieth day of September one thousand eight hundred and eighty six. ——

7. Upon the adoption of this Agreement by the Company the said James Russell shall be discharged from all liability in respect thereof. ——

8. If this Agreement shall not be adopted by the Company before the twentieth day of October next it shall be lawful for either of the parties hereto by notice in writing to the other to rescind the same and in case this agreement shall be so rescinded neither of the parties hereto shall have any claim against the other for compensation or expenses or otherwise in relation hereto. ——

As witness the hands of the said parties. ——

Witness
R Hammond
Gent
Auckland

William Bell Clarke

James Russell

Schedule. All that parcel of land in the said Provincial

Witness to signature of James Russell
Henry Brett

District containing 700 acres more or less being Allotment 463a of the Parish of Taupiri As the same is particularly described in a Deed of Lease from the Governor of New Zealand to the said Vendor dated the fourteenth day of June one thousand eight hundred and eighty six and delineated on the plan drawn thereon and hereon

William Hall Clarke

J Russell

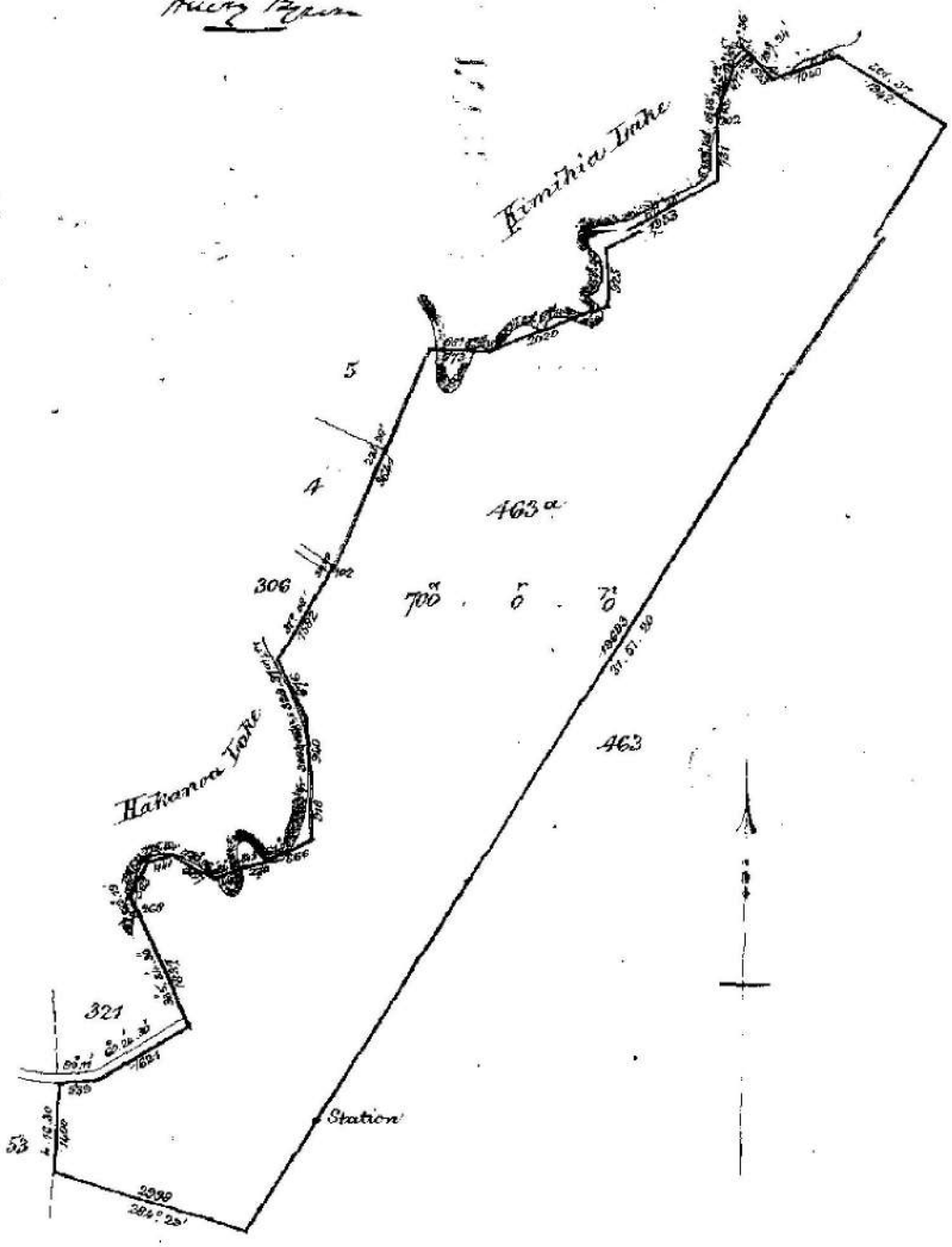
Witness

R Edmonds

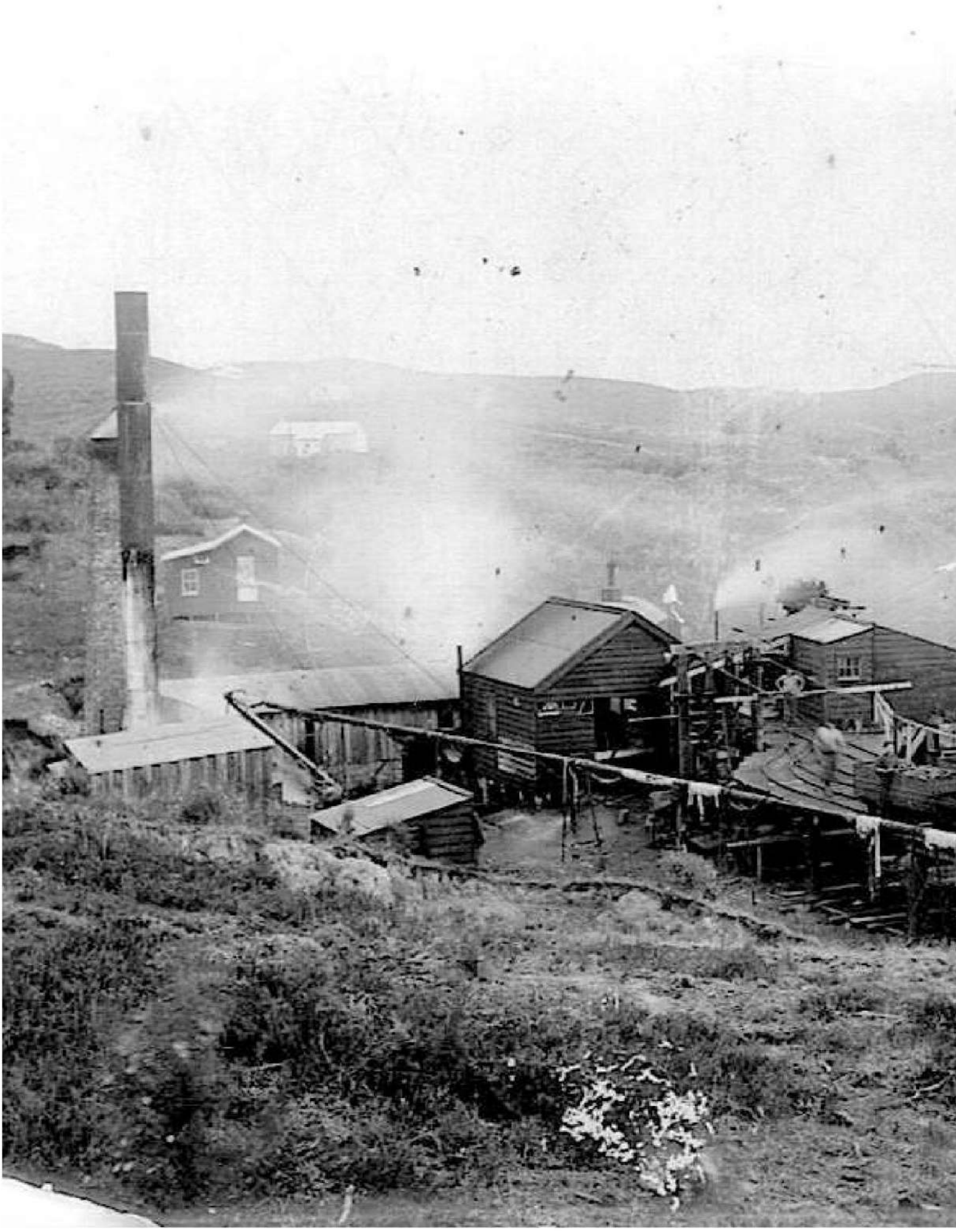
Coal Merchant

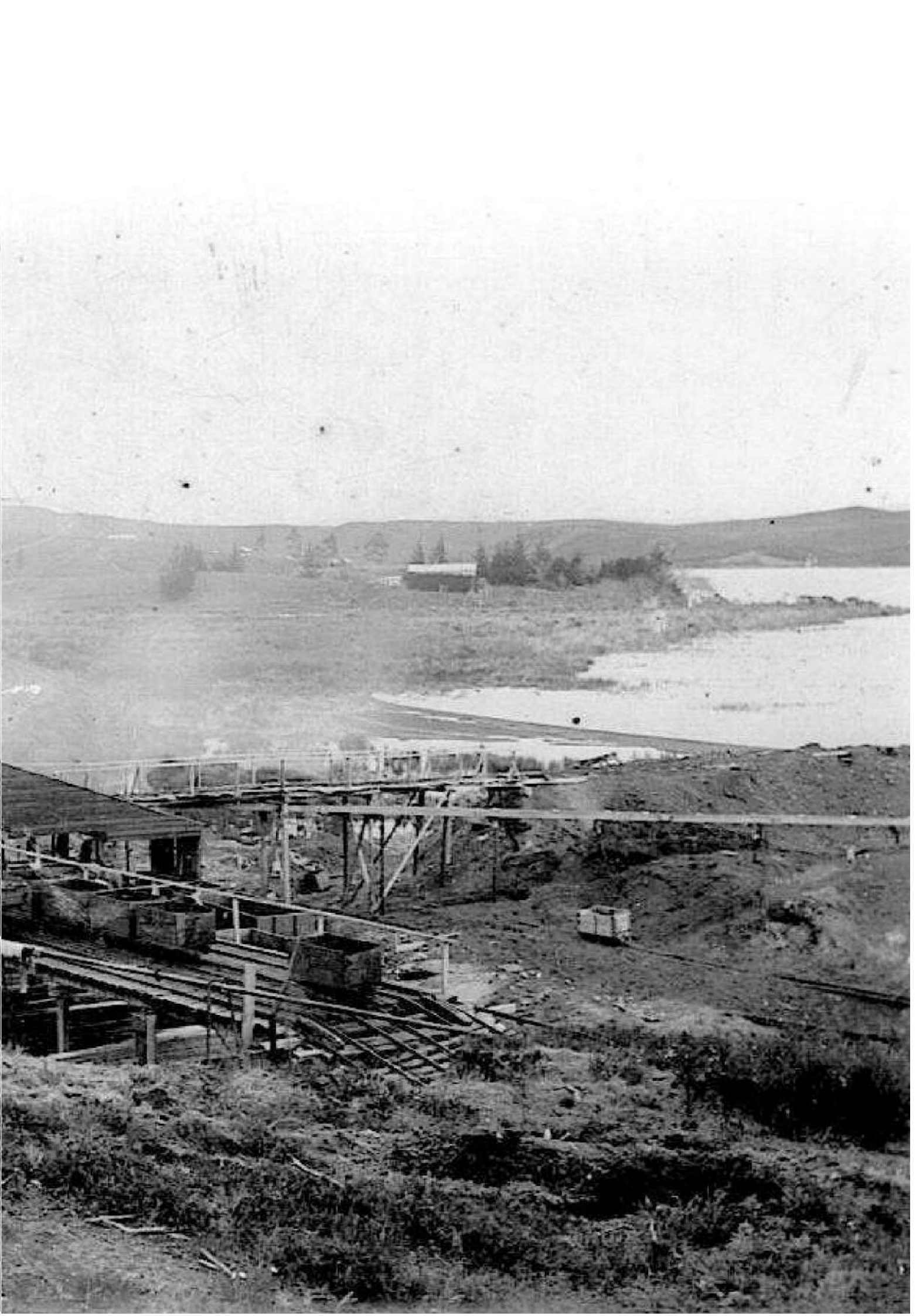
Auckland

Henry Ryan



The Taupiri Reserve Mine (Holland's Mine) on the southern shore of Kimihia Lake, 1895.





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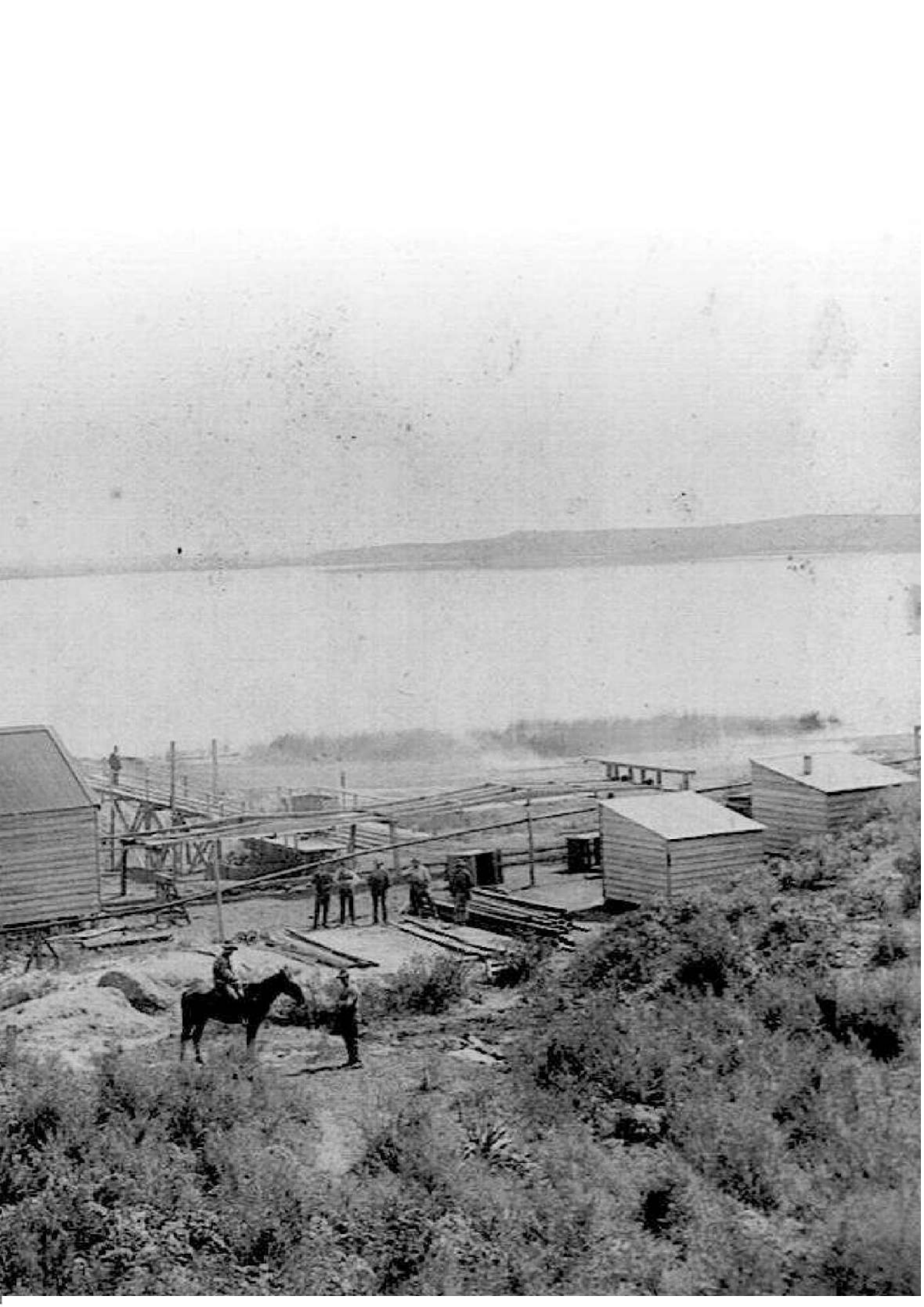
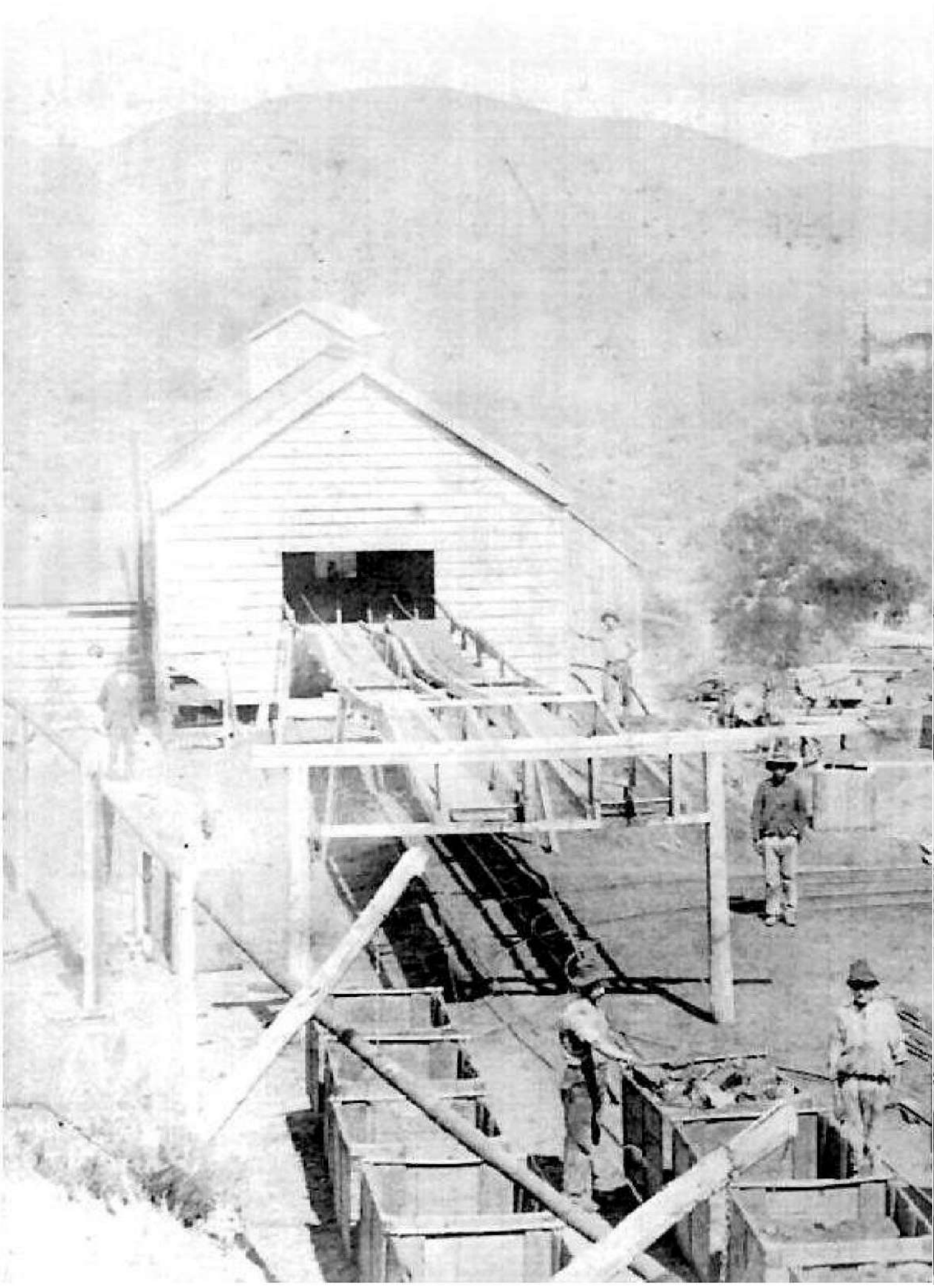
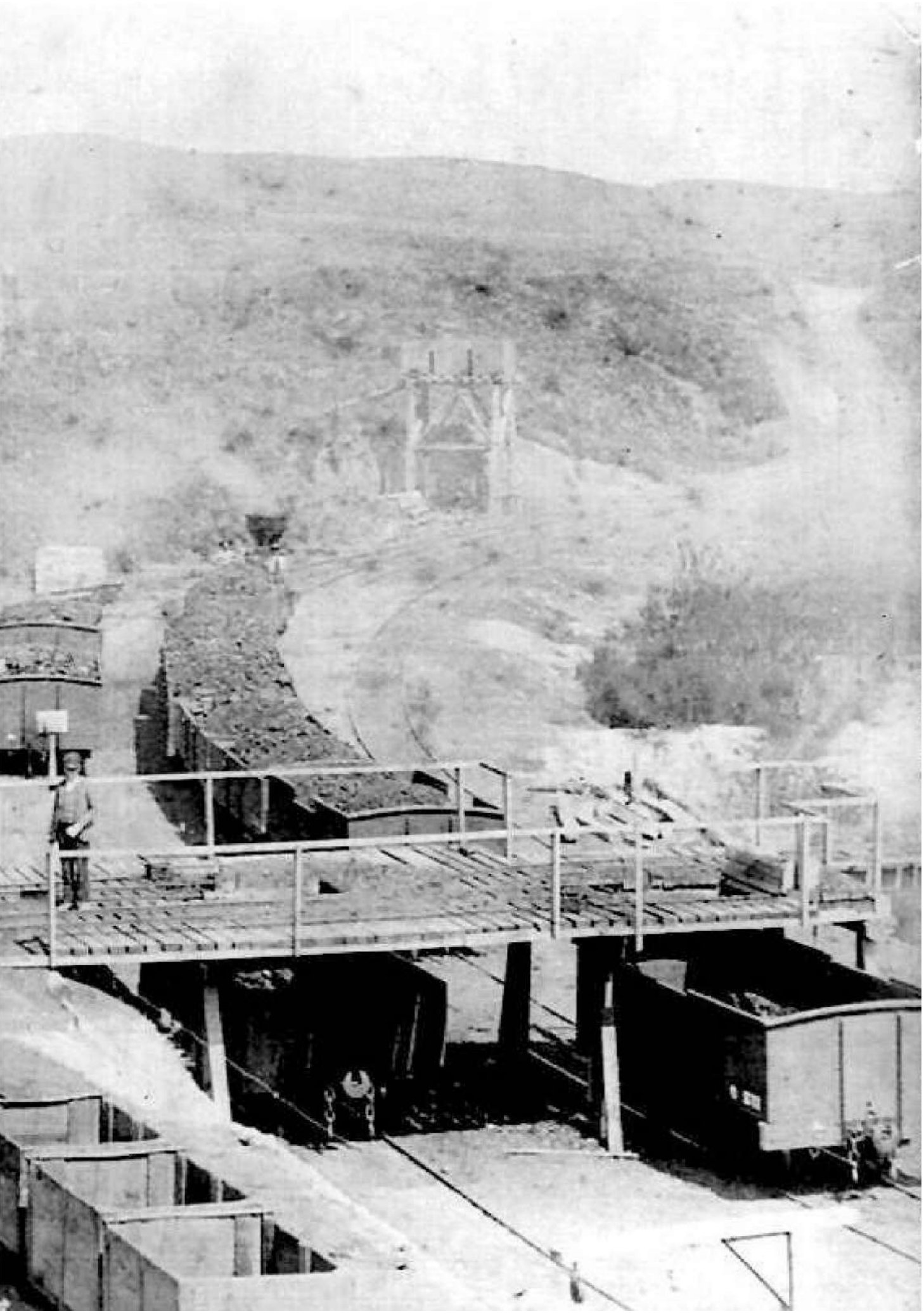


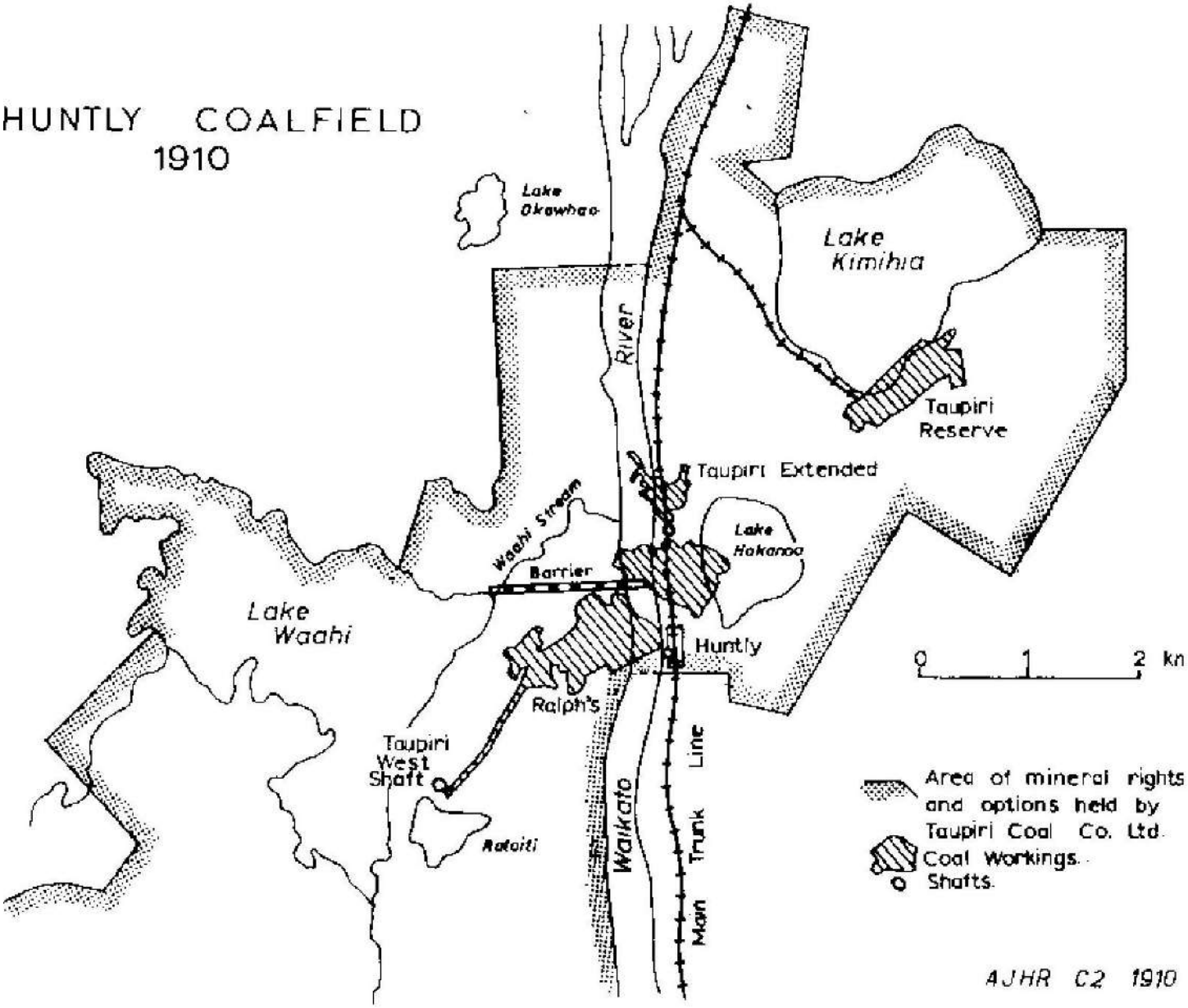


The Taupiri Reserve Mine (Holland's Mine) on the southern shore of Kimihia Lake.
Dated 1895.



Excerpts from the Annual NZ Mine Reports from 1892 to 1907

Featuring the Waikato Mine, Ralph's Taupiri Mine, Taupiri Extended Mine & Taupiri Reserve Mine.



Huntly coal situation, 1910.

1892

Waikato Colliery (7th July).

This mine employs twenty-one men underground. The places are all driven on bearings, but the plan is only in pencil, and undated. This will be seen to. In the working places to the east of the top of main jig the air is poor, but screens are to be put in, which will improve it.

Tuapiri *(sic)* **Reserve Colliery (8th July).**

The workings in this mine are principally under Lake Kimihia. All the bords are driven on bearings, and kept very regular. In most places there is a coal floor left, and I am informed by Mr. Harrison that there is never less than 4ft. of coal-roof. At the west level face there is a trickle of water, which keeps with the advanced faces. I could see further back where such had been running and had now ceased.

The dip is to north-west, at one in five, so that as the workings progress under the lake additional cover is gained. Reports kept. Special and general rules posted. Plan up to date, and air good.

Waikato Mine.

This mine, which is situated on the left bank of the Waikato River, and on the opposite side to the railway, is worked from an adit level, where there is no expense in hoisting or pumping. The cost of conveying the coal on punts to the railway-siding is, however, a drawback, and the quantity produced is therefore limited.

The workings were safely carried on, and during the year confined to headings and bords, no pillars being taken out. The ventilation is fairly good, although at times a change of wind causes a stagnation, which soon disappears.

The books are well kept, and the Act complied with. A copy of the plan of the workings of the mine has been sent to me, as required by the Act. The number of men employed is eight on the surface and on steamer and punts, and nineteen below ground: total, twenty-seven. The output for the year was 4,839 tons.

Ralph's Taupiri Mine.

(8th July) Only two men employed, at pillar-work near the out-crop. General and special rules hung, the latter without the required names. I requested Mr. Ralph to see to this. Shaft unfenced. This was attended to at once.

The workings in this mine during the year have been: driving the new dip, removing a pillar in the old mine which was under the place where the hauling-engine formerly stood, and sinking a shaft. It was found that, on account of the quantity of water in the new dip, it would be more economical to work the mine by sinking a shaft on the land between the railway and the Waikato River; the dip was therefore abandoned, and the timber drawn. The shaft was then sunk to a depth of 160ft., and through a seam of coal 65ft. in thickness.

The cover over the coal was of such a nature that no difficulty was experienced in sinking, as the running drift, found elsewhere in the neighbourhood, did not exist in the shaft. A bore-hole was made near by, and a working shaft about 10ft. by 6ft. is to be sunk with as little delay as possible. The first shaft will be used as a pumping and upcast shaft.

At my visit to the mine on the 10th December, I found that no cages were used, and that men were raised and lowered by the engines without being securely stayed to the rope, as provided in section 25 of the general rules. I instructed the manager to see that this precaution was taken in future, and to make the entries in the report-book in a more systematic manner.

The provisions of the Act were otherwise fairly well complied with. The average number of men employed was six on the surface, including manager and engineers, and ten men below ground: total, sixteen. The total output for the year was 2,079 tons.

Taupiri Extended Mine.

The workings in this mine during the year were driving headings and opening fresh bords to the southward, driving a heading to the northward to connect with the second shaft, which was sunk about 10 chains from the main working-shaft. The second shaft, which is 10ft. in diameter, sheathed with cast-iron cylinders, was sunk with considerable difficulty on account of the sandy drift and quantity of water to be contended with.

Bore-holes had been made in a circle from the surface down to the coal, and it was found that no obstacles were in the way, as was the case in sinking the main shaft, when trees and branches in the drift caused great delay. Provision was made to put on great pressure to force down the cylinders, which were in segments and built in the top, while the sand and drift were removed by a dredging-machine.

No water was pumped from the shaft until the coal had been reached, when a Tangye pump was used to keep the shaft dry whilst the coal was sunk through and the shaft bricked-up. Connection was made with the heading-drive from the main shaft on the day previous to my visit on the 11th December last. The depth of the second shaft is 204ft., the coal being 24ft. in thickness, and as the main shaft is only 174ft. in depth the pumping will be from the deepest one.

The ventilation of the mine is good, the fan being still used: 9,070 cubic feet of air per minute was passing through the working places at the time of my last visit for the use of fifty men and one horse below ground.

From the 20th September until the second opening was made the mine was worked in shifts in order that not more than ten men were taken below at one time.

The report-books are well kept, and the provisions of the Act complied with. A copy of the plan of the workings of the mine has been sent to me as required by the Act.

The number of men employed was sixteen on the surface and fifty below ground: total sixty-six. The output for the year was 29,460 tons.

Taupiri Reserve Mine.

The workings in this mine for the year have been under the Lake Kimihia. A series of bore-holes have been made, showing the depth of the cover, which is from 48ft. to 77ft. in thickness, chiefly strong fireclay. The bords are worked 14ft. in width, and the pillars are 21ft. in thickness. The height of coal worked is 13ft., and not less than ft. of coal left for a roof. It may therefore be considered that there is no special danger in working under the lake so long as the thickness of the cover mentioned continues and the pillars are not interfered with.

Thirty-seven men are employed at the mine, seven on the surface and thirty below ground. The ventilation was good; 4,408 cubic feet of air per minute passes through the workings, giving 116 cubic feet per minute for thirty-seven men and one horse working in the mine.

The report-book is well kept, and a copy of the plan of the workings of the mine has been sent to me as required by section 45, and the other provisions of the Act complied with. The output for the year was 17,221 tons.

No very serious accidents occurred during the year. The list of **accidents** reported are as follows:-

- Benjamin Housley got accidentally struck by a pick on 18th January, in the Taupiri Reserve Mine.
- William Patterson was injured by a rail bouncing up and striking him on the foot on

16th May, in the Taupiri Reserve Mine.
- F. Fisher was injured by getting jammed between a skip and prop on 11th July, in the Waikato Mine.
- Albert Tee got a blow on the eye from a piece of coal on the 15th August in the Taupiri Extended
- E. W. Coxon got accidentally scorched at the engine furnace on 14th November at the Taupiri Extended Mine.
- C. J. Minnett was lifting a truck and wrenched his shoulder on 22nd November on the surface at the Taupiri Extended Mine.

1893

Accidents: The accidents reported are as follows, none being of a very serious nature:-
- Joseph Yuracka was scalded by hot water from Tangye pump on the 28th January, 1893, in the Taupiri Reserve Mine.
- James Harris: Injured between buffer and truck on the 9th February, 1893, in Ralph's Taupiri Mine.
- John Guilliford was slightly injured by being struck on the back of the leg by a piece of stick on the 8th February, 1893, in Ralph's Taupiri Mine.
- David Taylor: Injury to finger on the 1st March, 1893, in the Kawakawa Mine.
- Albert Schlinker: Fracture of forefinger on the 18th March, 1893, in Ralph's Taupiri Mine.
- J. H. Evans: Injury to eye on the 21st April, 1893, in the Taupiri Reserve Mine.
- Timothy Callaghan: Injury to eye, by a blow from a piece of coal, on the 3rd November, 1893, in the Taupiri Extended Mine.
- Thomas Bell, junior: Injury to thumb on the 29th November, 1893, in the Taupiri Extended .

Taupire *(sic)* **Reserve.**—This mine has been steadily worked during the year. The ventilation is good. The provisions of the Act are complied with, and every care exercised. Twelve men were employed on the surface and 33 below ground. The output for the year was 13,223 tons.

1894

Waikato Mine.

This mine has again been steadily and carefully worked. The seam maintains a general thickness of 12ft.; the ventilation is good, and the requirements of the Act complied with. The output for the year was 11,278 tons. Eight men above and twenty-one men below are employed.

The work in this mine is carefully carried on. The ventilation, which was not always satisfactory, will be perfected when a fresh upcast shaft is sunk higher up the hill than the old upcast. The output for the year was 7,687 tons. Six men on surface and fifteen below were employed.

Ralph's Taupiri Mine.

This mine was worked until the 29th of May by the owners. mine was then leased for a period of five years, with right of an extension of term to ten years, to the Taupiri Reserve and the Taupiri Extended Companies, who took possession of the mine at that date and suspended all work; the pumps and machinery were since removed. The output to the 29th of May was 3,432 tons. Six men on surface and nineteen below were employed.

Taupiri Extended Mine.

(a) This mine continues to be carefully worked; the bords are safe and the ventilation good. The output was 26,025 tons. Ten men on surface and fifty men below were employed.

(b) Operations in this mine have been successfully carried on during the year. The workings have been extended towards the Waikato River, and the seam of col maintains its thickness, the bords being from 12ft. to 20ft. in height. The shaft and winding machinery is in good order. Safety appliances are used on the cages, and detaching-hooks on t rope. The ventilation is good, and the requirements of the Act observed. The output for the year was 30,426 tons. Eleven men above and fifty men below were employed.

Taupiri Reserve Mine.

(a) This mine has been worked chiefly to the westward of the extension of the incline. There has also been a considerable quantity of coal taken from the bords under the lake. The mine is well ventilated, and good cover left in the roof. The output for the year was 20,107 tons. Thirteen men on surface and thirty-two below were employed.

(b) Operations in this mine have been successfully carried on during the year. The workings have been extended towards the Waikato River, and the seam of col maintains its thickness, the bords being from 12ft. to 20ft. in height. The shaft and winding machinery is in good order. Safety appliances are used on the cages, and detaching-hooks on t rope. The ventilation is good, and the requirements of the Act observed. The output for the year was 30,426 tons. Eleven men above and fifty men below were employed.

Accidents:

No accident of a serious nature has been reported during the year. The following is a list of the accidents reported from the Taupiri Extended Mine & Taupiri Reserve Mine; the injured men were for a time unable to work :—
- James Holland: who was injured by a lump of coal falling on his foot, 10th February.
- William Crowder was shaken and bruised by fall of earth while at work in Taupiri Reserve Mine, 10th April
- Alfred Cadman: injured by a lump of coal falling on his toe, 24th April.
- Robert Colson: Jar to hand while bunking out, 28th May.
- Frederick Cox: Injury to hand while at work, 25th June.

- Thomas McQuillan: Injured by pick while at work, 4th July.
- Walter Waugh: Injured by a piece of coal striking his eye, 9th July.
- Daniel Wilson injured his back and private parts by slipping on a log at the pump in Taupiri Reserve Mine, 18th July
- Edward Burke: Injured by a wedge falling on his foot, 26th July.
- Thomas Russell: Jar to finger while at work, 10th August.
- William Paterson injured his leg while working in Taupiri Reserve Mine, 23rd August
- Thomas Griffiths (Waikato Mine): Bruise to arm, concussion of elbow-joint, through coming in contact with a skip while escaping from a fall of coal, 18th September.
- William Guilders: Struck by a piece of coal while at work, 24th October.
- Robert Robson: Going down an incline behind a skip, slipped on a stone and fell, 26th October.
- Charles Gorring Minnett: Rupture of hip while at work on bank, 12th November.
- James W. Wilson wounded his back while at work on the surface at Taupiri Reserve 19th December

1895

Waikato Mine: This mine has again been steadily and carefully worked. The seam maintains a general thickness of 12 feet; the ventilation is good, and the requirements of the Act cmplied with. The output for the year was 11,278 tons. Eight men above and twenty-one men below are employed.

Taupiri Extended Mine: Operations in this mine have been successfully carried on during the year. The workings have been extended towards the Waikato River and the seam of coal maintains its thickness, the bords being from 12ft to 20ft in height. The shaft and winding machinery is in good order. Safety appliances are used on the cages, and detaching hooks on the rope. The ventilation is good, and the requirements of the Act observed. The output for the year was 30,426 tons. Eleven men above and fifty men below were employed.

Taupiri Reserve Mine: The workings in this mine are carefully carried on. It was found that the extent of available coal to the westward is much greater than at first appeared, the dip of the seam becoming less as the heading was extended. The distance from the level above has increased, and the bords are of great length. The mine is well ventilated and the requirements of the Act complied with. The output of the year was 13,877 tons. Eleven men above and thirty-one men below were employed.

Accidents:
- Samuel Stockbridge and Thomas Hay were injured in the hands and arms by an accidental explosion in Taupiri Extended Mine, 24th January.
- John Dunn had his back injured by steel splinter in Taupiri Reserve Mine, 5th March.
- William Crowder was shaken and bruised by fall of earth while at work in Taupiri Reserve Mine, 10th April.
- Walter Waugh struck his foot with a pick in the Taupiri Extended Mine, 20th May,
- Robert Woolam was cut in the hand by piece of coal while at work in Taupiri Extended Mine.
- Hamilton McCaig cut his finger while cutting ti-tree on the surface at Waikato Mine, 6th July.
- G. E. Skellern injured his neck by falling on a barge while at work on the surface at Waikato Mine, 16th July.
- William Kerr injured his eye while at work in Taupiri Extended Mine, 23rd July.
- William Gurnich injured his hand when at work in Taupiri Extended Mine, 15th August,

1896

Waikato Mine.

Report (a) This mine has again been steadily worked. The distance of the further from the main adit necessitated the formation of a new jig to shorten the length of the road tilation is still satisfactory, though when the wind blows from a certain direction it become sluggish in the extreme workings to the rise. This will be improved by making a fresh upe in the locality. The output for the year was 12,444 tons.

Report (b) This mine is being steadily worked. During the year the southerly workings were carried to the outcrop, and all pillars in that direction will soon be taken out. portion of the coal has been derived from pillars, in the drawing of which great care is exercised, The chief portion of the coal has been derived from pillars, in the drawing of which great care is exercised and very little coal is lost.

The cost of timber and increased supervision adds materially. to the cost of working out the pillars.

No serious accident occurred during the year. The output for the year was 14,233 tons, being an increase of 1,789 tons compared with last year.

Taupiri Extended Mine

Report (a) The return of coal during the year was 28,988 tons, and shows an increase of 3,021 tons, compared with last year's yield, which amounted to 25,967 tons, instead of 40,160 tons as shown in report for 1895. The underground operations have been principally in the east and west districts.

The coal maintains its good quality, and the output could be doubled if trade increased. The workings are all in good order, and safe. The quantity of air passing through the workings is 20,000 cubic feet per minute, and the ventilation is good throughout.

Mr. Tattley, the manager, reports, "We are putting down a bore-hole about 10 chains in a north-westerly

direction from No. 2 shaft for the purpose of proving the strata to a depth of about 1,000 ft. below our present seam, which was passed through at 172 ft., and proved to be 20 ft. thick. Before cutting the main seam we passed through two seams of coal, 8 ft. and 5 ft. thick respectively. The bore is now down 210 ft."

Report (b) This mine is being worked steadily. The places towards the Waikato River are stopped, and the chief workings are towards and under the lake, inland lately ___?___ from the Government. The year's output amounted to 40,160 tons.

Taupiri Reserve Mine.

Report (a) Mining operations are here carefully carried on. It has necessary to continue the dip a further distance of 15 chains, it having been found cheap: one level of that length than to pursue the method formerly adopted, of making levels of when desiring to extend the dip into the seam. A new Tangye duplex pump, with a liftin, of 15,000 gallons per hour, has been purchased for the extension of the dip. The output for this amounted to 17,135 tons.

Report (b) The chief workings in this mine are under Lake Kimihia. The cover over the coal is of sufficient thickness to insure the safety of the mine. Large pillars are left, and after the first working nothing further will be done in removing any portion of the pillars, so that the probability of any subsidence is very remote.

The extension of the dip has been carried on, and new machinery placed in position to pump the water. Mr. Jonathan Harrison, the manager, gives the following description of the work: "During the year 1896 two new Tangye's steel boilers, of 20- horse power each, to work up to a pressure of 100 lb., have been erected, and a new brick chimney has been built.

"A new engine and pump, to lift 15,000 gallons of water an hour, have been placed in the mine, with 3 in. steel steam-pipes and 6 in. steel delivery-pipes. The new dip extension is now down 7 chains, and is still progressing in good coal. The dip of the coal continues at 8 ft. to 1 chain. This gives us 220 ft. of cover under the lake.

"The whole of the slits, returns, and old workings are regularly travelled and inspected. All the reports at the mine are kept up. The Mining Acts and special rules are posted at the colliery. The ventilation is taken weekly, and is very good. Hard clay is sent into the mine, and kept in each bord for shot-ramming. Bore-holes are regularly put up in the bords and levels."

The output of coal for the year was 18,660 tons, being an increase of 1,525 tons on last year's return.

Waikato Mine

This mine has again been steadily worked. The distance of the further seam from the main adit necessitated the formation of a new jig to shorten the length of the road. Titilation is still satisfactory, though when the wind blow from a certain direction it becomes (very) sluggish in the extreme workings to the rise. This will be improved by making a fresh ___?___ in the locality. The output for the year was 12,444 tons.

- John Dunn had his back injured by steel splinter in Taupiri Reserve Mine, 5th March, 1896

1897

Taupiry *(sic)* **Reserve Mine.**

The chief workings in this mine are under Lake Kimihia. The cover over the coal is of sufficient thickness to insure the safety of the mine. Large pillars are left, and after the first working nothing further will be done in removing any portion of the pillars, so that the probability of any subsidence is very remote. The extension of the dip has been carried on, and new machinery placed in position to pump the water.

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The new dip extension is now down 7 chains, and is still progressing in good coal. The dip of the coal continues at 8 ft.-to 1 chain. This gives us 220 ft. of cover under the lake. The whole of the slits, returns, and old workings are regularly travelled and inspected.

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1898

Waikato Colliery Company's Mine.

This mine has been steadily worked during the year. The operations in the mine have been confined to taking out pillars, and the manager has exercised great care for the safety of the men in taking out the coal, and a very small percentage of the coal has been lost.

Abundance of timber is kept at the mine ready for immediate use. The output of coal for the year was 13,317 tons, a decrease of 916 tons as compared with the previous year. Four slight accidents happened in the mine, but none of a serious character.

The Taupiri Reserve.

Report (a) The operations in this company's mine are directed in opening up the low level from the bottom of the incline shaft. The main level is being driven in a south-westerly direction under Lake Kimihia. The seam continues about its average thickness, and from 8 ft. to 16 ft. in height is being taken out in the level and bords.

The coal is softer in some of the bords than could be desired. Still, I am informed the seam at this level is opening up even more than was at first anticipated. The manager has been making considerable improvements

on the screens on the bank-head for screening the coal, which will be the means of effecting a great saving in labour, and by working the mine with economy he is sanguine of making the mine pay during the year that has been entered upon, if nothing unforeseen happens. The output of coal for the year 1898 was 15,874 tons, a slight decrease compared with the previous year.

The ventilation of the mine was good, and the mine safe. Eleven men were employed above ground and twenty-nine below. There were seven accidents happened in this company's mine in the early part of the year, but none of a serious character.

Report (b) This mine is being steadily worked, and a fair amount of coal is being produced. The workings in the mine are still confined to that part of the property under Lake Kimihia, but the principal works are directed from the new dip extension. Large pillars are left to keep the mine secure, and from 5 ft. to 8 ft. of tops are left on in the places to strengthen the roof. The output of coal for the year was 18,870 tons, an increase of 210 tons over the previous year. The ventilation is good, and the workings, to all appearance, safe; but, strange to say, no less than ten accidents were reported, most of them being of a slight nature.

Taupiri Extended Company's Mine.

This mine has been worked continuously during the year. The works in the early part of the year were confined to what are termed the east and west districts at No. 1 level, but the manager is directing the operations now in opening the mine at the dip or No. 2 level, near No. 2 shaft.

The levels are being vigorously pushed ahead, so that no time may be lost in opening up this portion of the mine, and, as the coal is of good quality at the dip, the prospects of the company look very encouraging. The output of coal for the year was 33,066 tons and 847 tons slack, an increase of 4,925 tons over the previous year. The ventilation is all that could be desired, and the mine is safe.

Two accidents happened in the mine: one was of a slight character; but the other, due to a fall of coal, proved fatal to a miner named William Crowder, but no blame could be attached to any one.

Taupiri Extended.

This company's mine has been steadily worked during the year, and although the output has not been as large as the previous year, yet the manager is sanguine that he year 1899 will be more prosperous, and is vigorously pushing on prospecting-works in the shape of boring on the property to the north of No. 2 shaft, and also extending a cross-cut drive at the low level for the purpose of opening up a section of coal to the north of the present workings, which as been proved by boring to contain a large quantity of coal that will pay to work.

Operations on the coal are proceeding as usual. The level and headings are taken in about 7 ft. high, and the bords from 16 ft. to 24 ft. in height, and, as the seam is from 20 ft. to 50 ft. in thickness, there is ample coal left in on the roof to keep the mine secure.

Bore-holes are also put up every 5 yards n the roof of the workings to ascertain if not less than 9 ft. of coal is left in on the roof. The ventilation in the mine is good, and on our last visit everything in connection with the mine was n good order, and safe. The output of coal for the year ending 1898 was 28,721 tons, being an increase of 5,192 tons compared with the previous year. There were seven accidents in the mine, one of which may be considered of a serious nature. There were seventy-seven men employed in and about the mine the first six months of the year, but this number has been reduced to ten men above ground and twenty-eight men below.

The Taupiri Reserve.

The operations in this company's mine are directed in opening up the level from the bottom of the incline shaft. The main level is being driven in a south–westerly direction under Lake Kimihia. The seam continues about its average thickness, and from 8 ft. to 16 ft. in height is being taken out in the level and bords. The coal is softer in some of the bords than could be desired. Still, I am informed the seam at this level is opening up even than was at first anticipated.

The manager has been making considerable improvements on screens on the bank-head for screening the coal, which will be the means of effecting a great saving in labour, and by working. the mine with economy he is sanguine of making the mine pay luring the year that has been entered upon, if nothing unforeseen happens.

The output of coal for year 1898 was 15,874 tons, a slight decrease compared with the previous year. The ventilation the mine was good, and the mine safe.

Eleven men were employed above ground and twenty- ine below. There were seven accidents happened in this company's mine in the early part of the rear, but none of a serious character.

Ralph's Taupiri Coal-mine.

This company resumed operations in their mine in the month of May last, and commenced to put coal on the market about the end of the following month, and for he six months ending the 31st December, 1898, succeeded in disposing of 12,725 tons of coal.

The operations in the mine are confined to working the coal in that portion of the company's property under the bed of the Waikato River. The shaft is only 190 ft. in depth, but as the seam is 65 ft. thick, and rom 7 ft. to 20 ft. of the coal from the bottom of the seam only is taken out, it leaves a great thickness of coal overhead, apart from the covering on the top of the coal; and the manager has been instructed to use every precaution, by putting bore-holes 9 ft. up into the roof every 5 yards in he headings and bords, to ascertain if the seam is thinning out, and also to prevent, if possible, not less than 9 ft. of coal being left overhead whilst working under the bed of the river.

The coal, of he kind, is of an excellent quality, and the prospects of the company are encouraging. The ventilation was good and the mine safe when last inspected. Ten men were employed above ground and forty men in the mine.

Accidents:

- James Evans met with a slight accident, getting his hand jarred. 5th January.
- Herbert Tribe cut his foot with an adze. 21st February.
- Thomas McQuillam received an injury to his leg by a piece of coal. 22nd February.
- Robert Muir had his eye injured by a piece of coal that flew from the pick.8th March.
- Jonathan Columbine had his side injured by falling on a truck.

1899

Taupiri Coal Company (Limited).

(E. S. Wight, manager).-Ralph's section:

During the past twelve months the main dip and headings have been extended in the direction of the newly acquired lease of coal under Lake Wahi. This work has been extended with reasonable dispatch, but owing to the uneven slope of the floor a large amount of expense has been incurred by straightening the main dip in order to get a uniform grade, as this will be the future main haulage road.

The work has been carried out with very great care, and when finished will give increased facilities in bringing the coal to the shaft. The greater part of the haulage is done by the endless-rope system, which works very well, and is a great when contrasted with the means previously used.

The portion of the seam worked varies from to 12 to 20 feet in height. The coal is of a very fine quality, and when broken out with ordinary care only only a limited amount of small coal is produced on account of its hardness, therefore the cost is minimum.

The mine has been inspected frequently, and although there has been a number of minor accidents in the shape of men receiving cuts and bruises, yet there have been no serious accidents, and as far as the working is concerned, there has been little cause for complaint.

A fan is used for purpose of ventilating the mine, and when driven at an ordinary rate of speed is capable of causing larger inrush of air than is required by the Coal-mines Act. The screening plant is working very satisfactorily, and has been a great saving by enabling the company to classify and deliver the coal into the railway-wagons at less cost than hitherto, and gives more satisfaction to consumers.

The output of coal for the year from this section totalled 88,856 tons, and 159 men were employed.

The Extended section:

Some extensive improvements have been effected during the year, and with completion of the screening plant, the erection of a new and first-class ventilation fan, a "Sirocco " ___?___ diameter and driven by a 54-horse power compound steam-engine, the extension of the main-dip headings, and other development-work, this section of the company's mine may be considered a valuable property.

For the year an average of ninety-three men were employed and 57,500 tons of coal produced. This is no mean output, but with the improved facilities a greater quantity could be delivered if required. The ventilation is good; the fan is causing 35,500 cubic feet of air to circulate though the workings, and with a slight improvement in the airways a much larger volume may be regulated.

An endless-rope haulage system was installed at this mine, driven by a pair of engines, __?__ diameter, 30 in. stroke, placed on the surface, connected with the mine by means of boreholes lined with iron pipes, through which the rope passes.

Taupiri Reserve

It appears that this section of the company's mine is kept as a reserve, so that the event of an increased demand for coal the company has this section to draw upon. The mine has been kept open and drained throughout the year, and an average of eleven men employed in keeping the workings and machinery in good order and producing 6,158 tons of coal, which is a sufficient quantity to comply with the terms of the lease.

The coal is of a good quality, and there is yet a large amount in sight. The mine when visited was found to be in good order, with a sufficient volume of air passing through the workings.

The total output for the year for the Taupiri coal-mines was 152,588 tons, being an increase of 33,967 over the preceding year, whilst dividends to the extent of £6,375 were paid.

Taupiri South (J Duncan, Manager)

The company has done but little work in this mine. Their Mention has been directed to that portion of the property near the top of the spur of the hill, where at one place opened out in the early part of the year 2,856 tons of coal was obtained; but as this place became exhausted another drive was put in the hill and 275 raised.

Since then a good deal of prospecting-work has been carried out, but not with as favourable results as anticipated, and it is said the company are likely to stop operations for the present. Five men were employed.

Taupiri West Coal-mining Company (Limited)

(R. McEwen, manager).

This is a new coal-mine, the property being situated on the western side of the Waikato River, and about a mile and a quarter from the Huntly Railway-station. The greater portion is on Crown lands held on lease from Government, and includes coal under Lake Rotoiti and the larger part of that under Lake Wahi, alltogether about 1,050 acres.

A considerable amount of prospecting has been done by the original syndicate who first took it up in the shape of boring, and who discovered two different seams of coal, the top seam being 10 ft. thick and the main seam about 24 ft. The prospects met with being very satisfactorily, the shareholders determined to sink a shaft, which has reached a depth of 180 ft., where was the seam was cut through and the coal found to be equal

to the best local production.

A small oil-engine used for the hoisting of the stuff broken in the shaft and for baling the water out to the depth named; but the prospects were such as to encourage the directors to obtain modern winding and pumping machinery, and a powerful winding-engine and plant have been purchased, and are being ……...

Taupiri Coal Company Ltd

In the early part of the year the Waikato, Taupiri Extended, Taupiri Reserve, and Ralph's Taupiri Coal Companies were reconstructed and formed into a company called the Taupiri Coal Company (Limited). The shareholders no doubt benefit by the change, a considerable saving having been effected, three mine-managers, three legal managers' offices, and other expenses connected with the working of three of the companies having been dispensed with, whilst the supply of coal to meet the demand has not been interrupted.

The new company at once stopped all work in the Waikato Mine, and operations in the Taupiri Reserve Mine were also stopped for a time, but this mine was again started for the purpose of producing a certain amount of coal to comply with the terms of the lease.

The work has been concentrated in obtaining coal to meet the demand from the Taupiri section and Ralph's Taupiri Mine, from which a large amount of good coal is forthcoming. The most important work in Ralph's Taupiri section has been the sinking of the dip a distance of 14 chains, from which two levels have been driven off, and beyond advancing the levels and headings in the Taupiri Extended section no new work of any importance has been carried out.

The seam of coal in the four sections of this company's mine varies from 16 ft. to 65 ft. in thickness, but, as the coal worked is either under the lakes or river, or in close proximity to them, large pillars have to be left in, more especially as the covering of the seam is mostly composed of running sand. As the bords are, as a rule, carried forward 16 ft. in width, and from 10 ft. to 24 ft. in height, a considerable quantity of coal is left in, and therefore a large area is traversed for a small quantity of coal in comparison to the thickness of the seam.

There have been 185 men employed in this company's mine, and the output of coal has been 68,929 tons, this being a decrease of 1,270 tons from the four mines last year.

1901

Taupiri Reserve

Work in the Taupiri Reserve section has been steadily carried on during the year, the operations being directed towards taking out the coal on the western side of the dip at No. 4 level and under Lake Kimihia.

The seam is divided near the centre by what is termed a “clod” (or band of stone), varying from 4 inches to 9 inches thick, and as the top portion is of inferior quality the bottom portion is generally taken out and the top left in, which makes an excellent roof. The portion worked varies from 10 ft to 16 ft and is of excellent quality.

When the mine was inspected in the month of June last, the manager’s attention was called to a soft portion of the roof where a fault had been driven through at No.2 level, and which was only being temporarily repaired with timber; but, as this was under the lake, it was pointed out to him that it would have to be made more secure, and this portion of the level is now being filled and rammed tightly in with clay, &c., from the surface.

At a subsequent inspection the workings were safe, but the ventilation was not as good as could be desired. An average of fifty-five men have been employed, and the output of coal was 18,621 tons.

Taupiri Extended

The work for the greater part of the year was confined to getting coal from the various bords which were in progress at the end of last year, but latterly the operations have been directed in driving a healing and dip on the western side of No. 2 shaft for the purpose.

So far as developments have gone, the coal has proved fully as good as anticipated. There are only a few men employed here now, but the average number of men employed has been forty-seven, and the output of coal was 21,742 tons.

1907

Taupiri Coal Mines Ltd

Ralph's Section (E. S. Wight, manager).

The company has not done any development work of importance, such as extending the main south-west dip headings to intersect the property underlying Lake Wahi, acquired some three years ago by this company. To some extent this may be attributed to the fact that great attention is being devoted to grading the work already done, so as to give a uniform grade for the haulage-way.

With a view to proving the thickness of the seam in the new property several bore-holes were sunk, but the results have not been made known. A new travelling -way, separate from the haulage-way in the south-west section, has been constructed, and it is a decided advantage over the old one, being more direct and far safer.

Several inspections of the mine were made at different intervals, and the ventilation was found to be all that could be desired. Everything else, with the one exception, gave entire satisfaction.

In January the mine-manager reported a creep in the pillar district immediately beneath the Waikato River, and that he considered it so serious that he had withdrawn the workmen. Your Inspectors visited the mine a few days later, and, in company with the mine officials and two representatives from the miners' union, carefully examined the pillar section, and found that the pillars were considerably damaged, in their opinion, by cold air being circulated through the section after it had been closed off for some time and become heated.

our Inspectors believed that there was no immediate danger, and advised that work might be

resumed, but that the company should take such measures as would adequately protect the workmen against a serious disaster occurring. The workmen were very much alarmed, no doubt through the manager withdrawing all workmen from the mine when the crushing of the pillars was observed, which action was approved by the Inspectors as a wise precaution.

After a little hesitation on the part of the men, work was resumed at the mine. The precautionary measures subsequently taken for the future work was resumed at the mine and did not meet with our approval, and, as a result, the matter was referred to arbitration, as provided for in sections 55 and 56 of "The Coal-mines Act, 1905." The Court's decision, as reported to the Department, relieves the company from compulsorily sinking another shaft, but, to guard against a disaster, pillars should be strengthened.

The output for the year reached 97,878 tons, and 183 men were employed.

The Extended section (Wm. Wood, manager):

The work in the mine is confined to the dip section, west of the shaft, and underlying the Waikato River. The development work headings have been pushed on, and a considerable area of coal opened out. The haulage roads and machinery connected therewith have been much improved during the year, and with an up-to-date screening plant the mine should maintain a modest output of coal, which is of good quality, and has a ready sale at Auckland and Waihi for household and steam purposes.

Since the installation of improved furnaces and fire-grates the small coal which was formerly thrown away as waste is now purchased by the mining companies.

For the year slightly over 9,000 tons of small coal has been sold from this mine alone. Several visits of inspection were made and it was found that great care was being exercised for the safety of the men. The ventilation was good, the newly erected Sirocco fan giving complete satisfaction. In this section of the company's property 152 men were employed.

Taupiri Reserve (Wm. Wood, manager). Report 1

This section, like the Ralph's and Extended sections, is underlying a water area, the surface overlying the coal being covered by Lake Kimihia. The mine is entered by an incline drive of considerable length to the deep levels, and is worked on the Great care has been taken in opening up the mine, and strong pillars bord and pillar system also. of coal are left in to support the overlying strata and prevent the flooding of the mine.

The coal is of a good quality, and the seam is very thick. This mine has been continuously worked for twenty years, being the oldest mine in the Waikato district, and has produced over 300,000 tons of coal. The mine is a comparatively dry one, and is worked at little cost, no expensive machinery being required.

Very few men are employed in this section, since it is reserved to meet any sudden demand that may be made. The mine is in good order, and well ventilated. demand that may be made.

Taupiri Reserve

(Wm. Wood, manager). This section, like the Ralph's and Extended sections, is underlying a water area, the surface overlying the coal being covered by Lake Kimihia. The mine is entered by an incline drive of considerable length to the deep levels, and is worked on the bord and pillar system also. Great care has been taken in opening up the mine, and strong pillars of coal are left in to support the overlying strata and prevent the flooding of the mine. The coal is of a good quality, and the seam is very thick.

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SUSPENSION OF WORK.

SUPPOSED SPONTANEOUS COMBUSTION.

In last Friday's Auckland Herald appeared the following telegram from its Huntly correspondent :—"Though such extreme reticence is being observed that it is almost impossible to obtain accurate information, it appears an undoubted fact that the Kimihia mine, which is held on lease from the Government and the Auckland University College Council by the Taupiri Mines, Limited, is on fire. It is supposed that the accumulation of slack and coal debris from the roof becoming overheated caused spontaneous combustion. The fire commenced some eight days ago, and the men were at once withdrawn. All work except that necessary to choke the fire has been suspended. It is stated that the fire originated in the old workings at Kimihia Lake, and that a considerable portion of the roof has collapsed. Several experienced miners are of opinion that it will be impossible to work the mine again. For some time past very few men have been engaged there. Mr. Boyd Bennie, the Government inspector of mines, is said to have visited the mine last week."

Newspaper clippings

Publication dates unknown

The trouble arose over a funeral. Wishing to attend it, some of the men asked for permission to commence work that day at 7 a.m. and knock off at 3 p.m. Not only did the manager accede to this, but he went a step further to meet the men, making the hour for knocking off 2 p.m. Then, certain of the miners at Kimihia, of whom the President of the Union happened to be one, stepped in. They declined to recognise the concession, and also took it upon themselves to decide that the men in the Kimihia mine would not work after noon that day, no request being made for any further concession. This was a challenge, and one that the manager was not slow to accept. He posted a notice on the Kimihia mine warning the miners that anyone knocking off work before the usual hour would render himself liable to fourteen days' notice.

form the issue of where the rights of the workmen and the rights of the employers begin. The trend of recent legislation has been in the direction of convincing us that the employers have no rights at all. However, there are still in the colony some people old-fashioned enough to believe that the employer who pays the wages is entitled to some of the rights, and to this obsolete class of wage-distributors Messrs E. W. Alison and W. Ralph evidently belong. Certainly they have not left the Huntly coal-miners much room for doubt concerning the mettle they are made of.

But the *Star*, with a characteristic contempt for the rights of the employer, "ventures to think that the management and the directors have acted with great lack of discrimination and judgment throughout." Also, the *Star* says:—"The request made by the men was perfectly just and natural." There was, however, no request in question. It is simply a matter of obedience or otherwise. The men knew the penalty of disobedience, and having disobeyed, they cannot honestly grumble at the penalty. Neither can any sophistry of the *Star* justify the audacity of any set of men, unionists or otherwise, in fixing their own hours in defiance of their employers.

Of course, the men obeyed their own leaders and disregarded the manager's notice. Consequently, Messrs Alison and Ralph visited the district, and, as a result of their enquiries, six miners were paid off: Messrs R. Grundy (president of the Huntly Miners' Union), John Hughes (ex-secretary of the Miners' Union), John McCaig, Robert Waugh, George Johnson, and Thomas Johnson. The men were paid off on coming out of the mine, and were offered fourteen days' pay in lieu of notice, being asked at the same time to sign a receipt terminating their engagement with the company. Thus the matter stands. The manager warned the men that absence from duty would be visited with dismissal. The men absented themselves, and were dismissed. It seems to us there is nothing more to say.

On May 20th, 1882 the following article appeared in the Waikato Times:

It is reported that Mr Foote's coal mine, Miranda, is for sale. Several Auckland gentlemen, amongst them Messrs Fraser and Tinne, Brissendon and Errington, 0. E., have during the last few days inspected the property and extended their visit to the Huntly mines, for the purpose, presumably of forming an estimate as to how long the supply from this source is likely to last, rather a difficult problem, as coal has been found near the Kimihia Lake, and at other places in the immediate neighbourhood.

In 1885 a license to mine was approved as indicated in this Waikato Times report of 24th October 1885:

At Thursday's meeting of the Auckland Crown Lands Board, the Assistant Surveyor-General forwarded a report on the application of Henry Byron for a license of mine for coal under Lake Kimihia, near Huntly.

It was agreed to grant a license for twenty-one years; rental determined by the chairman and the Assistant Surveyor-General at any price not less than 6d, and not to exceed 1/- per ton royalty.

Kimihia Mine was opened in the mid 1880's with John Ord as manager. At the time it was the biggest mine in the Waikato.

The discovery of a substantial seam of coal at Kimihia was confirmed in a media statement in the Waikato Times, 17th February 1887:

NEW SEAM IN THE TAUPIRI COMPANY S MINE

A correspondent writing to the Herald from Huntly, says:

"The Taupiri Coal Company have just bottomed the coal in their new shaft. The coal is excellent, and equal to anything yet found on this property. The seam is 40 feet in thickness. This means years of work for the Company, and prosperity for Huntly.

"Mr Murphy is getting well ahead with the branch line to the Taupiri Coal Reserve Company's mine, and the tenders are, I believe, to be invited next week for the driving of an adit to open the mine.

"The directors - Messrs E. Mitchelson and R. W. Hammond - were here last week and inspected the work already done."

An advertisement for tenders was placed in the Waikato Times, 26th March 1887:

TO MINERS AND OTHERS

TENDERS are hereby invited for DRIVING a DIP TUNNEL at TAUPIRI RESERVE COLLIERY.

Plans and specifications can be seen on the ground at Lake Kimihia.

Time for receiving tenders till Wednesday, 5 p.m., March 30th, 1887.

J. ORD,

Mine Manager

March 24th, 1887

Later the mine was to be declared unsafe and it was closed down. The miners all transferred to the "Extended" mine, the pithead of which stood where the Huntly Memorial Hall now stands just off the Hakanoa Lake Domain.

Shortly after the Waikato mines had been combined as Taupiri Coalmines Ltd, a Royal Commission of Inquiry into the working conditions in the Waikato Coalmines was set up. They sat in December 1900 and January 1901, in the different centres. A report on the Taupiri Coalmines Ltd stated:

Situation: On Waikato River at Huntly, 65 miles south of Auckland.

Area: 2,000 acres.

Capital: £85,000 ($190,000) in 85,000 shares of £1 ($2) each. 72,000 are paid up, 13,000 are unallotted. This nominal capital really represents the interests of the amalgamated companies in the property and does not represent cash.

Expenditure: £20,000 written down to £9,000 at Extended Mine. £18,000 spent at the other two mines.

Tenure: Lease from various owners.

Quality of Coal: Very good household coal - said to be fair for steam but cannot compete with waterborne coal from Whangarei mines.

Output: 78,000 tons a year.

Total output: $,026,000 tons *(sic).*

Average cost to company: 5 shillings and eight pence (58cents).

Wages earned: £2 5 shillings a fortnight ($4.50) or 9 shillings a day (90 cents) when working. There has been much broken time. By the ton, the men are paid 2 shillings 9 pence (28 cents) for household and 2 shillings 3 pence (23 cents) for steam. Price obtained 7 shillings and 3 pence (73 cents).

Workers of the Kimihia Mine in the 1980s, Many of whom also worked the land to break in their farms. There was at least one farmer, Mr Hall, who worked his shifts in the mine then trekked over the hills to Ngaruawahia for a weekend of “socializing”.

Number of men employed: 180.

Transit: By rail to Auckland costing 6 shillings 6 pence (65 cents) a ton.

Mine Management: The ventilation in the past has been deficient and not sufficient strictness in observing the requirements of the Act has always been shown. There is every prospect of an immediate improvement in this respect and also in providing two known means of egress from the mine. The ventilation in the Kimihia Mine is the most seriously deficient and the methods heretofore adopted have been unsatisfactory and must be altered.

General observations: There were originally four companies at work in Huntly. The Taupiri Extended was the principal mine and opened their mine about 25 years ago (N.B. this was the original Ralph's Taupiri mine registered 1874 of which the Extended was just that - an extension, but registered as the Taupiri Extended Coal Company in 1882). The Taupiri Extended leased their first mine from Mr R Ralph. This ran out 10 years ago (i.e. the old Ralph mine) and they then opened the present mine on 150 acres of freehold adjoining the old mine.

"Shortly after that Messrs Ralph and Biss sank a shaft near the river and opened the present mine (i.e. Ralph mine in the Main Street). There was not sufficient trade for four mines, and the Taupiri Extended and Taupiri Reserve leased Ralph's mine at £800 a year and kept it closed.

"The four companies have now combined into one company. The Extended mine and the Waikato mine (across the river) are doing very little; the chief work is being done in the Kimihia and Ralph Mines."

The members of the Commission were William Reeve Haselden, Stipendiary Magistrate; Joseph Proud, Mine Manager; John Lomas, inspector.

It is interesting to note that there has been a pithead at Kimihia for nearly 100 years; first the Taupiri Reserve Mine 1887-1910: then by various small private concerns of which the most durable was Taupiri East Coal Mines owned by the Holland family. In the 1940's a decision was made to opencast and the State opencast operated until the late 1970s, the lake being drained by a specially built dredge.

It was then decided to win the remaining coal under Huntly by underground mining and the East Mine was built, whose headquarters are on what was the bed of Kimihia Lake.

And why wasn't the coal won before? Consider the Inspector's report presented to the House of Representatives in 1925 for the year 1924:

"Taupiri Extended Colliery - On 11th April 1924, coal production at this colliery was suspended after being in continuous operation for a period of thirty-five years. A total output of 3,101,604 tons of superior brown coal was obtained solely from the bords and headings of the first working. On 27th June, the West District, embracing Nos 2, 3, 4, 5 and 6 sections was sealed off with substantial brick stoppings at a point below the entrance to No. 1 section.

"These stopping were erected to isolate the disturbed crushed and fire affected sections from the No. 1 development dip headings, which were at that time being vigorously extended to develop a large unworked area between the west and north sections. A system of hydraulic end filling of the bords in the northern section had been adopted by the company as a means to arrest a creeping movement already commenced in No. 5 section north, and to subsequently provide for the practicable working of the top seam and future extraction of pillars. Operations were in progress to flush the bords with sand when an unlocated fire broke out on the 25th July supposedly to have originated in the bords at No. 5 section where the crushing movement had commenced.

"The volume of smoke issuing from the fire precluded all efforts to attack and suppress the outbreak or surround it with stoppings in a position that would leave an area suitable for extensive stopping operations. Consequently, the management decided to short-circuit the ventilation from the affected part and withdraw the skips, winches and pumps to the surface. On the 29th August closefitting scaffolds were fitted in the downcast and upcast shafts at a point 8 feet (2.4 meters) from the surface, and sand fillings on top of the platforms effectively sealed off the mine workings thus temporarily rendering inaccessible the two thick workable seams of brown coal existing under the Crown and privately owned lands in the vicinity of the shafts.

"The occurrence of numerous fires and disturbances due to the crushing of the pillars caused serious monetary loss to the mine owners, and in the interest of those concerned it is to be hoped that other approaches will be considered in the near future for the development of this extensive coalfield."

It wasn't in the near future, it was nearly 50 years before the seams were mined again as the East (Kimihia) Mine.

Mr Hall, father of first-day enrollees Ernie and Archie, worked six days a week at the mine and walked over the old scrub track over the hills to Taupiri and on to Ngaruawahia to break in his farm on Saturday evenings to tramp back on Sunday evenings.

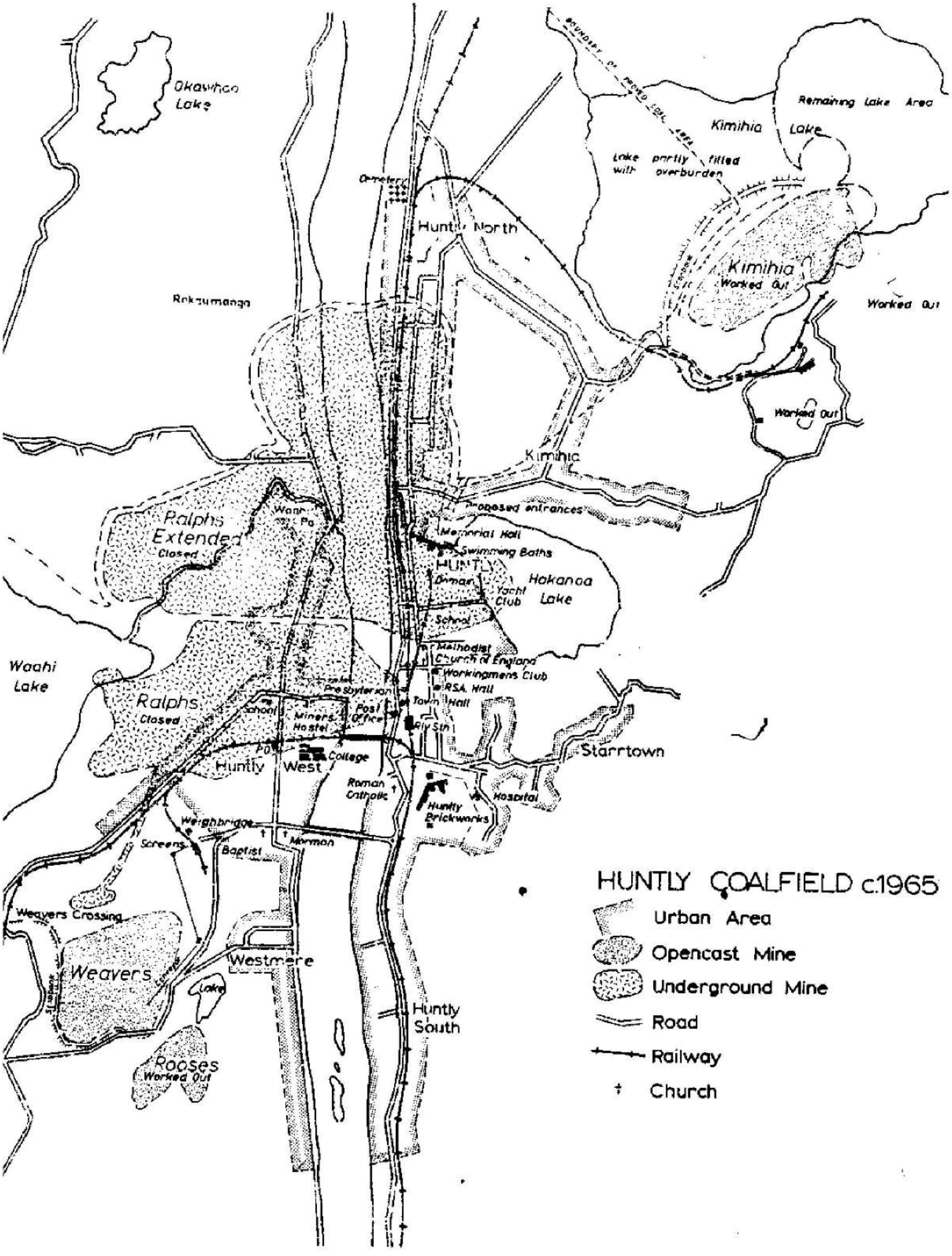
In the 1890's coal was discovered in large amounts on the eastern side of the lake and later it was discovered that the seam ran under the lake itself. In 1895 the underground miners drilled an exploratory shaft down through the island in the lake. This island no longer exists as so much spoil was dumped around it from the mine that is became surrounded by dry land.

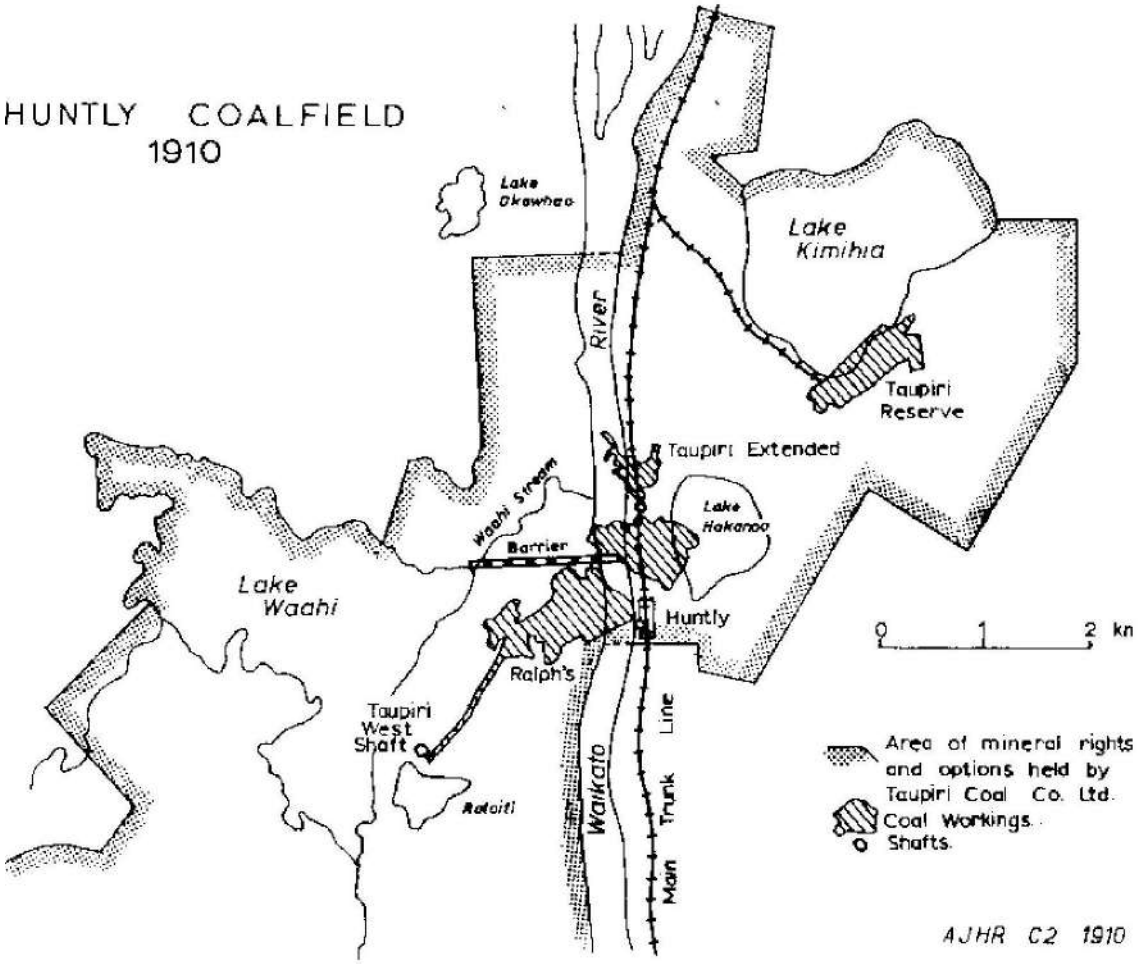
The Taupiri Coal Mining Company started mining and drove shafts into the hills. Lucy, a Clydesdale horse, was remembered as the perfect pulling horse, pulling 8-10 trucks at a time from the mine to Kimihia Station. The mine was successful for many years but eventually they closed the mine and the workings were taken over by the Holland family who were farmers in the district. Mining continued in a small way with one of the Holland family still at the mine in the mid-1950's.

At the turn of the century the population of Huntly was around 1000. Most of the men still worked in the mines, who, since the previous year, had been absorbed by the Taupiri Reserve (Kimihia) and the Waikato, on the west side of the river.

Looking across the lake from the vicinity of Russell Road at the early mining works on the Kimihia Lake southern shoreline.

Plan of the Taupiri Reserve coal mine drawn on linen and supplied courtesy of Neil Fowke, Strategic Geologist of Solid Energy. Note that the map is oriented with North at the bottom, showing the drives and shafts reaching down under the Kimihia Lake bed.


Okawhao Lake
Remaining Lake Area
Kimihia Lake
Lake partly filled with overburden
Huntly North
Kimihia Worked Out
Rakaumanga
Worked Out
Worked Out
Kimihia
Ralphs Extended Closed
Proposed entrances
Memorial Hall
Swimming Baths
HUNTLY
Hakanoa Lake
Yacht Club
School
Waahi Lake
Methodist
Church of England
Workingmens Club
R.S.A. Hall
Town Hall
Ralphs Closed
Miners Hostel
Post Office
College
Huntly West
Starrtown
Roman Catholic
Hospital
Huntly Brickworks
Weighbridge
Screens
Baptist
Mormon
Weavers Crossing
Weavers
Westmere
Lake
Huntly South
Rooses Worked Out
HUNTLY COALFIELD c.1965
Urban Area
Opencast Mine
Underground Mine
Road
Railway
Church

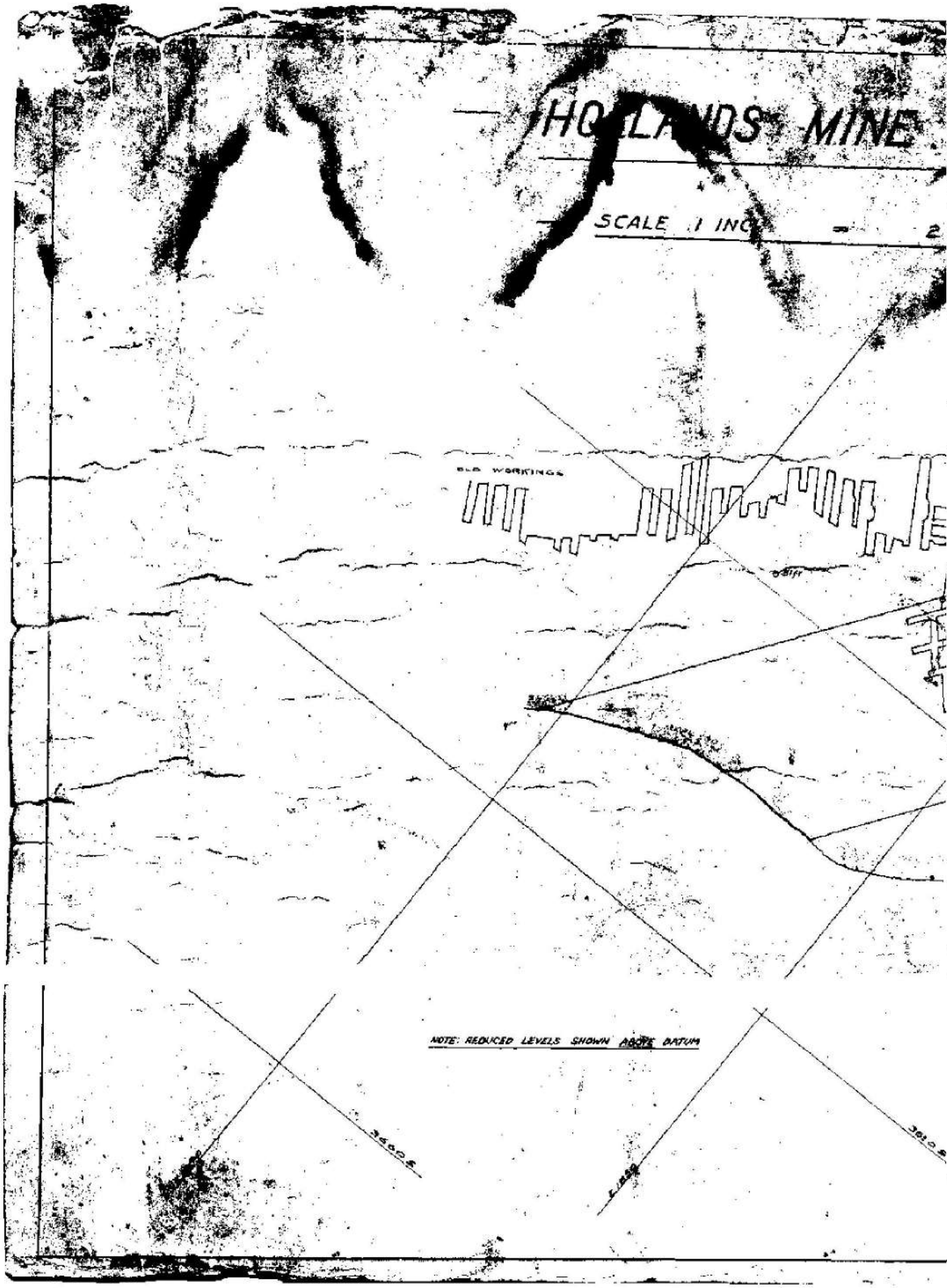


Huntly coal situation, 1910.

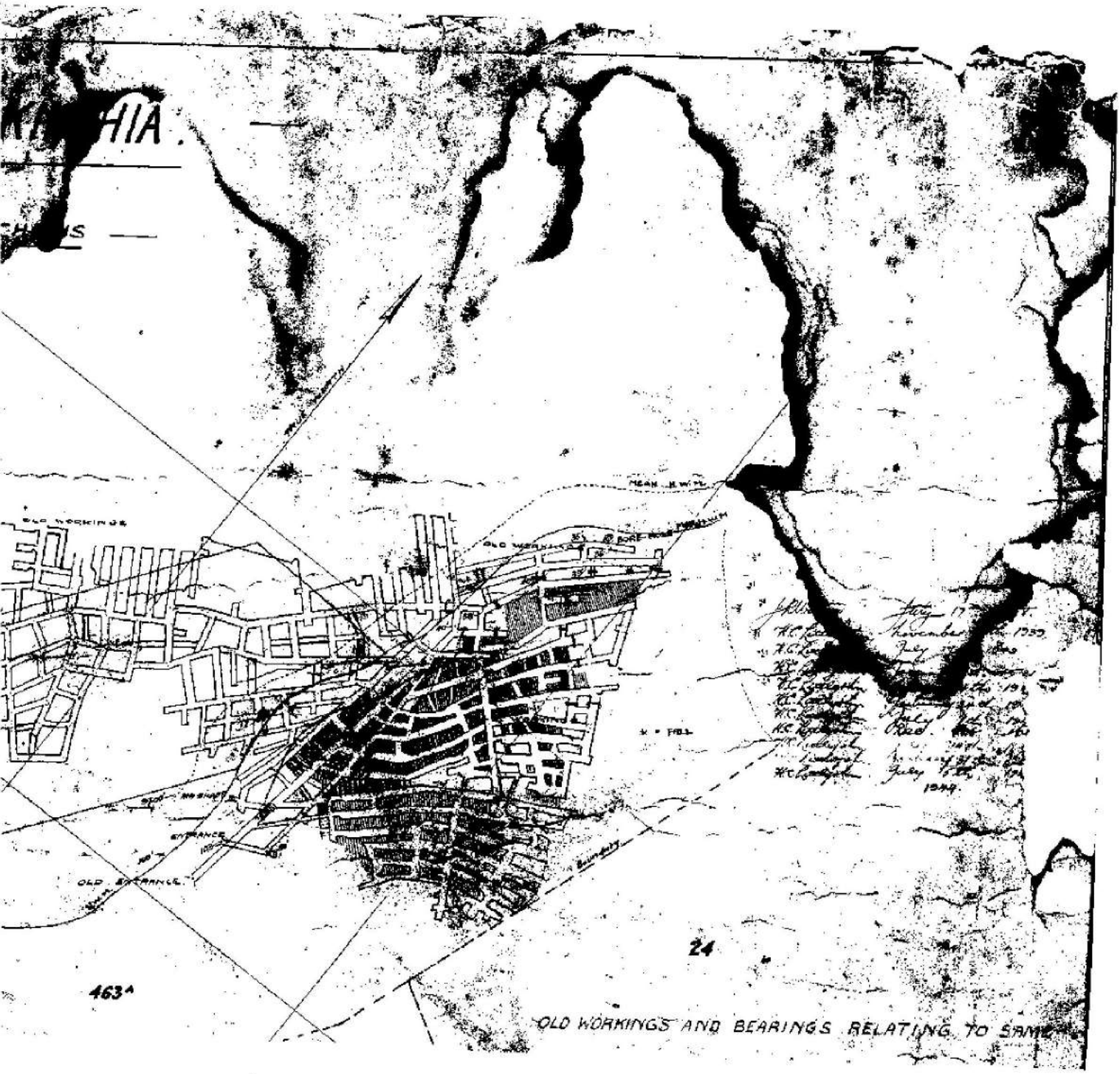
The Kimihia Branch Line

The longer arm of the branch line (heading east) went out to the original pithead. The shorter arm was constructed when the opencast pit was opened further to the west of the underground pithead. The longer section of the track was uplifted. Several small buildings and a water tank are in the sketch.

The "X" indicates the location of Kimihia School.



Partial drawing of the Holland's mine (on linen).
The mine ceased operations on 16th October 1944 and the entrance was sealed on the 20th of the same month.



OLD WORKINGS AND BEARINGS RELATING TO SAME

23A

NEW WORKINGS SURVEYED AND SHEWN

CONNECTED WITH SAME

Mining Board 16/10/44

Entrance sealed 20/10/44

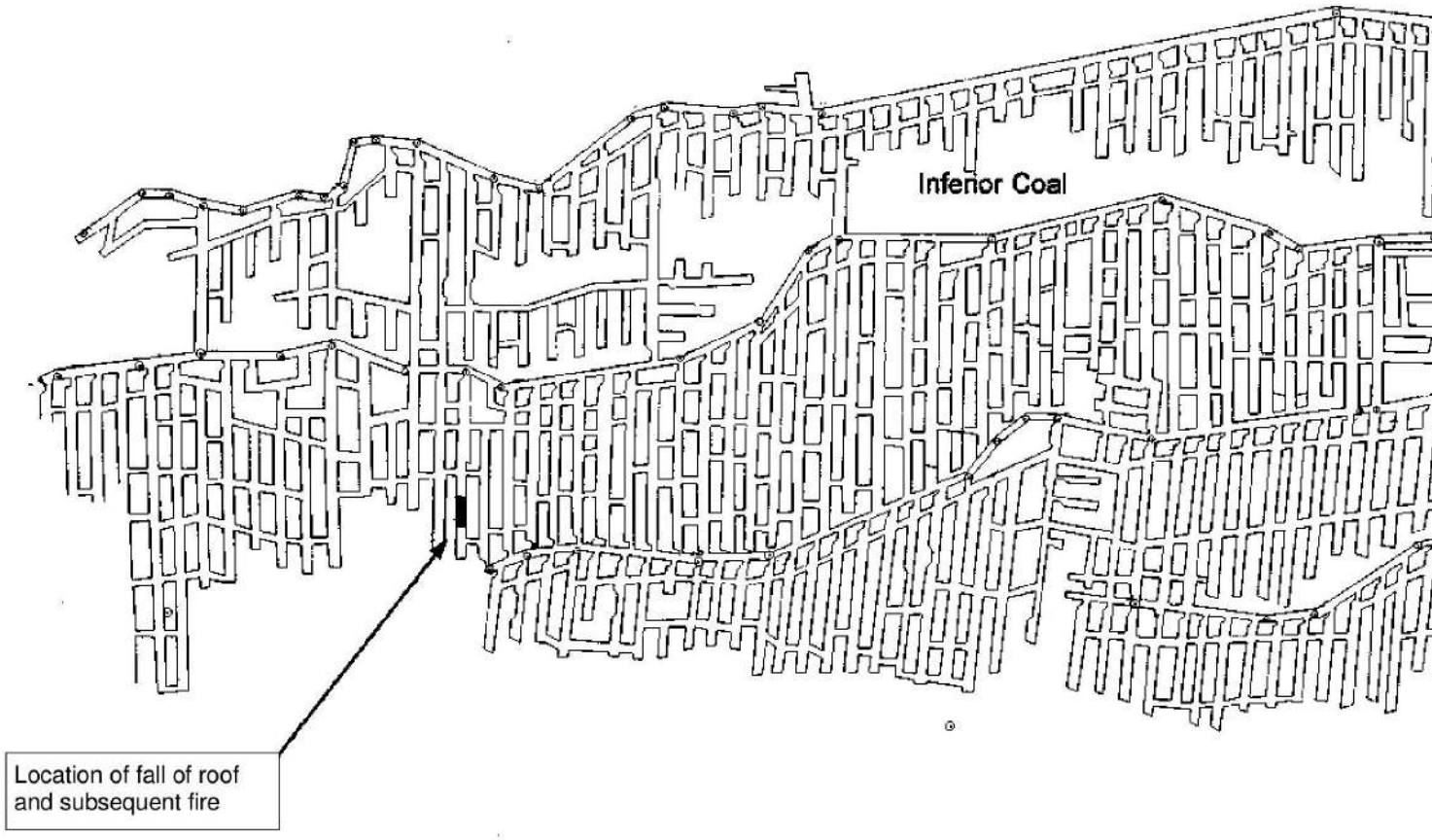
P.M. Sutton

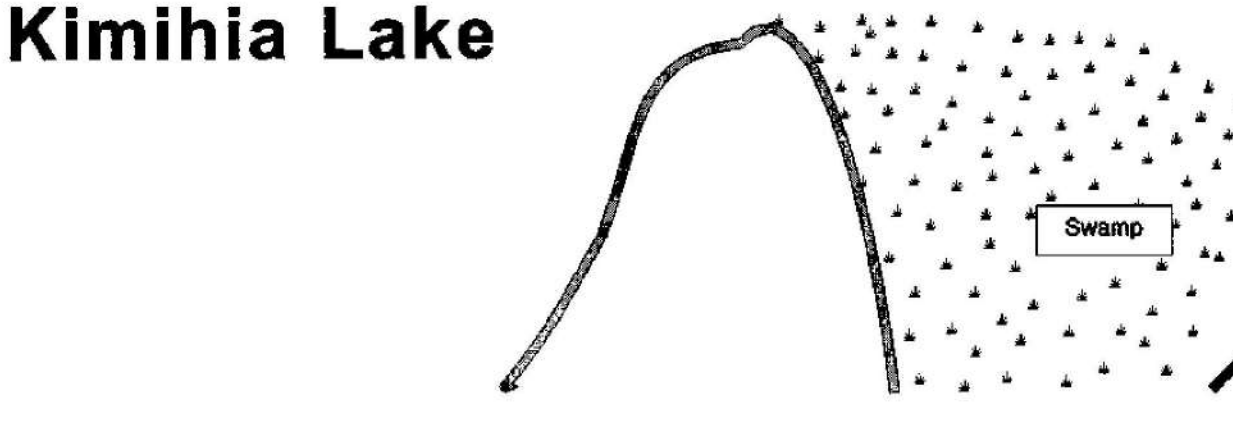
Inspector of Collieries

TAUPIRI RESER
COLLIERY

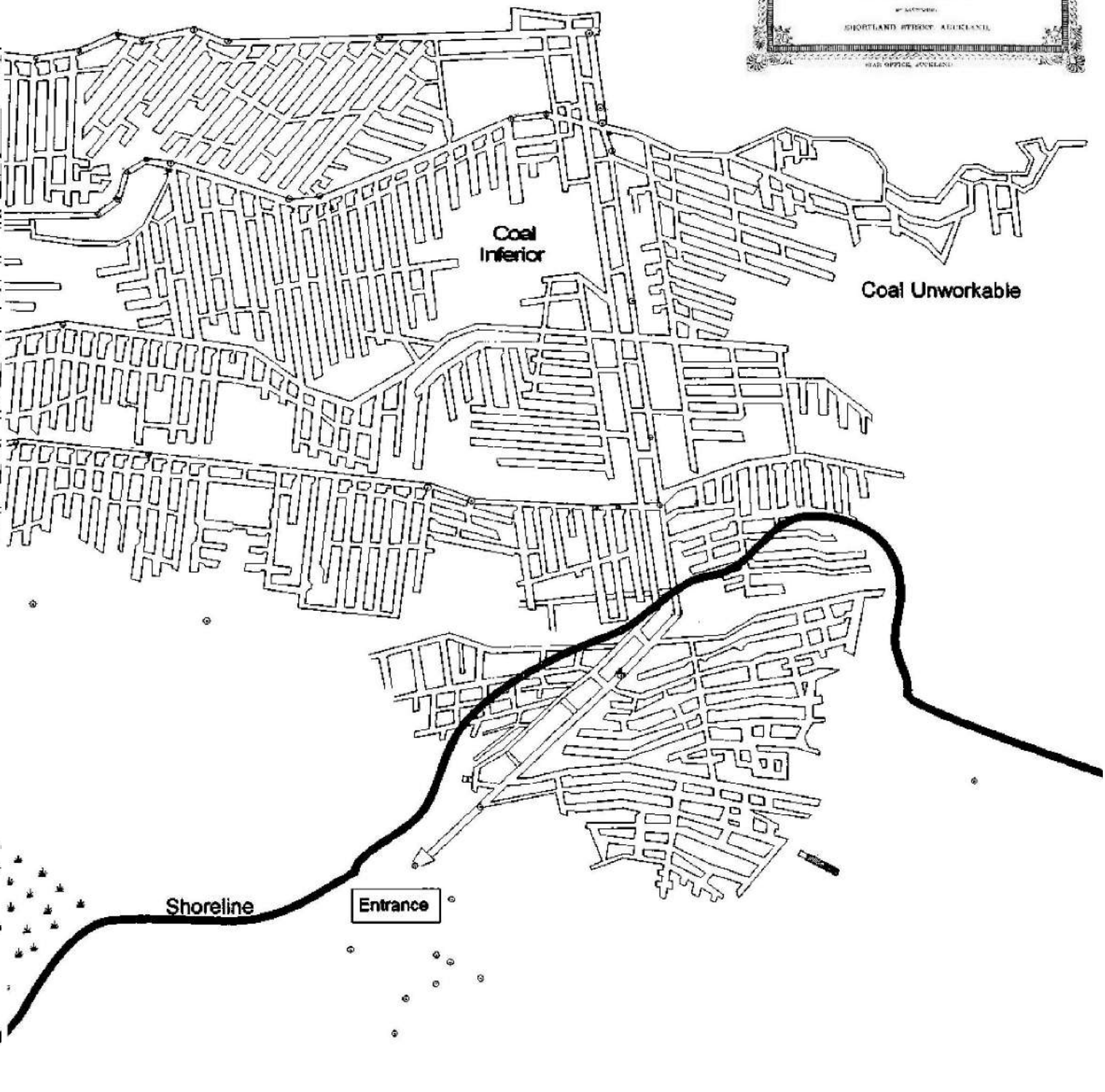
A tracing of the original and complete mine workings of the Kimihia underground mine taken from the original plans supplied by Solid Energy, Huntly.

The small circles with a dot in their centres are bore locations.





RVE



"THE COMPANIES ACT, 1882."

COMPANY LIMITED BY SHARES.

MEMORANDUM

AND

ARTICLES OF ASSOCIATION

OF THE

Taupiri Reserve Colliery Co

LIMITED.

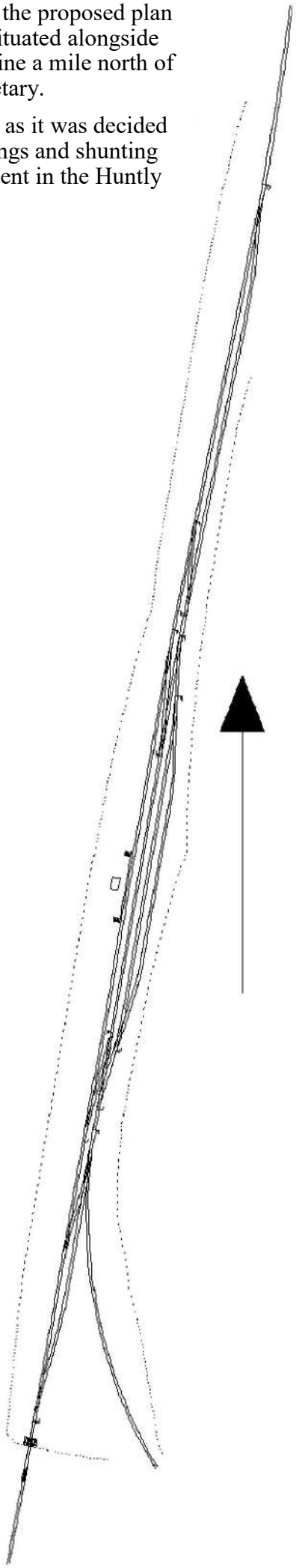
JACKSON & RUSSELL,

SHORTLAND STREET, AUCKLAND.

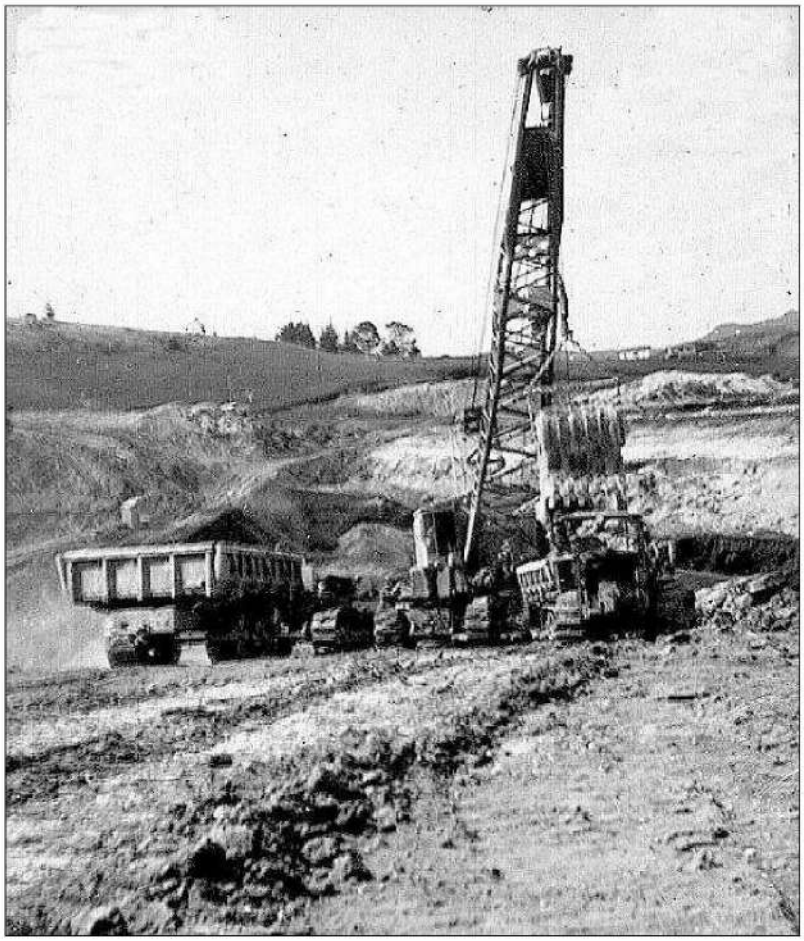
HEAD OFFICE, AUCKLAND.

This diagram was the proposed plan for sidings to be situated alongside the Main Trunk Line a mile north of the Kimihia Cemetary.

It was never built, as it was decided to expand the sidings and shunting yards already present in the Huntly township.

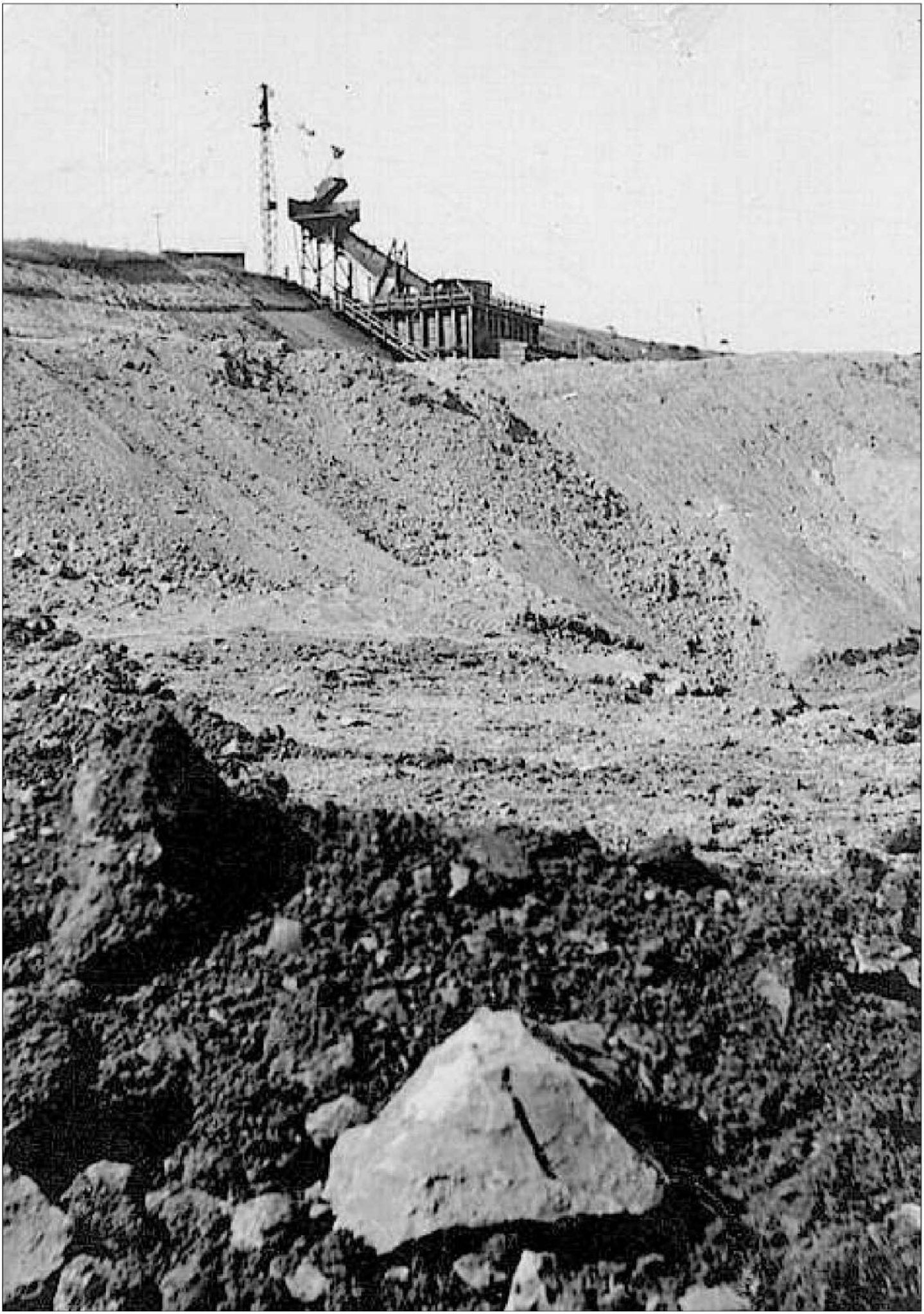


The side-tipping action of an Athey wagon.

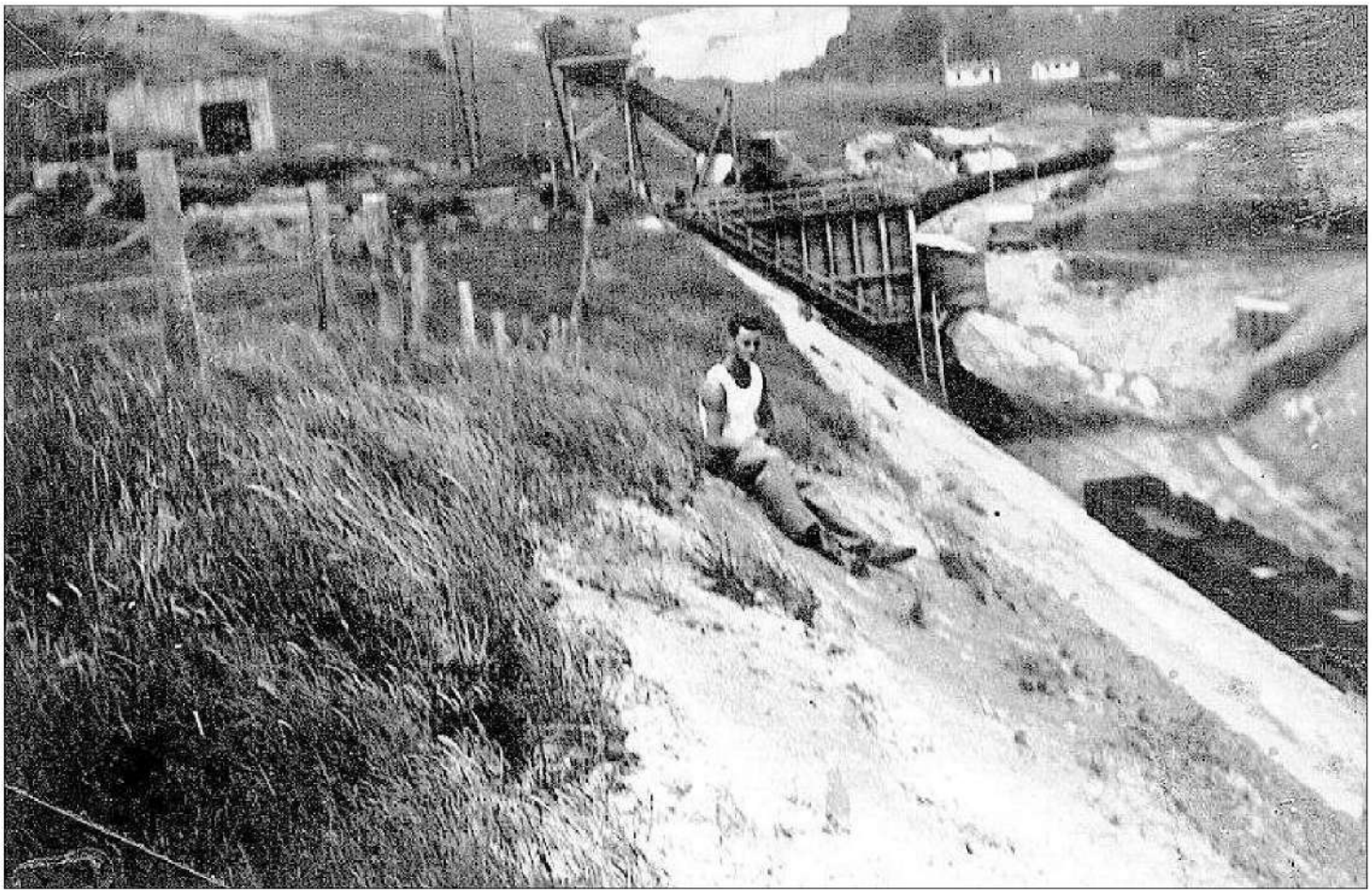


Tractor-pulled Athey wagons line up for overburden removal.

The Athey wagons were used until the very early 1950s, until they were replaced by self-loading carry-alls shown at the bottom of the page.



The “Flying Fox” was put to use once the over-burden had been stripped. The coal was scooped from a trench in the seam and tipped into a hopper that straddled the railway line. Bulldozers working on the seam kept the trench full of coal. At intervals the anchor point of the “Flying Fox” was moved to access the coal.



"Flying Fox" operator Harry MacDonald taking a break. The photo looks towards the West with the pit to the right. The Holland farmland is to the left. The "Flying Fox" was soon to be replaced with conveyors when the pit moved to the West and Harry "graduated" to the newly assembled electric 120 Bucyrus Erie (to be later nicknamed the "120-B". This new machine was assembled on site using the unreadable Russian instructions - a trial and error process.

With the 12-B removing overburden in the background, the Flying Fox continued to operate. The steel hawser can be seen running across the picture above the workman. The volume of earth that needed removal can be seen here - all of which was dumped into the existing Kimihia Lake over the coffer dam in the background.

The original Perry's farmhouse was converted for use as an office by the mining contractor Downer & Company.

In 1943 Bill Scurr, one of the miners, suggested that the level of Lake Kimihia be lowered to increase production from the mine. Later he had the satisfaction of seeing the Lake and the Mine developed according to his ideas.

In 1944 the New Zealand State Coal Mines took over and, after inspection, decided to close the underground workings and use opencast methods. Downer & Co. were contracted to work the mine.

Coal bins (hoppers) were built on the side of the hill with the railway line running under them for easy loading of carriages. At this early stage the coal was recovered from the pit area and brought to the bins by means of a 'flying fox' pulley system. A tall tower, placed above and behind the bins, supported the flying fox.

The control house for the unit was just above the bins. The 'fox worked on a grab method similar to the dragline style of the 120-B.

The company built a row of seven houses just above the last railway cutting before the bins and provided a good third to half of an acre for each house. This allowed for large back lawns and gardens.

Initially two areas in the hills were worked and Athey Wagons and 'carry-alls' were used to remove the overburden. It was decided to drain an area in the South-eastern section of the lake and a stop-bank (coffer dam) was built by the 'carry-alls' using filling from the hills.

On completion of the stop-bank the enclosed area was drained by large pumps and stripping commenced through the use of wagons drawn by tractors. These wagons were loaded by a large electrically driven excavator called the 120 Bucyrus Erie, later to be nicknamed the 120-B.

During this stage of the operation the 120-B was used as a drag-line. Later the boom was removed and a shovel unit attached.

A coal train serviced the bins twice a day out ofHuntly. Large quantities of coal were being mined by a staff of only 17 men, far fewer than required by an underground system.

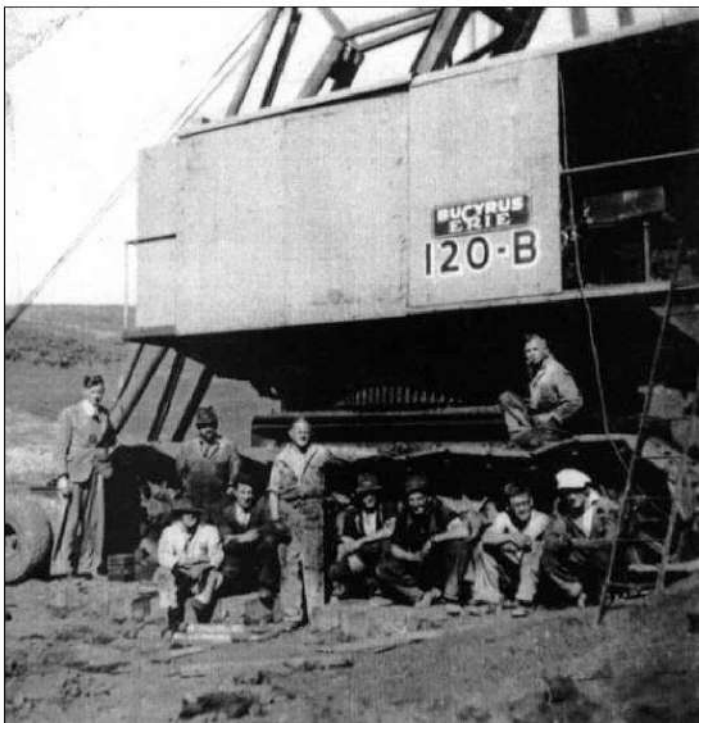
The mine constructed a boring plant which was erected on a barge and testing was conducted on areas in the south-western section of the lake to quantify the amount and quality of coal under that section of water.

The hard fireclay in the exposed pit was taken and dumped beyond the stop-bank, forcing the once-large lake to retreat to the north and now it is only a shadow of its former self.

Drainage from the hills to the south of the lake was through a canal that was dug parallel to the railway line as the water could not now find the lake it once did.

Once the thick sub-bituminous seam was revealed the coal was blasted and taken out of the ever-growing put via a conveyor belt that could be lengthened or shortened according to the location of the coal face. The many galleries of the underground workings were exposed.

The coal went through a crushing plant in



120-B in its latter stage of construction & testing.

Assembly instructions for this imported machine were all in Russian making its construction a hit-or-miss method for the most part. When completed, the testing of the machine was even more harrowing through discovering what each lever and control did when operated!

Harry MacDonald (crouched 6th from left) became admired for his skill at operating the machine. He had previously operated the Flying Fox over the first opencast pit.

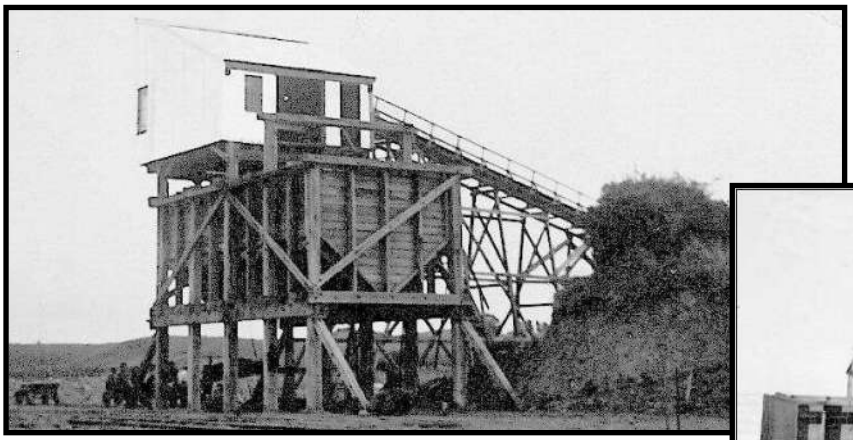
the pit before taken by belt up to the bins, newly placed to the west of the original workings. The bins held various grades of the coal prior to being hoppered into the railway trucks. Each truck was weighed as it passed over the weigh-bridge on the way out from under the bins.

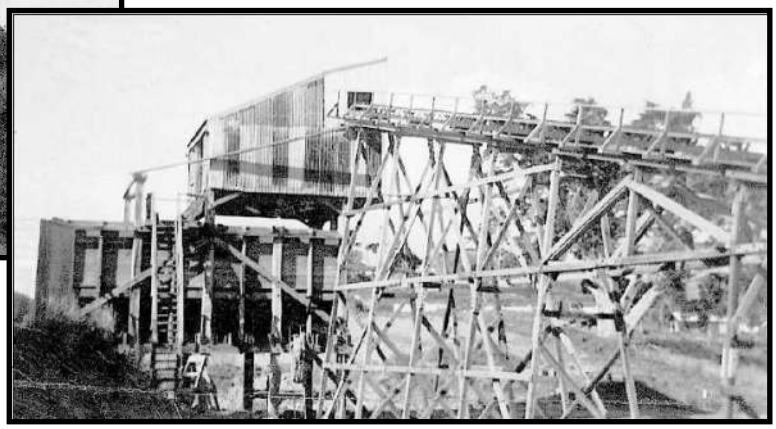
It was necessary for the coal to be crushed as a number of factories and hospitals used crushed coal to fire their boilers. Other firms required household nuggets or larger lumps.

By this stage larger overburden working machines were being used, similar to the carry-ails. These were imported from America and worked alongside the 120-B. These machines were called TS-300's. A second 120-B was purchased and now about 40 employees drew wages.

From time to time relics of the earlier Maori occupation of the area came to light. Tools, carved paddles, eeling baskets and the like were dug up. These were displayed at the Kimihia School and at the Downer & Co. offices near the mine.

The showers, kitchen and dining room at the Kimihia Mine, viewed from the lake edge.

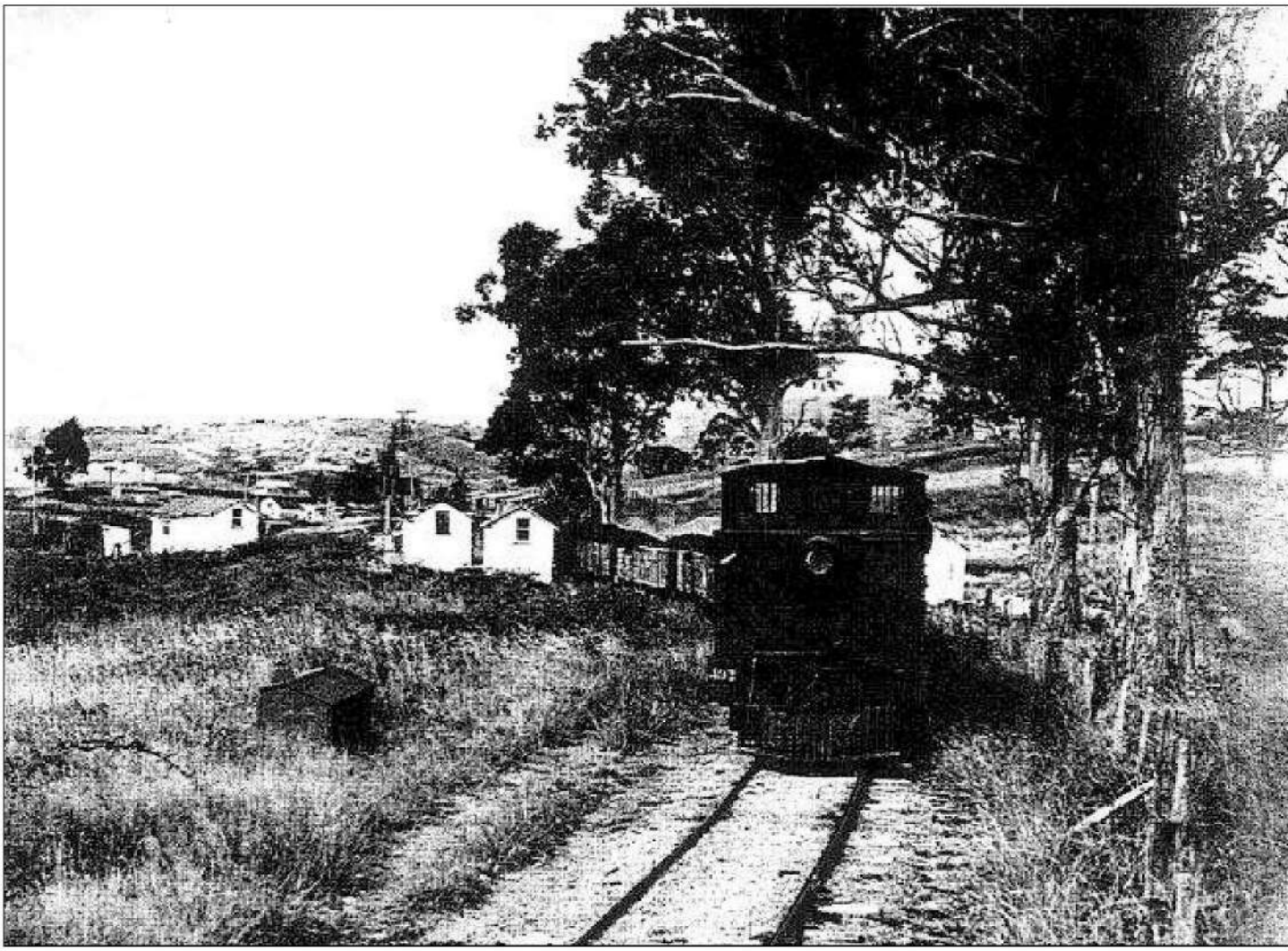




Coal storage and sorting bins.

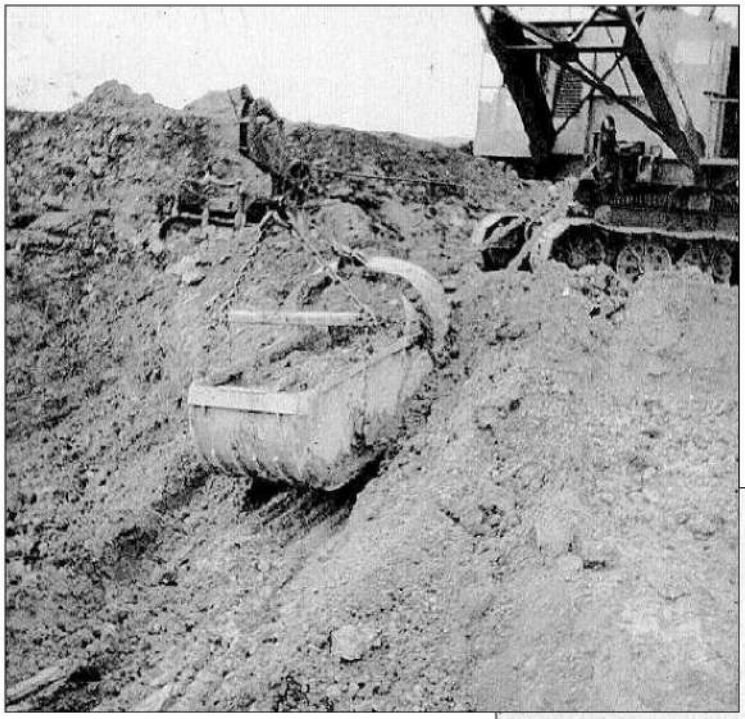
Above: Kimihia Mine employees and families.

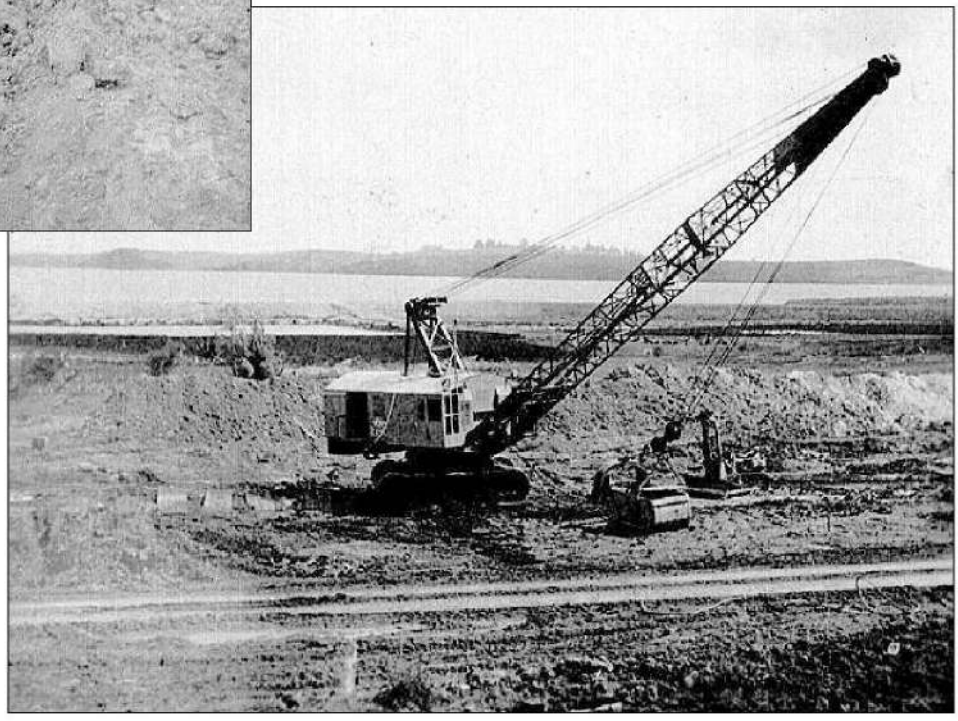
Below: A WG Class #492 locomotive leads the train of coal cars away from the mine (March 10th, 1962). The Quonset huts beside the mine are residences of some of the mine workers families.



Below: The same scene as the one to the left showing the old track bed and the drain, taken in 1996.

Kimihia Lake and the construction of the coffer dam to enable increased opencast mining of the coal seam.





Working to clear away the overburden from the 30-foot thick sub-bituminous coal seam.

Dredge is helping to win vast coalfield

Auckland Star, Thursday November 13, 1958

Modem-day coal miners at Lake Kimihia, near Huntly, are using a powerful suction dredge to help win two million tons of coal buried 100ft under the lake. Working round the clock, six days a week, the dredge is the first to be used in the Southern Hemisphere on a coalmining project.

During the next few years the dredge will suck up more than 4.5 million cubic yards of overburden and drain 60 acres of ponded lake water to let wheeled earthmovers strip the remaining 15,500,000 cubic yards of overburden from the coal seam.

Kimihia and coal have been linked ever since miners began burrowing under the lake in 1886. The underground workings were abandoned in 1912 after over a million tons of coal had been won from the seam.

Today, giant machines are tackling the same coalfield -from above. Costing 160,000 pounds, the dredge is the most expensive excavator on the job. In spite of its ships ventilators, engine room telegraph and siren, it's classified as "just another earthmover."

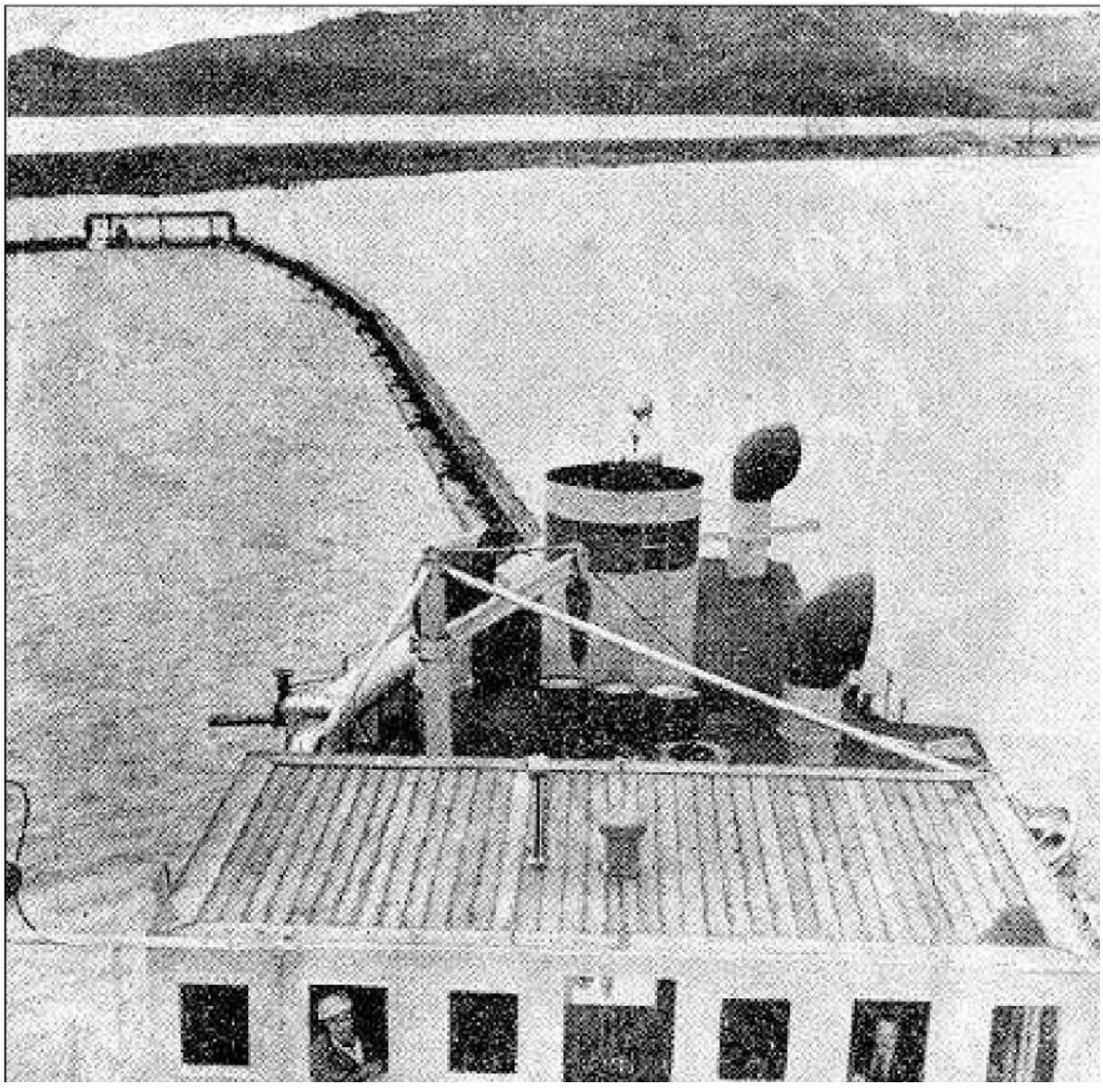
The dredge is at present taking a six foot 'bite' of black mud under 12 feet of water in one of the two large artificial ponds bordering the lake. Later it will traverse the same area, taking up a 30 foot slice of mud and clay and will then return to lift another 24 feet of overburden.

"The coal below is of quite high quality," said Mr G L Nanson, project engineer for the contractors, Downer and Company Ltd. "The ratio of overburden to coal is 10 to one - about the economic limit."

Nearby, coal is being excavated at the rate of 500 tons a day from an area that was once 100 feet under the lake. The coal lies in a 29 foot thick layer pierced by the old underground tunnels abandoned more than 30 years ago.

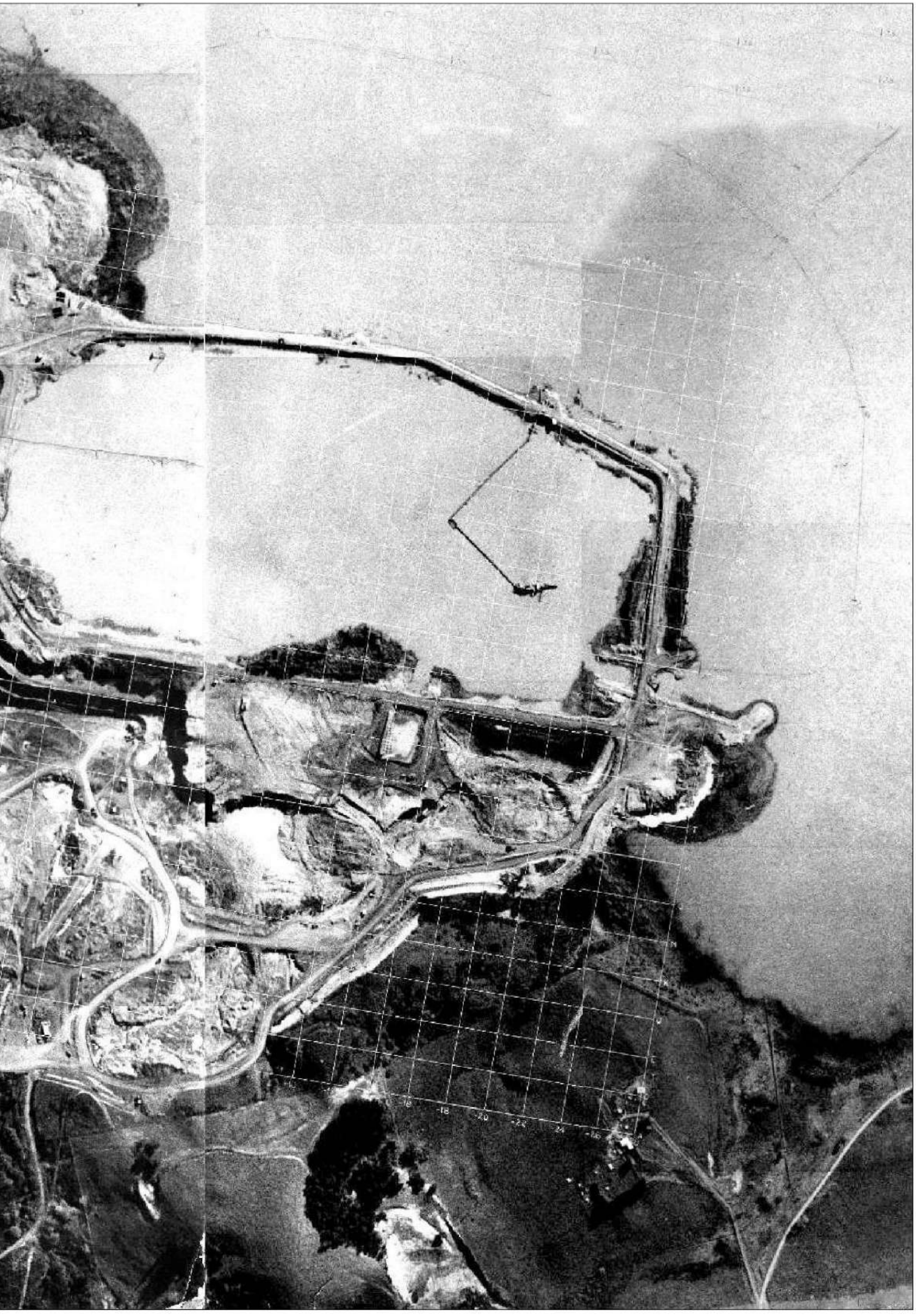
Elsewhere big electric shovels and earthmovers capable of shifting 25 cubic meters of spoil at a time, are stripping overburden from the coal seam. They are working a year ahead of the machines excavating the coal.

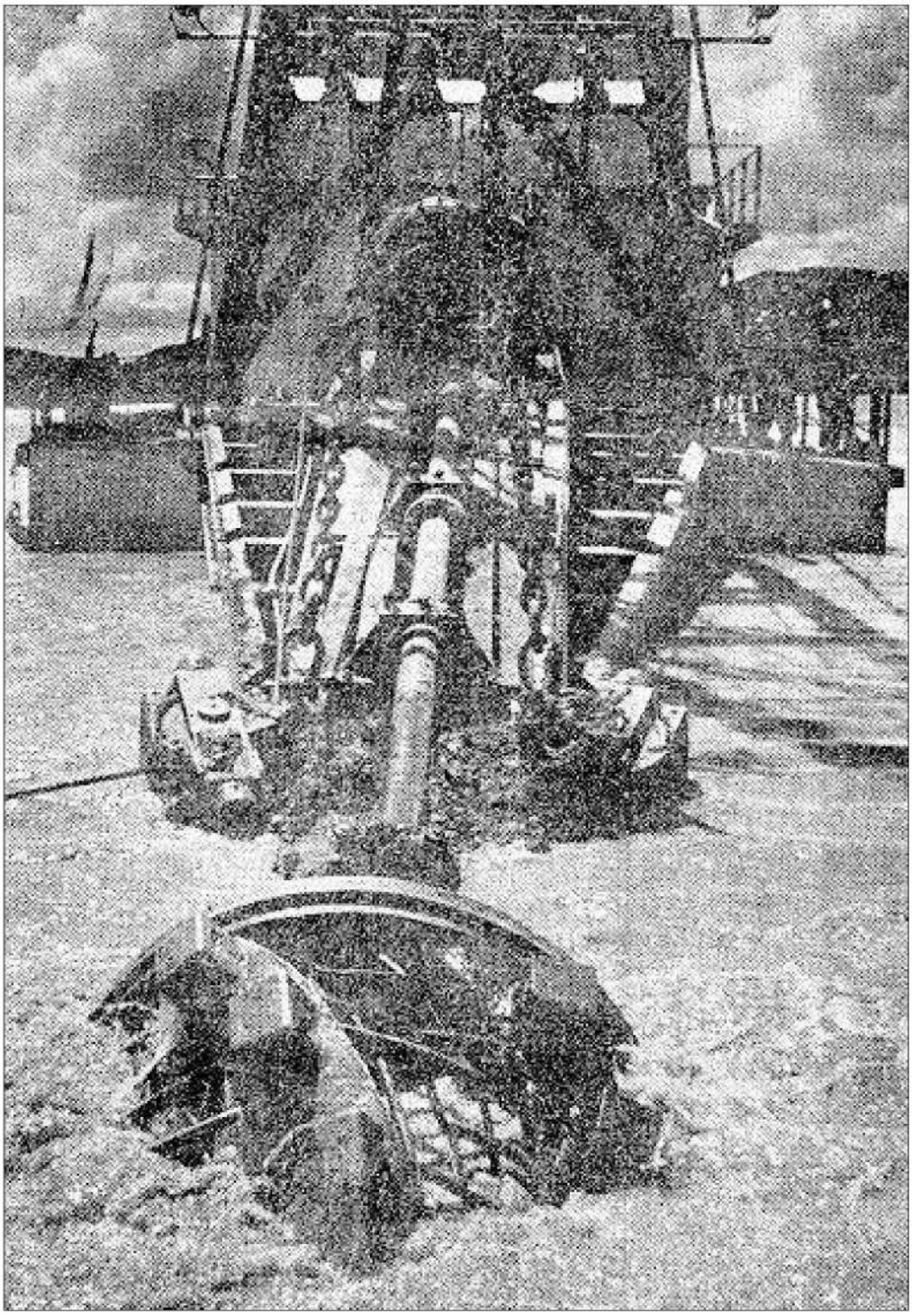
And at Weaver's Crossing, several miles from Kimihia, a start will be made next February to excavate 822,000 tons of coal there. Much of the 2.5 million cubic yards of overburden covering the coal has already been stripped.

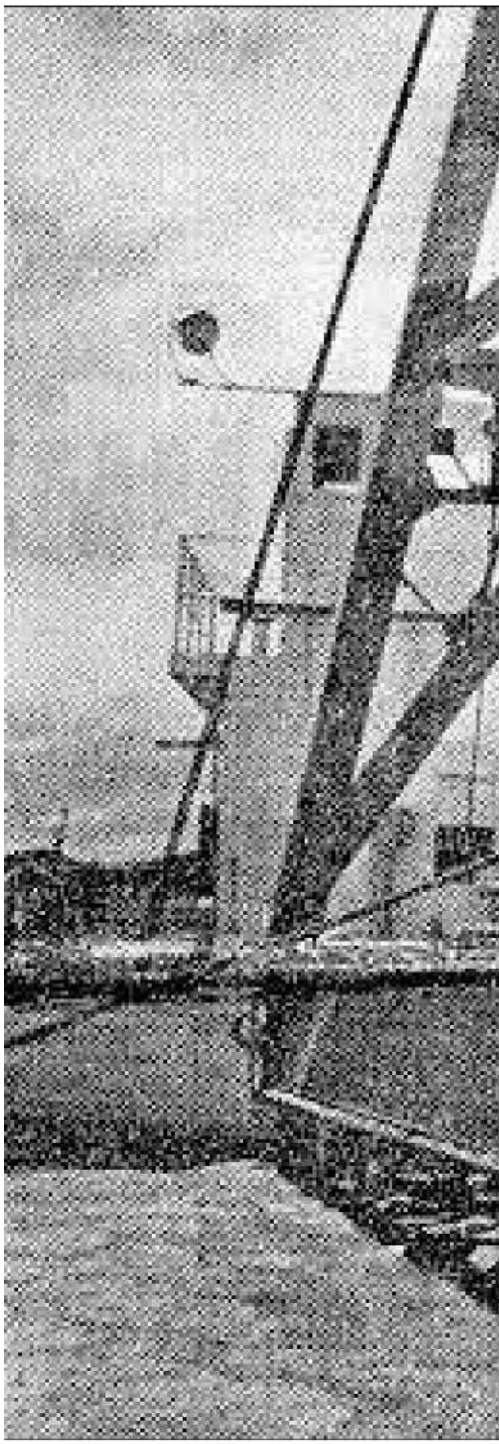


Although the dredge's funnel and ventilators make it appear an ocean-going vessel, the long pontooned pipeline snaking across the water gives a clue to its work.

Each year one and a half cubic yards of mud is discharged through the 18-inch pipe. The dredge has no rudder or propellers and moves by using its winches which are attached to cables moored on the shore.



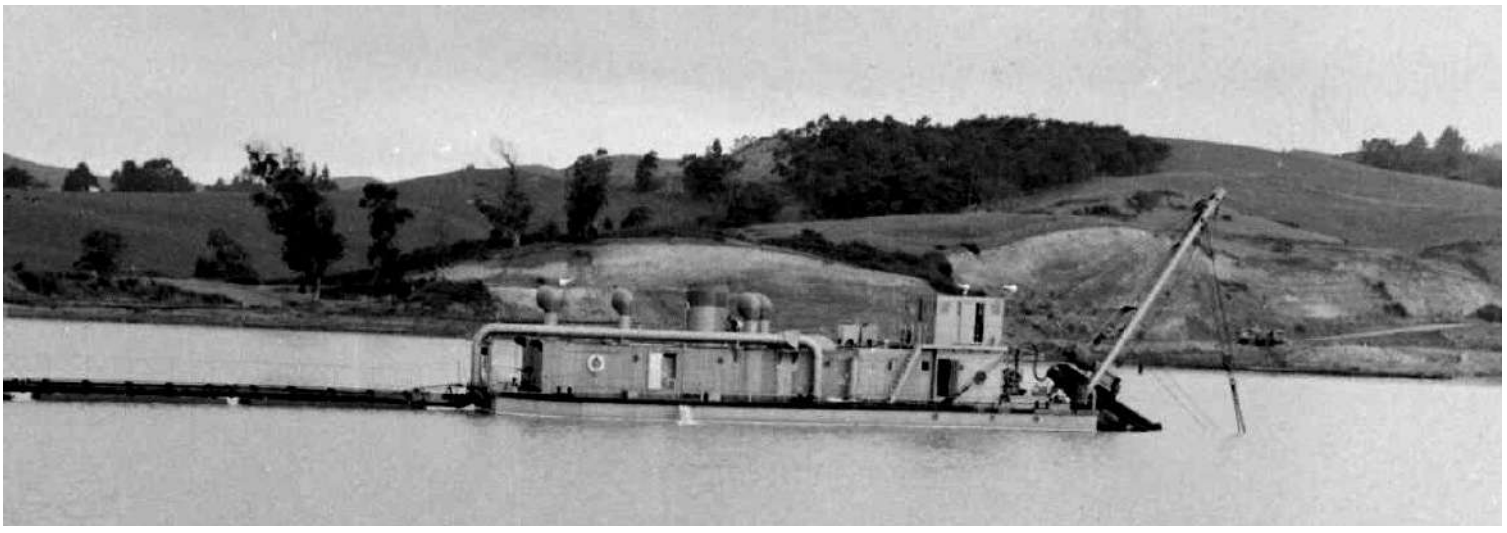




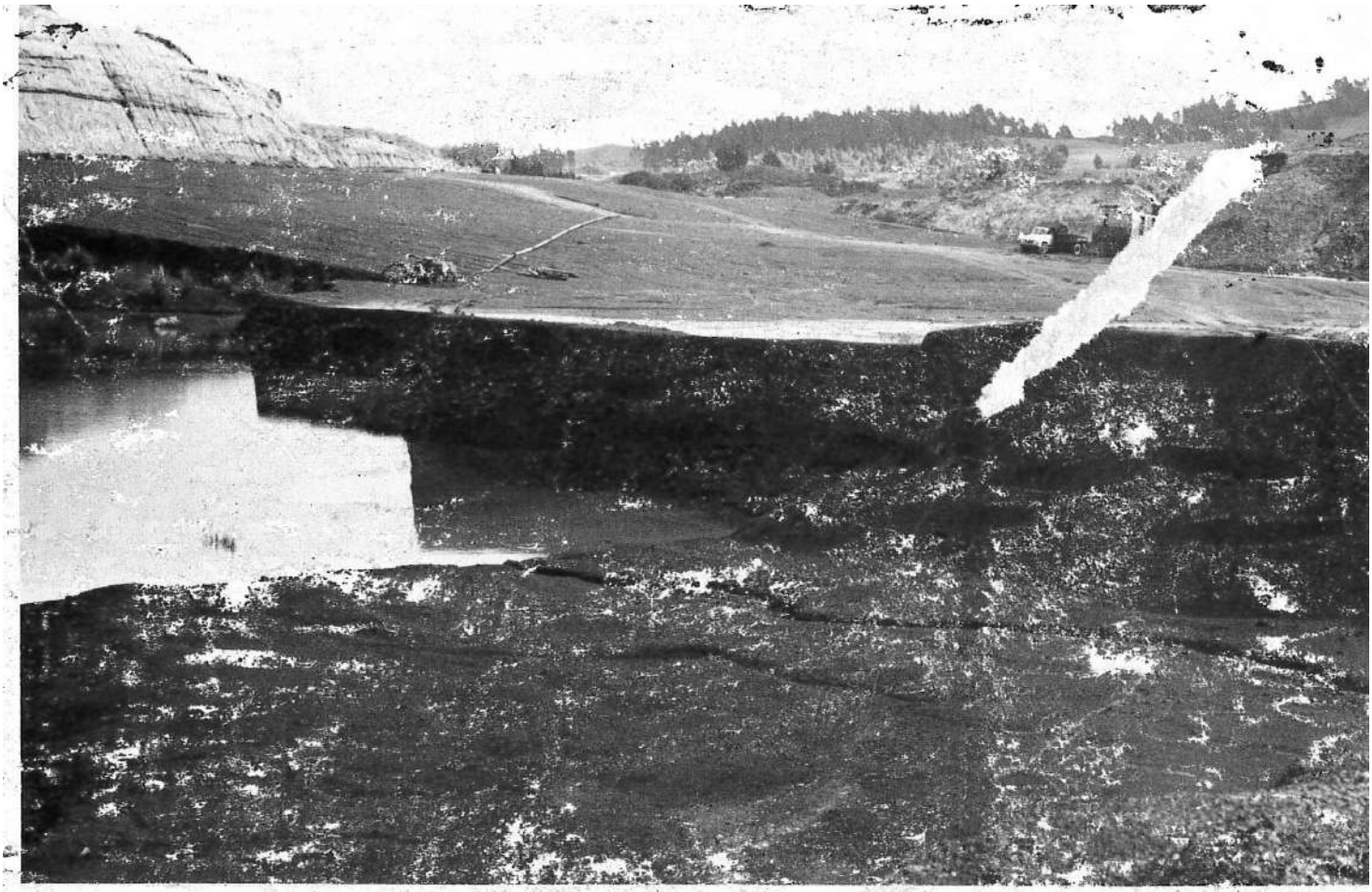
The cutting head of the dredge, with its drive shaft and supporting gantries are silhouetted against the dredge. One of the mooring cables is visible behind the cutting head. Two 360 horsepower diesel engines drove the main pumps. The dredge is 90 feet long and has a draught of five feet.

Dutch born dredge master Peter Erkelens looks out from the dredge's bridge. He's been in the dredging business all of his life, beginning when he was 12. He came to New Zealand from Australia. Three shift bosses work under him to keep the dredge working around the clock.

Deckhand/greaser Graham Harnett, one of the dredge's four shift crewmen, cleans the cutting head. The revolving head stirs up the mud on the lake bottom so that the dredge's big pumps can suck up a mud and water mixture. Because of the quantity of timber and logs buried in the mud the cutting head had to be raised frequently for cleaning.

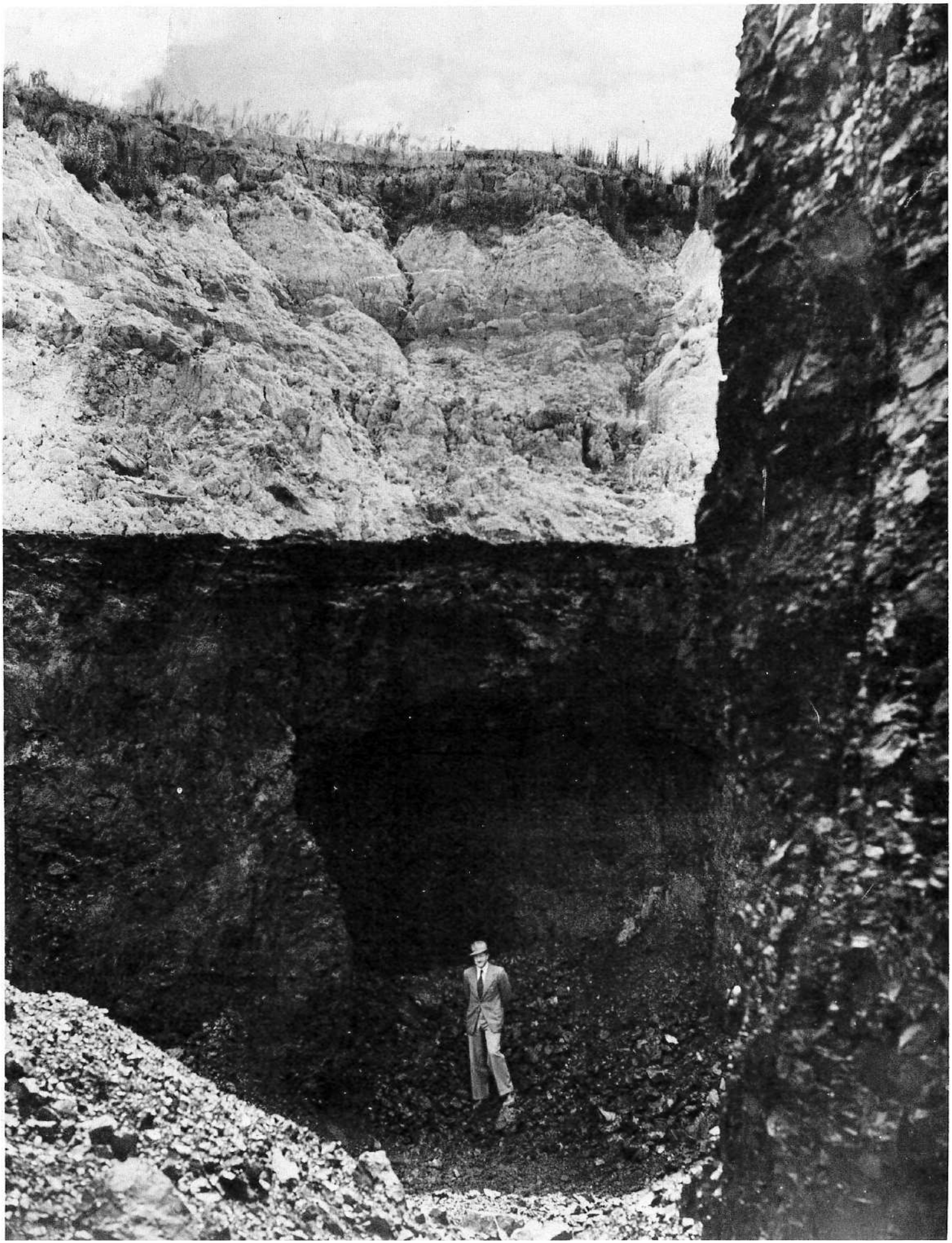


The dredge at work on Lake Kimihia.

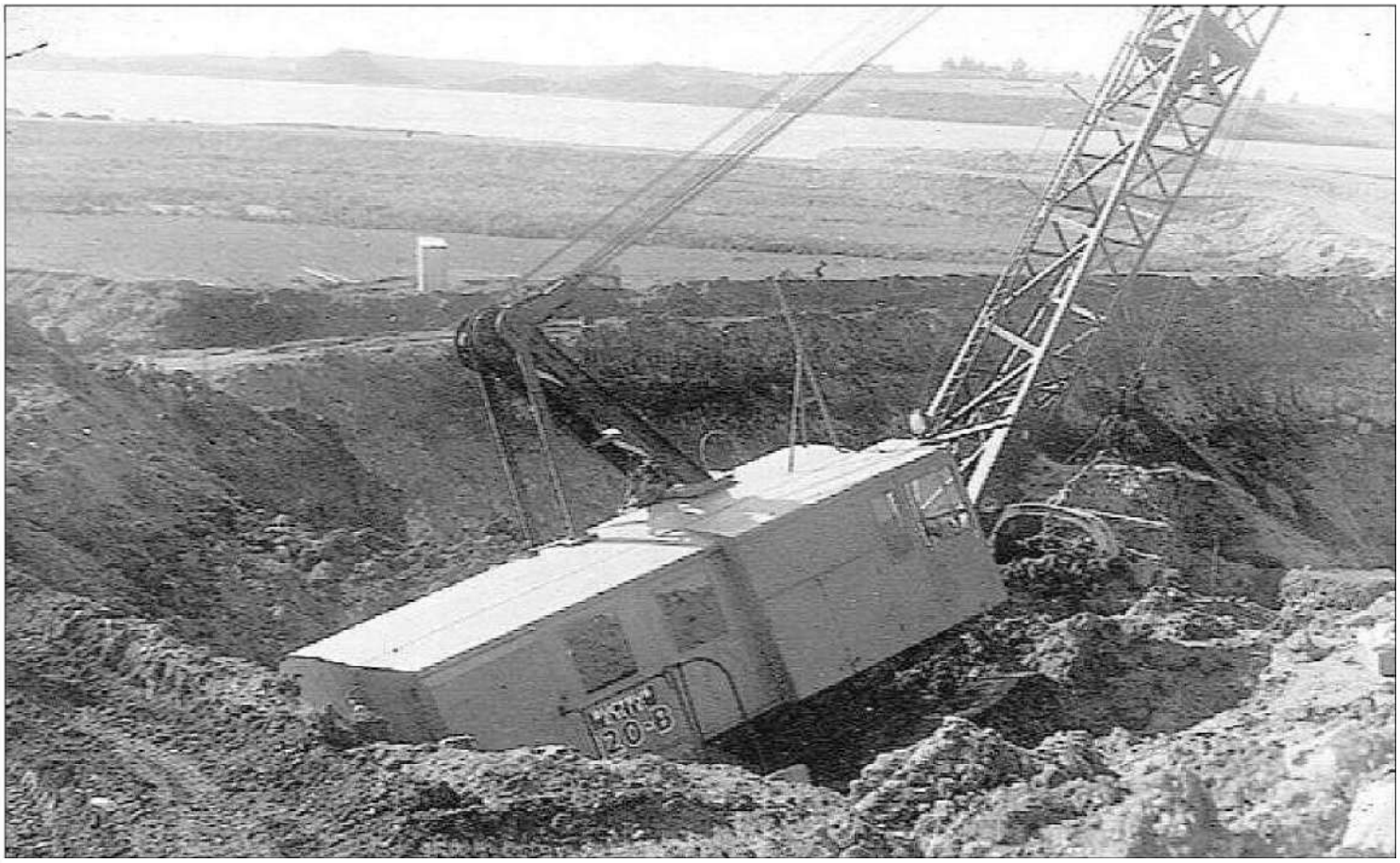


Coal on the bed of Lake Kimihia, 1969.

Right: In the 90 years since Kimihia was first mined it has produced over two million tons of coal. Although opencast mining has ceased, an underground mine, the Huntly East, is still winning coal from this area.



When Kimihia was first mined, between 1890 and 1900, the coal was won by digging underground beneath the bed of the Lake. During the Second World War when it was decided to opencast, the Kimihia Lake was drained exposing the old underground mining caverns approximately 30 meters below what had once been the lake surface.



The 120-B excavator loses its grip on reality.

As the mine excavations moved east so did the coal storage bins and a shortening and realignment of the railway was effected.

The old railway bed was lowered by earthmovers and converted into a water canal to drain the swamp and hill run-off from the south end of the lake. The village children watched this action from the safety of their front fences, just 15 meters away as the railway cutting in front of the houses was converted.

At one stage in 1953 when there has been heavy rainfall in the area the Waikato River had backed up into Kimihia Lake and the integrity of the stopbanks and the working pit were threatened. Men and machines worked day and night during these times to prevent any breaches of the bank and the possible flooding of the pit.

Establishing the major coffer dam for the new pit.

The children of the village found it looked like Christmas lights as they looked out over to the mine pit and stop-banks. The earthmoving machinery carried enough lights to see what they were doing as well as fixed lights to help illuminate the working areas.

The machinery and the men worked hard to keep the stop-bank height above that of the rising lake and the families put up with with the night-long noise of loud grinding engines and the sharp heavy-metal repair sounds from the nearby workshops as every man did his bit to preserve their livelihood.

At one stage of the mining up to 12 old tunnels were exposed in the coal face. It was during the great strike of the early `50's that the mine closed down, except for the safety officer who had to oversee the dead site to ensure that all would be safe and in readiness for the resumption of work when the strike ended. This job was carried out by Harry Macdonald, operator of the 120-B excavator.

The very heavy 120-B' s have had two accidents at the mine. The first was when the land under it gave way and the second was when one of the machines broke through the roof of one of the old galleries.

One of these accidents was reported in 1955 in the Huntly Press:

> Three bulldozers, two huge carryalls and an excavator which looked like a meccano product alongside the stricken machine are engaged in the main pit at Kimihia State opencast coal mine, in removing possibly 12,000 yards of spoil

from around one of the Dominion's largest shovels, which slid down a 40 foot bank in a recent landslide.

Weighing 153 tons, the machine, a 120B Bucyrus Erie shovel, is lying capsized and half buried in tons of very slushy spoil. It will be some time before the machine can be righted and any damage rectified.

During a recent thunderstorm Mr H. C.Littlejohn, Manager for Downer and Company, which operates the mine, was working in his office when he saw the great machine teeter on the far bank of the pit and fall headlong down with a terrific landslide.

Bound For Russia

Costing £80,000, the shovel came to New Zealand in 1945. It was destined originally for Russia through New York under lend-lease, but at the last moment was diverted to New Zealand. It is electrically operated and a 6000-volt feeder cable is used to supply it with power. Each shovel movement involves a different motor.

Some idea of its size can be gained from the fact that the caterpillar tracks are higher than a man's chest off the ground. One bite of its five cubic foot bucket is sufficient to fill a truck.

The machine is used for stripping overburden from above the coal seams.

Operating for the past 12 years, the Kimihia mine is situated on what was originally the bed of the lake. The daily output is about 500 tons of coal. It is estimated that the mine has produced 500,000 tons and has a further life of about 25 years.

In the present main pit can be seen the old galleries from an underground mine which closed down for economic reasons about the time of the First World War.

Large Stopbank

The whole mine area covers about 70 acres and a prominent feature of the landscape is the 70ft diameter stop bank which encloses from the rest of the lake the area to be pumped out and worked.

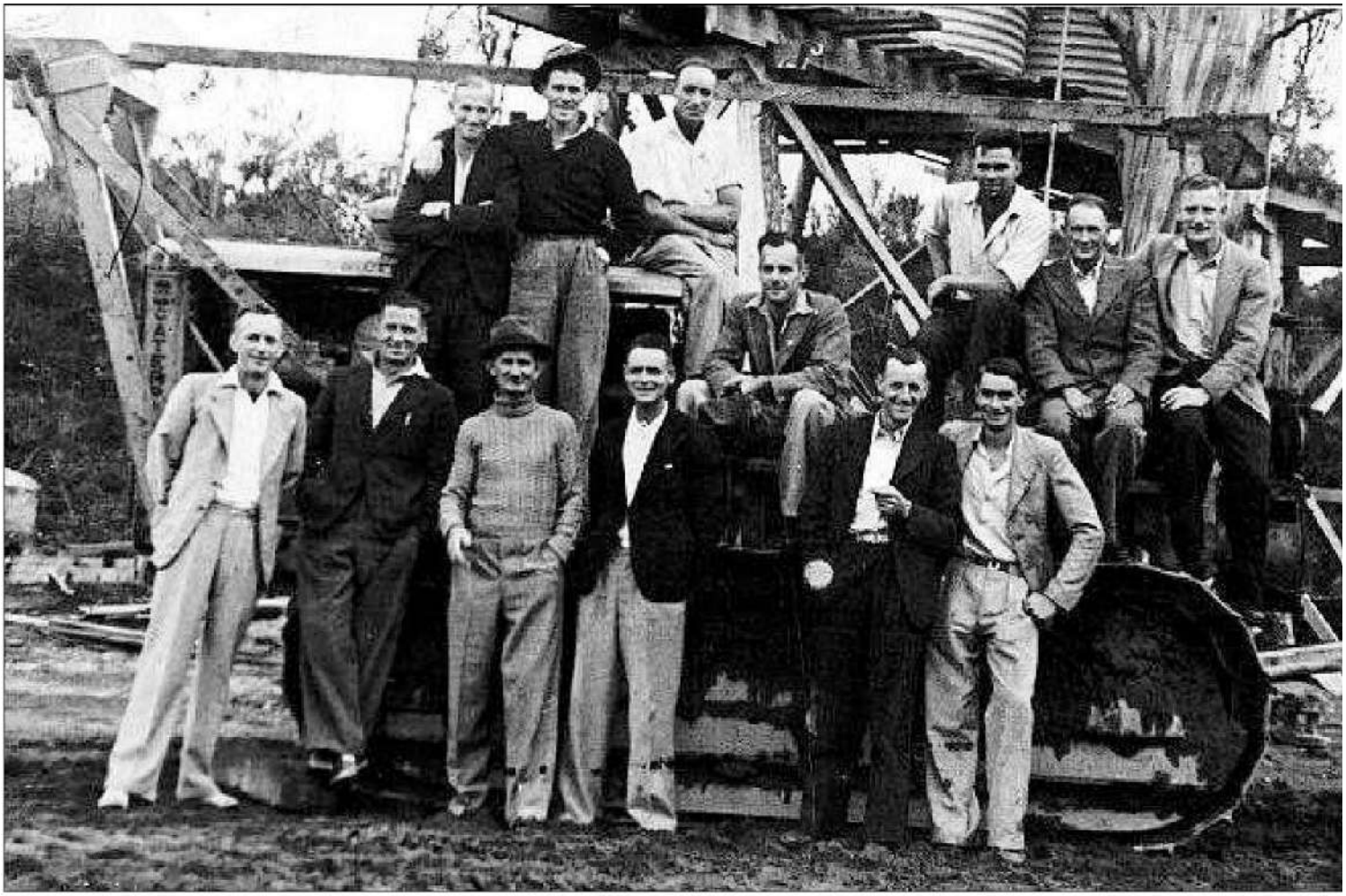
Part of the output from Kimihia goes to King' s Wharf power station which returns "white coal" to work the electrically-operated equipment in use at the mine.

Recent rains have interrupted work at Kimihia, but the temporary loss of the huge excavator has caused considerably more inconvenience.

A further report found in the Waikato Times dated 20th April 1960 was headlined . . .

Good Cheap Coal Even at 200 Feet Below Lake Level

More than one-third of the 4,800,000 cubic yards of overburden, mudstone and soft clay, covering the



Opencast workers pose for a “formal” photograph.

Coal from the pit was transported to the railhead by a rubber conveyor belt.

valuable coal seam at the Lake Kimihia opencast coal mining project, has been moved by the £150,000 suction dredge which went into operation last year.

This was stated by Mr G. L. Nanson, project manager of Downer and Company, contractor to the Government for the supply of coal from the mine, in an address to the South Auckland branch of the New Zealand Institute of Engineers in Hamilton last night.

The dredge works in a pond, stop-banked from the lake proper, sucking out the useless overburden and casting it into the lake.

It is estimated that there are 2,000,000 tons of coal to be won from the lakebed.

Even with the depth from lake level to the coal seam of up to 200 feet Kimihia was one of the most economic mines in New Zealand and was capable of producing good cheap coal, Mr Nanson said.

One of the main difficulties encountered with the dredging so far was the amount of timber and stumps on the lake bottom - no doubt the remains of a drowned forest.

There are logs of kauri and other timbers strewn all over the place, said Mr Nanson.

TIME LOST

Considerable time has been lost because the timber blocked the dredge pumps, which had smaller impellor passages than intakes.

A floating sluicing plant was built to loosen the stumps and logs and the timber was gathered up on a barge. This method proved satisfactory, he continued. Larger stumps were dragged towards the stopbanks by means of a tractor winch. Prolific growth of rushes on the lake bed mud also contributed to stoppages and hormone spray was used with some success. New pumps with larger impellor passages had been ordered, Mr Nanson said.

Another setback was the collapse of the stopbank between the present dredging pond and the lake proper.

The breaches had been repaired quickly with the aid of all possible land equipment pouring soft clay, fireclay, into the gaps to form extra banks and there had been a negligible movement of water. The lake was ept at a fairly constant level throughout the project, Mr Nanson said.

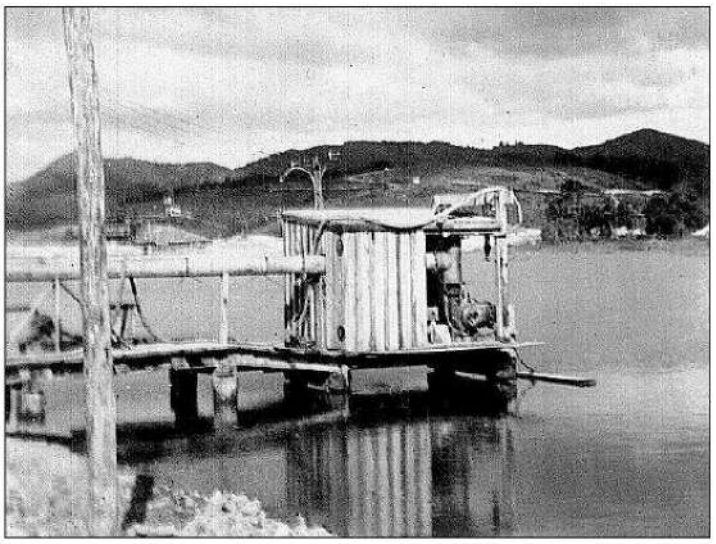
SCHEME CHECKED

The Ministry of Works had been called in to examine and check the whole scheme after the stopbank failures to ensure the safety of the project in view of the huge resources at stake. Although the Department of Mines had not received the final recommendations from the Ministry of Works, Mr Nanson said he understood the present scheme was favoured, although perhaps with some changes.

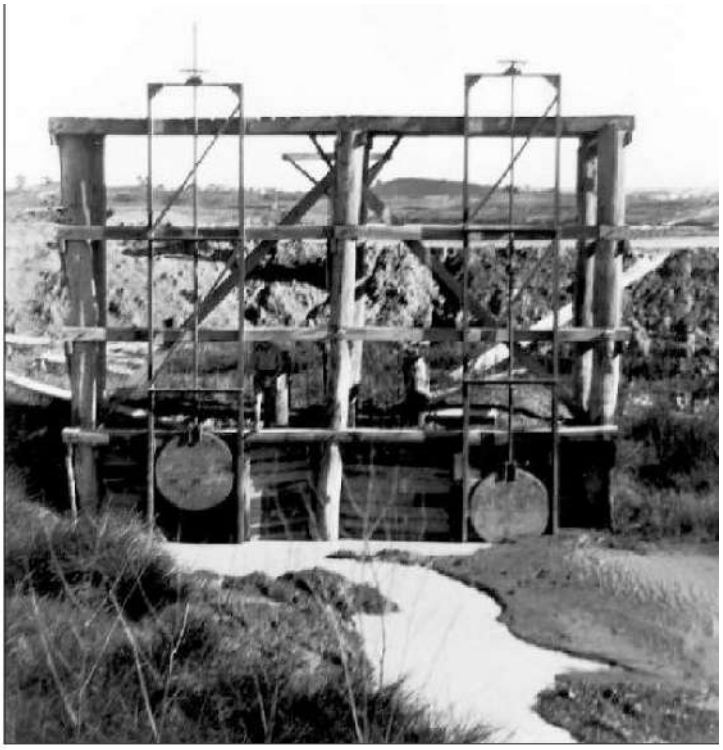
He said it would probably be desirable to build another stopbank outside the existing one.

"It would cost about £70,000 but it would definitely be worth it to make sure of winning the coal", he said.

Dredging the overburden had been chosen because it was cheaper than dry stripping. The latter would also involve the working of high, and consequently



One of the several pumping stations spread along the inner wall of the coffer dam.



The sluice gate used to control the level of water in the dredging pond.

dangerous, faces in the soft clay.

DISAPPEAR

The lake would eventually disappear almost altogether.

Asked whether the reclaimed land would be used for farming purposes, Mr Nanson replied that it would be difficult to get anything to grow, apart from some rushes, in the soft clay.

Mr Nanson illustrated his address with slides and gave a brief history of the mine, which was worked by underground methods as early as 1886, through all the mining methods used up to the present day.

The mine must have a history as varied as any in the world, he said.

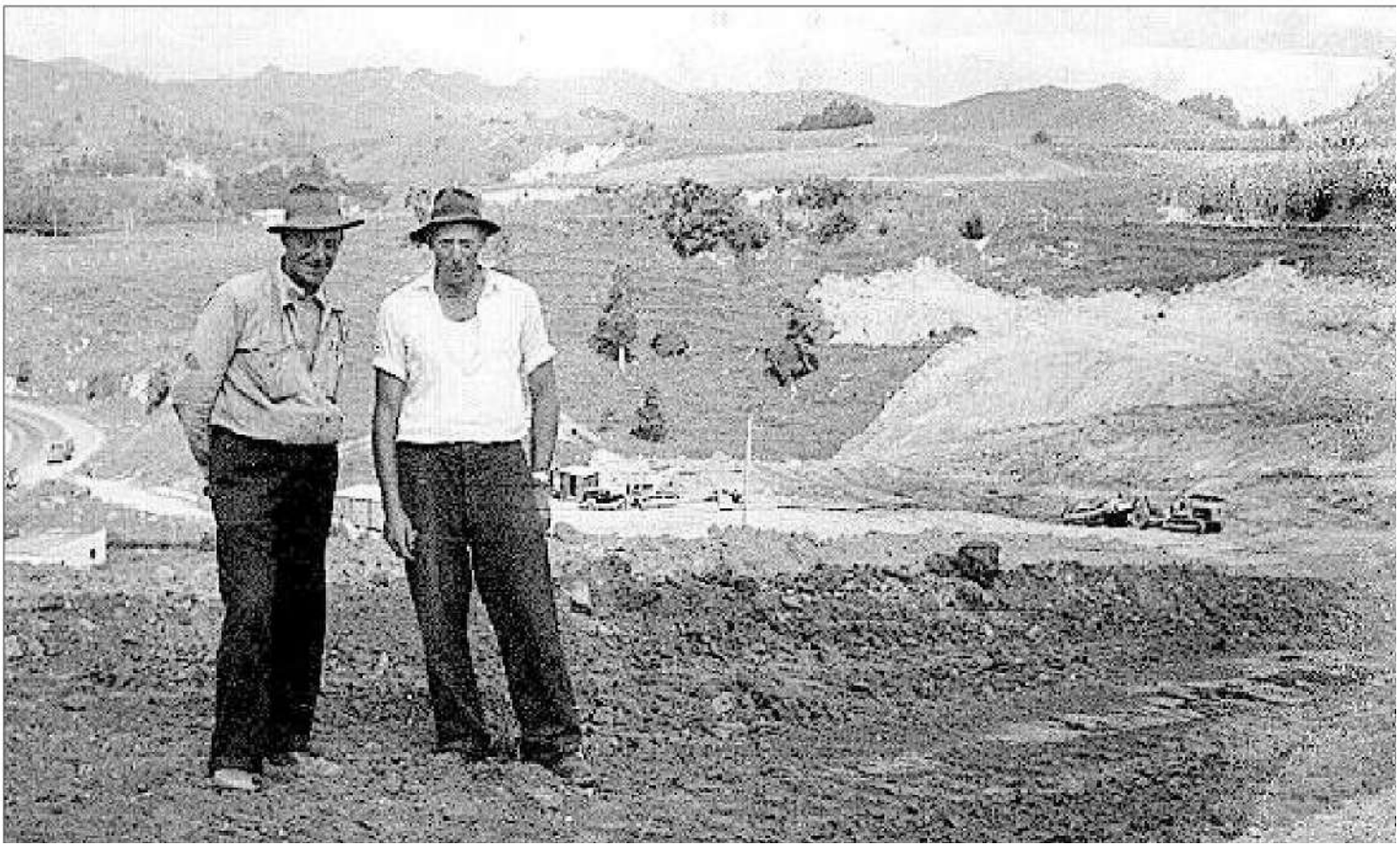
This report was followed by the same paper on 9th February 1961 with an article on the unique use of the dredge in coalmining:

Unique use of dredge in coalmining at Lake Kimihia, Huntly

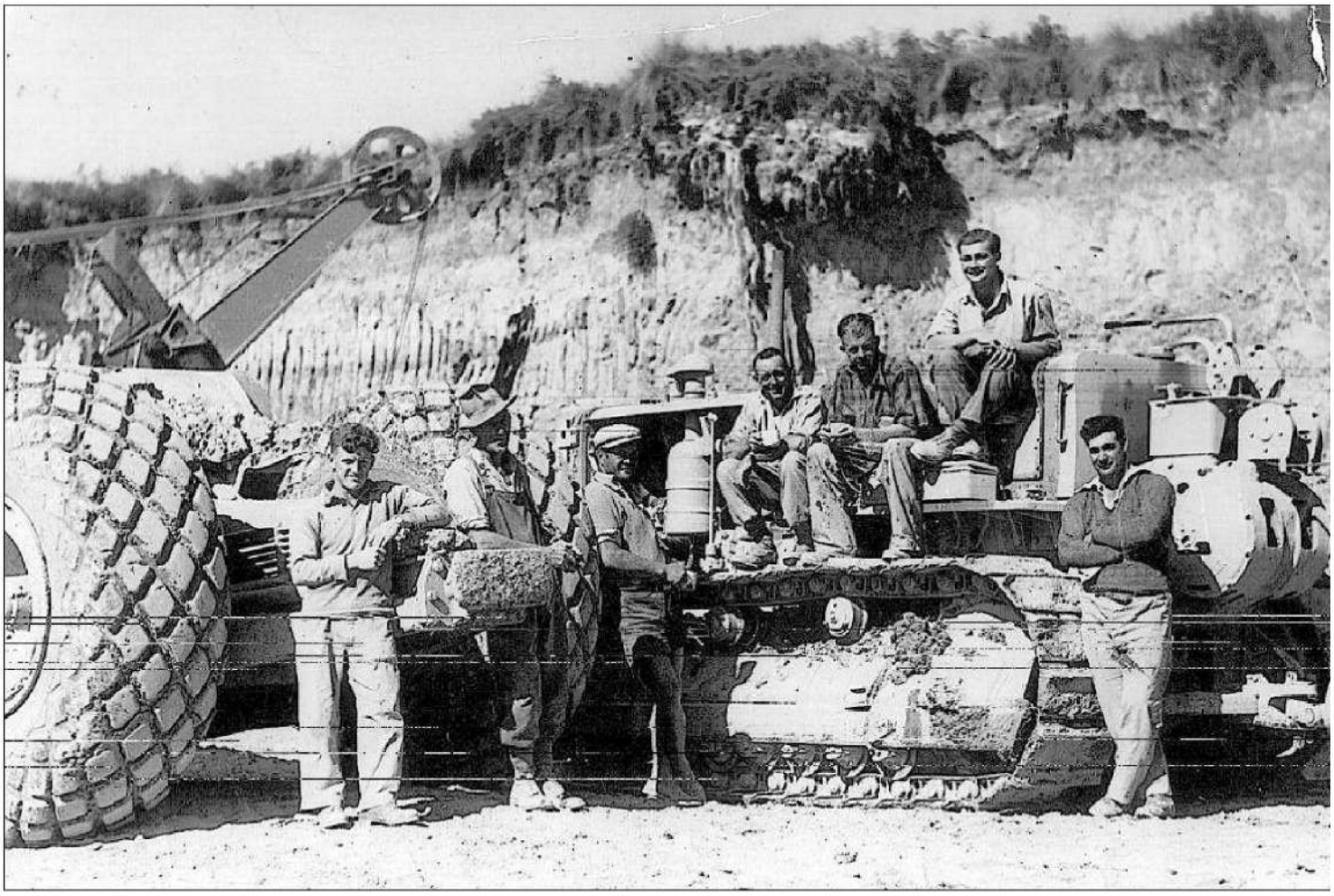
New Zealand is probably the first country to use a dredge for coal mining. A cutter-section dredge is part of the equipment at the Kimihia Opencast mine, one of the world's most interesting mines. The dredge is capable of shifting 1.5 million cubic yards of material in a year.

A few miles from Huntly, Waikato, approximately 400 tons of coal a day are extracted from the bed of Lake Kimihia. The mine's annual output of 80,000 tons makes it one of the most productive in New Zealand. If necessary it can produce 130,000 tons a year.

During the Second World War a considerable increase in the demand for coal prompted the Mines Department to consider reopening the Kimihia mine. It had been



Harry MacDonald (left) and a work colleague above the original #1 opencast pit.



Heavy machinery operators: (1)_____, Henry MacDonald, Joe Tohe, Clyde Lewis, Joe Slee, Reg Crampton and Bob Ralph.

worked as an underground mine for about twenty years at the turn of the century. To avoid further strain on the already overworked underground mining industry, it was decided to work Kimihia as an opencast.

First it was necessary to drain the lake and remove from 80 to 190 feet of pumiceous silt and fireclay overburden. So far the mine has yielded 900,000 tons of coal. At the present rate of mining the remaining 1.75 million tons should last another 20 years.

In two years a stopbank, one and a quarter miles long, was built to mark the outer fringes of the workable deposits. It rises 13 feet above normal lake level, and its crest, 31 feet wide, serves as a roadway for vehicles used in stripping the lake bed. Other stopbanks divide the enclosed area into ponds.

The Dredge's Task

The pumiceous silt which forms the top layers of the lake bed is removed in two 30 foot slices by the cutter-suction dredge. After the first slice has been excavated and pumped ashore through a floating pipeline, the water level is lowered by 30 feet and the process repeated. The dredge, which was prefabricated in Thames, is about 90 feet long and 28 feet wide.

It works 15 hours a day and removes 300 cubic yards of material per hour - sufficient material to fill a hole the size of a 3-bedroom house.

The contractors who work the mine for the Mines Department employ dredging because it is the easiest and most economical way of getting rid of most of the soft overburden.

As well as millions of cubic yards of silt, excavations of the overburden has yielded numerous swamp kauri and rimu logs, as well as a beautifully preserved Maori paddle. The presence of that relic is evidence that the Waikato must have once left its old course to form Lake Kimihia.

The fireclay which forms the remainder of the overburden is stripped by a giant 5-cubic yard excavator and loaded into motor scrapers which cart it away for use in reclaiming the lake. The excavator can load a 25-ton capacity scraper in 1.5 minutes.

The Coal Uncovered

The seam of coal exposed by these dredging and stripping operations varies in thickness from 25 to 29 feet. It is broken up by blasting and loaded on to a short conveyor belt which takes it to the main conveyor belt which in turn delivers it to the screens. There it is graded and crushed to "nut" size before being loaded into railway wagons. Kimihia "nuts" are used in light industrial plants and the slack is sent to the Meremere power station.

Recently, hydraulic conditions set up by dredging caused two breaks in the main stop bank. This did not

directly affect the workings but it necessitated extensive investigations and repairs costing between £80,000 and £90,000. Supplementary stopbanks were built to provide additional protection for the workings. Experts in the study of soil stability consider that the protection works now provide an adequate margin of safety. Despite this setback Kimihia opencast mine remains one of New Zealand's most important coal producers.

Coal was also carried out of the district by rail and over the narrow, but well-gravelled access road that had been put in about 1944 to service the village. From the lake shore the road curved up a short but steep hill past the school and, during the winter, the heavily laden coal trucks made hard work of the hill and regularly interrupted the schooling of the pupils as they ground past on the neighbouring road in first gear with exhausts belching and engines roaring.

On frequent occasion the trucks actually spun away the gravel covering over the clay base of the hill and they could not progress until a bulldozer from the mine came to assist them.

This happened far too often for the mine management and a lower grade road was cut up the hill in an arc around the offending area.

The trucks still screamed their protests as they crawled up and past the school but were uninterrupted in their journey.

In 1956 it was decided that a world first for an opencast mine in dredging was to be attempted further out in the lake to get at the seam as it shelved down deeper to the north. The importing from Australia of a powerful dredge was undertaken and it was used to chew up the lake bottom and pump the slurry out over the stop-bank and into the remaining section of lake.

First a large hole was scooped out of the original stop-bank and the dredge constructed in it. Upon completion of the dredge the water was let in. The dredge had a suction hose that drew water and mud into it and along a floating pipeline and out into what remained of the once-large lake.

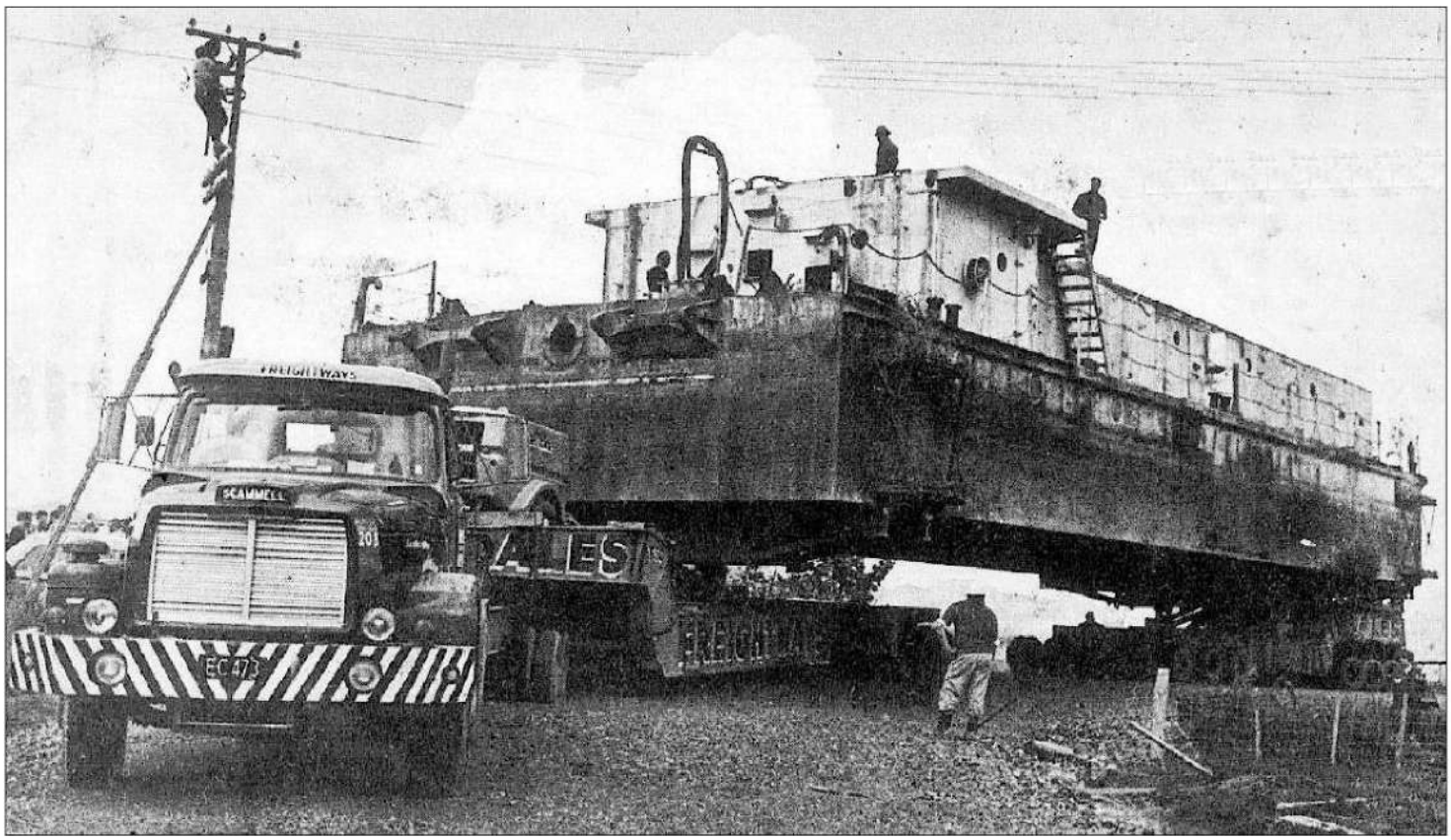
While the dredge was being constructed the earth-moving machines were constructing a very long stop-bank enclosing the area to be exposed. This basically completed the cutting off of the southern section of the lake.

Control gates were built in the northern bank to control the inflow of water to keep the dredge afloat. At intervals along the stop-bank there were suction-pipe stations that could be connected up to the dredge as it moved around its pond. A cat-walk was built along the top of the floating pipeline to give access to the dredge as well as providing a support for the diesel fuel pipeline to the dredge's motors and pumps. This floating piece of machinery was serviced by a motorboat and a barge.

The cutting head on the dredge was on the end of a long boom that could be raised and lowered and, just to the rear of the cutting head was the vacuum unit that drew up the resultant slurry.

As the dredging got deeper it was found necessary to add booster pumps to get the material up and over the dam. Also the dredge was stopped at periodic intervals to remove the huge stumps and trees buried in the old lake-bed.

The dredge was kept afloat by a sluice-gate in the dam regulating the flow of water back into the working pond.



The dredge being removed from the mine on a specially imported transporter onto the banks of the Waikato River.

Workshop #2 on the rim of the pit.

As the lake bed was lowered, so did the water level in the pond and eventually the pond was drained, the dredge removed and tractor-driven Euclid's and the 120-B's were used to strip the remaining overburden from the coal.

At this stage even larger machines were brought in from America called `Move-ails. The wheels on these machines were 8-9 feet high and new tyres for these and the TS-300s cost between 500 to 1000 pounds. The smaller `carry-all' tyres were just 300 pounds apiece.

By now there was a staff of 70 at the mine with 4,000 tons of coal a day being removed but by 1962 the need for coal had dropped off and some scaling down occurred. The dredge still operated but it would not be for very much longer as in 1968 it was moved out onto the Waikato River as reported by the media:

> Shifting this 150 ton river dredge from the Kimihia open cast mine to the bank of the Waikato River at Huntly was the biggest load ever moved in New Zealand, according to Mr W Sunde, transport manager for Dale's Freightways Ltd, of Auckland.
>
> Dales moves the dredge in a week-long operation, ending with a four-hour, three mile journey early last Sunday morning.
>
> Combined weight of truck, trailers, pushing units and load totalled more than 200 tons, and measured 156 feet long, 32 feet wide and 24 feet high.

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>
> Combined weight of truck, trailers, pushing units and load totalled more than 200 tons, and measured 156 feet long, 32 feet wide and 24 feet high.

The chain of vehicles, headed by the giant Scammell Contractor, had a total of more than 100 wheels on the ground.

"There wasn't a crane in the country that could lift the load," Mr Sunde said.

"So we had to jack it up manually. When we'd jacked it up 8 feet the trailers were backed in underneath and the dredge lowered on to them.

"All the trailer units were self-levelling, to ensure that all wheels carried an equal load whatever the level of the road surface."

The dredge is to be overhauled by its new owners, Dredging and Reclamation Ltd, of Christchurch, for work on the Waikato River or for resale.

A coal mine with an unusual, even unique, history will resume production within the next fortnight after being idle for more than two years. It is the Kimihia opencast, about three miles north-east of Huntly, from which the staggering total of 10 million cubic yards of overburden has been removed and from which a similar amount has still to be taken before the mine closes for good.

Perhaps the most unusual feature of the Kimihia mine is the fact that it is taking a new lease of life. In these days of oil and electric power there are more mines closing than opening in the coalmining industry but an increased demand for the good type of housecoal which the mine produces has rejuvenated Kimihia.

About 600 tons of coal will be hauled from the mine daily, with, of course, coal for the Waikato and Auckland districts, "nuts" for dairy factories and slack for the steam power station at Meremere.

If Kimihia's future is as bright as its past is interesting, then all will be well. The seam originally lay under a lake about 600 acres in area which has now dwindled to about one third of its size, much of it having been filled with the overburden from the opencast stripping work.

The mine is one of the few in New Zealand to have started its life as an underground working and to have been converted to opencast, with its hitherto black maze of tunnels and galleries laid open to the sun.

Coal is clean

The ratio of ten yards of overburden to one ton of coal is among the highest in the country. In some places the overburden is 220 feet thick on top of the 25 to 30-foot thick seam, but this does not prevent Kimihia from being an economic proposition.

The coal, although well buried, is extremely clean and compares favourably with any other household coal in the country.

The mine started production about 20 years ago (1944) and a million tons of coal came out of the tunnels before it was changed to opencast. The removal of ten million tons of overburden produced 1,200,000 tons of coal before the mine ceased production in January 1962.

It is estimated that another 1,750,000 tons of coal remain to be won by opencast methods and this will still leave a substantial quantity which, although too deep to be mined by opencast, could be won by conventional tunnel methods.

Stripping and other work has carried on at the mine site since production temporarily ceased.

The old bins have been demolished and a modern coal treatment plant built in their place. This plant screens, crushes and classifies the coal from the mine into coarse, nuts and slack grades.

Belt conveyor

A belt conveyor system transports the coal from the face to the bins, and thence away in railway wagons, with a minimum of handling.

Stripping of the overburden from the Kimihia seam started in 1941-42 and is likely to go on indefinitely. The spoil will be dumped in the areas from which the coal is removed.

In 1969 the production of coal was between 110-150,000 tons a year with an estimated 1,350,000 tons in reserve. The average weekly output of 2,500 tons was used mainly for factories and hospitals in the Waikato.

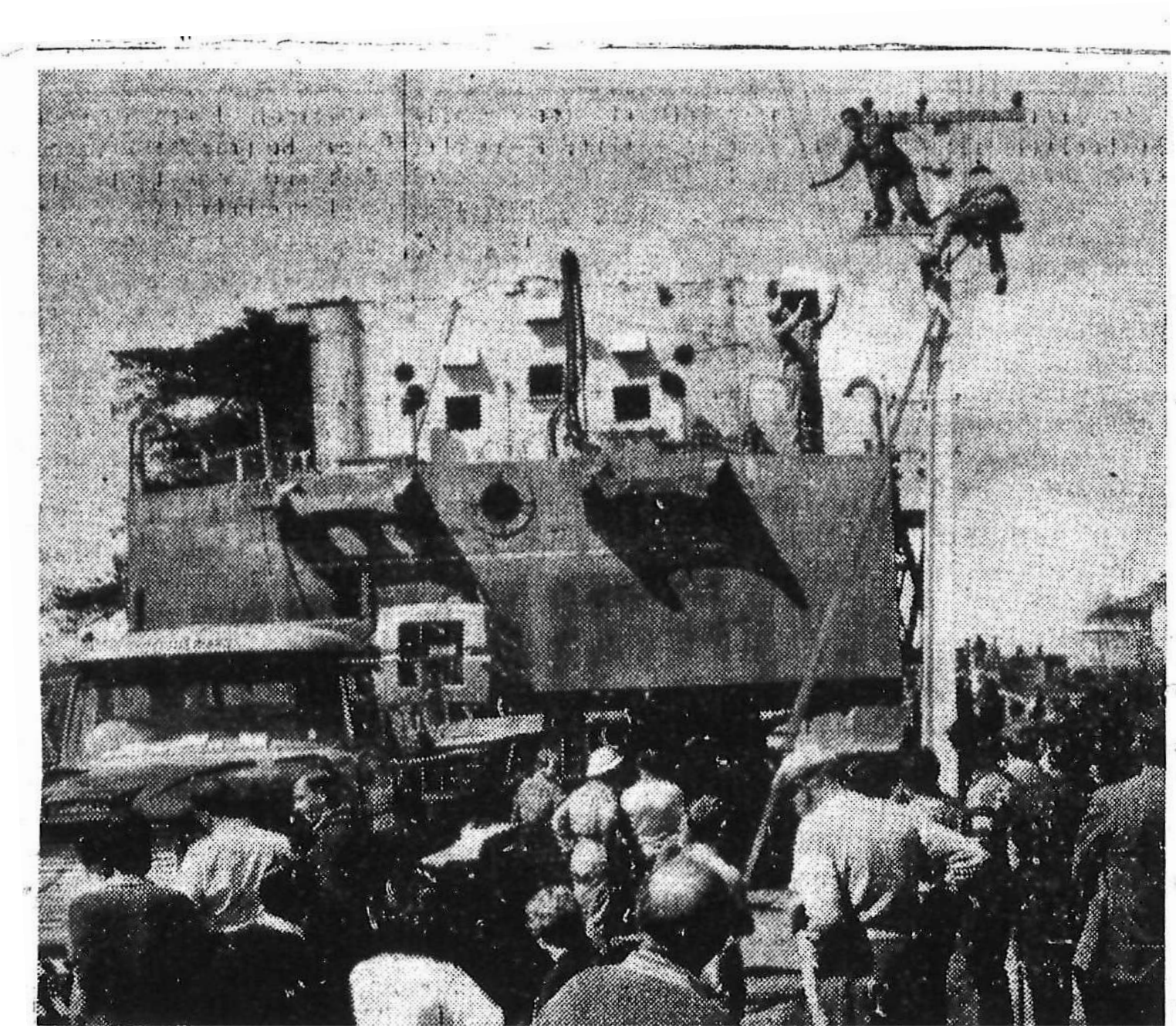
In 1970 it was planned that 6,000,000 yards of overburden was to be stripped at the rate of 500,000 yards a year. Part of the old lake bed which was not to be stripped was under consideration for use as an airstrip.

In these years Mr B Phillips of Downer & Co managed both the Kimihia and the Weaver's Crossing opencast mines.

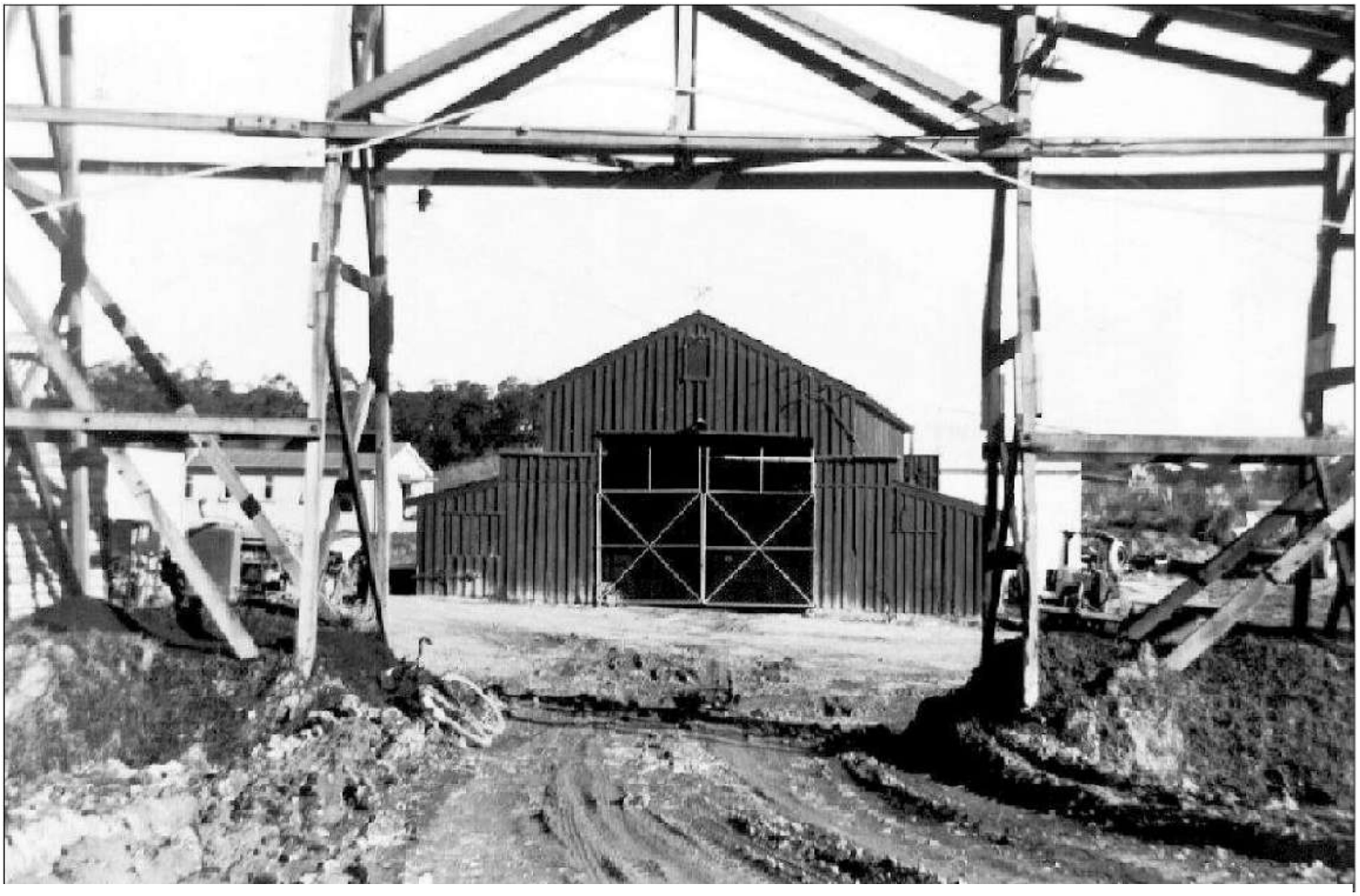
Early in 1969 Mr Bill Scurr retired after 52 years in the mines. He was born in Kaitangata in 1902 and started work at 13. He worked at Rotowaro in 1919 and during World War 2 he worked at the old Holland's Mine, now the site of the Kimihia Open Cast.

In 1972 Winstones took over the now-vacant school paddock and the surrounding farm and recovered the underlying clay for its brick-works operation in Huntly.

In 1978 the opencast mine closed and reverted to underground workings with new technology.



The dredge edges its way along the road towards the Waikato River, while Power-Board men shift overhead wires. The move took nearly four hours to complete. The dredge was used on the lake from 1950 to 1968. (Photograph 3rd October 1968).

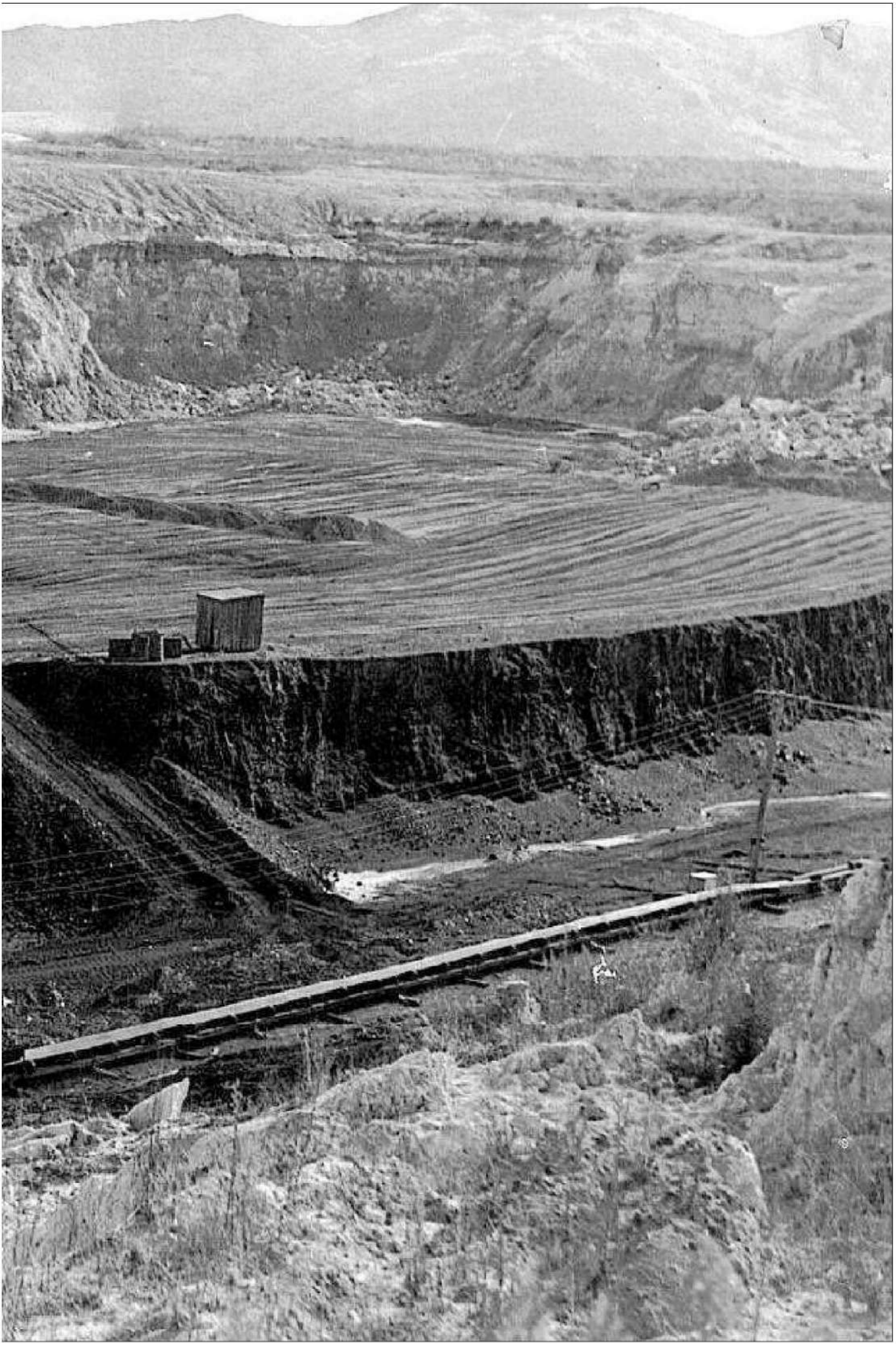


The main workshop viewed through the trestle supports of the conveyor belt.

A 1955 view along the length of the mining pit.

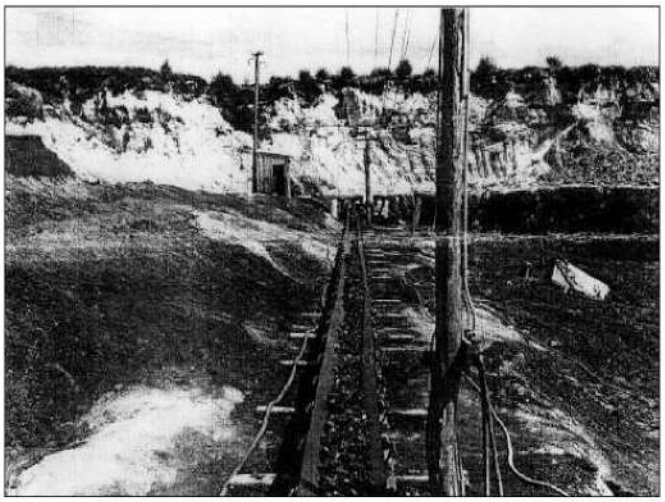
The 120-B electric excavator being viewed by Alexander MacDonald, father of one of the operators Harry MacDonald. During all operations around the machine care had to be taken that the very high voltage cable feeding the several motors were protected. During the repositioning of the 120-B the cable was hefted by hand. An interruption to the power flow would render the machine useless. At one point a second 120-B was added to the mine to increase the removal of overburden. The operating noise within the cab as the various motors spun up and down affected the operators hearing over a period of time. It was not a usual practice for ear-muffs to be worn. The cab had to be rotated so that the steps were above the tracks before access and exit of the operator. A large tonnage of weights were placed at the back of the cab to counterbalance the action of the bucket on the front arm.

A 1950s panoramic view of the southern tip of the opencast pit showing the workshops to the left and the coal bins to the right. The administration offices were just past the tree (out of shot) to the left.

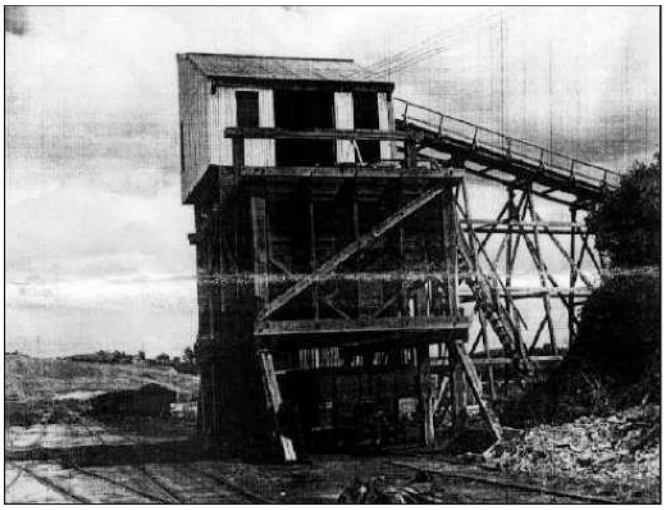


1963

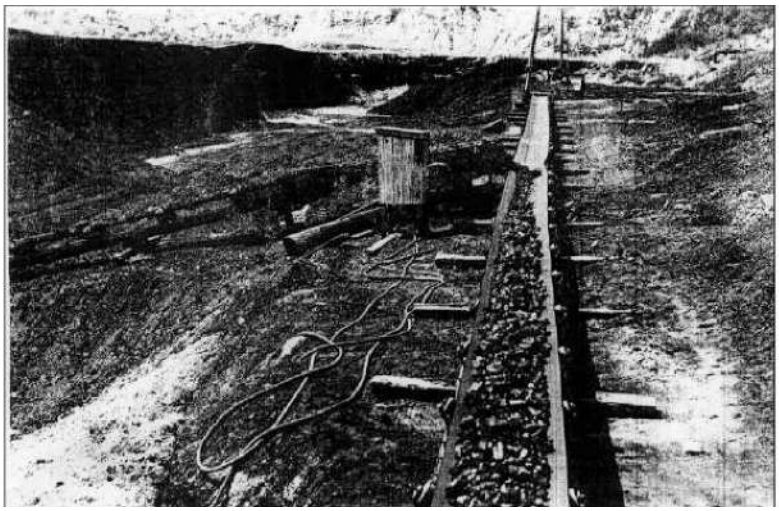
Mechanical shovel working the 28” seam.



Conveyor belts junction.



The loading bins, wagons & top of conveyor belt.



Conveyor belts junction.

A general view of the old underground tunnels, 10th March 1952.
National Archives Ref. AAVK Acc. W3493) B2836, B2837, B2838, B2839 & B2840.

1963

1991

Kimihia Lake Rehabilitation

In 1976 coal extraction from the Kimihia Opencast Coal Mine ceased, and plant and equipment was moved to other State Coal operations in the Huntly district. Further coal remained at the bottom of the opencast but at too great a depth below surface to economically remove by opencast methods.

Extracting coal by opencast mining involves in simple terms, the excavation of a hole to the top of the coal, dumping the overburden as waste, then winning the coal. The excavation "moves" over the surface following the coal, as overburden from new stripping is dumped in that portion of the opencast from which the coal has been excavated. The size of the excavation is determined by the depth from the surface to the coal, the steepest safe angle at which the sides of the excavation can be cut and benched, and allowing for a sufficient area of exposed coal in the floor of the pit for its most economic extraction. Winning coal by opencast must cease when the cost of removing the overburden exceeds the value of the coal. This situation occurred at Kimihia where the coal beds dip away from the working face and the coal gets deeper.

Plans to extract the remaining coal from the Kimihia area - the so-called "East Side" reserves - were drawn up in succeeding years. Finally in 1972, approval was given to develop the Huntly East Mine by establishing headworks inside the old Kimihia Opencast and driving into the coal from the bottom of the opencast.

Construction of the mine buildings, coal handling and storage facilities, road and rail access, and other headworks commenced in 1977, and the area of land within the opencast needed for the new mine was defined and put into use. Rehabilitation of the remaining area was the next step.

In July, 1978, New Zealand State Coal Mines retained the geological and environmental consultants, Applied Geology Associates, to undertake a study of the abandoned opencast and the directly surrounding mine affected land and make recommendations for the rehabilitation of the area. This report covers the consultants' work, and the action now underway to implement their recommendations.

History of Mining at Kimihia

Coal was first mined at Kimihia from a small underground mine located near the present railway siding. After a typically stop-go existence, mining ceased and State Coal Mines acquired the rights to the coal, and in the early 1940's commenced removing overburden for the development of the Kimihia Opencast.

To gain access to coal beneath the lake, a stopbank was constructed across the lake, and the southern portions drained. The lake sediments and

water were pumped into the remaining lake beyond the stopbanks.

The free water surface of the lake was reduced in this way from 316 hectares to 58 hectares.

Coal Mining proceeded in a generally north easterly direction with strippings being placed beyond the stopbank, and later in the mined areas. The areal photo is a composite showing the mine in 1963 when disruption to the surrounding land was at its height. Since cessation of opencast mining in 1976, natural revegetation has taken place and the majority of the mine affected land is covered by sparse toitoi and other hardy plants.

The Future of Kimihia

Most of the area of Kimihia Opencast is below river level, and water enters the mine by seepage from the walls and surface run-off requiring continuous pumping from the floor of the opencast. This must continue for the life of the East Mine to prevent flooding of the underground workings. When underground mining ceases, the pumps will be shut off and the opencast will slowly fill with water to form a new deep lake within part of the original Lake Kimihia. This is not expected within 25 years.

The rehabilitation plan for Kimihia is focussed on this eventual lake, but provides for interim land uses within the opencast during under-ground mining. Earthworks, soil preparation and planting within the mine and along the eventual beaches are designed to accommodate the eventual lake and to cater for productive and compatible land uses prior to the formation of the lake. The sketch is an artist's impression of the opencast as it may look in the future.

Beyond the present opencast, the mine disturbed land to the perimeter of the original lake is included in the rehabilitation proposals and land uses compatible with the eventual lake have been recommended by the consultants, and are being encouraged and financially assisted by State Coal Mines.

KIMIHIA - THE STUDY AREA

A fundamental requirement for successful rehabilitation of the Kimihia Opencast is compatibility between existing and proposed adjacent land uses, and due recognition of water quality and drainage aspects. The area considered in the study therefore, included land beyond the Opencast, particularly Lake Kimihia, and all the low lying area not in pasture.

1 Crown Land applied for or taken by State Coal Mines under Part III of the Coal Mines Act, 1925.
2 Unoccupied Crown Land.
3 Land owned by Waikato County.
4 Crown Land under application for ownership by Huntly Borough.

The majority of the area is Unoccupied Crown Land and land applied for taken under Part III of the Coal Mines Act 1925.

The entire study area (including the opencast) is shown in the Waikato County District Scheme zoning maps as Lake, and has an underlying Rural A Zoning.

The following land uses were identified in the area to be rehabilitated:

The Opencast

The Kimihia Opencast can be considered in simple terms as a hole in the ground surrounded by spoil which has been taken from that hole. The area of spoil has in places reverted to other land uses and is dealt with later, or now lies fallow supporting casual recreational use.

The pit is oval in shape, being 350 metres wide and 1,200 metres long and 50 metres deep. The northern walls of the pit have been cut from the soil and rock covering the coal seams, and represent the final working face of the mine, while the southern and eastern walls have been constructed with the spoil excavated from the north and backfilled into the worked-out area of the pit.

The cut and fill slopes forming its walls are constructed at the maximum safe angle and highest faces between benches. For the material exposed in the northeast corner of the opencast, these limits were perhaps exceeded toward the end of mining, and slips have developed at these places. The only land use within the pit is the development and associated surface installations of the Huntly East Mine.

Underground Mine

The Huntly East Mine is an underground mine with portals to the three inclined drives located within the old opencast. Coal won from this mine will be lifted by conveyor to a road and rail head under construction on the south-eastern rim of the opencast. A new road and parallel railway is nearing completion to connect the coal preparation and storage plant with State Highway 1 and the main trunk railway line.

Coal production has just commenced from underground development, and when fully operational, the mine will produce 400,000 tonnes of coal each year.

State Coal Mines land use requirements for the Huntly East Mine include this access strip from the east bank of the Waikato River to the southern rim of the Kimihia Opencast, plus the southern portion of the opencast. During the life of the underground mine, it is necessary to maintain the depressed water level in the opencast to protect the workings from flooding. Surface run-off and groundwater seepage is pumped from the floor of the opencast and discharged over the northeastern rim to the drainage channel leading to Kimihia outlet. The eventual discharge point may be varied when water rights are granted and stipulated as a condition of such water rights.

Municipal Waste Disposal

The Huntly Borough Council utilise part of the original area of Lake Kimihia for waste disposal. An oxidation pond has been constructed to the old western margins of the lake with provision for further expansion to the north towards Kimihia Outlet. At the southern end of the oxidation pond, the Borough operates a refuse tip which is being extended to the east, and has an expected life of a further six years at the present rate of use.

Lake and Wetlands

The present Lake Kimihia is the fifth largest lake in the Lower Waikato Basin with a lake and adjacent wetland area totalling 123 hectares. It is a natural ponding area for floodwaters from the surrounding catchment which is 2,278 hectares in area. The swampy margins of the lake are regularly underwater after periods of high rainfall.

Lake Kimihia was originally 316 hectares in area, and following mining, the remnant area of water is now only 58 hectares. Two drainage channels are maintained around the perimeter of the original lake to take water to the old Kimihia Outlet, and from there, a single channel discharges into the Waikato River. The northern perimeter drain takes the discharge from the remnant Lake Kimihia, and the southern drain skirts the perimeter of the opencast.

The wildlife values of the area are high, and the lake is rated by the Wildlife Service as one of the more valuable wildlife habitats of this type in the region. The lakes wildlife values and productivity are related to a number of factors including: ratio of lake area to surrounding wetland, extensive beds of submergent and emergent aquatic plants, water regime and the inter -relationship of this lake with other wetland habitats in the region.

Twenty-five wetland bird species have been recorded from Kimihia with a slightly lesser number of additional species recorded on the upland fringes. The area is a breeding ground of the black swan, grey mallard and shoveller ducks and pukeko. Other game birds found in the area include pheasant and quail, and all are hunted in season.

Three species of shag, two species of heron, swallows, stilts and hawks are also found in the area.

Many of these are absolutely protected species and some are relatively rare. The diversity of bird species in this area exceeds the number found in most other wildlife habitats, including rich indigenous forest areas. The lakes and fringes are used extensively by hunters during the game season for waterfowl hunting. Recent figures indicate 30 -100 individuals use the area each year for this purpose. A number of ornithologists also visit the area because of the interesting species present, and the excellent access to the lake and wetlands.

Recreational Activity

There are some established recreational uses of the study areas organised by clubs and pursued by casual participants. The Huntly Car Club has a dirt track on the Waikato County Council land adjacent to Lake Kimihia. The club organises races on the circuit and is keen to improve the standard of the track and provide more facilities. Pony Club riders use the stop bank adjacent to the northern perimeter drain, and trail bikes range over the drier land between the wetlands and the opencast.

***Land Adjacent to the** Study Area*

The study area lies within Waikato County, but the boundary of Huntly Borough is just to the west of the western perimeter drain.

Outside the limits of the original Lake Kimihia and to the south-west of the opencast, the land is zoned residential, and homes are situated along the low ridge overlooking the opencast. Elsewhere farms on rolling hills surround the opencast, remnant lake and low lying wetlands of the original Lake Kimihia.

PLANNING CONSTRAINTS FOR REHABILITAHON

Land Capability

The physical characteristics of the land within and around the Kimihia Opencast place definite restrictions on the potential land uses. Among the factors which directly influence the decision on land use are soil, drainage vegetative cover and the slope of cut and fill batters.

Four classes of land can be recognised in the Kimihia Study area, using the above parameters.

1. Low lying wetlands, adjacent to the lake and spreading across the northern and western sections of the study area up to the perimeter drains. The wetlands are dry most of the Summer, but periodically flood in Winter. They occupy an area of approximately 120 hectares, and include the Huntly Borough oxidation ponds.
2. Low angle slopes (0° to 10°), mainly on fill from opencast mining, which form a water barrier between the opencast and remnant Lake Kimihia and wetlands. The fill between the wetlands and the northern rim of the opencast is only 4 metres above the wetlands, but between the remnant Lake Kimihia and the opencast, the fill rises to 12 metres above lake level. On the south-eastern side of the opencast, the fill has been laid in benches, and the top flat slopes are mostly less than one metre above the altitude of the wetlands and lake, but rise unevenly to 12 metres. The total area of this class of land is 120 hectares.
3. Moderate angle slopes (10° - 30°), forming the upper rim of the opencast on its long north-western and western sides. This class of land is all below the level of the lake and wetlands, and covers some seven hectares.
4. Steep cut and fill slopes within the opencast and moderate undercut slopes in the northern face which have in places failed. These slopes extend from below the moderate cut slopes and low angle tops of the overburden dumps to the floor of the opencast in a series of near vertical faces and horizontal benches to a depth of 55 metres. The total area of steep cut faces is about 10 hectares.

In addition to these, there is the remnant Lake Kimihia which occupies 53 hectares in the north-east of the study area, and the floor of the opencast which is approximately 8 hectares in area, and is mostly covered with water.

Underground Mining

Underground mining by State Coal Mines will continue at this locality for the next 25 to 35 years, depending on the market requirements and amount of coal that is recovered from the seams. State Coal Mines have six main requirements during this period which must be taken into account in deciding land uses in the study area.

They are:

1 Road and rail access from Highway No. 1, and the trunk line to the coal storage and loading facilities at the southern rim of the Kimihia Opencast.

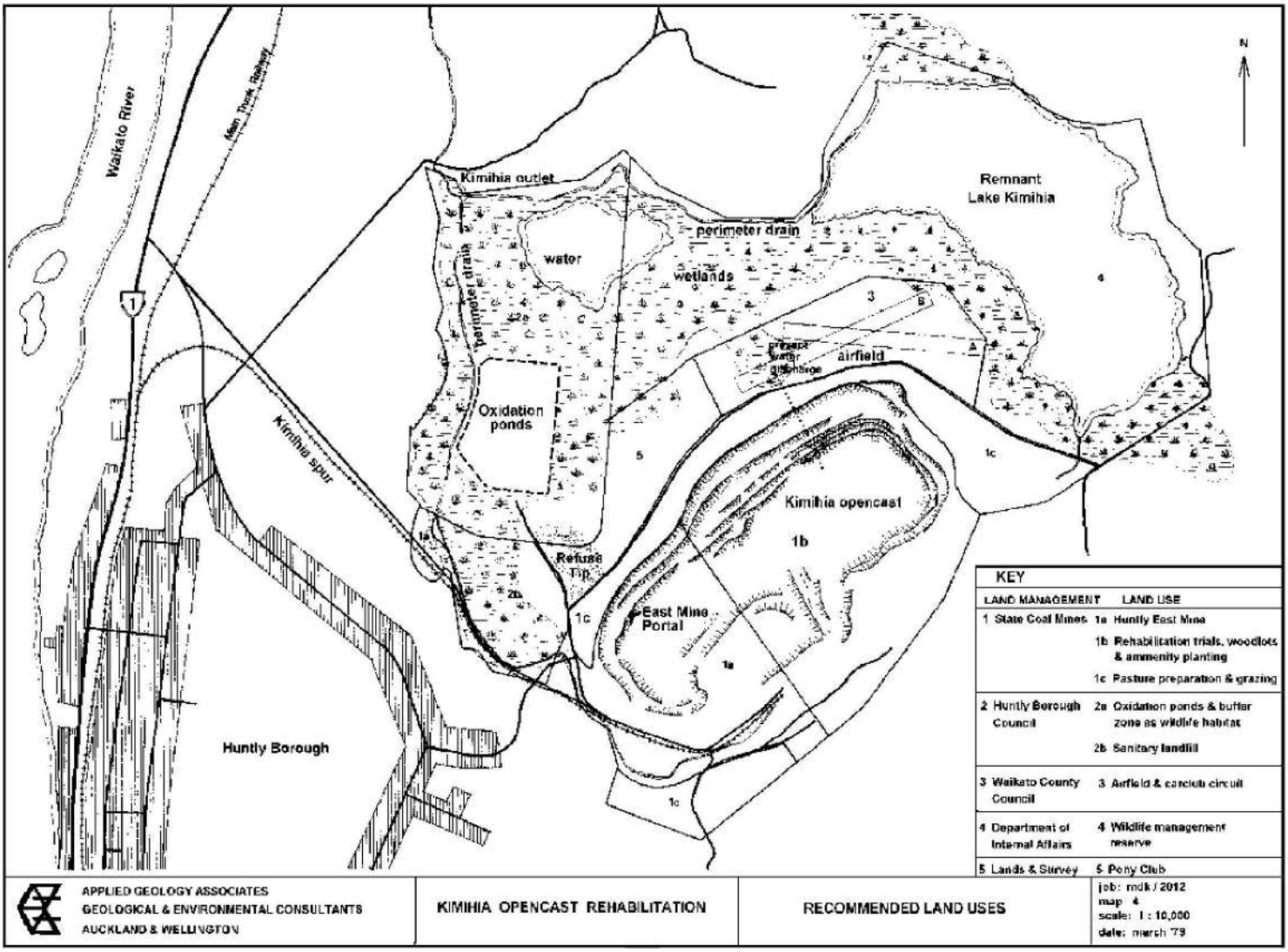
2 Sufficient surface area for the efficient operation of the mine taking in the mine portals, machinery sheds, office and amenity blocks, and coal transport facilities to the storage area. These facilities will occupy the southern portion of the floor and rim of the opencast.

3 A safe water level in the opencast must be maintained below these installations and access is required to the floating pump located over the sump. The right to discharge this water into the Kimihia Outlet drains is necessary.

4 Restricted access to steep batters, slumping or potentially slumping ground, and water filled sumps, all of which are hazards for public and for animals.

5 For safety reasons, there must be restrictions placed on the movement of people around the mine workings, and fire hazards must be kept well away from any coal at the surface. The batters and benches of the opencast, particularly those above the portals of the mine, must be kept clear of debris and drains maintained to direct water away from the face.

6 The degree of surface subsidence and



its timing in relation to the removal of coal underground will depend on the mining methods and recovery factors applied to different sections of the coalfield. New land use development over the coal to be removed cannot be undertaken as the risk of subsidence would preclude the maximum extraction of the underlying coal.

Catchment Management

Prior to mining, the study area as the original Lake Kimihia, performed a necessary function ponding the stormwater for the whole Kimihia catchment. With the reduction in area of the lake and decrease in water holding capacity, the two perimeter drains constructed around the edge of the original lake drain the catchment quickly during times of very heavy rainfall. This results in the ponding of floodwater on farmland between Kimihia outlet and the Waikato River. When the Waikato River is at high flow, the flood gates in the stopbanks prevent water from the river flooding the low lying farmland.

With the extraction of coal from the Huntly East Mine, subsidence will occur at the surface. The degree of subsidence and area affected will depend on the thickness of coal removed, and what coal is left in the ground as support. Maximum recovery would cause the surface to subside below the present water table and create another shallow lake.

This new ponding area would go some way to replacing the function originally performed by the whole of the study area of holding stormwater run-off prior to discharge into the Waikato River.

The existing lake and wetlands will continue to act as a ponding area for flood waters, but the total area cannot be considered for ponding until the cessation of underground mining and the opencast is flooded.

Post Mining Constraints

On completion of the mining at the Huntly East Mine, it will no longer be necessary to continue pumping water out of the opencast.

With the impoundment of surface waters and seepage in the opencast, a new lake will be

formed. The extent of the lake and height of the water will depend on the height and location of its outlet into either the southern perimeter drain to Kimihia Outlet or to Lake Kimihia to the north. An obvious outlet, given the present landform, would be to the south through the recently constructed access road to the Huntly East Mine, which has an elevation of 10 metres above Moturiki datum. The eventual lake level could be lowered by the excavation of an outlet down to 8.5 metres, allowing for a gradient of 0.5 metres to Kimihia Outlet. In periods of persistent rainfall or storms, water level would rise with flooding within the whole study area.

The decision over the height of the future outlet from the eventual opencast lake will have to comply with the flood control scheme to be implemented by the Waikato Valley Authority, and take into account the probable flooding which will occur downstream from Kimihia Outlet following underground mining and surface subsidence.

The choice of eventual lake level in the opencast determines the location of any earthworks required to establish stable beach slopes around the eastern and south-eastern rim of the opencast.

Visual Considerations

The study area nestles within low rolling hills, mostly under pasture, but with some patches of bush. The remnant lake and wetlands are a natural environment in this setting, but the opencast mine is stark and an unnatural landscape. The opencast is overlooked by Huntly residents living along the top of the ridge on the western side of Kimihia, and further residential development is taking place on the lower slopes nearer the opencast.

The visual impact of the site will be fully assessed in order that positive visual management guidelines and specific proposals can be developed. The principal objective, therefore, will be the rehabilitation and integration of the presently disturbed landscape to create a new landscape with its own valid basis and identity. The Landscape Architecture Division of the Ministry of works are involved in this assessment as part of the design and construction of surface facilities required for the Huntly East Mine.

The technique of landscape integration would rely not only on the screening of unpleasant views and general landscape amelioration, but also on the creation of focal points and visual identity areas in the landscape. Integration of the site with its surroundings and setting is the aim - not the obliteration or complete screening off of the site. Where screening may be necessary or desirable in many cases, this can best be achieved with strategic planting and/or contouring at or near the particular view point rather than relying on planting at or near the object to be screened. The scale and density of woodlots and areas of vegetation within the site must be sensitive to ecological and visual relationships.

Land Use Proposals

Various local authorities, Government Departments and recreational clubs have expressed interest in taking over portions of land within the study area, or being given use of Crown Land. Most proposals put forward to date have involved long-term or permanent use of the land beyond the perimeter of the opencast and future opencast lake. Other "temporary" proposals concern parts of the opencast which will not be flooded for at least 25 years. The following proposals are being supported by State Coal Mines on the recommendation of their consultants.

Wildlife Management Reserve

The Department of Lands and Survey prepared a proposal to reserve an area of Crown Land within the study area for wildlife management and to appoint the Minister of Internal Affairs to control and manage the reserves. The proposal covers the remnant Lake Kimihia and surrounding wetlands extending west towards Kimihia outlet,approximately 94 hectares in area. The majority of the low lying land sought for the proposed wildlife management reserve is held by local farmers under temporary tenancies, and is used for grazing.

The creation of a wildlife management reserve is aimed at multipurpose public use and wildlife enhancement by:

1 Planting tree species favoured by wildfowl, to control the pussy willow and improve game bird population.

2 To provide bird watching and nature study opportunities for school groups, clubs and individuals.

3 To improve the number of game birds to be hunted in season.

It is not intended to create a wildlife refuge or game hunting area, nor is it intended to close the

area to grazing. The aim of the reserve is to have controlled game bird hunting over part of the area combined with controlled grazing on dryer areas.

State Coal Mines have agreed for the release of land held under Part III of the Coal Mines Act requested for the reserve and will be providing up to $50 per hectare for tree planting and track preparation.

Huntly Borough Council

Huntly Borough has a requirement for land to accommodate improved services to cater for an expected residential and industrial expansion. There is a need for flat land, close to the Borough, for public utilities such as the oxidation ponds for sewerage disposal and rubbish tip, both present in the study area. The Borough Council consider that if further land was available in this area, then noxious industries could, with easy access to the main railway line, be attracted to Huntly.

In addition, two recreational clubs in the Borough require land at the present time.

1 The Rotongaro Pony Club is seeking approximately 4 hectares of nearly flat pasture to cater for their total range of equestrian activities. This includes access to horse trails on adjacent land such as the wetlands and perimeter of Lake Kimihia for club jaunts. At present, the club has 30 members, and is about to lose the small block of land they currently use adjacent to the State Highway.

2 The Huntly Car Club established a road circuit for their club activities on the Waikato County land within the study area, which it is hoped will be developed as an Airfield. The club is keen to work with State Coal Mines if land could be made available for their use and to launch a fund raising campaign to construct the facilities at a new circuit.

State Coal Mines have agreed to put into pasture the area sought by the Pony Club, and the land has been prepared for sowing. The Department of Lands and Survey have agreed to lease this land directly to the Pony Club.

The consultants recommend to State Coal Mines that they encourage the Huntly Borough Council to cease operations at the present refuse site, and design a properly prepared and managed sanitary landfill at the adjacent low lying land next to the western perimeter drain extending north to the oxidation ponds. Surface excavation and sealing with drains to collect leachate for treatment, and a programme of filling the land ahead of underground mining would create suitable industrial land adjacent to the road and rail access to serve the Huntly East Mine. Use of the facilities would not be practical until mining ceased, and an industrial subdivision could be part of the long-term land use proposals.

Waikato County Council - Airfield

The Waikato County Council took part of the Crown Land reclaimed by the construction of the stopbank and dumping of soil prior to opencast mining. The Councils intention was to form a Category B airfield capable of taking Group 7 aircraft. Such airfields are generally unsealed and are used for general aviation such as 3 - 7 passenger single and twin engined aircraft. The airfield would provide a base for the three light aircraft currently owned by residents in and near Huntly, which are used for business and private purposes. At present, the nearest registered airfield is at Te Kowhai, 30 kilometers distant. It was proposed that Huntly Borough and Raglan County Council share the cost of construction, as rate payers in each local authority could profit from this new public utility. The supporters of the airfield proposal consider that it would serve as a base for top-dressing aircraft and an aeroclub, in addition to satisfying the existing need of local aircraft owners.

State Coal Mines will assist with the earthworks required to form a 610 metre by 50 metre airstrip up to an amount similar to that required to re-establish pasture within the Part III Coal Mines Act areas.

The consultants have noted two suggested alignments for the airstrip on this land:

Option "A" (0950) would be the cheapest in terms of necessary earthworks, but would limit other land use within the area.

Option "B" (0650) conforms to the most suitable alignment for the prevailing winds, and would allow the Huntly Car Club to establish a new circuit on this land and share parking and other facilities as they were established.

There are further opportunities for multiple use of this land. The development of an airfield would necessitate the provision of some shelter, clubrooms if an Aero Club was formed, toilet facilities and a car parking area. The cost and use of these facilities could be shared with other

clubs such as the Huntly Car Club and users of the Wildlife Management Reserve.

The Wildlife Service will also require a marshalling point for their planned school and club tours through the wetlands, and they may wish to negotiate access over the Waikato County land for a footpath around the airstrip. The adoption of "Option B" for the airfield alignment would assist this proposal as well.

Motorway Construction

The National Roads Board have decided on the most likely route for the proposed Motorway which will bypass the township of Huntly. It will cross the study area, aligned about north-south just to the east of the Borough oxidation ponds to the west of the Kimihia Opencast. This route places the Borough refuse tip directly in the path of the proposed Motorway. The possible commencement date for construction is as yet undecided.

Opencast Perimeter

The perimeter of the opencast will be the future lake margin, and its establishment now in a form suitable for that eventual situation is important. A study of available literature on small artificial lakes in similar "soft" rocks indicates that beach gradients of 5° would be stable. Accordingly, the batter slopes in the perimeter area have been checked over a range of elevation spanning the expected high water level - low water level range, and the sections with greater than 5° slope will be benched and flattened. This will enable a beach to be established eventually along the entire western and northern margin of the present opencast.

The future beach areas are being established in pasture at the recommendation of the consultants following revegetation trials carried out by State Coal Mines with the assistance of the Department of Agriculture and Fisheries. As well as establishing grass cover along the eventual lake shore, this pasture development is being used as a test area for later reference for revegetation of mined areas elsewhere. The first areas that have been regrassed are now fenced, and stock water has been provided to enable controlled light grazing to assist with weed control and grass root development, leading towards the development of improved soil structure. Lime applications prior to sowing and later repeated fertilizer applications are included in this work.

Opencast

The land capability analysis highlights the restricted options available for the use of the opencast, given the requirements for continued mining from the southern end. It has been agreed that selected areas of the opencast, particularly the area of strippings, be planted in woodlots and amenity plots on an experimental basis. A range of species has been recommended to the consultants for planting in the unprepared ground to test adaptability and growth rates for visual amenity, erosion control and, if feasible, as a source of revenue. The recommended species include forest tree species such as pine and gum, as well as a range of more ornamental nursery grown stock. Some amenity planting has been recommended for the opencast perimeter.

This programme is now underway with plants being provided from the nurseries of Forest research and Lands and Survey department. The Ministry of Works and Development will assist with the planting.

KIMIHIA GRASSING TRIALS

Specifications for Kimihia Grass Trial

Plots

An area of 2.5 hectares has been cleared above the East Mine drives. This area is being used as a trial plot to determine suitable seed mixes and fertilizer applications.

The following are the three seed mixes and the five fertilizer mixes used.

Fertilizers 1, 2 and 3 were spread and disced in before sowing seed.

Fertilizers 4 and 5 were spread after seeding.

Seed Mix 1 Rate (Kg/Hectare)

Ruanui Ryegrass	15
Paspallum	5
Yorkshire Fog	4
Browntop	3
Chewings Fescue	5
Cocksfoot	5
Maku Lotus	3
White Clover	2

Seed Mix 2

Ruanui Ryegrass	30
Browntop	3
Chewings Fescue	3

Maku Lotus	2
White Clover	2

Seed Mix 3

Ruanui Ryegrass	36
Maku Lotus	2
White Clover	2

Fertilizer 1:	2.5 tonnes/hectare	Lime
Fertilizer 2:	7.5 tonnes/hectare	Lime
Fertilizer 3:	750 kg/hectare	Super
Fertilizer 4:	125kg/hectare	Diammonium Phosphate
Fertilizer 5:	187kg/hectare	Top Crop Red

Conclusions Reached from Grass Trial Plots

The trial plot was set up to test the following:

Types of grasses that will establish themselves on the soil present;
The effect of high and low rates of application of lime;
The reaction of grasses to the addition of phosphates (Diammonium Phosphate) and Potash (Top Crop Red).

Soil samples taken from the vicinity of the test plots gave the following results: Ph 5.1, Ca 6, K 11, P 4, Mg 60.

Plot 13 was sown without the application of Diammonium Phosphate or Top Crop Red. Overall growth of grasses was poorer than the rest of the plots with very little initial clover growth.

Only one plot demonstrated a reaction to the high rate of lime addition. This was Plot 1, which, at the time of inspection, had not reacted to the lack of rain to the extent Plot 2 had. The lime tends to condition the soil and promote an improved structure in the soil which aids water retention. The trial plots do not conclusively show the advantage of the higher rate, but as the cost of lime is not high, the higher application rate was chosen. The other beneficial effects of the lime is in breaking down some of the clays in the soil, which would improve the effect of the second cultivation prior to seeding. This was the reason for applying the lime at least two months prior to seeding.

In most plots, the reaction to Diammonium Phosphate was greater than that to Top Crop Red. Accordingly, Diammonium Phosphate was chosen as a convenient source of additional phosphate; the greater reaction to phosphate in Diammonium Phosphate, rather than Superphosphate, is caused by the higher percentage of phosphate available in Diammonium Phosphate. Top Crop Red contains a similar rating with potash replacing phosphate.

An inspection of the trial plots showed the most striking success of the grasses sown was that of clover and maku lotus, which are the species best suited to low fertility soils. As the fertility increases, the clover would eventually take over from the lotus and eventually the rye, fog and browntop would establish themselves. Each of these last three species had germinated and of these, the rye was the most prolific.

Examination of the trial plots failed to locate any germination of the paspallum and cocksfoot species, which apparently are not suitable to the initially low fertility soils.

TREE PLANTING SPECIFICATIONS

The following specifications covers the supply and planting of the listed trees. No planting plan as such is provided as all planting will be located and supervised on site by the Landscape Architects

GENERAL

Works included within this specification to cover the planting of disturbed areas and areas of overburden and strippings as directed by the landscape architects. Generally there will be no planting on batters steeper than 2:1.

The planting programme is the first stage in an experimental vegetation project. Thus the areas and distribution of planting will be determined on site.

No planting is to be carried out in any areas until approval to proceed is given by landscape architects.

SUPPLY OF PLANTS

The following forest tree lines are required:

3000 Pinus Radiata
2000 Eucalyptus Regnans
1000 Eucalyptus Delegatensis

The following nursery grown stock is required. All plants to be supplied in the equivalent of $2^1/2$ inch pots:

100 Acacia Dealbata
100 Acacia Longifolia
100 Acacia

Melanoxylon
100 Albizia Lopantha
100 Cytisus Proliferus

The following willow and poplar species are required. These trees may be open ground stock or rooted cuttings:

50 Salix Arenaria
50 Salix Caprea P.G.
50 Salix Caprea N.
50 Salix Viminalis
50 Populus x Euramericana Flevo
50 Populus x Euramericana 1 - 154
50 Populus Ynnanensis

All plants to have a habit of growth that is normal to the species and are to be sound, healthy, vigorous nursery grown stock. All plants are to be free of nursery pests, plant diseases, sun scald abrasions and other disfigurements. All plants to have a normal and vigorous root system which are neither root nor pot bound.

All plants to be of the species, variety and pot size as specified. No plant substitutes shall be made without the written approval of the landscape architects.

At time of planting all plants to be fertilized with a "complete" commercial fertilizer. The application method, rate and timing of this nursery operation to be discussed with the landscape architects.

A light grazing was recommended in Autumn to reduce the growth that would otherwise need to be sustained over the dry summer. During May, the plot was to be grazed heavily, and super applied.

Specification for Perimeter Grassing at Kimihia

The area shall be completely cleared of all toitoi by grubbing out all roots. This material is to be piled into a heap and burnt, when dry. Concurrently with the burning of the toitoi, the area shall be fertilized with lime, and the lime worked in by cultivating to a minimum depth of 20 centimetres.

Seed Mix	Kg/Hectares
Ruanui Ryesgrass	20
Yorkshire Fog	4
Browntop	2
Chewings Fescue	5
Maku Lotus	2
White Clover	2

All legumes are to be freshly innoculated with the correct innoculum.

Fertilizer

Lime:	7500 Kg/hectare
Superphosphate:	875 Kg/hectare
Diammonium Phosphate:	125 Kg/hectare

The lime is to be spread and cultivated in concurrently with clearing of toitoi during November-December, 1978. The remaining fertilizer is to be given after further cultivation in February/March, 1979.

This contract has been let and most of the opencast perimeter and the area allocated to the pony club has been cultivated.

PLANTING

1 Planting to be carried out in September, 1979, or as directed by the Landscape Architects.
2 During delivery and while holding plants on site, care must be taken to ensure peat pots do not dry out.
3 All handling, storage and planting operations to be in accordance with normal horticultural practice.
4 Prior to planting operations, planting plans and/or full site supervision and direction will be given to the location and general **disposition of planting**
5 Planting operations to be modelled on forest tree planting technique, and as such, ground preparation to be minimal. That is, where grass exists, this is to be screened off in 1 foot (300 mm) square. A hole sufficiently wide and deep enough to take the peat pot to be dug or grubbed. Plant to be placed in a hole so that all of pot buried. All plants to be firmly heeled in.
6 Peat pots to be thoroughly wet at time of planting. During planting operations, all plants to be maintained and watered.
7 At completion of planting, all equipment to be removed and rubbish to be cleared from site.