

80 REPORT ON THE PROPOSAL TO BORE FOR COAL IN THE TOWNSHIP OF
TRIABUNNA, SPRING BAY, AND ITS NEIGHBOURHOOD.

Geological Surveyor's Office, Launceston, 2nd August, 1890.

SIR,

I HAVE the honor to report that, in accordance with your instructions of the 8th July, I went to Spring Bay on the 15th ult., and put myself in communication with the Warden of the Municipality, Mr. Lester. I found that it was desired that I should report on the advisability of having a series of borings made by means of the diamond drill, to ascertain if payable seams of coal exist in the district, and on the sites for such borings if undertaken. An examination of three different localities in this connection was requested,—namely, the township of Triabunna and its immediate vicinity, the Ravensdale Estate near Little Swanport, and Prosser's Plains on the Back River, some four miles west of Orford.

Triabunna and its vicinity.—I attach a map of the township of Triabunna and the country immediately surrounding it for the purpose of explaining this report. The township is laid out at the head of Spring Bay on a large alluvial flat, bounded towards the north and north-west by high hills of greenstone, and rising towards the south and south-east into low hills of sandstone. At Orford the greenstone ranges sweep round and come out on the coast line at the mouth of the Prosser's River, but between Orford and Spring Bay the country may be said to be all sandstone, with the exception of a mass of greenstone at Meredith Point. On the eastern side of Spring Bay the sandstone country predominates, reaching through to Oakhampton. The high spur running southward to terminate in Cape Bourgainville is, however, greenstone, and a great mass of this rock also reaches from Point Horne Look-out nearly to the Oakhampton quarries. Most likely there are many other intrusions of greenstone in the low range separating Spring Bay from Oakhampton Bay. Three dykes of this rock penetrate the sandstones at Dusky Bight, the Oysterman's Station, and to the north and south of these the sandstones are hardened, jointed, and baked-looking, as if they had been subjected to the action of great heat. The argillaceous nature of the sandstones on the beach allows them to show the effects of heat more than the white quartzose freestones overlying them. Whether the main masses of greenstone have been intruded through the sandstones or are of older date I have seen no evidence in the district to pronounce with any certainty, but in either case the result is the same as far as coal seams are concerned, the greenstone must cut them off. If the greenstones are of later formation than the coal measures, it is possible that they may form cappings over the latter in places, but I fear that much hope cannot be founded on this possibility in the district now in question, appearances being much more in favour of the belief that there have been no large overflows from the dykes. We may, therefore, regard the greenstones as forming the boundaries of the coal formation. It is a very difficult matter to make out the amount and direction of dip of the strata in this locality, owing to the sandstones which show in all the available sections being very much "false-bedded." As the result of a large number of observations, I came to the conclusion that there is on the whole a very gentle northerly dip of from one to two degrees, but that there are gentle undulations which alter the direction and amount of the dip very considerably. Faults breaking the strata are also probably present. Selwyn, in his report on this district, mentions a fault showing at the head of the estuary. I was not able to find the spot, probably owing to the creek being somewhat high, but the differences in level of the seams of coal struck on the east and west sides of the estuary of themselves point to the existence of such a fault. On the beach at the east end of Vicary street there is a bed of shaly clay striking N. 47° W., and dipping to the N. E. at the high angle of 52°, which indicates the proximity of another fault, the sandstones immediately to the southward being nearly horizontal.

There are two very distinct sorts of sandstone found in the area under consideration, one very quartzose, sharp to the touch, white or yellow freestone, the other composed chiefly of fragments of a felspathic rock now altered to clay, and containing sometimes very little, sometimes a good deal, of quartz sand. This is generally of a greenish grey, sometimes yellowish colour, and frequently contains fragments

of carbonaceous matter. Some of the beds contain mica, occasionally in considerable quantity. The felspathic sandstone lies immediately over the principal coal seam in all the shafts sunk to it on both sides of the estuary. It is seen on the beach all around the head of the estuary. From Patten Point southward along the eastern shore of Spring Bay to opposite Observatory Point a bed of felspathic sandstone is found similar in most respects to that just mentioned. It is overlaid by white freestone, which, from being 15 to 20 feet above high water mark opposite Observatory Point, dips gently down until north of Patten Point it altogether conceals the felspathic rock beneath. At Patten Point there is an outcrop of micaceous, black carbonaceous shale, and along the beach to the northward I found numerous fragments of hard brick red shales containing impressions of leaves of one of the typical fossil ferns of our upper coal measures. As I could not find any of this shale *in situ* above high-water mark, it seems likely that it lies lower down, perhaps under the felspathic sandstone. From its appearance, however, I should judge that the intrusive greenstone cannot be far from it, as it appears to have been hardened and altered by heat. It seems probable that the two beds of felspathic sandstone mentioned are separated by a thick bed of white freestone, and borings through the first felspathic bed, after passing through the known seam of coal underlying it, should be carried down through the freestone to try for a lower bed of coal in the second felspathic stratum.

A good deal of work has been done already to test the coal in this neighbourhood. On the map I have marked the positions of the various workings as nearly as I could ascertain them. It is much to be regretted, however, that reliable information as to what has been done in the past is now very difficult or impossible to obtain. Even when Mr. Selwyn reported on the field in 1855, he was unable to get exact information as to much that had been done. As his report is now almost unobtainable, I attach a copy of his plan and sections, and of the part of his report relating to Spring Bay. On my plan the letters A, B, C, and D refer to the shafts and bores denoted by the same letters on Mr. Selwyn's plan, except that C is now what is known as Gurney's Shaft, the shaft having been sunk on the previous bore. E on the plan is the site of another bore, pointed out to me by Mr. Bresnahan, but about which I could get no information whatever. F, G, and H are shafts sunk since Mr. Selwyn's report, about 1873, on the township, and J is a shaft sunk in 1875. K is the place where I think it would be advisable to bore with the diamond drill. In the shaft C, I was informed a seam of coal 4 inches thick was passed through at a depth of about 45 to 50 feet, and at 97 feet a seam 5½ feet thick was encountered. A drive was put in on this for 50 feet, but the coal proved useless. It has been suggested, with a great deal of probability, that the intrusion of the greenstone ridge to the north-east of the shaft may have been the cause of the impregnation of the coal with the large amount of mineral matter it contains. I was not able to get any of the coal to test this supposition in any way. This seam appears to be from 50 to 52 feet below high-water mark at points B and C. The stones round C show that the stratum of felspathic sandstone met with in shafts H and J here also immediately overlaid the coal, thus establishing the identity of the seams, and showing that there must be a downthrow on the eastern side of the fault. Shaft D, as Selwyn observes, is south of the line of outcrop of the coal, which must here dip to the northward more than two degrees, otherwise it would have been cut in the shaft. Shallow borings in the flat between C and D would probably soon strike the outcrop of the seam. I have not been able to find if any coal was got in the shaft F, but from both G and F coal was raised, and I was told that a shipment of 50 or 60 tons had been sent to Melbourne, but my informant could give me no information about its quality or the price it brought. From G a drive was made towards the Roman Catholic Chapel, or about N. 55° W., but whether it was driven level, on the dip, or to the rise, I could not find out. If level, its direction gives us the dip of the seam as about N. 35° E., which agrees fairly well with some other observations. It is to be presumed, from the fact of the abandonment of the mines, that the coal was not of good quality. None of it is now obtainable. At J a shaft was sunk for 155 feet, passing through felspathic sandstone full of carbonaceous matter, and with occasional thin beds of shale and of carbonaceous matter full of iron pyrites. From the bottom of the shaft a bore was put down for a further distance of 80 feet, which cut a seam of coal 5 feet thick at 205 feet, and then passed through several feet of fire-clay. Nothing further was done. It is clear, therefore, that the greater part of the western portion of the township of Triabunna is on coal, though probably much of it is of poor quality. Some 20 or 30 chains below the junction of Brady's and M'Laine's Creeks, the white, gritty sandstone crops out in the bank of the latter, lying nearly horizontal, and similar sandstone is seen in the flat to the west and south of it also. The coal-bearing area at present known may be said to lie between a line drawn N.W. from shaft F and the greenstone hills to the north of the township.

As the residents are anxious to set the question of the existence of workable coal at rest, I would recommend that they bore at K with the diamond drill. This is about the centre of the known coal area. The 5-foot seam ought to be struck at about 120 to 130 feet, and the bore should then be carried down to 700 or 800 feet to try for lower seams which may or may not exist. It is true that the shaft D shows no coal for a depth of 200 feet below the known 5-foot seam, but the beds of carbonaceous shale and felspathic sandstone found on the eastern side of Spring Bay do not appear to have been reached in it. These appear to underlie the white sandstones met with in the shaft, and may dip to the north-east more rapidly than their apparent north-westerly dip along the shore would indicate. As mentioned above, a bed of fossiliferous shale seems to exist somewhere in connection with the felspathic sandstone near Patten Point, which, with the carbonaceous shales, would indicate that it is by no means below the horizon at which coal might be expected. The large amount of false bedding of the sandstones may be taken to indicate that they were laid down in shallow water, consequently slight changes in the level of the shore might have led to the alternate formation of beds of sandstone and coal. The littoral character of the sandstones in this part of the country is further shown by the occurrence in Crabtree's Quarry, near Orford, of a bed of coarse gravel lying in a depression hollowed out of the previously existing sands. In this quarry it was reported that a bed of black shale was struck below the sandstones; but, if so, it is now quite covered over again. It is only by boring that the existence of lower beds of coal can be demonstrated or disproved; and, looking to the magnitude of the gain to the colony and to the district, should good coal be found near to such a splendid harbour as Spring Bay, I certainly think a bore should be put down. That there is a great risk of failure to find any coal of value is indubitable; but, on the other hand, the reward of success is a

great one. If the bore at K were carried down, say, to 800 feet, it would almost certainly yield us sufficient information to judge of the advisability of boring in other places in the district. To test the ground thoroughly, at least three bores are required: one in the middle of the large flat to the west of the township, and another inland to the east from Patten Point about 20 chains, in addition to the one at K. The boring should not prove very expensive. The strata are probably similar to those passed through by the diamond drill at Seymour, where the cost was 7s. 8½d. a foot. This might be fairly taken as a probable estimate of the cost of boring at Triabunna also.

Ravensdale Estate.—No coal of any sort has yet been found in this locality, but there is a very considerable extent of the coal measure sandstones, and there is therefore a possibility of finding coal by boring. On the road from Triabunna to Little Swanport greenstone is the prevailing rock passed over, though there are occasional patches of sandstones. The relation of these to the greenstone seems to me to favour the theory that the latter rock is of more recent formation than the sandstones, and intruded through them. Occasional dykes of greenstone may be seen clearly penetrating the sandstones, and I could see no reason to suppose that these dykes were of later origin than the main greenstone masses.

Between Triabunna and Grindstone Bay, and from Grindstone Bay north to Little Swanport the country is said to be all sandstone, so that if coal were found in it there would be a large field. Prospecting by borings is therefore well worth trying.

The Ravensdale estate contains a large extent of sandstone country. A large mass of greenstone comes into the southward from Mr. Salier's residence, and this rock also cuts off the sandstone to the south-west in Mr. Chaffey's property. The sandstones seen in the Ravensdale Rivulet are yellowish brown quartzose freestones, more highly inclined than those around Triabunna. No fossils were seen in them. In the creek some 30 chains above the shepherd's hut, beds of shale dipping east 4° to 5° are found. These underlie the sandstones found lower down the creek. I did not find any fossils in these either, and their position in the coal measures is therefore doubtful. Interstratified with the shales a thin bed of greenish felspathic sandstone similar to that overlying the Triabunna coal was noticed. Lower down the creek the sandstones dip more steeply, angles of 21° and 25° being observed, and at the crossing of the creek to the shepherd's hut and lower down it they again appear to be flatter, the angle of dip being from 7° to 3° easterly. As the section of the creek exposes a great thickness of sandstone beds without coal, I think that the best place to bore would be south of Shepherd's hut, where the drill would soon reach the unseen strata lying beneath the shales above-mentioned. A bore about 5 chains up the creek from the hut would be well situated.

Prosser's Plains, Back River.—This appears to be the most promising place of the three visited for finding payable coal, as the existence of a useful seam is known, and what has to be ascertained by boring is its extent and depth below the surface. The coal crops out in the Back River in Section 1682. The river being in flood at the time of my visit, the outcrop was not visible. Mr. Selwyn reported in 1855 on this coal as follows:—"At Prosser's Plains, in the Back River, a branch of Prosser's River, and about five miles from the residence of T. Cruttenden, Esq., two seams of coal occur, together about four feet thick, dipping (S. 15° W.) to (W. 20° S.) from 35° to 50°, and passing under a flat of about 2000 acres. These coals are bituminous, though not of first-rate quality. They ignite freely, and burn with a bright flame, but are of rather slaty structure, and contain a large percentage of earthy and incombustible matter. On three sides of the flat the carboniferous beds are cut off by high ridges of massive greenstone; but on the fourth side, towards the plain and in the direction of the dip, no eruptive rocks occur. In this direction the above seams of coal, and perhaps others, might be found at no great depth, over a considerable area. The distance, eight or ten miles, from the nearest shipping-place in Prosser's Bay, and the great expense attendant on the construction of the necessary road, appears the chief difficulty in the way of their being worked to advantage. The greater part of the ground is, I believe, the property of the Crown. The very high angle at which the seams are dipping where exposed in the Back River is probably only local; and they would most likely be found to flatten at a short distance on the dip, in conformity with the overlying sandstones to the south west."

I have very little to add to Mr. Selwyn's lucid description. The whole of the flat, from the outcrop of the coal down to the Prosser's River on the course of the Back River, is sandstone,—the greenstone rising abruptly on the east side of the latter stream. To the south west from the outcrop there is sandstone for a long distance, and this sort of country extends through to the back of Buckland. If coal lies under all of this sandstone, the field will be of great importance. Some years ago a shaft was sunk in the flat to the south of the coal outcrop about half-a-mile, but I could get no information as to its depth. It was abandoned before reaching the coal. The rock passed through was a somewhat felspathic sandstone, but containing more quartz sand than the felspathic sandstone over the coal at Triabunna. The same rock is seen in the side of the Back River, near the outcrop. Another shaft was sunk close to the outcrop many years ago, and coal was taken from it. I collected a few of the fragments strewn about the surface, and sent them for analysis to the Government Analyst. He reports thus:—

"The sample of coal from Buckland forwarded by the Government Geologist has been examined, and the following results obtained:—

	Per cent.
Fixed Carbon.....	73·6
Matter volatile at red heat.....	15·1
Sulphur.....	0·7
Mineral matter (ash).....	8·0
Moisture lost at 212° F.....	2·6
	100·0

The coal does not coke. A workable seam of this quality would be of great value."

Local reports have always agreed in describing this coal to me as caking when fired. Possibly the weathered fragments analysed have lost this property. The analysis cannot be looked upon as fairly representing the bulk of the seam, as I did not pick up any of the fragments of black shale accompanying those of coal, though doubtless both came from the seam. It rather represents, probably, the purer bands of coal in the seam.

I have no hesitation in saying that boring should undoubtedly be done in this locality. The extent of the measures, and the size and quality of the seam, give every hope that payable coal will be found. For the first bore I should recommend a site about 10 or 15 chains W.S.W. from the outcrop. The unfinished shaft above mentioned would be a good site for a second bore.

The distance from the outcrop to deep water in Spring Bay is in a direct line about seven miles. I do not think that there would be any unusual engineering difficulty in getting a tramway to the harbour in about ten miles of distance. This would be no great matter if the coal was of good extent and quality.

Parishes of Hodgson and Page.—A glance at the county map shows the Parishes of Hodgson and Page to be still almost entirely Crown lands; I was informed that these lands were barren sandstone country, not fit for agricultural and pastoral purposes, and consequently not taken up. If the borings at the Back River and Triabunna should find good coal, there will be good reason to hope that it also exists under these barren lands. A geological examination of these should be made, and, if required, bores should be executed to test for coal.

In concluding this Report, I have to acknowledge many courtesies and much information from Mr. Lester, the Warden of Spring Bay, Mr. J. J. M'Clusky, Messrs. Salmon, Salier, Pitt, Mace, Stewart, and others, who did all they could to show me the District and to explain what had been done.

I have, &c.

A. MONTGOMERY, M.A., *Geological Surveyor.*

The Secretary of Mines, Hobart.

COPY OF PORTION OF MR. A. R. C. SELWYN'S REPORT UPON SOME OF THE COAL SEAMS OF VAN DIEMEN'S LAND, 1855.

"Spring Bay and the Township of Triabunna.—The vertical section, Pl. II., Figs. 1, 2, 3, 4, are drawn from data furnished by Mr. Vicary.

The works are all abandoned for the present, and the shafts full of water. I was, therefore, unable to examine any of them.

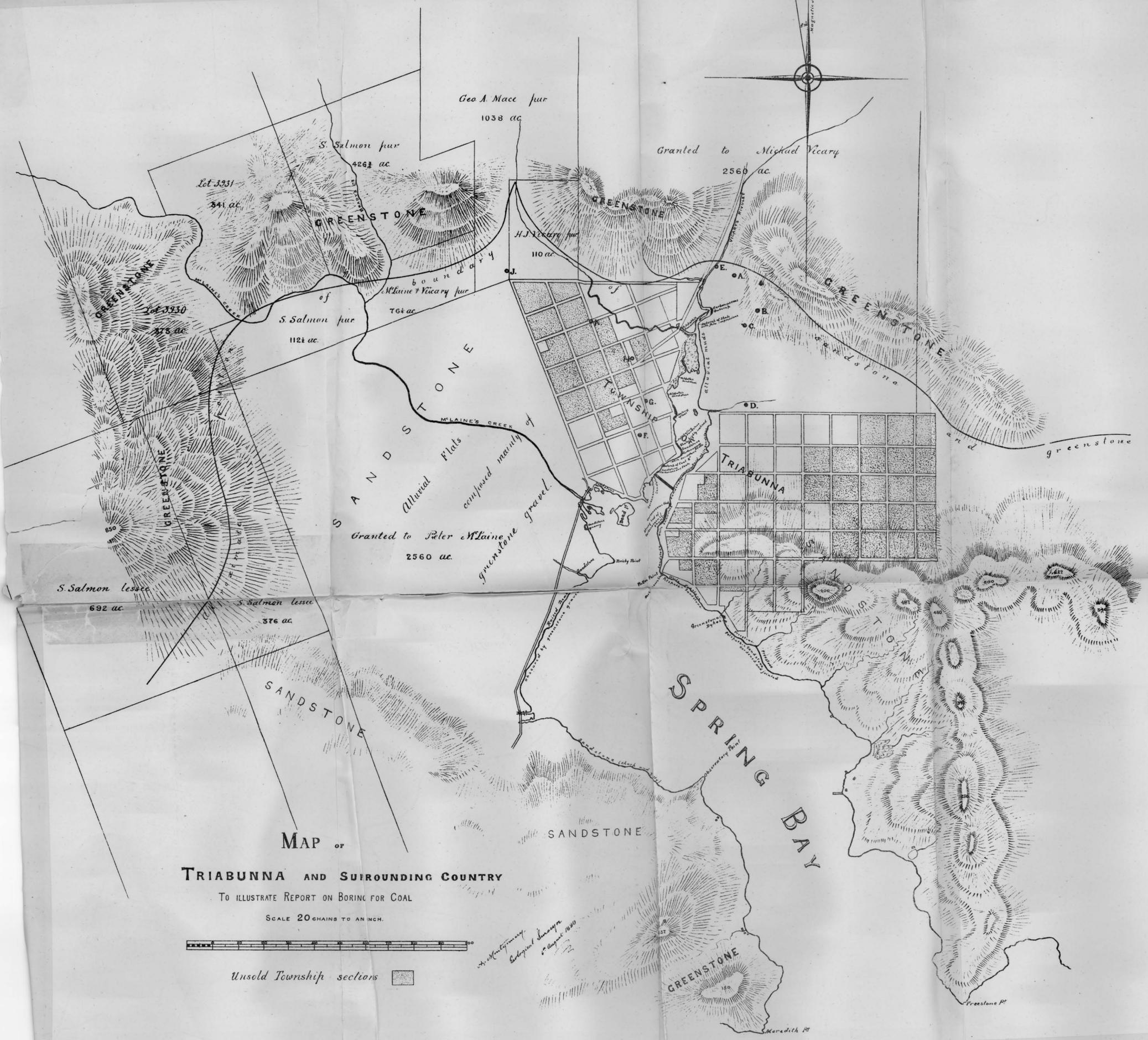
As I had no map of the locality, the plan is merely a sketch of the surface, in which I have attempted to show the position of the different workings, and the general relations of the beds as seen on the surface. The shaft marked D was the first work executed, and was sunk with the intention of cutting the 3½ foot seam of coal, which is seen cropping below high-water mark on the west bank of the estuary, and which, but for the existence of the fault A.B., of which the parties do not seem to have been aware, would have been successful. Owing to this circumstance, however, they sank and bored 200 feet in beds immediately underneath the crop of the coal, and which are exposed to view on the surface to the south along the shores of the estuary,—thus wasting both time and money.

In the several bores and shafts A. B. C. D., a thickness of nearly 400 feet of coal measures has been proved, in which only one seam of coal of a workable thickness exists.

This seam could, however, I think, be worked over an area of at least 300 acres: this, taking the seam at 3 feet, and the cubic foot of coal at 56 lbs., would give something like 900,000 tons of coal. The seam is said to be 5 feet, but it has never been cut except with boring-rods at B. and C. on the plan.

The largest workable area would probably be on the west bank of the estuary, where no works have hitherto been executed, the land being a Government Township Reserve.

In the area above described no shaft would, I think, require to be carried more than 200 feet in order to obtain coal. I was unable to obtain specimens from which the quality of the coal could be judged; but Captain Vicary states that it is an excellent bituminous coal, ignites freely, and burns with a bright flame. Such being the case, and considering the proximity to the shipping-place, some additional outlay in this locality would, I think, be desirable, and would, if properly expended, in all probability result in the discovery of a workable coal-field."



MAP OF
TRIABUNNA AND SURROUNDING COUNTRY
 TO ILLUSTRATE REPORT ON BORING FOR COAL
 SCALE 20 CHAINS TO AN INCH.

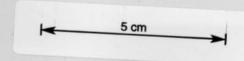
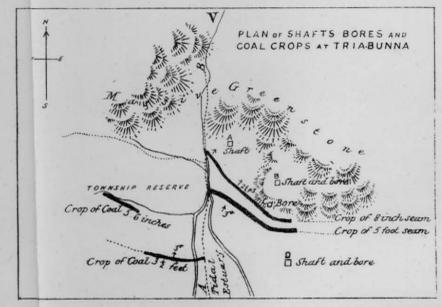
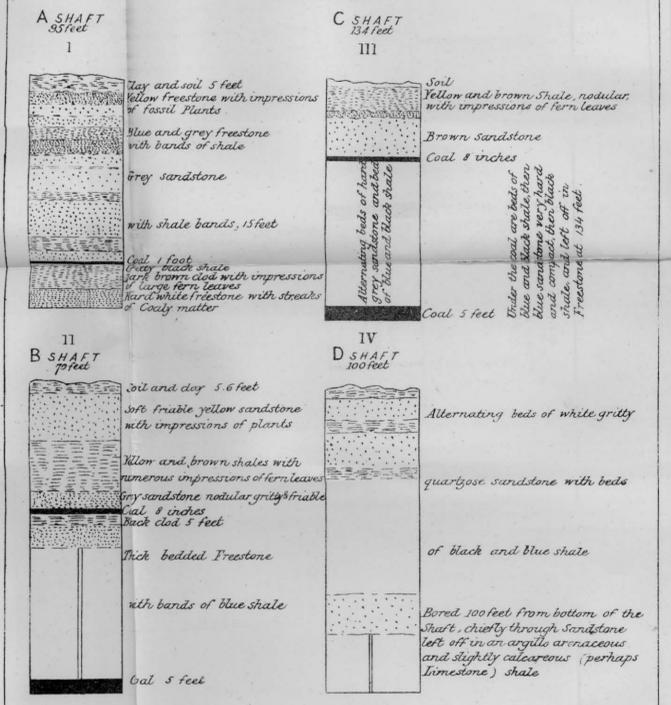


PLATE II
 Scale 40 ft to 1 inch



Handwritten notes:
 by Montgomery
 Geological Survey
 20 August 1890

Meredith 1890