

REPORT
ON THE
Victoria Coal Mines,
LOW POINT, SYDNEY, C. B.

BY
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By request of the proprietors of the above mine, I visited the locality on the 24th and 25th of July last, in company with W. Fraser, Esq., and Mr. Ross, the manager of the mine, and have subsequently made assays of coal from the more important beds.

The Coast at Low Point and its vicinity exhibits, on the property of the company, which is a water area extending for about four miles along the south side of Sydney Harbour, nearly the whole of the coal beds known in Eastern Cape Breton; arranged more compactly than is usual, owing to the high angle of dip. In all eleven workable beds are known on the area. I regard six of these as valuable under existing circumstances. The others will be of economic importance in the future, but are not at present deserving of attention.

I shall proceed to describe the more important beds of coal, and shall then make some remarks on the works at present in operation and the probable future of the mine.

I. BEDS OF COAL OCCURRING ON THE PROPERTY.

(1). THE CARR SEAM.—This is the highest in position of the beds seen on this Coast. It is not exposed on the property of the Company, but is seen in the high sea cliff eastward of Low Point. Here it is four feet in thickness, and is a clean compact coal. The roof is gray shale with coaly layers, overlaid by a thick sandstone. Its dip is N. 10° E., at an angle of 10°; but on the property of the Company it must have a higher and more northerly dip. On assay it gave—

Volatile matter	39.0
Fixed carbon	59.0
Ash	2.0
	100.0

It will therefore yield 61 per cent of excellent coke, and at least 37 per cent. of illuminating gas, so that it must be of great value as a gas coal, as well as for the ordinary uses of bituminous coals.

(2). THE PAINT SEAM.—This is separated from the above by perhaps 400 feet of beds, consisting of sandstone and shale. It is a thicker bed than the preceding; and in an opening made for extracting coal for country use, showed the following section:—

Shale and coal,	1 ft. 3 in.
Coal,	1 ft.
Shaly under-clay,	1 ft. 7 in.
Coal,	1 ft.
Shaly band,	4 in.
Coal,	3 ft.
Shaly band,	1 ft. 2 in.
Coal,	4 ft.
	13 ft. 4 ins.

For practical purposes this may be regarded as an 8 feet seam, divided into two floors by 14 inches of shaly matter. The coal is of excellent quality. A sample of the lower bench gave on assay—

Volatile matter,	. . . . .	38.8
Fixed carbon,	. . . . .	59.4
Ash,	. . . . .	1.8
		—
		100.0

The coke amounts to 61.2 per cent., and like that of the preceding bed is highly vesicular. The yield of illuminating gas is also very large.

The strike of this bed, which follows the shore for some distance, is S. 85° W. magnetic, its dip being to the northward at an angle of 38°. Above the coaly shale mentioned in the section, it has a strong roof of gray laminated sandstone. This bed is very accessible on the property, and is probably the most valuable next to the Ross seam, which it exceeds in quantity of coal.

(3). THE CRANDALL SEAM.—This is separated from the above by about 200 feet of sandstone and shales. Its roof is a gray shale holding numerous fossil plants. This bed could not be well seen at the time of my visit, owing to the extinction of coal from the outcrop for country use. It is stated to be 4 feet 4 inches in thickness; the upper part hard compact coal, the lower part laminated and with much mineral charcoal. A weathered sample from the outcrop gave on assay—

Volatile matter,	. . . . .	35.4
Fixed carbon,	. . . . .	63.0
Ash,	. . . . .	1.6
		—
		100.0

The coke is more dense than that of the previous beds, and the illuminating gas less, while the heating power will be greater. This coal is said to be very valuable for smith's use, and must also be of the first quality for domestic fires and as a steam coal.

(4). THE ROSS SEAM.—This is separated from the Crandall seam by about 400 feet of sandstone and shale, including two small coals, of 2 ft. and 18 inches thickness respectively. It is 6 ft. 7 inches in thickness, of which 6 ft. 3 inches are excellent coal of uniform quality, five inches on the roof being coarse. The roof is a tough arenaceous shale, 12 feet thick, overlaid by a hard laminated sandstone 20 feet in thickness. The dip is N. 5° E. at an angle of 40°. Two samples of this coal were assayed, one from the top the other from the bottom bench, with results as follows:—

	Top.	Bottom.
Volatile matter,	. . . . . 39.6	37.8
Fixed carbon,	. . . . . 57.2	59.6
Ash,	. . . . . 3.2	2.6
	—	—
	100.0	100.0

The coke is vesicular and of excellent quality, and leaves very little ashes, so that on the whole this may be regarded as one of the finest coals of Cape Breton for any of the uses to which bituminous coal is applied. The Ross seam is the one at present worked, two slopes having been opened in it, as will be noticed in the sequel.

Between this bed and that next to be mentioned there are not less than 575 feet of sandstones and shales, including two beds of coal not at present of importance. The first is the "Willie Fraser" seam, 2 feet thick and of excellent quality. The second is the bed known as "No. 3," four feet in thickness, but said to be of inferior quality and contaminated with bi-sulphuret of iron.

(5). THE HUGH MCGILLIVRAY SEAM.—This bed could not be distinctly seen at the time of my visit. It is said to contain five or six feet in thickness of coal, with some thin shaly bands. I did not procure a sample of it.

(6). THE FRASER SEAM.—This seam is separated from the last by barren measures, estimated at about a thousand feet in thickness, and consisting principally of gray irregularly bedded sandstones, with shales, and several small seams of coal, one of them (the D. McGillivray seam) 2 feet in thickness. The Fraser bed is 6 feet in thickness, and has been opened by an adit for country use. It dips to the north at an angle of 30° and is the lowest bed of workable thickness known on this Coast. The difference of dip

does not imply any fracture, but merely an undulation of the beds. This coal has three small clay partings, each two or three inches in thickness. It differs in appearance from all the others in the section. It is compact, and resinous in its lustre, and traversed by numerous oblique joints, often slicken-sided, giving it the aspect of some of those bituminous beds known as "oil coals." It is, however, a true coal, with more coke and less volatile matter than any of the others. Its coke is dense and hard, and its gaseous matter very dense, like that of Cannel coal. I anticipate that it will prove very valuable, both for steam and gas purposes, though it contains a little disseminated bisulphuret of iron, being inferior in this respect to the best coals of the section. A specimen on assay gave—

Volatile matter,	31.4
Fixed carbon,	62.4
Ash,	6.2
	<hr/>
	100.0

This coal should be tried as a gas coal, and also as an oil coal.

2. OPENINGS ON THE ROSS SEAM.

A slope has been driven in the Ross seam to a depth of 400 feet, and two levels have been run out to the Eastward. A second slope, adjoining the first, is now in progress. The raising and pumping are at present performed by a small engine working up to its full capacity. It discharges about 20 gallons per minute, which is greater than the present leakage of the mine. The pump employed is, however, equal to the discharge of four times as much water, if provided with a more powerful engine. The slopes above mentioned appear to be judiciously placed, and might be used for the extraction of coal on the large scale. At the time of my visit about 50 tons of coal, evidently of excellent quality, were on the bank.

3. FACILITIES FOR SHIPMENT.

A shipping wharf, suitable for small vessels, has been built in the shelter of a projecting reef, at a short distance from the slope, and a tram-way to connect this with the mine is in progress. The principal shipping place, however, is $3\frac{1}{4}$ miles distant, inside the S.W. Bar of Sydney Harbour, where there is ample and safe anchorage, and where a large area of the soil has been acquired by the Company. At this place the Company has built a substantial pier, 300 feet long and 23 feet wide, 21 feet above high water mark, and having a depth of 16 feet of water at the end at low tide. No safer or more commodious loading-place could be desired, but to render it available a railway four miles in length is required to connect it with the mine. The intervening country is level and favourable for the construction of such a road. So valuable is this shipping place, that I anticipate that the Company, if so disposed, may be able to afford the necessary facilities for shipment to other coal proprietors on the south side of Sydney Harbour not so favourably situated.

4. PROSPECTS OF SUCCESS IN MINING UNDER THE SEA.

One of the principal points to which I was desired to give attention, is the question of the possible disadvantage arising from the coal beds on this property being under the waters of Sydney Harbour, the Company possessing facilities only for entering on their outcrops near the shore. On this subject I would mention the following considerations, as showing that no insuperable difficulties exist, and that the disadvantages are compensated by the favourable character of the property in other respects.

(1). The strike of the beds runs for some distance so nearly parallel to the shore that the levels of the mine can be extended on both sides of the slopes, and that openings for ventilation can be made along the crop.

(2). The high dip of the beds causes them rapidly to sink to such a depth that the roof will become exceedingly thick before the mine extends under water of any considerable depth. The present slope, 400 feet deep, has a thickness of 200 feet of firm strata over its extremity, which as yet is scarcely advanced beyond low-water mark.

(3). There is no appearance of any faulting or dislocation, and nothing of this kind is to be apprehended, except at a depth and distance not likely to be reached in mining for a great length of time.

(4). The beds do not extend under the open sea, but only across Sydney Harbour; and at Lloyd's cove, on the opposite side, the General Mining Association has extended

its works under the Harbour without difficulty. Further, no indications of unusual wetness appear in the present mine.

(5). Though the above considerations apply primarily to the Ross seam now worked, and which has been estimated to contain 20,000,000 of tons of coal within the area of the Company, they are also applicable to the other beds, while the admirable facilities for shipment are equally available for all the beds of coal.

For the above reason, I believe that the area in question presents the most favourable possible position for submarine mining; and that if a sufficient amount of coal be left untouched in the outcrop, and sufficient pillarage maintained, there will be nothing to prevent the successful working of the mine on any scale that may be desired, while the facilities for shipment and the excellent quality of the coal afford the strongest inducements to extract it largely at this place.

I append to this Report a tabular synopsis of the more important coal-beds of the area, with their thicknesses and qualities; and for information as to the extent and position of the areas, estimates of the amount of coal contained in the beds and the cost of railway and other equipments, I may refer to the valuable plans and reports already prepared for the Company by Prof. Hind and others.

(Signed,)

J. W. DAWSON.

MONTREAL, August 29, 1868.

SYNOPSIS OF THE PRINCIPAL COAL-SEAMS AT VICTORIA MINES.—(Order descending.)

Name of Bed.	Thickness.	Volatile matter.	Coke.	Fixed Carbon	Ash.	Remarks.
"Carr"	4 ft. 0 in.	39.0	61.0	59.0	2.0	Ash reddish gray. Coke highly vesicular.
"Paint"	8 ft. 0 in.	38.8	61.2	59.4	1.8	Ash red. Coke highly vesicular. Sample from lower beach.
"Crandall"	4 ft. 4 in.	35.4	64.6	63.0	1.6	Ash light reddish, Coke somewhat compact.
"Ross"	6 ft. 3 in.	38.7	61.3	58.4	2.9	Ash reddish gray. Coke moderately vesicular.
"Hugh McGillivray"	5 ft. 0 in.	.....	.....	.....	.....	Not assayed. Quality reported somewhat inferior to Ross seam.
"Fraser"	6 ft. 0 in.	31.4	68.6	62.4	6.2	Ash dark reddish gray. Coke somewhat compact. This coal has some of the properties of Cannel. It has great heating power, and produces much dense carbonaceous gas, but is inferior in purity to the others.
Total thickness.....	33 ft. 7 in.					

The thicknesses given are at right angles to the plane of the beds, and include only clean coal independent of partings. Coals under 4 feet thick are excluded as not at present profitable. The gas-producing power of the several coals will be found to be nearly in proportion to their amounts of volatile matter, and their heating power nearly in proportion to their amounts of fixed carbon. The four first coals are eminently valuable in both respects, and also in their small quantity of ashes. The "Crandall" excels in heating power; the "Carr" in gas-producing power; the "Paint" and "Ross" are intermediate.