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EVALUATION REPORT

COLDWATER COAL MINES
MERRITT, B.C.

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May, 1948

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The coal lands held by the Coldwater Mines consist of a number of lots in the immediate vicinity of Merritt and formerly owned by the Middlesboro Collieries and the Diamond Vale Company, both of which companies are now dissolved.

These lots are as follows:

Lot 166	comprising 902 acres (Middlesboro Mine area)
Lot 4 (N1/2)	comprising 320 acres (1 mile south of Middlesboro mine)
Lot 121	comprising 320 acres (embracing area north of diamond vale mine.)
Lot 122	comprising 308 acres (1/2 mile south of Diamond Vale Mine)
Lot 123	comprising 323 acres (1/2 mile west of Diamond Vale Mine)
	2,173

with the exception of the western part of Lot 166 all the above areas are on the practically level valley bottom south and east of Merritt.

From the accompanying plans it will be seen that the above lots form one continuous property running northeast-southwest through the Merritt coalfield, and contain the area from which nearly 2,000,000 tons of coal was produced by the Middlesboro Collieries from a comparatively small area on Lot 166.

The above Lots should contain all the seams proved and worked on Lot 166; this is referred to later.

On Lot 166 there are a number of seams of good coal outcrop and from these outcrops all the former mines were started in the various seams and no shaft sinking was required. Following is a description of the different

seams discovered and worked on Lot 166, together with their average thickness, their distance apart stratigraphically, and the mines in which the various seams were mined by the Middlesboro Collieries. These seams are given in descending order but are numbered in the order in which they were discovered and worked.

No. 2 Seam, 5' thick — Worked in No. 2 and No. 2 North mines.

-75'-

No. 3 Seam, 2.5' thick — Worked in No. 3 mine.

-50'-

No. 6 Seam, 4' thick. — Worked in No. 6 section of No. 4 Mine and in No. 3 North Mine.

-210'-

No. 8 Seam, 7' thick. — Worked in Nos. 8 and 9 sections, No. 4 Mine.

-180'-

No. 4 Seam, 10' thick. — Worked in No. 7 and 4 East Mines and No. 4 section of No. 4 mine.

-120'-

No. 5 Seam, 4.5' thick — Worked in 5 East Mine and No. 5 section of No. 4 Mine.

-180'-

No. 1 Seam, 14' thick. — Worked in No. 1 Mine and No. 5 West Mine.

The above gives a total of 37' thickness of coal contained in the different seams as found when the various mines were being worked, but while the thicknesses given and the distance between the seams is accurate,

the above tabulation is based on information gained from the workings as a whole rather than from one specific area and should be truly representative of conditions to be expected further to the northeast on Lots 166, 122, 123 and 121 and on the north half of Lot 4.

While indications for the continuance of the above seams to the east and northeast into Lots 122, 123 and 121 are very satisfactory, there is no definite information available, or reliable deduction possible, at the present time regarding the northeastern limits of the above seams, and until such time as these limits are determined by drilling or prospecting on Lot 121 and the northeast portions of Lots 122 and 123, it would be wise to consider these areas in the meantime as potential reserves only.

HISTORY OF PREVIOUS MINING

Coal was known to exist in the Merritt area in the latter part of the past century, but although a small amount of drilling had been carried out between 1892 and 1904, no attempt to produce coal was made until the completion of the railroad from Spences Bridge was made in 1906. During this year the Nicola Valley Coal and Coke Co. started the Middlesboro Colliery about one mile west of Merritt and built up a good business in supplying railroad coal which continued to be the main outlet for this coal for many years, with a moderate tonnage being sold to industry and domestic users.

In 1906 the Diamond Vale Coal and Iron Co. started shaft sinking

operations on Lot 122 close to the boundary near the No. 2 Mine of the Middlesboro Colliery, but although coal was reached, various difficulties, principally financial, caused the abandonment of this part of the field in favour of small seams discovered on the eastern side of the basin. These seams have been mined at intervals, but the total production to date does not exceed 50,000 tons.

In 1910 the Coal Hill Syndicate started mining operations on Lot 1227 adjacent to the western boundary of Middlesboro Colliery, and in the same seams and in the next 15 years produced over 500,000 tons of coal, the yearly production being largely governed by railroad demands.

Immediately north of Lot 166 the Pacific Coast Coal Co. sank a shaft and reached a coal seam at approximately 100' from the surface, but the coal was not satisfactory in thickness or quality and this operation was abandoned after a very small amount of work was done. It is possible that the seam reached here was one of the upper series which outcrops on the northeastern side of the basin.

The total production of over 2,000,000 tons of coal from the seams worked on the rising ground on the southwest side of the basin was from a number of mines of very moderate size rather than from any large single operation. This was due to the ease with which new openings could be made from the outcrops of the different seams and possibly an effort to shun the ordinary maintenance cost of a large mine which would probably have been less than the combined costs of a number of

small mines for the same production. Only one of these mines was projected over 2,000 feet from the portal and most much less than this.

TOPOGRAPHY

The greater part of the Merritt coalfield underlies the flat bottomed valley in which Merritt is situated, with coal seams outcropping on the southwest and northeast sides of the field.

On the southwest side these outcrops occur on rising ground and the seams have a general dip towards the northeast, although in the immediate outcrop area there are local variations of the dip and strike which have caused small local basins at several points.

Previous mining carried on by mines delven down the pitch from these outcrops prove that the pitch becomes more uniform with depth. The seams found to outcrop on the northeast side of the field are much thinner than those on the southwest side and appear to belong to a series higher in the strata and these seams have not been discovered on the southwest side as their limit in that direction is probably covered by the thick gravel deposit which is general on the valley floor. There is approximately 2 - 1/2 miles between these southwest-northeast outcrops and most of the area in between is covered by a gravel deposit from 100' to 200' thick. This surface gravel thins out towards the southwest and on the southwest part of Lot 161 the solid strata is at the surface, which facilitates entry to the various seams in this area.

MINING ACCESSIBILITY

While a number of mines have been operated on Lot 166, all the workings are contained in two areas having a total acreage of 180 acres. Of this No. 2 and 3 Mines operating in No. 2 and 3 seams cover some 60 acres on the northeast end of the Lot and all the other mines occupy 120 acres on the extreme west end. This leaves a large area of virgin ground between these mined areas and this ground should contain all the valuable seams discovered and worked by the mines on the west end of the Lot.

These seams should continue in a north easterly direction and be found underlying the area of No. 2 and 3 mines and into Lots 122, 123 and 121.

While there is much recoverable coal in the abandoned mines, the main value in this part of the property lies in this virgin ground in which the individual seams can be easily reached for initial development and production.

Later this main area could be developed by means of a cross measure slope or drift driven westerly from the vicinity of No. 2 Mine to intersect all the seams lower in the series. This would concentrate operations, make for economy, and would permit selective mining of the seams that were found to suit specific requirements.

No. 2 Mine on the west end of Lot 166, and operated in No. 2 seam, was driven towards the Coldwater River which formerly constituted the property boundary between the Middlesboro Collieries and the Diamond

Vale Coal and Iron Co., and at a number of points the workings of No. 2 Mine reached this boundary line and were in good coal at these points (if evidence was required on this point, slight encroachment across the property line indicate the coal was found to be satisfactory).

No. 2 Mine was abandoned many years ago to facilitate the concentration of all operations on the west end of Lot 166 and was allowed to fill with water. There are conflicting reports regarding the tonnage of coal left in the pillars in No. 2 Mine, but while there is no doubt that there is a considerable amount of recoverable coal remaining, the chief value of this No. 2 Mine is the ready access which it offers for the immediate development of the No. 2 seam on Lot 122.

No. 2 Mine has recently been dewatered to a point some 700 feet from the portal of the main slope with an accompanying moderate recovery of coal from pillars and very little caving has been discovered so far.

The slope itself is standing in first class condition to the extent that immediate driveage could be started towards the coal area on the south-west end of lot 122.

The greater part of Lots 121, 122 and 123 carry a considerable thickness of surface gravel which enhances the value of the above ready means of developing this part of the area. There is no doubt that later, when the coal reserves under Lots 121, 122 and 123 are more definitely determined, a central point should be selected for the sinking of two shafts which could

deal with the main area embraced by these lots, but a large production can be reached and maintained for many years before this should be necessary.

While in the vicinity of the outcrop areas the pitch of the seams towards the central basin is from 25° to 30°, there is every reason to expect that this pitch will lessen towards the northeast.

The thickness of the various seams and the moderate pitch will permit the efficient use of modern equipment with an accompanying high production per man per day, and if an efficient system of panels is incorporated in the layout of the mine or mines, the total required production per year may be obtained by the development and extraction of the coal in the number of panels necessary for any given tonnage.

Such a panel system concentrates operations, reduces maintenance costs, is an effective fire control and permits the total abandonment of that part of the mine immediately the coal is extracted.

COAL RESERVES

There is no doubt that the seams enumerated are continuous on Lot 165 and for a considerable distance, if not wholly under Lots 122, 123, 121 and the N. 1/2 of Section 4, but to be conservative the writer is assuming that only one half of the acres of the latter lots is coal bearing and, to cover any thinning of the seams, that the aggregate thickness of the coal seams is only two-thirds of the thickness found on Lot 165, or say 25' thick. This would give 1,900 acres at 30,000 tons per acre, or a total of 54,000,000 tons of coal on this part of the property, and leave a large area as a potential reserve.

On this vital point it may be worth noting that the Report of the Royal Commission on Coal 1946 (pages 632-639) in dealing with the Merritt Nicola coal area, estimated 71,[illegible],300 tons of coal in eight square miles, but based this tonnage largely on the thin seams then being operated on the north-eastern side of the basin, while the main proven areas with superior seams lie to the west and southwest.

The Middlesboro Collieries, by more or less sporadic mining methods, recovered over 15,000 tons of coal per acre of ground broken, but on only the western end of the 160 where all the seams outcropped was mining carried on in all the seams. In the area to the Northeast only Nos. 2 and 3 mines were worked and the main lower seams were not mined.

TRANSPORTATION

The Canadian Pacific Railway from Spences Bridge, via Merritt, passes through this property and there is a spur line, standard gauge, from the railroad to the No. 2 mine.

As mentioned above, the mineral area is practically level and any necessary additional trackage or yards can be projected at little cost.

The distance to Vancouver via Spences Bridge is 240 miles and the freight rate for coal is $[illegible] per ton.

By rail the distance to Kamloops is 109 miles, and there is a satisfactory rail service to that point through the Okanagan Valley.

MARKETS

This property could be operated very satisfactorily by any large user of coal for industrial purposes of their own as this would permit mining to be laid out with a specific daily or yearly production and, if desired, sufficient coal could also be produced to supply other consumers on any given scale.

This coal has in the past been used satisfactorily for gas production in Vancouver, and if a supply was guaranteed this could offer a market for a large tonnage, as gas making in Vancouver uses over 125,000 tons per year and as the Vancouver Island coal mines, the former source of supply, are now decreasing in productivity, it is most unlikely that these mines will ever again be able to supply all their former large consumers. It may be mentioned that during the past several years the Vancouver gas works had to obtain fully half of the required coal from Alberta with a freight rate of $4.20 and upwards per ton.

The retail coal dealers in Vancouver and the Coast generally would welcome coal from Merritt area as this is a satisfactory allpurpose fuel and the smaller sizes give excellent results as a stoker coal for either industrial or domestic automatic stokers. During the war years British Columbia has had to depend largely on Alberta coal because of decreased production within the Province to the extent [illegible] coal shipments to B.C. since 1939 were as follows:

ALBERTA COAL SHIPMENTS TO BRITISH COLUMBIA

Year	Short Tons	Year	Short Tons
1939	239,227	1943	963,000
1940	311,232	1944	678,660
1941	304,928	1945	868,396
1942	652,222	1946	982,415

With the increasing costs of Alberta coal and the high, and probably increasing, freight rate, the better grades of Alberta coals are now retailing at over $15.00 per ton in Vancouver, with the cheaper grades, if the term "cheaper" is applicable, at a minimum of $10.00.

DIAMOND DRILLING

The presence and continuity of the coal seams on Lot 166 is established beyond doubt, but some diamond drilling should be done to definitely prove the continuity of the seams into and through Lots 122, 123 and 121, although, as mentioned under "Mining Accessibility", the upper, or No. 2 seam, is proved to the southwest boundary of Lot 122 by the workings of No. 2 Mine.

In the early part of the century a number of diamond drill holes were started in this general area, but apparently the equipment then available had difficulty in penetrating the thick gravel deposit which constitutes the valley floor, and very few of these holes reached solid ground, although it is reported that several reached coal. No authentic records of this early drilling are available.

In this regard it may be worth noting that during 1945 and 1946 the Provincial Department of Mines did several thousand feet of diamond drilling

on section 14 (adjacent to Lot 121) in ground similar to that mentioned above, and it was found that the modern diamond drill had no difficulty in drilling through the 100' - 200' of surface gravel and at a moderate cost.

It is possible that if a responsible coal mining company contemplated large scale operations on the lots dealt with in this report, the Government could be induced to do further drilling as an aid to re-establish coal mining in the Merritt area.

Diamond drilling would have a definite place in any long range operation of this property as a whole, but there is sufficient areas already proved to permit large scale mining for many years before drilling would actually be required.

VALUE OF THE COAL

The following analyses of coals from Middlesboro Collieries will show that these have a high average value and this should increase as depth is gained.

These analyses are from "The Analyses of British Columbia Coals" published by the Provincial Department of Mines.

Sample No.	Date Received	Colliery	Moisture	Volatile Combustib/Matter	Fixed Carbon	Ash	Sulphur	British Thermal/ Units/	Moisture Loss After 4 Days	
9343	5/2/26	#2 M. seam (new Prosp.)	3.30	29.40	56.60	8.70	0.60	12,090	6.00	Poor
[illegible]	5/2/26	#4 M. seam	3.40	30.00	58.10	6.50	0.60	12,710	3.00	Fair
[illegible]	5/2/26	# 5 seam	4.00	31.30	56.60	7.00	0.70	12,555	4.00	Fair
[illegible]	5/2/26	# 6 seam	4.00	29.40	54.00	9.20	0.75	11,780	3.00	Poor
[illegible]	3/10/41	#29(mine run)	3.26	31.2	56.7	8.3	0.55	12,400	3.8	-
9342	5/2/26	#1 seam	3.30	30.00	56.10	10.60	.70	12,090	2.0	Fair

The Directory of Canadian Coals, 1945, by the Mines Department, Ottawa, shows that while Middlesboro coals are not strongly coking by themselves, they form a splendid coke when blended by 1/2 to 2/3 of strongly coking coals and give an excellent gas production.

CONCLUSION

The coal property dealt with in this Report has a number of definite advantages that merit the close attention of any company requiring a long range coal supply for their own uses or for general sale to industry, railroads or domestic consumer. Among these advantages are:

Known existence of workable coal seams.

Coal of excellent quality.

Ease of entry to the seams.

Large area available.

Good transportation facilities and low cost to Vancouver.

Low mining costs.

Until it is known what daily and yearly tonnage of coal is required and whether modern mining equipment will be installed, it would be difficult to estimate mining costs with any degree of accuracy. With the above essential points determined costs could be closely approximated and submitted.

With the known conditions of the various seams and with new mines developed by means of modern equipment, mining costs should be lower than anywhere else in British Columbia as practically all the presently producing

mines are old operations which have been only partly modernized in order to maintain their existence.

(Signed)
(James Dickson)

Mining Engineer.