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PRELIMINARY SURVEY OF THE COAL RESOURCES OF UPPER CRETACEOUS ROCKS, NORTHEASTERN BRITISH COLUMBIA (93, 94)

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KEYWORDS: Coal geology, Dunvegan Formation, Wapiti Formation.

INTRODUCTION

The area covered by this study area forms a triangle in the northeast corner of British Columbia. The east side of the triangle extends 600 kilometres south from the British Columbia, Alberta, Northwest Territories common boundary point and the north side extends 250 kilometres west from the same point.

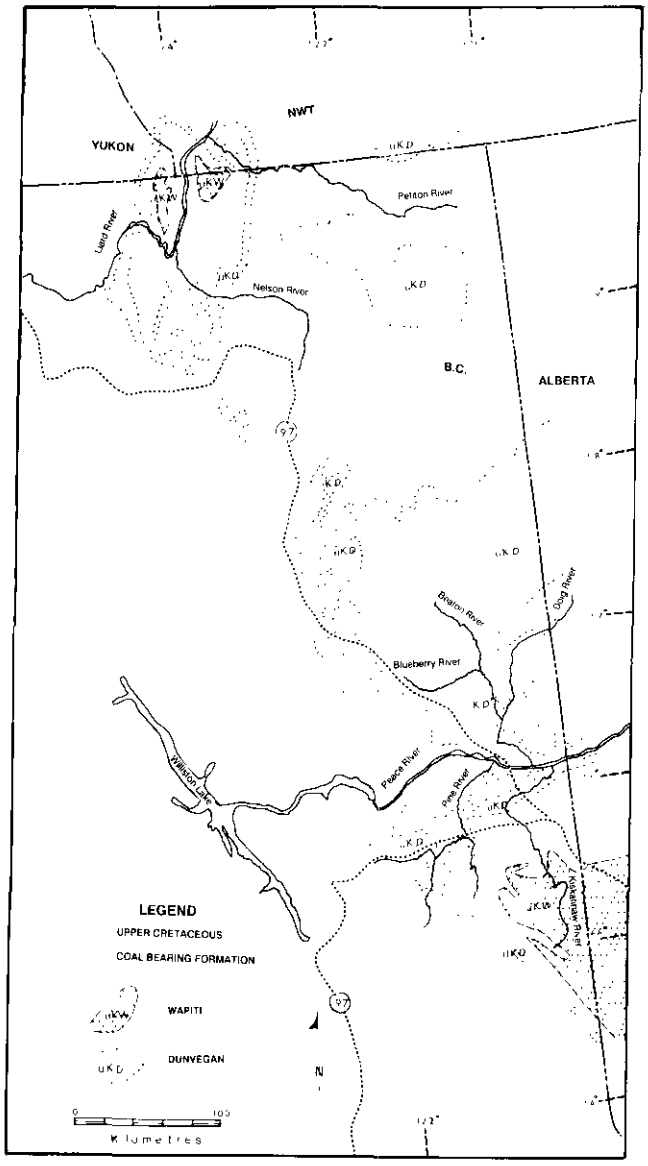

Figure 4-8-1. Location of Dunvegan and Wapiti formation outcrops in Northwestern British Columbia.

There are two major Upper Cretaceous coal-bearing formations in this area separated by marine shales: the Dunvegan Formation of Cenomanian age and the Wapiti Formation of Late Cretaceous to Early Paleocene age. Figure 4-8-1 illustrates the general extent of outcrops of Dunvegan and Wapiti formations in Northeastern British Columbia. Coal also occurs in at least one small Tertiary basin.

The lower part of the Dunvegan Formation includes a 30-metre section containing up to four coal seams, all generally less than 50 centimetres thick. Lateral extent of the coal seams within the Dunvegan is not known, but they are absent in some outcrop locations. Drilling in the Wapiti Formation south of Dawson Creek indicates that a single seam, generally less than 2 metres thick, is nearly always present at the base of the formation. A Tertiary basin containing about 5 metres of lignite extending over an area of approximately 5 by 15 kilometres is located on the Alaska Highway at Mile 533.

In general the open-pit coal resource potential of the Upper Cretaceous appears at this time to be marginal even for local markets. It is possible that the Tertiary coal basins may provide more resource potential.

1989 FIELD PROGRAM

The 1989 field program consisted of two weeks fieldwork in September. The late start did not permit a longer or more detailed field study. In preparation for the fieldwork all geological literature on the area was checked for references to coal occurrences, and a number of people were contacted who might have detailed knowledge of coal in the area. Generally the area is rolling farmland or wooded and swampy. Rivers have incised canyons into the landscape to produce good outcrops. It was found that the low-rank coals survive as boulders in the rivers and that boulder prospecting would probably be effective for a limited distance from source.

Roads in the vicinity of Chetwynd, Dawson Creek and Fort St. John were driven extensively. North of Fort St. John the Alaska Highway and the Liard Highway (No. 77) were checked to Coal River and the Northwest Territories border, respectively.

An attempt was made to examine as many known coal occurrences as possible, as well as to prospect in obvious places adjacent to roads. Fifteen coal samples were collected; in most cases they are extensively weathered and will probably only be useful for total ash and vitrinite reflectance rank determinations. All coal occurrences identified in the literature or found during the season are tabulated.

TABLE 4-8-1
LOCATION OF UPPER CRETACEOUS COAL OUTCROPS

Occurrence	Formation	Coal Description	Location Description	Reference
Lone Prairie	Dunvegan	One to four coal seams each less than 30 cm thick; very weathered; flat dipping.	15 km southeast of Chetwynd; 2.2 km east of the Lone Prairie/Tumbler Ridge road intersection on the Lone Prairie road.	Present study
Moberly Lake	Dunvegan	Single seam less than 30 cm thick; very weathered; flat dipping.	9 km north of Chetwynd on Highway 29; east side of road.	Present study
Island Lake road	Wapiti	Single seam; 15 cm thick; near base of Wapiti.	Off Highway 2, 30 km south of Pouce Coupé on Island Lake road 1.27 km north of Kiskatinaw River.	Present study
Kiskatinaw bridge, Alaska Highway	Dunvegan	Three coal seams from top to bottom, 50, 70 and 20 cm thick in 30 cm of sand and mudstone stratigraphy.	Between Dawson Creek and Fort St. John under bridge over Kiskatinaw River; north side.	Present study
Peace River	Dunvegan	Three thin coal seams from top to bottom, 10, 35 and 10 cm thick.	5.5 km south of bridge over Peace River and 100 m east of Alaska Highway.	Present study
Doig River	Dunvegan	Boulders up to 20 cm in length in river bed.	35 km northeast of Fort St. John and 20 km above confluence with Beaton River a secondary road crosses Doig River.	Present study
Lower Cache Creek road	Dunvegan	One 90-cm seam including 55 cm of clean coal.	35 km north of Fort St. John on Highway 97; 7.2 km on Lower Cache Creek road to southeast.	Present study
Blueberry River	Dunvegan	A few small boulders of coal in river bed.	55 km north of Fort St. John and 20 km east of Buik.	Present study
Coal River	Tertiary	Lignite boulders in river bed; outcrop approximately 10 km upriver. Basin about 5 km by 15 km.	Mile 533. (Kilometre 858) Alaska Highway.	Present study McConnell (1891), McLearn and Kindle (1950), Williams (1944)
Wapiti	Wapiti	Single seam at base of formation; up to 2 m thick.	South of Dawson Creek.	Gulf (1981)
Coldstream Creek	Dunvegan	Coal occurrences, no thickness specified.	Southeast of East Pine on Highway 97 between Dawson Creek and Chetwynd.	Selwyn (1877)
South of Pine River valley	Dunvegan	Thin coal beds.	South of Smokey River.	Spieker (1921)
Pine River canyon	Dunvegan	Four coal seams top to bottom, 15, 20, 61 and 70 cm thick.	East of Chetwynd near Wartenbe Mtn.	Selwyn (1877)
Pine River	Dunvegan	61 cm coal seam.	Near East Pine on Highway 97.	Williams (1934)
Kiskatinaw River	Dunvegan	51 cm seam.	5 km above mouth of Kiskatinaw River.	Williams (1934)
Doig River	Dunvegan	76 cm seam and 30 cm seam.	16 km above mouth of Doig River.	Williams (1934)
Alaska Highway Mile 66	Dunvegan	Thin coal seams in quarry.	Mile 66 (Kilometre 106), Alaska Highway, quarry.	Hage (1944)
Table Mtn.	Dunvegan	30 cm coal seam near base of Dunvegan.	Mile 354 (Kilometre 370), Alaska Highway.	Williams (1944)
Liard River Pretty Hill	Wapiti	50 cm seam.	15 km upriver from Fort Liard.	Hage (1945)
Liard River	Tertiary	Two small Tertiary coal basins.	20 km south of Watson Lake on Alaska Highway.	Dowling (1915)
Petitot River	Dunvegan	Coal in mudstone, no thickness given.	Near Highway 77 and B.C. border.	Stott (1982)
Kotaneelee River	Wapiti	38 cm coal seam, poor quality.	20 km up the Liard River from Fort Liard, 3 km above mouth of Kotaneelee River.	Hage (1945)

STRATIGRAPHY

DUNVEGAN FORMATION

The Dunvegan Formation is of Cenomanian age; it contains mainly nonmarine sands and conglomerates, but marine shales are also present. The thickness ranges from 150 to 200 metres. Generally the Dunvegan outcrops as light buff-coloured, massive, coarsely crossbedded sandstones with some mudstone or silty zones; channels are often visible. The base of the Dunvegan is usually underlain by dark marine shales of the Shaftesbury or Sully formations; the top is overlain by the marine shales of the Kaskapau Formation.

Thin coal seams occur in the lower part of the formation. No reports of seams thicker than 1 metre have been found.

WAPITI FORMATION

In British Columbia south of Dawson Creek, the Wapiti Formation consists of nonmarine clastic sediments, mainly sandstones and siltstones. It has an estimated thickness of 400 metres and ranges in age from Late Cretaceous to Early Paleocene. The base is underlain by the Chungo sandstone of the Puskwaskau Formation. A thin coal seam marks the base of the Wapiti. The coal-bearing sections found in Alberta in the upper part of the Wapiti appear to have been eroded in British Columbia.

MINING HISTORY

There are no reports of commercial mining of Upper Cretaceous coals in Northeastern British Columbia. Minor amounts of coal have been taken from seams in the Dunvegan Formation in Beatton and Kiskatinaw rivers in the past. During construction of the Alaska Highway, lignite at Coal River was used for heating camps.

UPPER CRETACEOUS AND YOUNGER COAL OUTCROPS

Table 4-8-1 locates and describes all coal occurrences found during this study or mentioned in the literature. Generally references to coal occurrences in the literature are lacking in detail, some exceptions are as follows: Gulf Resources Canada Ltd. (1981) provides a detailed evaluation of the resource potential of the Wapiti Formation south of Dawson Creek; McLearn and Kindle (1950) and Williams (1944) provide some details on the Coal River lignite basin.

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