

This document was produced
by scanning the original publication.

Ce document est le produit d'une
numérisation par balayage
de la publication originale.

CANADA
DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

GEOLOGICAL SURVEY

PAPER 47-22

PRELIMINARY MAP
NANAIMO COALFIELD
BRITISH COLUMBIA

BY
A. F. BUCKHAM



OTTAWA

1947

LIST OF COAL MINES AND PROSPECTS

- | | | |
|--|---|--|
| 1. Lantzville Collieries Ltd., No. 1 mine | 22. Canadian Collieries (Dunsmuir) Ltd., Extension Prospect mine; | 53. Vancouver Coal Mining and Land Co., Ltd., Southfield No. 1 slope |
| 2. Nanaimo-Wellington Collieries Ltd., Lantzville mine | 23. " " " " Tunnel to Nos. 1, 2, and 3 mines, | 54. " " " " Southfield No. 2 slope |
| 3. Little Ash mine | Extension Colliery | 55. " " " " (Southfield) No. 3 mine |
| 4. R. Dunsmuir and Sons, Wellington Colliery, Dunsmuir's original entry | 24. " " " " Extension Colliery, No. 1 slope | 56. New Vancouver C. M. and L. Co., Ltd., (Southfield) No. 4 slope |
| 5. " " " " Wellington Colliery, Wellington mine, No. 1 level | 25. " " " " " " No. 2 slope | 57. " " " " (Southfield) No. 5 mine |
| 6. Canadian Collieries (Dunsmuir) Ltd., No. 9 mine | 26. " " " " " " No. 3 slope | 58. Western Fuel Co., Reserve mine |
| 7. R. Dunsmuir and Sons, Wellington Colliery, Wellington mine, adit level | 27. " " " " " " No. 4 mine | 59. Pacific Coast Coal Mines, Ltd., South Wellington Colliery, Fiddick slope |
| 8. " " " " Wellington Colliery, No. 1 shaft | 28. " " " " " " No. 6 slope | 60. " " " " South Wellington Colliery, Richardson slope |
| 9. " " " " " " No. 2 shaft | 29. " " " " " " Vancouver slope | 61. " " " " " " Morden mine |
| 10. " " " " " " No. 3 shaft | 30. " " " " " " Old No. 1 slope | 62. Canadian Collieries (Dunsmuir) Ltd., Alexandria mine |
| 11. " " " " " " No. 4 shaft | 31. " " " " " " " " " " " " No. 5 mine | 63. " " " " " " " " " " " " No. 10 mine |
| 12. " " " " " " No. 5 shaft | 32. " " " " " " No. 7 slope | 64. " " " " " " " " " " " " No. 10 mine |
| 13. " " " " " " No. 6 shaft | 33. " " " " " " White Rapids mine | 65. Granby Consolidated Mining, Smelting and Power Co., |
| 14. East Wellington Coal Co. [Chandler] No. 1 shaft | 34. " " " " " " No. 8 mine | " " " " Granby Colliery, No. 1 mine |
| 15. " " " " " " No. 2 shaft | 35. Wolf Mountain prospects | 66. Granby Consolidated Mining, Smelting and Power Co., |
| 16. East Wellington Coal Co. Ltd., [1920] East Wellington mine | 36. Black Jack outcrop | " " " " Granby Colliery, No. 2 mine |
| 17. Vancouver-Nanaimo Coal Mining Co., Ltd., East Wellington (Jingle Pot) mine No. 1 | 37. Hudson's Bay Co., No. 1 pit | 67. Consumers Coal Co., Ltd., Round Island prospect |
| 18. New Vancouver Coal Mining and Land Co., Ltd., Northfield mine | 38. " " " " " " No. 3 pit | |
| 19. Western Fuel Co., Wakelish mine | 39. " " " " " " Park Head level free | |
| 20. " " " " " " Horewood mine | 40. Vancouver Coal Mining and Land Co., Ltd., Douglas mine, water level | |
| 21. " " " " " " Horewood mine, adit level | 41. Hudson's Bay Co., Pemberton Encampment prospect | |
| | 42. " " " " " " Newcastle (Sage) mine | |
| | 43. " " " " " " Fitzwilliam mine | |
| | 44. Western Fuel Co., Brechin mine | |
| | 45. " " " " " " Newcastle shaft | |
| | 46. " " " " " " Protection mine | |
| | 47. " " " " " " No. 1 mine | |
| | 48. Vancouver Coal Mining and Land Co., Ltd., Douglas slope | |
| | 49. " " " " " " Douglas shaft | |
| | 50. " " " " " " New Douglas slope | |
| | 51. " " " " " " New Douglas mine, adit level | |
| | 52. Western Fuel Co., New Douglas [191] slope | |

SYMBOLS USED FOR MINE WORKINGS

Slope or adit
 Shaft
 Prospect
 NOTE. The letter "V" beside symbol indicates that it is an auxiliary opening used chiefly for ventilation.

DESCRIPTIVE NOTES

The Vancouver group of metamorphosed volcanic and sedimentary rocks, chiefly andesitic lava, is the oldest known in the area. The rocks are probably mainly of Upper Triassic age, but no fossils have been found in them in this area, and they may include some undifferentiated late Paleozoic strata. They were deformed and mountain-built and were intruded and metamorphosed by granitic and gabbroic rocks, probably in late Jurassic or early Cretaceous time. A subsequent period of erosion developed a coastal lowland with a relief of about 500 feet. On this were deposited about 7,600 feet of Upper Cretaceous sediments, the Nanaimo group. These comprise conglomerate, sandstone, shale, and coal, in lensy beds of rapid accumulation. The stratigraphy is summarized in the accompanying columnar section.

Two periods of strong deformation are represented in the Nanaimo area. The first occurred about the time of the intrusion of the granitic rocks. Probably the members of the Vancouver group were then folded and faulted, although no structures have been distinguished as referable to the first period alone. The second affected the rocks of both the Vancouver and Nanaimo groups, and from a study of the regional geology it is known to have occurred in post-Eocene time.

The structure of the Nanaimo area is dominated by strong faults crossing it from southeast to northwest. These are parts of a major fault zone extending along the east coast of Vancouver Island for at least 70 miles. Where the faults have been observed in the Cretaceous rocks they are chiefly thrusts. Clean breaks in the measures, where observed, are in the Extension and lower formations, but may occur, unexposed, in higher beds in the southeastern part of the area. In the higher formations only sharp overturned folds, lacking actual nappes of the measures, have been seen. Traced along strike, most faults seem to be of the rotational or hinge type. They strike in general northwest, but considerable divergences were noted, and in places the changes are rather abrupt.

The rocks of the Nanaimo group are also folded, the folds, excepting those associated with dislocations, being broad and open. The strike of the folds generally parallels that of the faults, and the faults, sharp overturned folds, and broad open folds all appear to have been caused by the same stresses.

Coal, from the Upper Cretaceous formations, is the chief economic mineral product of the area. The Nanaimo coalfield has, since 1852, produced almost half the total of coal mined in British Columbia, mainly from the Wellington, Newcastle, and Douglas seams, from which has come more than 90 per cent of the field's total production.

A thin seam occurs near the base of the Haslam formation near Black Jack Mountain (36). The few outcrops seen are thin and dirty.

Several coal seams lie near the base of the Extension formation. At the base is the main Wellington (No. 1) seam; 35 feet above is the Little Wellington (No. 2) seam; and 60 and 75 feet above are the Wellington Nos. 3 and 4 seams respectively. These upper seams rarely exceed 2 feet in thickness. The most conspicuous feature of the main Wellington seam is its variation in thickness, due to undulations, chiefly in the roof. It averages 4 to 7 feet in thickness over a workable area 12 miles long and an average of 1 mile wide, exclusive of an outlier at Lantzville. Its floor is usually sandstone, and its roof is commonly shaly sandstone or shaly sandstone and shale are common in the seam. The most important mines working the Wellington seam were in the vicinity of Wellington and Extension. The productive area near Wellington is bounded by the outcrop and by faults on the north and southwest, and the seam becomes unworkable south of section 17 and east of the centre of range 7, Mountain land district. The Extension coal area is bounded by the outcrop and by faults on all sides but the east, where it was but little mined east of range 1, Cranberry land district. The main Wellington seam was worked in all mines and prospects listed from 1 to 35 inclusive, with the exception of 4, 6, 20, 21, 22, and 27, which worked the No. 2 seam. Both these seams were worked in properties 1 and 16, and the main seam and Nos. 3 and 4 seams in property 18.

A small seam, of very patchy occurrence, is found about 200 to 250 feet above the base of the Extension formation.

The Newcastle seam, at the base of the Newcastle formation, is the most restricted in distribution but the most regular of the three main seams, averaging about 3 feet 6 inches in thickness over a workable area of 2 by 1/2 miles underlying Newcastle and Protection islands. Its floor is usually shaly sandstone and its roof varies from sandy shale to fine conglomerate. The seam commonly lacks partings. It was worked in properties 38, 41, 42, 44-47, and 52.

The Douglas seam occurs in the Newcastle formation, an average of 60 feet above the Newcastle seam. It has a workable area 9 1/2 by 1 1/2 miles. It averages a little more than 5 feet in thickness, but the thickness varies to much the same degree as the Wellington seam, and south of property 53 this irregularity is even more noticeable. Both floor and roof rocks are of variable composition, and undulations, causing variations in seam thickness, are most commonly in the floor. Partings of rock and "rash" are common, and in many places, especially in the south, the seam is strongly sheared. The most important mine in the Douglas seam was No. 1 mine (47), which was operated for 55 years (1883-1938) and yielded about 18 million long tons. Its workings, chiefly submarine, extended from the shafts (47) east to within a quarter mile of Jack Point, and from the Newcastle shaft (45) south to the south shore of Nanaimo harbour. This downthrow part of the Douglas seam, east of the harbour downthrow, was also worked in properties 43, 44, and 58. The part of the Douglas seam west of the downthrow has been worked almost continuously from the Hudson's Bay mines in the city of Nanaimo (37, 39, and 40) for more than 7 miles south to Cassidy, including the Southfield and South Wellington coalfields (48-49, 50-51, and 53-66).

An anticline exposes a coal seam (47), considered by some to be the Douglas seam, on Round Island, but the available information is insufficient to prove this.

In the Protection formation five seams between 6 and 9 inches thick occur in places. This zone is that of which the Cumberland seams occur, but the seams do not occupy corresponding stratigraphic positions.

The experience of 95 years of mining and prospecting has delineated the areas of workable coal with considerable accuracy. It has shown that all the seams become unworkable seaward, on average of about 1/2 mile from their extreme western outcrop. The area east of Lantzville mine (2) might support another mine for a few years, and prospecting in the Black Jack area (36) might possibly reveal workable deposits. Apart from these, when the present working mines (33 and 54) are exhausted, there appears little chance of further large-scale operations, although small-scale operations will probably continue for years.

LEGEND

CRETACEOUS
 UPPER CRETACEOUS
 NANAIMO GROUP (3-13)
 GABRIOLA FORMATION: sandstone
 NORTHUMBERLAND FORMATION: shale, sandstone, conglomerate
 DE COURCY FORMATION: mainly sandstone
 CEDAR DISTRICT FORMATION: mainly shale
 PROTECTION FORMATION: mainly sandstone, coal
 NEWCASTLE FORMATION: mainly sandstone and shaly sandstone; coal outcrops seen are thin and dirty
 CRANBERRY FORMATION: sandstone, shaly sandstone, conglomerate
 EXTENSION FORMATION: conglomerate, coal
 HASLAM AND EAST WELLINGTON FORMATIONS: 4A, chiefly shale; 4B, chiefly sandstone; some coal
 BENSON FORMATION: conglomerate

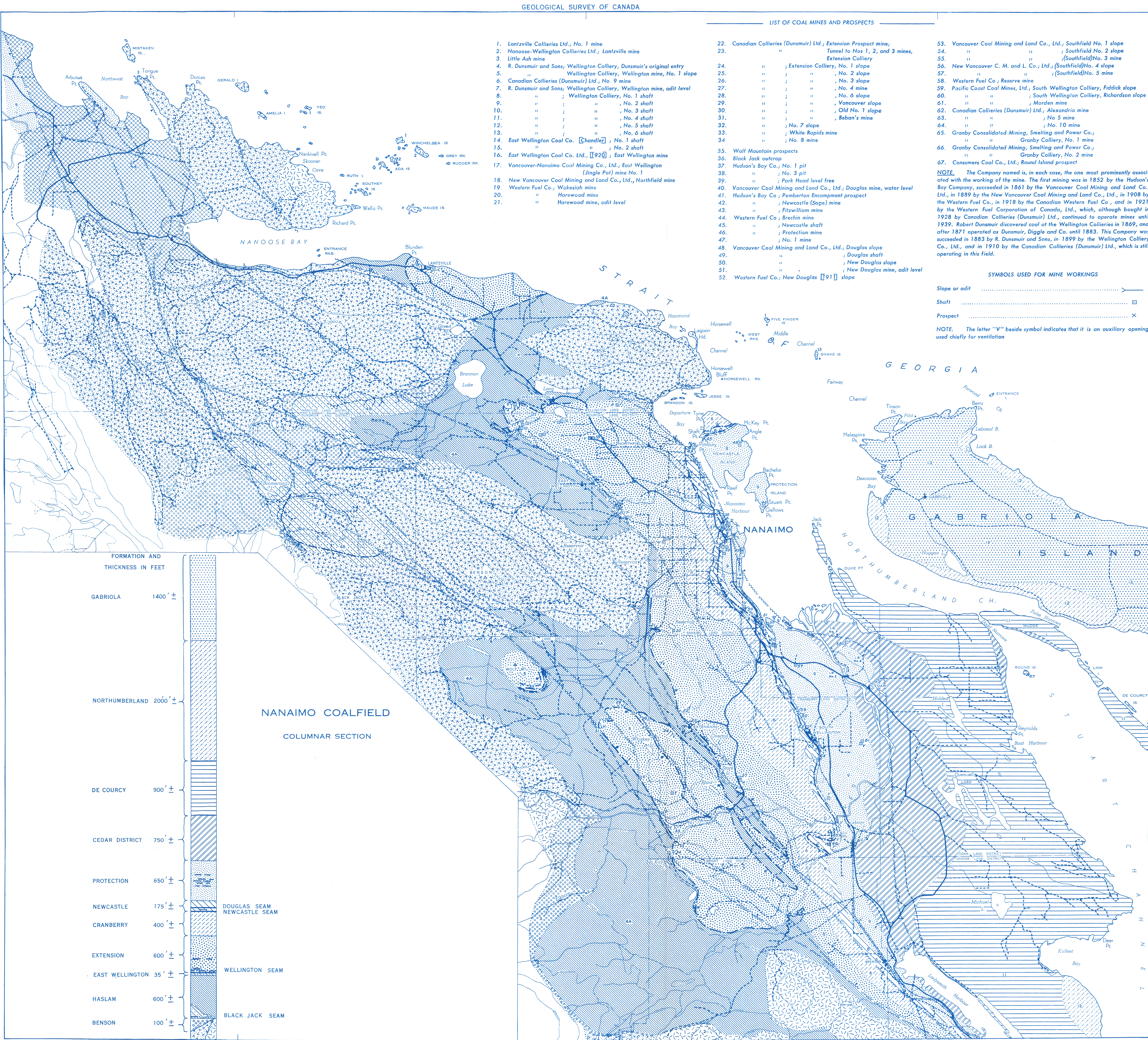
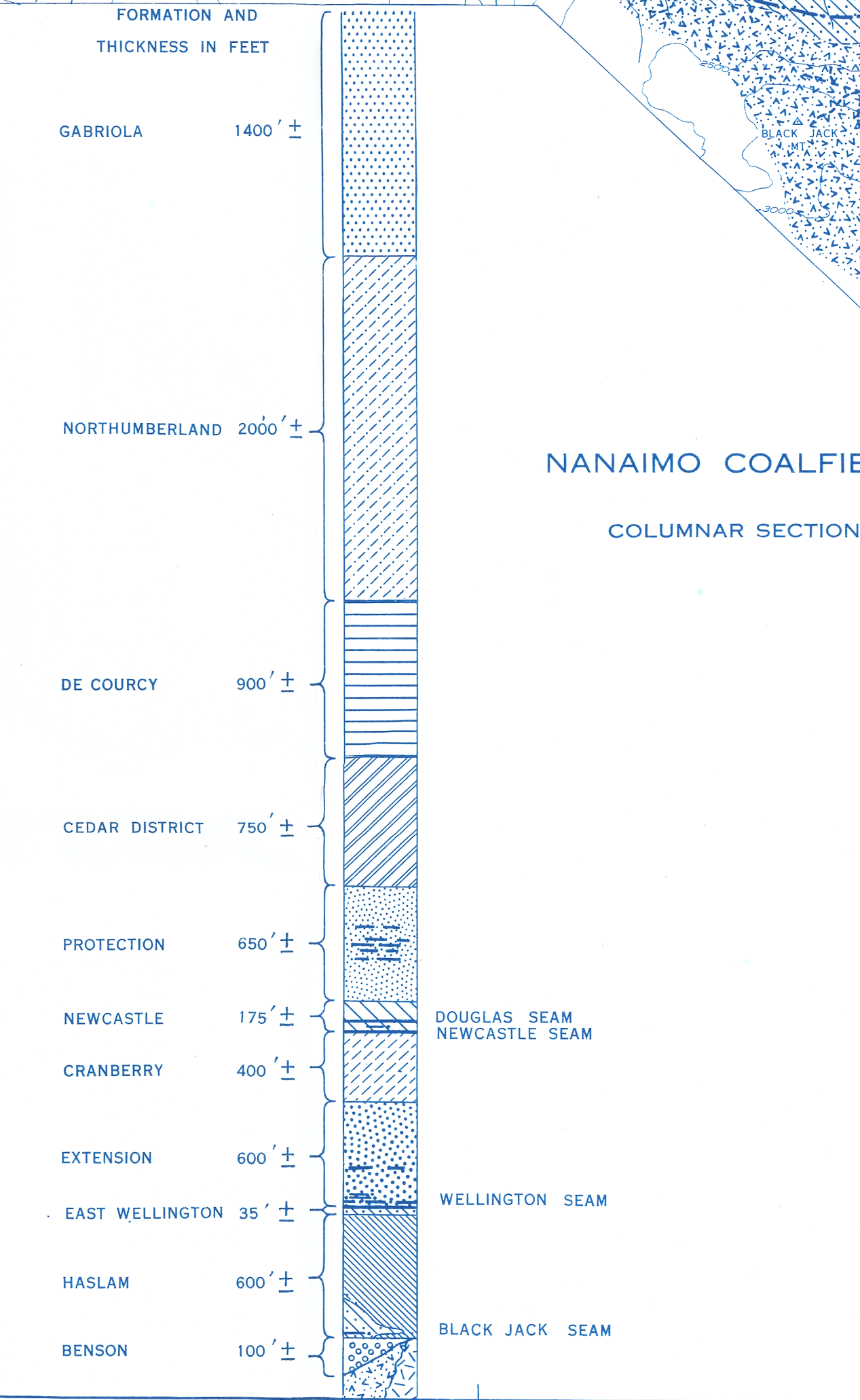
JURASSIC AND/OR CRETACEOUS
 UPPER JURASSIC AND/OR LOWER CRETACEOUS
 Granodiorite and allied rocks

TRIASSIC AND (?) JURASSIC
 UPPER TRIASSIC (MAINLY OR ENTIRELY)
 VANCOUVER GROUP
 Andesite, basalt, quartzite, argillite, limestone, schist. May include some undifferentiated late Paleozoic rocks

Fault (dot indicates downthrow side)
 Coal seam (W—Wellington; D—Douglas; N—Newcastle)

Geology by A. F. Buckham, 1943-1946
 Base map by British Columbia Forest Service, 1937, with additions by A. F. Buckham

Main road
 Secondary road
 Railroad
 Post office
 Buildings
 Pipe-line (or flume)
 Wharf
 Contour interval, 500 feet



This document was produced by scanning the original publication. Ce document est le produit d'une numérisation par balayage de la publication originale.

CARTOGRAPHY BY THE DRAFTING AND REPRODUCTION DIVISION 1947