1985 EXPLORATION WORK

HOLBERG INLET COAL LICENCES, Nos. 7981 TO 7988 INCLUSIVE

RUPERT LAND DISTRICT

Lat. 50 deg. 37'

Long. 127 deg. 48'

NTS Sheet 92 L/12W

NORTHWESTERN VANCOUVER ISLAND

BRITISH COLUMBIA

Prepared For :

TEXACO CANADA RESOURCES LTD.

CALGARY, ALBERTA

Prepared By :

GARDNER EXPLORATION CONSULTANTS

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Date Work Performed :
July 22 - Aug. 1, 1985

775

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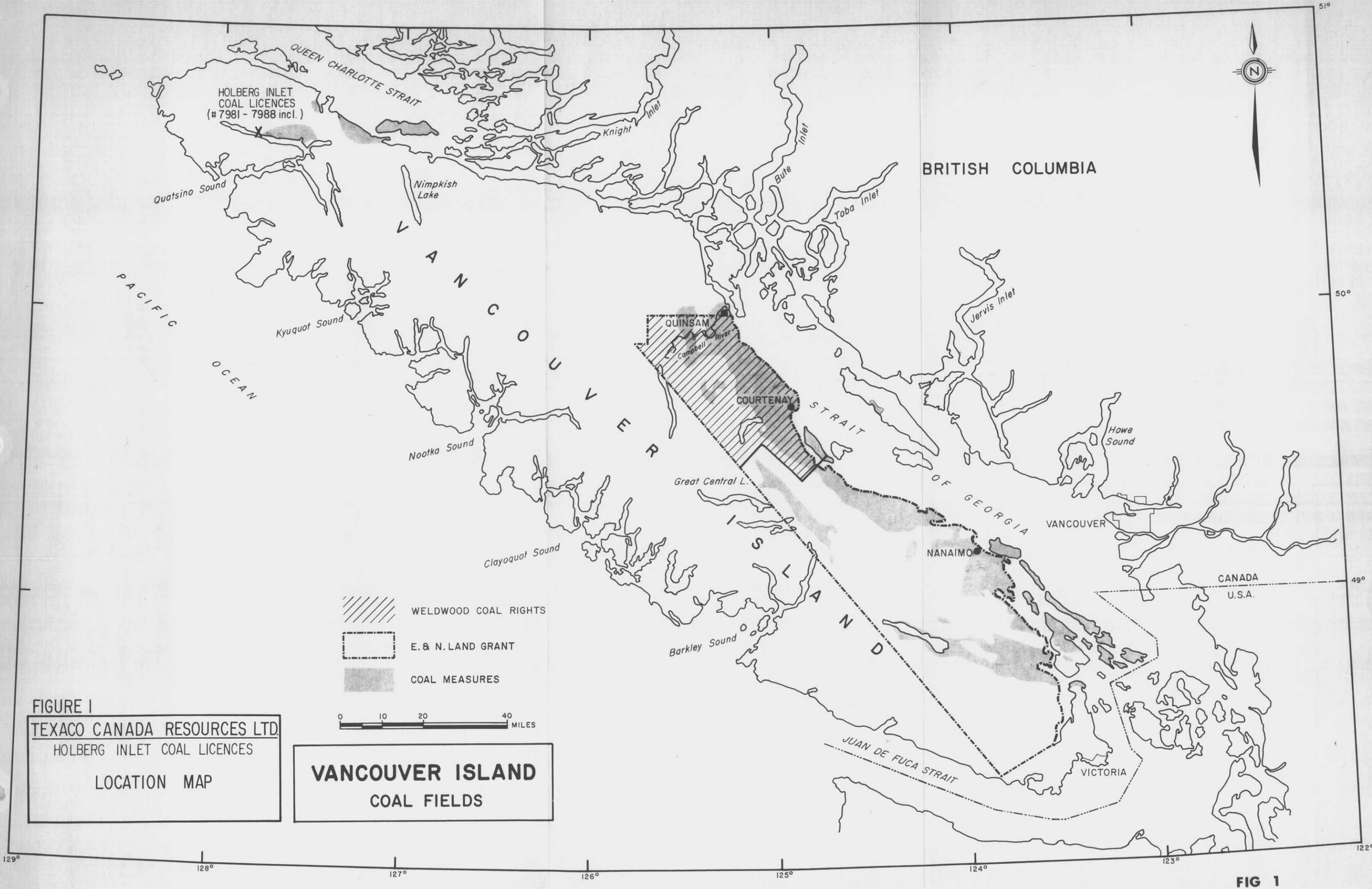


FIGURE I

TEXACO CANADA RESOURCES LTD.

HOLBERG INLET COAL LICENCES

LOCATION MAP

VANCOUVER ISLAND

COAL FIELDS

FIG 1

Chapter 1

INTRODUCTION

1.1 Location and Description of Holberg Inlet Coal Licences

Coal Exploration Licence Nos. 7981 - 7988 inclusive, held by Texaco Canada Resources Ltd., are located in the northern part of Vancouver Island, British Columbia at Latitude 50 degrees 37 minutes and Longitude 127 degrees 48 minutes (see Figure 1.). Vancouver Island is the largest island on the Pacific Coast of North America, 290 km. long by an average 80 km. wide.

The licences, known as the Holberg Inlet Coal Licences ("the property"), cover approximately 1,550 hectares (3,830 acres). They are contiguously located on the north side of the Holberg Inlet, approximately midway along its length. The property reaches from the high tide mark on the inlet, inland in a northerly direction to a maximum distance of 2.9 km (1.8 mi.).

The anniversary date of the licences is March 1, 1986.

1.1.1 Climate and Physiography

The topography of the property is variable. It is characterized by low hills along the edge of the inlet backed by more rugged and steep topography farther inland. Elevations vary from sea level at the tide line to 522 m. (1714 ft.) above sea level on Licence No. 7985.

Major drainages, such as Cleskaugh Creek, Hushamu Creek and the Youghpan River incise steep-sided, narrow valleys between the uplands and join the inlet to form low swampy deltas. Other much smaller creeks and freshets of intermittent flows (according to the season) join the inlet at intervals along the length of the property.

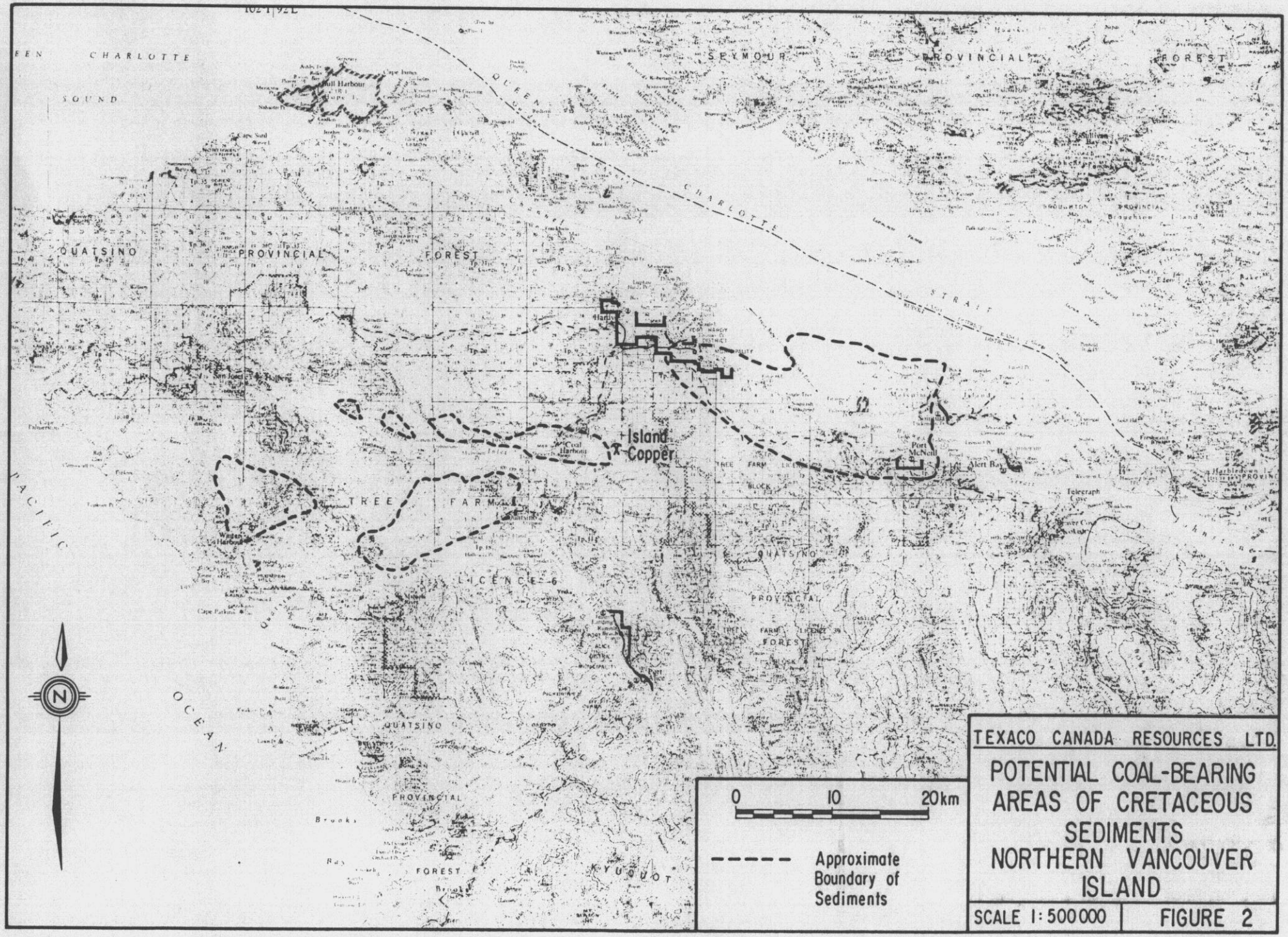
The climate of the area is typical of a wet coastal northern latitude area: rainfall averages 140 cm. to 165 cm. annually, with the majority of this precipitation occurring as rain between the months of October to April. A considerable winter snow pack develops at elevations greater than 750 metres, and snow sometimes occurs at sea level, however these lower level snowfalls seldom remain on the ground for more than a few days. Residual snows sometimes remain on the ground at elevations from 50 to 750 metres for much of the winter months. Seasonal temperature fluctuations range from -10 degrees to 32 degrees Centigrade.

1.1.2 Accessibility

The property is located midway between the villages of Holberg, located on the northwestern extreme of Holberg Inlet, and Coal Harbour, located on the southeastern extreme of the inlet near its junction with Quatsino Sound.

A private logging road owned by Tribune Timber Ltd. (a subsidiary of Western Forest Products Ltd.) provides limited access to the southeastern part of the property between the Youghpan River and Hushamu Creek. This logging road is an all-weather private industrial road that joins the paved public highway between Coal Harbour and Port Hardy. No other roads are located on the property area.

The property is also accessible for barge traffic from the outer or west coast of Vancouver Island via Forward Inlet, Quatsino Sound and Holberg Inlet.



TEXACO CANADA RESOURCES LTD.

POTENTIAL COAL-BEARING AREAS OF CRETACEOUS SEDIMENTS NORTHERN VANCOUVER ISLAND

SCALE 1:500 000 | FIGURE 2

Chapter 2

SUMMARY AND CONCLUSIONS

Coal Exploration Licence Nos. 7981 - 7988 inclusive, held by Texaco Canada Resources Ltd., known as the Holberg Inlet Coal Licences, cover approximately 1,550 hectares (3,830 acres). They are contiguously located on the north side of the Holberg Inlet, approximately midway along its length.

The area along the north shore of Holberg Inlet (or the West Arm, as it was earlier named) was prospected in the early 1900's. This work took the form of a few scattered diamond drill holes and some short adit work from a coal outcrop which has not been located during the recent work.

Work performed in 1984 by Texaco Canada Resources consultants and staff outlined two potential areas of Lower Cretaceous sedimentary deposition: one in the vicinity of Hushamu Creek and another in the vicinity of Cleskaugh Creek. Both areas front on tidewater and are within 4 km of each other. As a result of this work both areas were taken under licence by Texaco Canada Resources Ltd.

1985 exploration work on the Holberg Inlet Coal Licences consisted of mapping on a scale of 1 : 50,000, with more detail in areas of exposed coal measures. To date approximately $12,000 of exploration work has been expended on the 1985 study.

The 1985 work shows that the sedimentary trend found in Hushamu Creek does not extend past Coal Licence No. 7982. No continuity of sedimentary deposition or structure exists between the Cleskaugh Creek and Hushamu Creek areas.

The Cleskaugh Creek area is structurally complex, with measured dips in the 60 to 70 degree range. A lack of outcrop on the inland portion leads to a great deal of interpretation, however, the area does not exhibit enough coal resource potential or favourable structure to warrant the maintenance of the licences.

The Hushamu Creek area is more favourable for the delineation of potential coal resources, as evidenced by the identification in the field of one main coal exposure in the bank of a creek and two other locations on the sedimentary trend of coal float. The structure is also favourable, although dips on the sediments are in the 25 to 30 degree range. The land surface falls away to the south and beneath the inlet, as does the dip slope on the sedimentary sequence.

The coal exposure measures a total of 2.815 metres (9.2 ft.) and consists of dull, blocky coal with some carbonaceous mudstone partings. The zone has a well-defined roof and floor, although

it is exposed in a faulted section and some structural disturbance is evident.

The seam was sampled in four separate units: raw heads of each unit showed greater than 50% ash, with a sulphur content varying from 0.51 to 1.21 %. Float/sink testing at a 1.6 separation indicated that much of the ash is inherent and yields are correspondingly low.

The total estimated in-situ coal resource for the area currently under licence is 4.85 million metric tonnes. The total estimated in-situ coal resource for the area not presently covered under licence is 2.43 million metric tonnes. The aggregate total for these two contiguous areas is 7.28 million metric tonnes. This assumes a coal thickness of 2.8 metres as measured. This calculation assumes that the quality of the seam improves away from the faulted zone, which can only be ascertained by drilling and coring work.

On the strength of this study, Coal Licence Nos. 7983 to 7988 inclusive can be surrendered to the Crown. Coal Licence Nos. 7981 and 7982 can be retained. The potential coal resource not covered by these two licences can be taken under licence by applying for Lot 324, consisting of 233 ha (576 acres).

Chapter 3

GEOLOGIC SETTING

Because of its marginal continental location, the geologic history of Vancouver Island is chiefly related to plate tectonics and massive crustal movements on the Pacific margin of North America. Vancouver Island represents submarine and later terrestrial vulcanism associated with rifting along an ocean floor subduction zone, formed from the Pacific oceanic plate colliding with the western edge of the North American continent and being subducted beneath the continental margin. These crustal movements began in Paleozoic time and have continued to the present. Most of the vulcanism associated with rifting, however, took place in early Mesozoic time[1]. During the Jurassic and Triassic periods, massive outpourings of pillow and flow lavas, and aquagene tuffs formed volcanic island arcs, eventually forming the Insular Mountain Belt, which covers Vancouver Island, the Queen Charlotte Islands, the Alaska panhandle and the Wrangell and St. Elias ranges of Alaska. These volcanic buildups

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1. Muller, J. E., "Evolution of the Pacific Margin, Vancouver Island, and Adjacent Regions", Can. Journal of Earth Science, Vol. 14, 1977

are represented on northern Vancouver Island by the thick basalts of the Triassic Karmutsen Formation, and the major batholiths of the Bonanza Volcanics and the acidic Island Intrusions of Lower to Middle Jurassic. These volcanic complexes form the basement rock upon which later clastic sedimentary wedges of Lower and Upper Cretaceous Age were deposited.

3.1 Sedimentation

Muller[2] describes Upper Jurassic and Lower Cretaceous sedimentation in northwestern Vancouver Island as follows

> ...the eastward onlapping wedge of clastic sediments consists of upper Middle to Upper Jurassic, as yet unnamed sediments, the Lower Cretaceous Valanginian to Barremian Longarm Formation, and the Aptian to Cenomanian Queen Charlotte Group. The lower formations, mainly greywacke and siltstone, only occur in small areas along the west coast and are only a few hundred metres thick. Further east, the upper conglomerate is up to 1000 m. thick and contains cobbles of volcanic rocks and of porphyritic granitoid rocks, presumably derived from high level plutons. Clearly these beds are of a clastic wedge, shed westward from the extinct but still elevated Jurassic volcanic arc.

The general range of southwesterly dips measured in the Lower Cretaceous sedimentary sequences around Coal Harbour and the Quatsino Sound area during the current field reconnaissance

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2. Muller, J. E., "Evolution of the Pacific Margin, Vancouver Island, and Adjacent Regions", Can. Journal of Earth Science, Vol. 14, 1977

FIGURE 3

TABLE OF FORMATIONS OF VANCOUVER ISLAND*

	PERIOD		STAGE	GROUP	FORMATION	SYM-BOL	AVERAGE THICKNESS IN m.±	LITHOLOGY
CENOZOIC					late Tert. volc's of Port McNeill	Tvs		
					SOOKE BAY	mpTsb		conglomerate, sandstone, shale
			EOCENE to		CARMANAH	eoTc	1,200	sandstone, siltstone, coglomerate
			OLIGOCENE		ESCALANTE	eTe	300	conglomerate, sandstone
			early EOCENE		METCHOSIN	eTm	3,000	basaltic lava, pillow lava, breccia, tuff
MESOZOIC		LATE	MAESTRICHTIAN	NANAIMO	GABRIOLA	uKGa	350	sandstone, conglomerate
					SPRAY	uKs	200	shale, siltstone
			CAMPANIAN		GEOFFREY	uKG	150	conglomerate, sandstone
					NORTHUMBERLAND	uKn	250	siltstone, shale, sandstone
					DE COURCY	uKdc	350	conglomerate, sandstone
					CEDAR DISTRICT	uKcd	300	shale, siltstone, sandstone
					EXTENSION - PROTECTION	uKep	300	conglomerate, sandstone, shale, coal
			SANTONIAN		HASLAM	uKh	200	shale, siltstone, sandstone
					COMOX	uKc	350	sandstone, conglomerate, shale, coal
		EARLY	CENOMANIAN ALBIAN APTIAN?	QUEEN CHARLOTTE	conglomerate unit	lKqc	900	conglomerate, greywacke
					siltstone shale unit	lKqp	50	siltstone, shale
			VALANGINIAN BARREMIAN		LONGARM	lKl	250	greywacke, conglomerate, siltstone
	JURASSIC	MID to LATE	TITHONIAN CALLOVIAN		Upper Jurassic sediment unit	uJs	500	siltstone, argillite, conglomerate
		EARLY	TOARCIAN? PLIENSBACHIAN SINEMURIAN	BONANZA	volcanics	lJb	1,500	basaltic to rhyolitic lava, tuff, breccia, minor argillite, greywacke
					HARBLEDOWN	lJh		argillite, greywacke, tuff
	TRIASSIC	LATE	NORIAN	VANCOUVER	PARSON BAY	uTrpb	450	calcareous siltstone, greywacke, silty-limestone, minor conglomerate, breccia
			KARNIAN		QUATSINO	uTrq	400	limestone
					KARMUTSEN	muTrk	4,500	basaltic lava, pillow lava, breccia, tuff
		MID	LADINIAN		sediment - sill unit	Trds	750	metasiltstone, diabase, limestone
PALEOZOIC	PENN. and ? PERM.			SICKER	BUTTLE LAKE	CPbl	300	limestone, chert
					sediments	CPss	600	metagreywacke, argillite, schist, marble
					volcanics	CPsv	2,000	basaltic to rhyolitic metavolcanic flows, tuff, agglomerate
	DEV. or EARLIER							

* Courtesy: Muller, J.E., "Geology of Vancouver Island"
G.S.C. No. O.F. 463, 1977

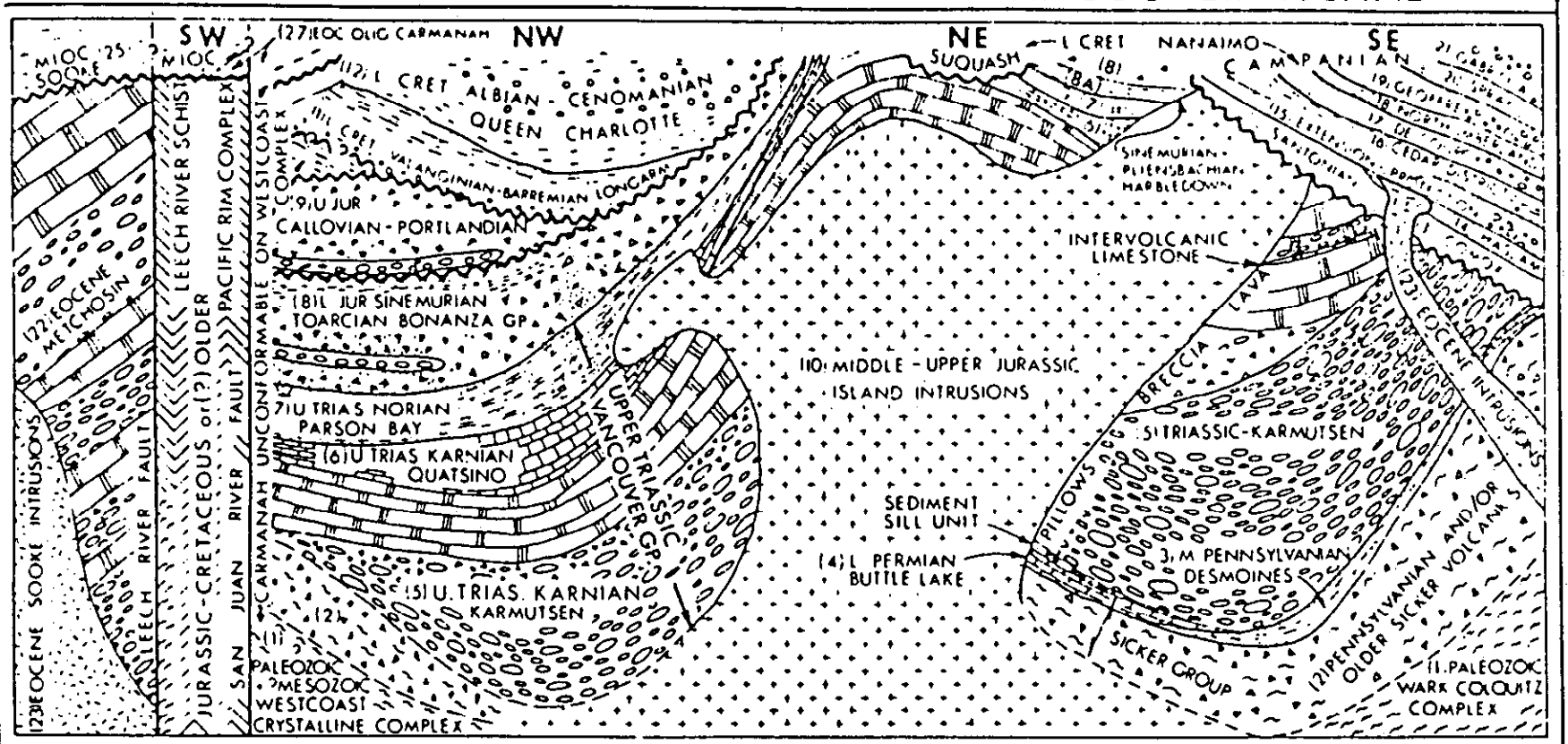
reinforces Muller's theories of eastward onlap during Lower Cretaceous time. Muller continues:

> The Early Cretaceous shelf sequence of the west coast is succeeded by the Upper Cretaceous Nanaimo Group of eastern Vancouver Island. Only in one place in the central northern part of the island are the two sequences believed to be in stratigraphic contact. Elsewhere Upper Cretaceous sediments overlie with marked unconformity pre-Cretaceous rocks including Jurassic Island Intrusions. The molasse-type coal-bearing marine and deltaic deposits of sandstone, siltstone, shale, and conglomerate contain Santonian to Maestrichian fossils.....
>
> .....the Early Cretaceous basin was on a shelf sloping southwestward to the Pacific Rim trench. The Late Cretaceous "Georgia Basin" was inboard of emerging Vancouver Island ranges and deepened to the northeast.

This difference between Lower and Upper Cretaceous sedimentary buildups is clearly evident in the field: in the Late Cretaceous Suquash area, measured dips are predominantly to the northeast and east, as opposed to general southwesterly dips measured in the Lower Cretaceous sediments in the Coal Harbour area. The significance of this can be found in the differing characteristics of the rock types in each of the areas, and more importantly, the characteristics of the coal seams. It also means that observations and conclusions drawn from the Late Cretaceous area can not be inferred for the Lower Cretaceous areas, because the source areas for sedimentation are different.

FIGURE 4

RELATIONSHIPS OF FORMATIONS OF VANCOUVER ISLAND*



*Courtesy: Muller, J.E., "Geology of Vancouver Island", G.S.C. No. O.F. 463, 1977

3.2 Structure

Post-Cretaceous structural deformation in the northern Vancouver Island area is responsible for the preservation of a portion of both the Lower Cretaceous sediments around Coal Harbour, Quatsino and Holberg Inlet, and the Late Cretaceous sediments of the Suquash area on the northeast coast. This structural deformation manifests itself in the form of major normal (gravity) faults which, in many cases, are bounding features of sedimentary areas: the sediments of the Cretaceous are preserved on the downdropped structural blocks. In many cases, this faulting occurs as a number of related 'step' faults. Minor reverse faults also occur at numerous locations. These reverse faults are generally high angle planes associated with compression and localized uplifts.

In addition to the predominant faulting, Post-Cretaceous movements have resulted in minor folding. This folding is not clearly evident in surface exposures because the folds are generally gentle and broad with shallow dips, however, drilling has confirmed their presence in some areas.

3.3 Origins of Structural Deformation

The Post-Cretaceous structural deformation evident in the northern Vancouver Island area is chiefly the result of Tertiary Volcanic activity and uplift. However, many workers have attributed fault movements in Tertiary time as occurring along pre-existing fault and fracture planes that originated during the major rifting that occurred during the Triassic.

Muller [3] describes Late Tertiary volcanic rocks near Port McNeill:

> Late Tertiary volcanic rocks are exposed in small areas south of Port McNeill. They are basalt, almost unconsolidated tuff and breccia, volcanic boulder conglomerate and light-coloured dacite tuff.

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3. Muller, J. E.,"The Geology of Vancouver Island",1977

3.4 Surficial Geology

The northern part of Vancouver Island has been subjected to glaciation during the Pleistocene and also some earlier period, when glaciation covered the Georgia Strait, the Queen Charlotte Strait and the entire island with a continuous ice sheet originating on the mainland and flowing southwest[4]. During the Pleistocene a number of glacial sequences originated from centres on Vancouver Island, and ice flowed in all directions from these centres, especially down the fjoords and major valleys such as the Nimpkish Valley, south of Port McNeill.

Glacial erosion and scour occurred on the higher elevations, while varying thicknesses of glacial debris and outwash material were deposited on the lowland areas, in particular the relatively flat-lying sedimentary basins. This glacial deposition has masked the underlying sediments very effectively on northern Vancouver Island. Surface exposures of Cretaceous sediments are few in number, and occur along the tideline where the erosive action of the sea has uncovered the bedrock, or along major fault contacts, where scarp lines occur.

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4. Muller, J. E.,"The Geology of Vancouver Island",1977

Chapter 4

HISTORY OF COAL EXPLORATION WORK

The area along the north shore of Holberg Inlet (or the West Arm, as it was earlier named) was prospected in the early 1900's. The following excerpts are from Ministry of Mines Annual Reports-

From report of B. W. Leeson, Mining Recorder, Quatsino Mining Division, 1903, pp. 194, 195 :

> "On the West Arm iron and coal deposits have been discovered, ... On the north side of the main sound and on Forward Inlet, coal formation occurs, some small croppings of a fine quality of coal being known on Winter Harbour, although none of sufficient size to work."

From Leeson's report of 1904 :

> "It is reported that a Mr. Pearson, of Vancouver, with three others, arrived by a recent steamer at the West Arm to bore for coal, but the extent of their intended operations has not been ascertained."

From Leeson's report of 1905 :

> "Mr. Pearson, of Vancouver, is steadily working on the West Arm, employing three to five men running tunnels and drilling for coal, but with what result is not yet known."

From notes of a visit by the Provincial Ministry of Mines, (W. F. Robertson), 1907, pp. 150-151, 173. :

The fact that coal measures, and probably workable seams exist on the West Arm of Quatsino Sound has been known for many years, as the coal seams at Coal Harbour were at least partially prospected some years ago by a California company, which acquired the land and did a little work, but not enough to prove or disprove whether the seams were sufficiently extensive to permit their being worked.

About midway in the length of the West Arm, on the north side, the coal-bearing formation shows up on the beach, these measures extending to the west for pretty near the length of the Arm. For some years the Quatsino Coal Syndicate, under the manaagement of Mr. Thos. P. Pearson, has been prospecting for coal in this area, and, in 1905, put down three boreholes at what is known as Pearson's Lower Camp. The first hole was put down near the beach to a depth of 156 ft.; the second hole was sunk about one-third of a mile inland and was drilled to a depth of 218 ft., while the third hole was put about three-quarters of a mile inland and was drilled to a depth of 40 ft.. In none of these holes was any coal encountered of workable thickness, some three or four inch seams were encountered in the second hole and also some gas, but the workings were eventually abandoned.

Mr. Pearson then moved westward along the Arm to within three or four miles of its western extremity, where he established his 'Upper Camp', and in the vicinity took up ten prospecting areas. On one of these areas he was able to locate a very fair seam of coal, somewhat impure at the outcrop but containing great possibilities. The point at which the coal outcrops is about one mile from the Arm on the steep bank of Pearson Creek, 100 ft. above the bed of the creek and 175 ft. above sea level. The seam dips S. 30 degrees W., at a moderate angle, into the bank and towards the Arm.

The work so far done is not claimed to be more than prospecting work, but consists of an upper tunnel, a rock cross-cut adit tunnel, which at 80 ft. in cuts a coal seam, the outcrop of which is visible higher up in the hillside. At a somewhat lower level, the second tunnel, also a rock cross-cut adit tunnel, has been driven, reaching the coal at 110 ft. in. A slope in the coal connects the two levels and has been sunk about 30 ft. below the lower level, while in from the tunnel, a drive about 150 ft. long has been made in the coal and along its strike.

To prove the coal further to the dip, a borehole was being put down, which was then down 110 ft., and if the dip held true, should strike the seam at a depth of 120 ft..

The seam, as exposed, lay under a clay-shale and over a sandstone, giving the following section in descending order:

1' 8"	--	Coal
9"	--	Clay
2' 7"	--	Coal
1' 0"	--	Clay
4' 3"	--	Coal
3' 0"	--	Black Shale & Coal
13' 3"	--	Total Seam Thickness

The various layers of coal seemed about the same quality and a sample was taken representing the average of the upper portion of the seam, which gave, at the Government laboratory, the following analysis :

Moisture	1.80%
Volatile Combustible Matter	30.67%
Fixed Carbon	19.63%
Ash	47.90%
	100.00 %

"It is premature, as yet, to predict what the future of the discovery may prove to be; it is a strong, well-defined coal seam, somewhat dirty where struck, but that trouble may disappear in a short distance. The area of the seam remains to be determined, which will require time, but as a prospect is such that a railway to the Arm and good shipping facilities could easily and cheaply obtained. The management is going ahead slowly but surely, and within a year should have some interesting data to present."

From O. A. Sherberg, Mining Recorder, Quatsino Mining Division,

Report for 1908, pp. 145,199 :

"The Quatsino Coal Syndicate, under the management of Thomas P. Pearson, has been working on its property on the West Arm during the summer and until the latter

part of October, when the work was closed down for the winter. Mr. Pearson expressed himself satisfied with the results of the work so far done, and he expects to be back again to start work in the early spring."

pp. 199:

On Vancouver Island, Mr. Pearson has been engaged in developing the coal seams described in the report of 1907, on the West Arm of Quatsino Sound, with results satisfactory as far as they go, but more work must be done before the ultimate value of the property will be known."

From Report of O. A. Sherberg, Mining Recorder, Quatsino Mining Division, 1909, pp. 148. :

"The coal claims situated on the West Arm of Quatsino Sound and owned by the Quatsino Coal Syndicate, have been worked with a few men since the latter part of September."

From report of 1910, pp. 153 :

"Development work has been carried on continuously during the past year by Thomas Pearson of Vancouver, on the coal property, situated on the West Arm of Quatsino Sound, owned by the Quatsino Coal Syndicate. The underground work has been extended to about 600 ft.. In the latter part of September a diamond drill was brought here and work started on a coal property consisting of twenty claims situated on the north side of the main channel of Quatsino Sound, opposite Limestone Island. The Manhattan Coal Company, which owns a few coal claims on the south side, will be ready in about a week to start work on its property near Monkey Creek with a diamond drill."

pp. 175 :

"On Vancouver Island, in addition to the areas actually being worked, there is a Cretaceous coalfield in the Quatsino Mining Division on Quatsino Sound now being developed by Mr. Thomas Pearson and associates, which gives promise of containing extensive beds of workable coal; prospecting workings have been in progress here for about four or five years, with

considerable success."

From O. A. Sherberg's Report for 1911, pp. 193, 223 :

> "Under the management of Thomas P. Pearson, development work has been carried on continuously on the coal property owned by the Quatsino Coal Syndicate. The property is situated on the West Arm of Quatsino Sound. The underground work has been extended 800 ft. On the several other claims on the Sound very little work has been done during the year."

The references to this early prospecting work abruptly cease in about 1911, and no further reference to the West Arm area could be found.

4.1 Description of Recent Work

1984 work consisted of a general reconnaissance of the whole of the north island area, including the Suquash basin, the Coal Harbour area, the Winter harbour area and others. Reconnaissance of the north shoreline of Holberg Inlet, west from Coal Harbour for a distance of approximately 18 km. revealed some favourable geology for potential coal resources. Road traverses of all of the existing logging roads in the area provided some data for the inland areas, however, the absence of roads was a limiting factor. In areas along the coastline where sediments were found to exist, creek traverses were undertaken in order to define the boundaries of the sedimentary areas.

The most important area in terms of favourable geology and positive indications of coal occurrence was the Hushamu Creek area. Sandstone outcrops on the beach just east of Hushamu Creek, dipping to the south at approximately 30 degrees. A traverse up the creek indicated that an area of sedimentary deposition occurs on the southwest side of the creek. Large pieces of coal float up to 10 cm in thickness indicated that a significant coal seam occurred within the sedimentary section.

Some possibilities were also recognized near Cleskaugh Creek and it was thought that some of the old prospecting work had been

undertaken in this area.

On this basis, Texaco Canada personnel applied for and received the Holberg Inlet coal exploration licences.

Chapter 5

DESCRIPTION OF PRESENT WORK

Current exploration work on the Holberg Inlet Coal Licences consisted of mapping on a scale of 1 : 50,000, with more detail in areas of exposed coal measures. These areas, however, are few and much of the geology has been inferred from air photo interpretations.

Creek traverses proved to be the best method of locating rock outcrops, as well as examinations of the shoreline along Holberg Inlet.

Mapping and field work was confined to a period between July 22 and August 1, 1985. The work was undertaken by this author and N. J. Paithouski of Texaco Canada Resources Ltd. A summary of costs expended on the Holberg Inlet Coal Licences from Mar. 1, 1985 to the present time is as follows:

Figure 5. - COST SUMMARY, 1985 EXPLORATION WORK

Mapping and field work	$ 5,640.21
Laboratory and Anaytical	$ 598.00
Drafting and Reproduction ...	$ 347.69
Final Reporting	$ 5,300.00
TOTAL	$ 11,885.90

Chapter 6

GEOLOGY OF THE HOLBERG INLET COAL LICENCES

The main thrust of the field work was to define the limits of the sedimentary bodies located in the vicinity of Hushamu and Cleskaugh creeks, identify the structural regime and locate any coal outcrops which may occur in the area, as evidenced from the occurrences of coal float in the creeks and rivers.

Field work in the Holberg area has isolated two Lower Cretaceous sedimentary occurrences along the north side of Holberg Inlet known as the Hushamu and Cleskaugh Creek areas. The work shows that the sedimentary trend does not occur to the northwest of these areas in such lowlying valleys as the Goodspeed River (See Appendix I. Map A.). The valley of the Goodspeed River, which is separated from Holberg Inlet by a high ridge of volcanics, lies within a Triassic-Jurassic belt which is represented by a series of banded cherts and metamorphosed greywackes, tuff and breccia. These units all dip very steeply in a southwesterly direction. They are part of the Jurassic Bonanza Group, which is chiefly volcanic in nature but contains some elements of marine sediments which indicate a submarine

volcanic island arc complex. In only one very confined area on the south side of the Goodspeed valley near its headwaters was Cretaceous conglomerate found. This area, because of its proximity to the top of the southern ridge, is interpreted to be a small remnant of the thick Lower Cretaceous conglomerate unit which is found extending over a large area from the south side of Holberg Inlet south to Quatsino Sound. The remainder of the Cretaceous section has been eroded from this uplifted block.

6.1 Rock Types

The following rock assemblages occur in the Holberg Inlet area:

- Pre-Cretaceous Rocks - This grouping includes the volcanic rocks of Triassic-Jurassic age such as the Upper Triassic Vancouver Group (consisting mainly of flow and submarine basaltic lavas, limestone, and cherty beds), and the Jurassic Bonanza Group (consisting mainly of lava, tuff and breccia with cherty and slaty beds). Also included are some Upper Jurassic siltstone, argillite and conglomerate.

- Cretaceous Rocks - This grouping includes a basal boulder conglomerate section varying from 0 to 10 metres thick, siltstone members of varying thickness, medium grained grey to buff weathering hard sandstone up to 30 metres thick, soft white to grey claystone beds up to 3 metres thick,

conglomerate members and at least one coal seam up to 3 metres thick. On the Holberg Inlet licence area, the maximum thickness of the entire Lower Cretaceous sedimentary section including the coal measures is approximately 60 metres thick.

- Post-Cretaceous Rocks - Include the Island Intrusion Complex which actually transgresses the entire time interval from early Jurassic to Late Cretaceous and other dyke and sill volcanic intrusions which in some localized situations alter the sedimentary units.

6.2 Structure

The structure of the Holberg Inlet area and in particular the Holberg Inlet Coal Licences is dominated by faulting. The faulting is predominantly normal or gravity faults but some secondary reverse faulting has been identified in the field. The cross-sections included as Appendix II. illustrate the structural regime over the property area. The faulting within the sedimentary section generally follows two main orientations: East-west faults roughly parallelling the formation strike and north-south faults at right angles to formation strike.

Faulted sections of sedimentary rock to the east of the licence boundary expose the coal seam found near the base of the

sedimentary section.

No folding was encountered during the course of the mapping work on the Holberg Inlet Coal Licences, except such localized folding that is directly associated with fault structures.

In general, the structure of the sedimentary body found in the vicinity of Hushamu Creek is that of a down-faulted block along the north side of an east-west striking major downthrow surfacing beneath the waters of Holberg Inlet. The sedimentary rocks on the northern edge of this major downthrow are generally dipping to the south at angles of 25 to 35 degrees and strike more or less east-west (See Appendix I., Maps B & C). The sedimentary body is cut off on the west and east sides by secondary normal faults, across which is found older volcanic rocks of Triassic age. The fault block containing the sedimentary beds has also been subjected to secondary faulting roughly parallel to the east-west strike of the sedimentary units.

The sedimentary units found near Cleskaugh Creek are much more structurally disturbed and although no sedimentary exposures were encountered inland, dips on the sediments along the coastline east of Cleskaugh Creek ranged from 60 to 70 degrees.

The present work has confirmed that there is no continuity between the Cleskaugh Creek and Hushamu Creek sedimentary deposits. These two areas are separated by a large topographic high consisting of Triassic Bonanza volcanics (See Appendix II.,

Section D-D').

6.3 Description of the Coal Measures

The coal measures as described in this section are confined to that area around Nusnamu Creek. No exposures of these sedimentary rocks fitting the description of the sediments directly associated with the coal measures area were found in the Cleskaugh Creek area.

The base of the sedimentary formation consists of a boulder conglomerate unit varying in thickness from 0 to 10 metres. This conglomerate is exposed in a fault situation on the bed of a creek just northwest of the Tribune Timber log dump (See Appendix I. Map B. and Appendix II. Section A - A'). Above the conglomerate unit is a hard, medium grained, variable bedded sandstone, medium grey to brown in colour and weathering to buff and rusty brown. The thickness of this sandstone is estimated at 5 to 10 metres. Above the sandstone is a layer of siltstone at least 2.5 metres thick where measured. The siltstone is medium grey in colour, hard and uniform. A layer of carbonaceous mudstone and dirty coal of a measured thickness of 0.55 metres rests on top of the siltstone and forms the basal section of the main coal zone.

The coal zone is exposed on the same creek just north of the Tribune Timber log dump (See Appendix I. Map B. and Appendix II. Section A - A'). The coal zone outcrops as a result of a faulted section on the west side of the creek bank. The fault structure can be seen running through the coal zone, creating a drag-fold and some limited displacement. The true thickness of the coal zone is measured from the north side of the fault feature and measures a total of 2.815 metres (9.2 ft.). It consists of mainly hard, dull, boney coal with minor softer mudstone sections.

The roof of the coal zone is that of a hard, blocky mudstone, medium grey in colour weathering to orange, with some concretionary weathering structures evident. This mudstone roof measures 0.16 metres (0.52 ft.) at the exposed section.

Above the mudstone roof is a fine to medium-grained sandstone, variable bedded and buff coloured weathering to brown. This sandstone measures more than 0.39 metres (1.28 ft.), with the top covered by overburden. This sandstone is present some distance down the creek and again at tidewater (Location #1, #2 & #8a on Appendix I. Map B.). The total thickness of this sandstone unit is estimated at from 20 to 45 metres, as measured from the cross-sections in Appendix II. This total thickness, however, has not been confirmed in the field due to the shortage of outcrop. Varying thicknesses of siltstone interbeds are contained within

this sandstone horizon, as evidenced by outcrop exposures along Hushamu Creek.

The total sedimentary section as documented above is illustrated in Figure 6., as follows:

FIGURE 6. - TOTAL SEDIMENTARY SECTION, HUSHAMU CREEK AREA

ROCK UNIT (From Top)	TOTAL THICKNESS (metres)	DESCRIPTION
SANDSTONE	45	Fine to medium grained; buff to brown Siltstone interbeds; variable bedded;
COAL ZONE	2.8	Mudstone roof and floor; hard, dull, boney coal with minor mudstone partings
SILTSTONE	2.5	Medium grey, hard; uniform;
SANDSTONE	10	Medium grained; hard; variable bedded; Buff weathering to brown and rust;
CONGLOMERATE	10	Coarse sandy and gritty matrix with cobbles and boulders of basalt and chert;
TOTAL SECTION:	70.3 metres (231 ft.)	

6.4 Coal Seam Description

The following is a detailed description of the coal zone as measured and described in outcrop in the creek bank just northwest of the Tribune Timber Log Dump (See Appendix I. Map B. and Location #9 on Map C.):

FIGURE 7. - DESCRIPTION OF THE COAL ZONE, HUSHAMU CREEK AREA

LITHOLOGY (From Top)	THICKNESS (metres)	DESCRIPTION
SANDSTONE	0.39+	Fine to medium grained; brown weathering; variable bedded; some concentrically weathered sections Thickening downdip;
SANDSTONE	0.31	Coarse grained; variable texture and bedding; hard; lighter coloured;
MUDSTONE	0.16	Medium to dark grey; weathering to orange and rust; flaggy but hard, boney layers throughout; some carbonaceous sections;
COAL	0.05	Bright and dull banded; dirty; hard;
COAL	0.21	Blocky; hard; dull
MUDSTONE	0.05	Medium to light grey; weathering to orange; hard;
COAL	0.03	Blocky; dull;
MUDSTONE	0.06	Medium to light grey; weathering to orange; softer; lensoid;
COAL	0.29	Blocky; fairly uniform; some bright sections;

LITHOLOGY	THICKNESS (metres)	DESCRIPTION
MUDSTONE	0.03	Medium grey to black; carbonaceous and coaly;
COAL	0.70	Blocky; hard, dull boney sections throughout; visible pyrite;
PYRITE	0.015	Very finely disseminated pyrite in a distinctive band;
COAL	0.06	Blocky; fairly clean;
SHALE	0.03	Carbonaceous; fissile;
COAL	0.18	Blocky; boney; dull; hard;
MUDSTONE	0.10	Medium brown to black; coaly;
COAL	0.27	Blocky; hard; dull with some minor bright sections;
MUDSTONE	0.07	Medium grey; hard;
COAL	0.12	Soft; blocky; dull with some bright sections;
MUDSTONE	0.03	Cream to grey; soft;
COAL	0.03	Dull; soft; some bright sections;
MUDSTONE	0.04	Carbonaceous; harder;
MUDSTONE	0.11	Black to dark grey; carbonaceous;
MUDSTONE	0.34	Carbonaceous; dirty coal bands throughout;
SILTSTONE	2.50	Medium grey; hard; uniform;
SANDSTONE	2.00+	Medium grained; variable bedded; hard;

The seam section as measured in outcrop and sampled by the channel sample method is illustrated in Figure 8. The seam is

characterized by four major zones, which were sampled separately:

- a 0.26 metre (0.85 ft.) upper section plus a 0.14 metre (0.46 ft.) coaly mudstone parting (Sample 5a.)
- a 1.02 metre (3.35 ft.) middle section relatively free of parting material (Sample 5b), and
- a 0.845 metre (2.77 ft.) lower zone with thin mudstone partings and pyritic lenses (Sample 5c),
- a 0.55 metre (1.80 ft.) basal section with abundant carbonaceous mudstone and dirty coal material (Sample 5d).

The total section as sampled measures 2.815 metres (9.2 ft.)

In addition to these outcrop samples, a sample of coal float from Location 5 (see Appendix I. Maps B & C) was analysed for correlation purposes. This sample was labelled HI-85-03.

6.5 Analytical Methods

The following methods of sample preparation and testing were used: A. Sample HI-85-03 (Coal Float, Location 5) - The sample was crushed to <25 mm, riffled into two splits. On one split proximate, sulphur and calorific value analyses were performed.

B. Samples HI-85-05a, 05b, 05c and 05d (Outcrop Samples, Main

		TOP (covered)	TRUE THICKNESS (metres)	SAMPLE NUMBER	PROXIMATE ANALYSIS (AIR DRY BASIS)
					Moisture (%), Ash (%), Volatile Matter (%), Fixed Carbon (%), Sulphur (%), Calorific Value (cal/kg)
SANDSTONE:	fine to medium grained; buff coloured; weathering brown variable bedding		+ 0.39		
SANDSTONE:	coarse grained; lighter coloured; hard; variable bedding		0.31		
MUDSTONE:	medium grey weathering to orange; hard; some concretionary structures; blocky		0.16		
			0.05		
COAL:	bright, blocky, clean		0.21	5(a)	2.87, 55.01, 18.61, 23.51, 0.52, 3014
MUDSTONE:	medium to light grey; weathering orange; coaly sections; softer at base		0.14		
COAL:	blocky but dull		0.29		
	mudstone parting		0.03		
COAL:	blocky; hard, dull boney sections throughout; visible pyrite		0.70	5(b)	2.93, 51.95, 19.56, 25.56, 1.34, 3261
COAL:	blocky; fairly clean; pyrite at top		0.075		
SHALE:	black; fissile; carbonaceous		0.03		
COAL:	blocky; hard; boney; dull		0.18		
MUDSTONE:	medium brown to black; carbonaceous		0.10	5(c)	3.36, 54.43, 18.23, 23.98, 1.11, 2877
COAL:	blocky; hard; bright & dull sections		0.27		
MUDSTONE:	medium grey; hard		0.07		
COAL:	soft; blocky; dull		0.12		
MUDSTONE:	light grey		0.03		
COAL:	dull, soft		0.03		
			0.04		
MUDSTONE:	carbonaceous, harder		0.11		
MUDSTONE:	carbonaceous; dirty coal bands throughout		0.34	5(d)	
SILTSTONE:	medium grey; hard		2.50		

FIGURE 8.

TEXACO CANADA RESOURCES LTD

HOLBERG INLET COAL LICENCES

GEOLOGICAL DESCRIPTION & ANALYTICAL RESULTS, MAIN COAL ZONE

SCALE:			
DRAWN BY: S.L.GARDNER	DRAFTED BY: EJD	CHECKED BY:	DATE: OCT 1985

Coal Zone) - Each sample was crushed to <25 mm riffled into two splits. From one split, a head sample for each was taken for proximate, sulphur and calorific value analyses. Samples 05a, 05b and 05c were combined to form a composite of the main part of the seam. This composite was weighed and subjected to a float/sink test at a separating specific gravity of 1.6. The float fraction was weighed and analysed for proximate, sulphur, calorific value and Free Swelling Index. The sink fraction was weighed and analysed for moisture, ash and sulphur.

Sample 5d was subjected to the same float/sink test work as the composite sample.

The results of this analytical work are documented in Appendix III.

6.6 Analytical Results

It is interesting to note that all of the samples are greater than 50% ash in the heads (see Appendix III.). Sulphur contents are variable but an average would be about 1%. High ash contents even in the middle section of the coal zone (Sample 5b: 51.95% ash A.D.B.) indicate that the coal is of a generally dirty nature. Much of this ash is inherent and does not sink out very easily. This is evidenced from the float/sink analyses at 1.6 S. G. At this separating gravity, much of the coaly material was lost in the sink fraction, giving a very low yield of 16.1% for the composite sample. Even at this low yield, the float fraction still contained about 30% ash. These figures indicate that the coal would not be amenable to preparation techniques and would require a fairly sophisticated system involving fine crushing of raw coal feed in order to liberate the inherent ash material.

The sulphur content is satisfactorily reduced from about 1% in the raw to .64% at 1.6 S.G. in the floats.

Some Free Swelling Properties are indicated, even at 30% ash. At 20% ash for Sample 5d, the F.S.I. is 3. At 10 to 15% ash, the F.S.I. could be expected to approach 5 or 6.

Residual moisture contents are low: this is a characteristic of

most Vancouver Island coals.

Chapter 7

ESTIMATION OF POTENTIAL COAL RESOURCES

The estimation of potential coal resources for the Holberg Inlet Coal Licences is confined to the area surrounding Hushamu Creek as far east as the Tribune Timber Log Dump (mapping work has shown that the coal measures do not exist over the licence areas to the west, i. e. between Hushamu and Cleskaugh Creeks).

For purposes of coal resource estimation, the following assumptions are employed:

- A seam thickness figure of 2.8 metres can be used for purposes of estimating coal resources in place. This figure is the result of field measurements at one outcrop location discussed in previous section. It must be emphasized that the in-situ reserves generated as a result of employing this 2.8 metre thickness will not reflect recoverable reserves because of the very high ash contents associated with the raw coal. For this exercise, it is assumed that the coal seam will become cleaner away from the faulted zone and away from the volcanic contact. This assumption can only be proven or disproven by drilling.

- For the purposes of resource estimation, a volume/mass conversion of 1.4 Relative Density, which is the average density of clean coal, will be employed.

- An average dip of the coal seam of 25 degrees is used. At this dip, and using the 2.8 metre coal thickness, the factor of 38,558.8 metric tonnes per hectare reflects the mass of coal in place.

- Assume the boundaries of the coal area are the secondary cross-faults evident on Appendix I. Maps B. and C. and that the area shown in yellow is the area underlain by the main coal zone.

Using the above assumptions, the following calculations can be made:

A. Potential reserve area, Coal licence nos. 7981 & 7982
= 125.68 hectares
Therefore, 125.68 ha X 38,558.8 tonnes/ha

= 4,846,070 tonnes

B. Potential reserve area, Lot 324 (not under licence at this time):
= 63.12 hectares
Therefore, 63.12 ha X 38,558.8 tonnes/ha

= 2,433,831 tonnes

TOTAL POTENTIAL COAL RESOURCE, Using the above assumptions:

= 7,279,901 tonnes
or, 7.28 million metric tonnes

Chapter 8

CONCLUSIONS AND RECOMMENDATIONS

As a result of the 1985 field work conducted on the Holberg Inlet Coal Licences, the following conclusions can be drawn:

1. Lower Cretaceous sediments containing coal measures occur over an area on the north side of Holberg Inlet, about midway down its length. The coal measures cover an area of approximately 126 hectares, or 311 acres, on Coal Licence No. 7981 and a small fraction of No. 7982. An additional area of coal measures occurs immediately east of Licence No. 7981 on Lot 324. This area measures approximately 63 hectares, or 156 acres. It is not currently covered by a coal licence.

2. The coal seam near the base of the sedimentary section is exposed on Lot 324 and measures 2.815 metres, or 9.2 ft., including a coaly mudstone basal zone.

3. Analytical testing of channel samples of this coal seam indicates that the seam is very high in inherent ash, with ash values reporting at 50 to 60% as received. The sulphur

content of the as received samples averages about 1 % and cleans down to about .6%. Float/sink testing at a separating gravity of 1.6 indicates that the coal is not amenable to cleaning, especially in the coarser fractions.

4. There are some possibilities that the seam would retain its thickness and become cleaner away from the faulted section where it is exposed, however this could only be demonstrated by coring and drilling work.

5. The total estimated in-situ coal resource for the area currently under licence is 4.85 million metric tonnes. The total estimated in-situ coal resource for the area not presently covered under licence is 2.43 million metric tonnes. The aggregate total for these two contiguous areas is 7.28 million metric tonnes. It must be clearly stated, however, that these in-situ figures do not reflect recoverable coal reserves, due to the low yields associated with very high ash contents in the raw coal.

6. There is no possibility of finding economic coal seams on Coal Licence Nos. 7983, 7984, 7985, 7986, 7987 and 7988.

As a result of the mapping and exploration work, the writer submits the following recommendations for consideration:

1. That Texaco Canada Resources Ltd. surrender Licence Nos. 7983, 7984, 7985, 7986, 7987 and 7988 before the

anniversary date of Mar. 1, 1986.

2. That Texaco Canada Resources Ltd. apply for one additional licence of 233 hectares covering Lot 324. The total initial expenditure for this acquisition would be $ 1,424.00 covering the rental period for 1986 - see Appendix V.: Changes to the B. C. Coal Act and revised schedule of fees.

REFERENCES

1. Dowling, D. B., "Coalfields of British Columbia", (1915), Geological Survey of Canada Memoir 69

2. Gardner, S. L., "Geolgical Reconnaissance of Vancouver Island Coal Areas, Suquash Basin and Outliers", (1984)

3. James, A. R. C., "The Coalfields of Vancouver Island", (1969), B.C. Dept. of Mines and Petroleum Resources

4. Muller, J. E., "Port McNeill and Nanaimo Basin", (1967), Geological Survey of Canada Paper 67-1

5. Muller, J. E., "The Geology of Vancouver Island", (1977), Geological Survey of Canada O.F. 463

6. Ministry of Mines Annual Reports for 1897 - 1915.

STATEMENT OF QUALIFICATIONS

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PERSONAL INFORMATION

DATE OF BIRTH :	July 20, 1952
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CITIZENSHIP :	Canadian

EDUCATION

Four year Bachelor of Science Degree specializing in soft-rock geology from the University of Alberta, Edmonton, Alberta, Canada (1974).

PROFESSIONAL STATUS

Member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta since 1977.

WORK EXPERIENCE

One year with the Department of the Environment, Provincial Government of Alberta as a Junior Groundwater Geologist. Responsible for field operations of two groundwater testing rigs on rural water development programs and buried channel investigations. 1974 - 1975

One year with a major Canadian coal producing company, Luscar Ltd. of Edmonton, Alberta as Plains Geologist, responsible for exploration and development work in new areas and at producing mines in Alberta and Saskatchewan. 1975 - 1976

Two years with Quinsam Coal Ltd., a Luscar Ltd. - Weldwood of Canada Limited Joint Venture Partnership, as Project Geologist, responsible for exploration and in-fill drilling and coring within the boundaries of the Quinsam Joint Venture Area. 1976 - 1978

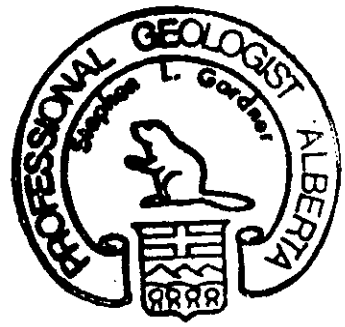
Seven years as an independent coal exploration consultant in western Canada and the western United States. -1978 to present-

I HEREBY CERTIFY THAT I AM AN INDEPENDENT CONSULTING GEOLOGIST, HAVING PRACTISED MY PROFESSION AS AN INDEPENDENT ON A CONTINUOUS BASIS FOR A PERIOD OF 7 YEARS.

SIGNED

Stephen L. Gardner

DATE : OCT. 30, 1985



APPENDIX I.

(M1) 775

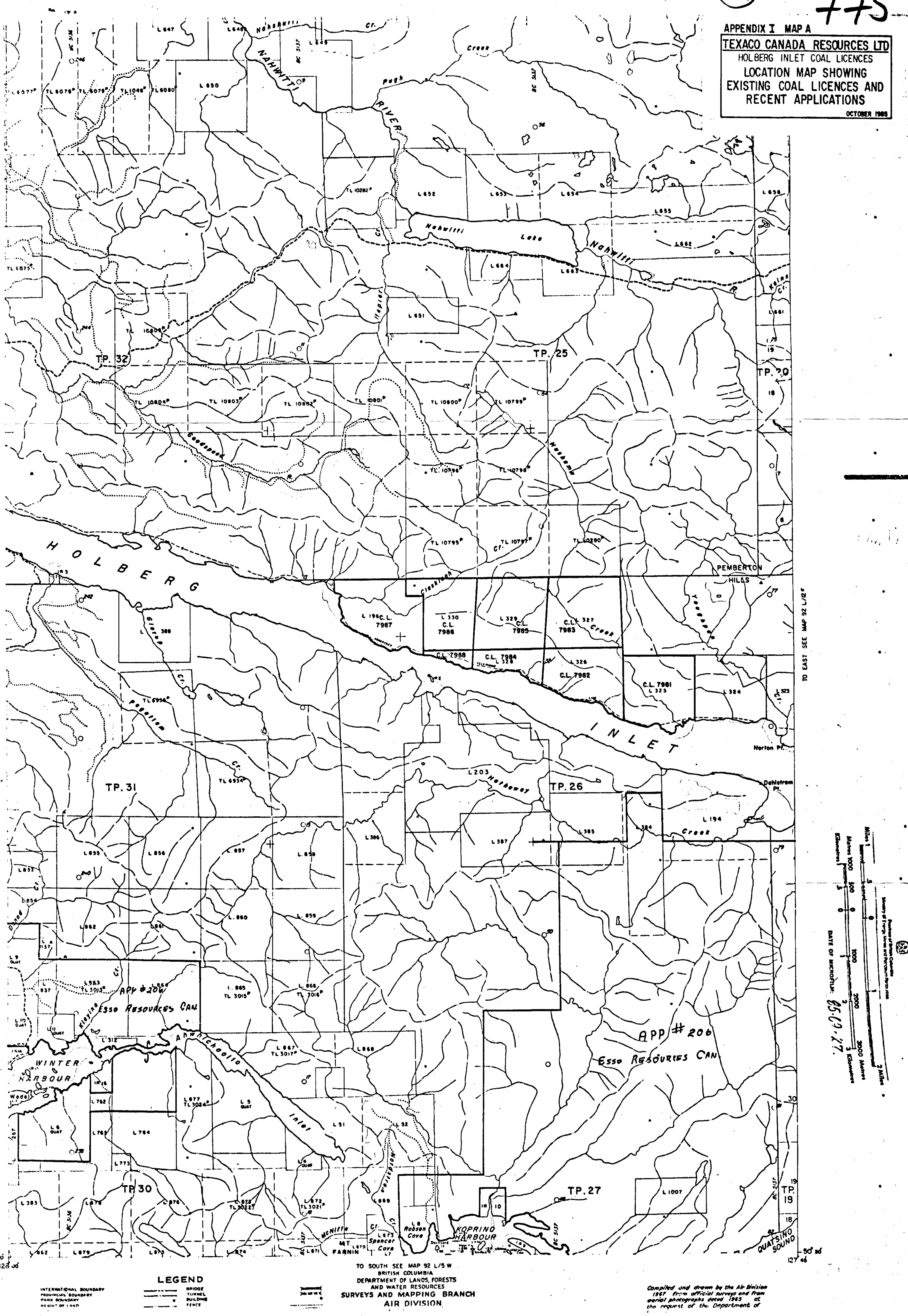
APPENDIX I MAP A

TEXACO CANADA RESOURCES LTD

HOLBERG INLET COAL LICENCES

LOCATION MAP SHOWING EXISTING COAL LICENCES AND RECENT APPLICATIONS

OCTOBER 1988



APPENDIX I MAP B

TEXACO CANADA RESOURCES LTD.

HOLBERG INLET COAL LICENCES

SURFACE GEOLOGY SHOWING LOCATION OF CROSS-SECTIONS

SCALE: 1:10 000

DRAWN BY:	DRAFTED BY:	CHECKED BY:	DATE:
S.L.GARDNER	EJD		OCT 1985

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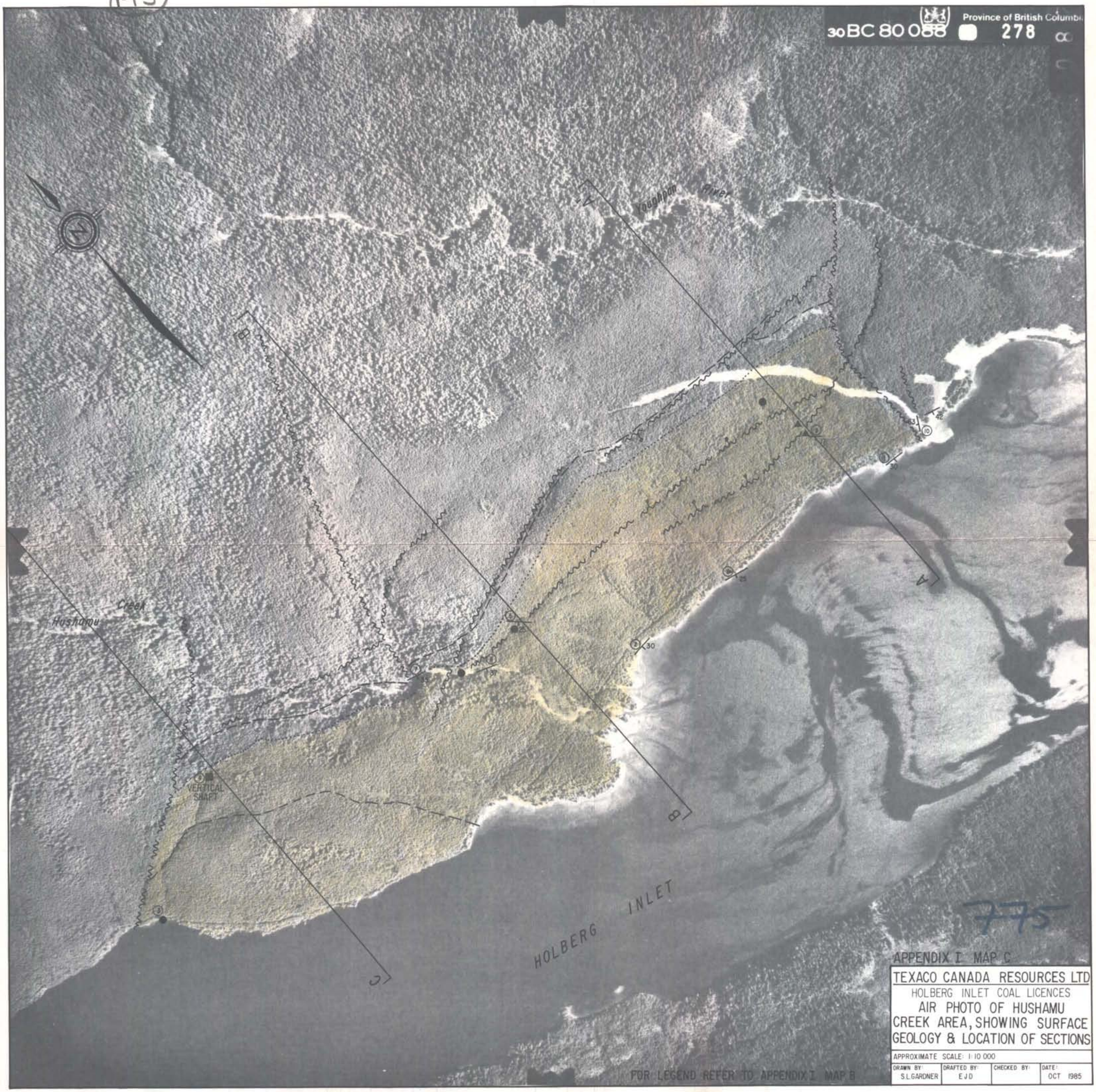

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APPENDIX I MAP C

TEXACO CANADA RESOURCES LTD

HOLBERG INLET COAL LICENCES

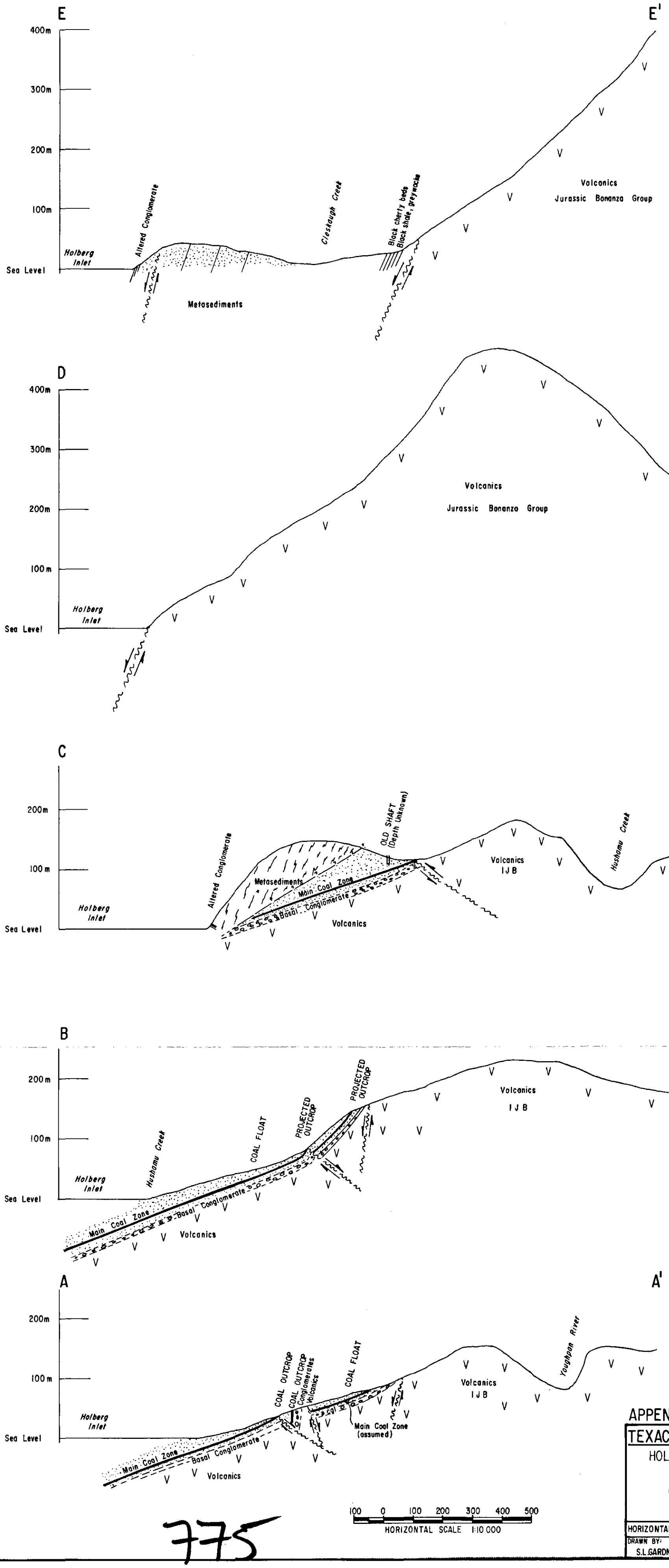
AIR PHOTO OF HUSHAMU CREEK AREA, SHOWING SURFACE GEOLOGY & LOCATION OF SECTIONS

APPROXIMATE SCALE: 1:10 000

DRAWN BY:	DRAFTED BY:	CHECKED BY:	DATE:
S.L.GARDNER	EJD		OCT 1985

FOR LEGEND REFER TO APPENDIX I MAP B

APPENDIX II.



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M4

APPENDIX II

TEXACO CANADA RESOURCES LTD

HOLBERG INLET COAL LICENCES

GEOLOGIC SECTIONS

HORIZONTAL SCALE: 1:10 000		VERTICAL SCALE: 1:5000	
DRAWN BY: S.L.GARDNER	DRAFTED BY: EJD	CHECKED BY:	DATE: OCT 1985

Chemex Labs Ltd.

Analytical Chemists *Geochemists* *Registered Assayers*

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Phone: (604) 984-0221
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274 WESTWOOD RD. - R.R. #3. SITE 'S'
NANAIMO. B.C. - V9R-5K3

CERTIFICATE NO : A8514709
DATE : August 16th, 1985

RAW COAL

SAMPLE NO	BASIS	R.M. %	ASH %	V.M. %	F.C. %	SULFUR %	C.V. CAL/G
HI-85-03	A.D.	1.29	58.18	15.25	25.28	0.19	3221
	DRY		58.94	15.45	25.61	0.19	3264
HI-85-05a	A.D.	2.87	55.01	18.61	23.51	0.52	3014
	DRY		56.63	19.16	24.21	0.53	3103
HI-85-05b	A.D.	2.93	51.95	19.56	25.56	1.34	3261
	DRY		53.52	20.15	26.33	1.38	3359
HI-85-05c	A.D.	3.36	54.43	18.23	23.98	1.11	2877
	DRY		56.32	18.86	24.82	1.15	2977

CERTIFIED BY.....

Chemex Labs Ltd.

Analytical Chemists *Geochemists* *Registered Assayers*

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NANAIMO, B.C. - V9R-5K3

CERTIFICATE NO : A8514709
DATE : August 16th, 1985

FLOAT/SINK AT 1.60 S.G.

SAMPLE NO	BASIS	HEAD ASH CALC. %	F/S	YIELD %	R.M. %	ASH %	V.M. %	F.C. %	SULFUR %	C.V. CAL/G
HI-85-05 a+b+c	A.D.		F		2.25	29.45	24.27	44.03	0.64	5387
	DRY	54.26		16.1		30.13	24.83	45.04	0.65	5511
	A.D.		S		2.75	57.26			1.21	
	DRY			83.9		58.88			1.24	
HI-85-05d	A.D.		F		2.11	19.45	25.80	52.64	0.95	5432
	DRY	62.90		6.4		19.87	26.36	53.77	0.97	5549
	A.D.		S		1.97	64.56			0.51	
	DRY			93.6		65.85			0.52	

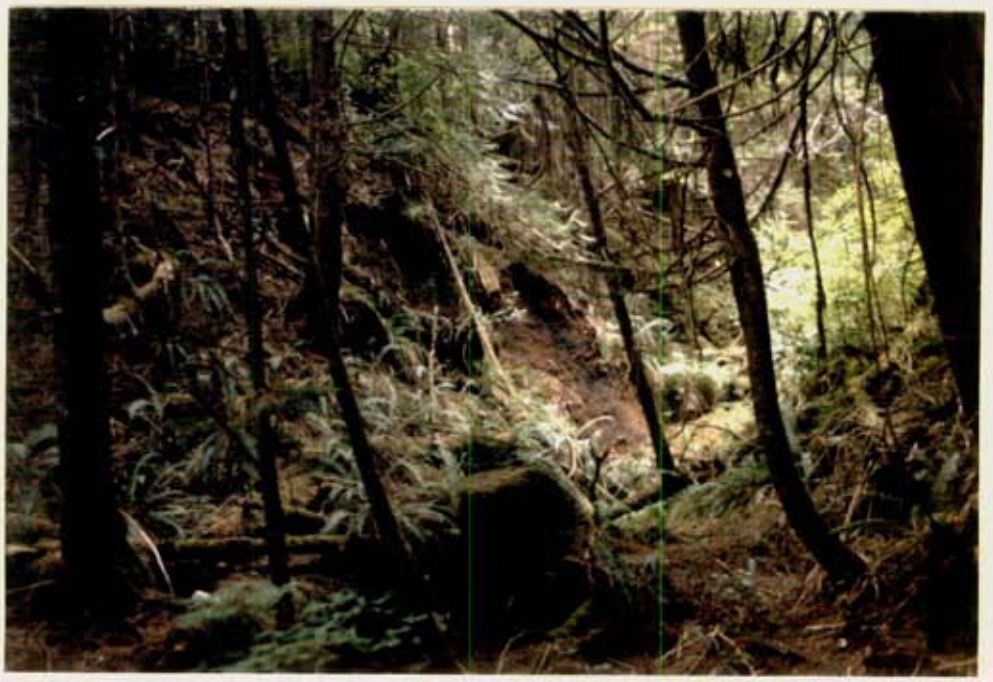
FSI ON 1.60 FLOAT :

HI-85-05 a+b+c 1.5

HI-85-05 d 3

CERTIFIED BY... B. Twarts .....

APPENDIX IV.



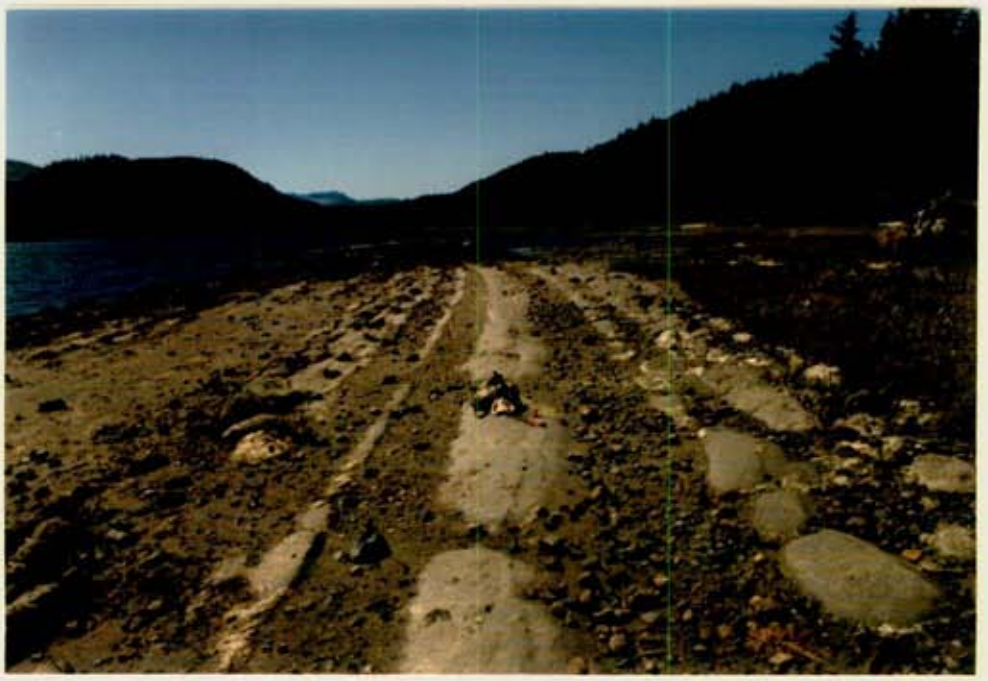
PLATES VII. & VIII. - Exposed section of main coal zone.

PLATE V. – Coal float at Location 5, Map B. Float was sampled and analysed as HI-85-03.

PLATE VI. – Trenching work, main coal zone on creek northwest of Log Dump.

PLATE III. - Faulted off sandstones at Location 10, Map B. Note log dump at left side of photo. Photo looking south. Machete lodged in bedding plane.

PLATE IV. - Old wooden-lined shaft at Location 4, Map B.



PLATES I & II. Plate I. looking west, Plate II. looking east from Location 2, Appendix I. Map B. Southerly-dipping sandstones stratigraphically above maine coal zone, Hushamu Creek area. Note Tribune Timber Log Dump in Plate II. Note variable bedding in sandstones, with muddy recessive units.

APPENDIX V

SCHEDULE A
Table of Fees

1.	Application for licence	$ 25
2.	Application for limited production permit	$ 50
3.	Application for lease to produce coal	$ 1 000
4.	Application to extend term of lease	$ 300
5.	For late filing of application to extend term of licence	$ 40
6.	For filing notice to group-for each licence in group	$ 10
7.	(a) For recording a document effecting a disposition under section 9 (2) of the Act	$ 100
	(b) Each licence or permit affected	$ 25
	(c) Each lease affected, subject to section 3 (2)	$ 25
8.	Section 14 (2) (b) Initial Rent for Coal Licence	
	For the purposes of section 14 (2) (b) of the Act in 1985	$5/ha, or fraction
	For the purposes of section 14 (2) (b) of the Act in 1986	$6/ha, or fraction
	For the purposes of section 14 (2) (b) of the Act on or after January 1, 1987	$7/ha, or fraction
9.	Section 18 (2) (b) Extension of Coal Licence to Dec. 31/89 - Rent	
	For the purposes of section 18 (2) (b) of the Act in 1985	$5/ha, or fraction
	For the purposes of section 18 (2) (b) of the Act in 1986	$6/ha, or fraction
	For the purposes of section 18 (2) (b) of the Act in 1987, 1988, 1989 and 1990	$7/ha, or fraction
10.	Section 18 (2) (b) Extension of Coal Licence after Dec. 31/90 - Rent	
	For the purposes of rent calculation on and after January 1, 1991 all coal licences which existed in 1986 will be deemed to have been issued on their anniversay date in 1986.	
	For the purposes of section 18 (2) (b) of the Act for the first 5 one year terms	$7/ha, or fraction
	For the purposes of section 18 (2) (b) of the Act for the second 5 one year terms	$10/ha, or fraction
	For the purposes of section 18 (2) (b) of the Act rent will increase by $5/ha at the end of each 5 years beginning with the 11th year.	
11.	For the purposes of section 24 (2) (b) of the Act	$10/ha, or fraction
12.	For the purposes of section 25 (2) (b) of the Act	$10/ha, or fraction
13.	Holding Lease	
	For the purposes of section 26 (2.1) of the Act	$10/ha, or fraction

Government Bill

Third Session, Thirty-third Parliament
34 Elizabeth II, 1985
Legislative Assembly of British Columbia

BILL 51

COAL AMENDMENT ACT, 1985

Honourable C. Stephen Rogers
Minister of Energy, Mines and Petroleum Resources

Explanatory Notes

SECTION 1: The definition of "owner" is replaced by a definition more consistent with the definition of "owner" in the *Petroleum and Natural Gas Act*.

SECTION 2: Section 2 (1) (b) is amended to remove the word "hold" to ensure that if a person inadvertently ceases to be a free miner he does not for that reason lose his permit, licence or lease.

SECTION 3: Section 7 is amended to make the entry and surface right provisions the same as in the more recently updated sections 6 and 11 of the *Mineral Act* and to give the Mediation and Arbitration Board jurisdiction to settle matters of dispute.

MINISTER OF ENERGY, MINES
AND PETROLEUM RESOURCES.

BILL 51 – 1985

COAL AMENDMENT ACT, 1985

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of British Columbia, enacts as follows:

1. Section 1 of the *Coal Act*, R S B.C. 1979, c 51, is amended

(a) in the definition of "licence" by striking out "section 17;" and substituting "section 14;", and

(b) by repealing the definition of "owner" and substituting the following:
"**owner**" means
(a) the Crown in right of the Province for land so owned,
(b) a person registered in the land title office as the registered owner of the surface area or as its purchaser under an agreement for sale, and
(c) a person to whom a disposition of Crown land has been issued under the *Land Act*.

2. Section 2 (1) (b) is repealed and the following substituted:
(b) acquire or renew a licence or lease or acquire a permit.

3. Section 7 is amended

(a) by repealing subsection (1) and substituting the following:
(1) Subject to this section, a free miner may enter, occupy and use coal land and prospect, explore for, develop and produce coal.
(1.1) The right of entry under subsection (1) does not extend to
(a) land occupied by a building,
(b) the curtilage of a dwelling house,
(c) orchard land, or
(d) land under cultivation.
(1.2) Notwithstanding this or any other Act, the minister may restrict the use of surface rights by a person who holds a licence where, after inspection and giving reasonable notice to that person, he considers that the surface area is so situated that it should be used for purposes other than mining.
(1.3) Where surface rights are restricted under this section
(a) the minister shall serve the licensee with a notice of the restriction, and
(b) the licensee may appeal to the Lieutenant Governor in Council at any time within 30 days after service of the notice.

SECTION 4: Section 9 is amended

(a) to remove the requirement for submission of a plan of operation which is covered by the *Mines Act*,

(b) to eliminate the need for the minister's consent to transferring a licence, permit or lease, and

(c) to eliminate the restriction on private royalty agreements.

SECTION 5: Section 10 is amended

(a) to include reclamation money under the *Mines Act* among money that must be paid under the *Coal Act* before property can be removed from the land under an expired licence or lease,

(b) to change references from "minister" to "chief gold commissioner", and

(c) to ensure that vesting under subsection (3) occurs only on order of the chief gold commissioner, rather than automatically after 12 months.

SECTION 6: Section 12 is amended

(a) by repealing subsection (3) to enable the Mediation and Arbitration Board to make decisions respecting surface rights, and

(b) to update the free use permit subsection.

(1.4) No compensation is payable as a result of a restriction under this section", and

(b) by repealing subsections (4) and (5) and substituting the following:

(4) The Mediation and Arbitration Board under the *Petroleum and Natural Gas Act* has, on application of a free miner or owner, authority to settle matters of dispute arising from rights acquired under this Act in respect of entry, use or occupation, security, rent and compensation, and for this purpose the *Petroleum and Natural Gas Act* applies.

(5) In an arbitration under subsection (4) involving a conflict between rights acquired under this Act and rights acquired under the *Land Act*, the Mediation and Arbitration Board shall take into account which of the rights was applied for first and shall give the holder of those rights some priority in its consideration of the dispute between the parties.

4. Section 9 is amended

(a) by repealing subsections (1) to (4) and substituting the following:

(1) A provision in a disposition by a holder of a licence, permit or lease that has the effect of dividing the interest in the licence, permit or lease on the basis of the stratification, physical position or characteristics of the coal under the location is void.", and

(b) in subsection (5) by striking out "coal administrator" and substituting "chief gold commissioner".

5. Section 10 is amended

(a) by repealing subsection (1) and substituting the following:

(1) Where a licence or lease expires, is surrendered or is cancelled under this Act, the former licensee or former lessee may, not more than 12 months after the date of the expiry, surrender or cancellation, and subject to the consent of the chief gold commissioner, enter the location and remove any mining plant, machinery, personal property and other material placed by him on the location.",

(b) in subsection (2) by striking out "for application fees, rentals, royalties, penalties and interest, if any, owing on the licence or lease, the minister" and substituting "under this Act and the *Mines Act*, the chief gold commissioner", and

(c) in subsection (3) by adding ", on order of the chief gold commissioner," after "shall" and by striking out "minister," and substituting "chief gold commissioner,".

6. Section 12 (3) and (4) is repealed and the following substituted:

(4) The holder of a licence may enter, occupy and use the surface area of the location for the purpose of exploring for and developing coal on the location and, subject to the entering into of an agreement in the form of a free use permit under the *Forest Act*, is entitled to use and remove timber situated on the location at the time he applies for the free use permit

SECTION 7. Section 14 is amended to remove plan of operation requirements which are covered by the *Mines Act* and to add licence issuing from the repealed section 17.

SECTION 8: Sections 15 to 17 are repealed to remove the publication requirements from the Act.

SECTION 9: Section 18 is amended to replace statutory work requirements with a power to prescribe them by regulation.

SECTION 10: Section 21 is amended to remove the administratively inconvenient requirement to have all consolidations effective "as of the date of grouping".

SECTION 11: The new section 21.1 eases the administrative burden resulting from licences having a variety of anniversary dates.

SECTION 12: Section 22 is amended to allow forest licence rights even if the lessee is not the sole occupant of the surface area.

SECTION 13: Section 24 is amended to remove publication requirements.

SECTION 14: Section 25 is amended to allow more flexibility in the length of initial and revised terms of a lease.

SECTION 15: Section 26 is amended to require a rent to be paid on a non-producing lease.

SECTION 16: Section 36 is amended to allow extension of time after the time limit has expired, as in section 65 (d) of the *Mineral Act*.

7. Section 14 is amended

(a) by repealing subsection (2) (c), and

(b) by adding the following subsections:

(3) On receipt of an application and compliance with subsection (2), the minister may issue a licence to the applicant

(4) Where the minister does not issue a licence, he shall refund the rent paid under subsection (2) (b)

8. Sections 15 to 17 are repealed.

9. Section 18 (2) (c) is repealed and the following substituted.

(c) if required by regulation, proof that the licensee performed or caused to be performed on his location a value of work per hectare, and the regulation may also prescribe different values of work for different terms of the licence;.

10. Section 21 (2) is amended by striking out ", as of the date of grouping."

11. The following section is added

Licence anniversary change

21.1 The minister may, on application of a licensee, change the anniversary date of a licence, and where he does so, the work requirement and rent shall be prorated for the terms affected by the change

12. Section 22 (3) is amended by striking out "only".

13. Section 24 (4) is repealed.

14. Section 25 (1) is amended

(a) by striking out "a term not exceeding 21 years" and substituting "the term requested by the applicant, not to exceed 30 years", and

(b) by striking out "extended terms he considers appropriate." and substituting "terms requested by the lessee, not to exceed 15 years from the date of the expiry of the previous term."

15. Section 26 is amended

(a) by adding the following subsection

(2.1) An application under subsections (1) and (2) shall be accompanied by a prescribed rent in respect of the location , and

(b) in subsection (4) by striking out "Sections 14 to 17 do" and substituting "Section 14 does".

16. Section 36 (2) (a) is amended by adding "whether or not the time limit has expired" after "Act".

SECTION 17. Sections 38 and 39 are spent transitional provisions.

SECTION 18. Consequential amendment.

17. Sections 38 and 39 are repealed

Consequential Amendment

Mineral Land Tax Act

18. Section 14 (7) of the *Mineral Land Tax Act*, R.S.B.C. 1979, c. 260, is amended by striking out "section 17 of the *Coal Act*," and substituting "section 14 of the *Coal Act*,".

Commencement

19. This Act comes into force by regulation of the Lieutenant Governor in Council.

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