NORTHEAST BRITISH COLUMBIA

Report on the Geology of the Southwest Corner of Kwadacha Wilderness Park and the Mt. Alcock Ba-Pb-Zn-Ag Showing (94F/11)

by

D.G. MacIntyre
1980

INTRODUCTION

Potentially economic barite-Pb-Zn-Ag occurrences have recently been discovered in northeastern British Columbia (94F,K,L). These occurrences are associated with silicious argillite, chert and shale of the Middle to Upper Devonian Gunsteel "Formation". The geologic setting of the occurrences is very similar to those of the Selwyn basin in Yukon and the Meggen deposit in West Germany.

The Gunsteel Formation is exposed in a series of narrow discontinuous belts bounded by northwest trending imbricate thrust faults (Figure 2). The area of economic interest is over 180 km long and is centered approximately 72 km north of Williston Lake. During the 1979 field season a two-man helicopter-supported field crew mapped and examined mineral occurrences within this belt. A total of 5 days was spent mapping that part of the belt which passes through the west half of Kwadacha Wilderness Park (Figure 2). This report summarizes the results of this work.

GEOLOGY

The geology of the southwest corner of Kwadacha Wilderness Park is shown in Figure 3. Also shown is an interpretive SW-NE structural section that passes through Mt. Alcock, Mt. Luke and Mt. Holden.

Cambrian to Ordovician (unit C-O)

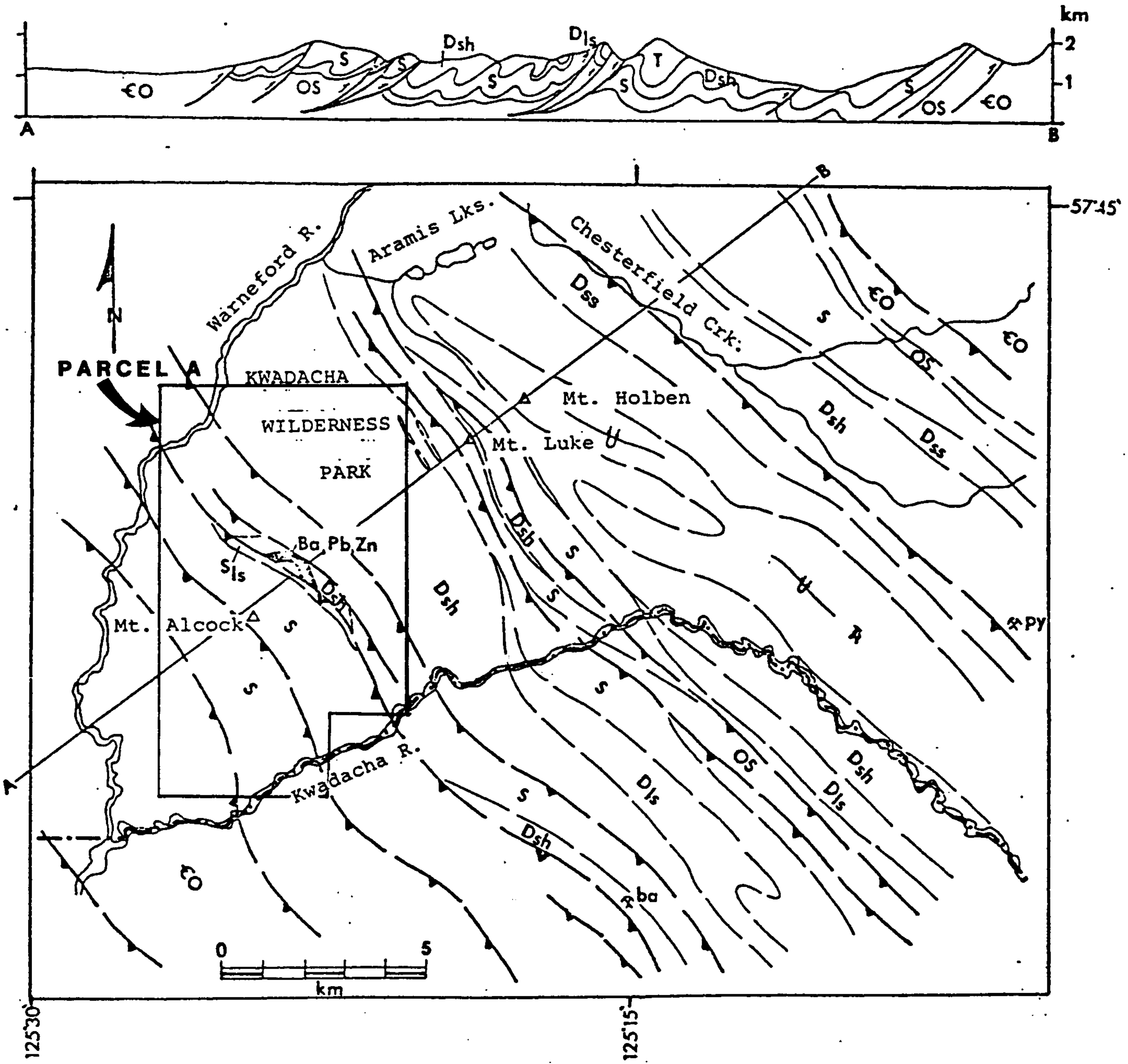
The oldest rock exposed in the area of Figure 3 are the calcareous phyllitic mudstones of the Cambrian to Ordovician Kechika Group (map unit C-O). These rocks underlie the extreme southwest and northeast corners of the map-area. No significant mineral occurrences have yet been discovered in Kechika Group rocks of the project area.

Ordovician to Silurian (unit OS)

The Kechika Group is unconformably overlain by cream to buff weathering laminated calcareous siltstone and black graptolitic shale. Within Kwadacha Park this unit is relatively thin and discontinuous. Much of the thrusting in the area has been directed along this unit which is very incompetent relative to overlying and underlying formations. These rocks have been tentatively correlated with the Ordovician Road River Formation which is host to the Howard Pass Pb-Zn deposit in Yukon. However, within the project area no significant mineral occurrences have been found within this unit.

Silurian (unit S)

Ordovician rocks are unconformably overlain by up to 400 m of distinctive orange to brown weathering dolomitic siltstone and minor limestone of apparent Silurian age (map unit S). These rocks are well exposed on ridges west and east of Mt. Alcock, along the west slope of Mt. Luke, and in the northeast corner of the map-area (Figure 3). Locally, the basal part of the Silurian section is



LEGEND

U. TRIASSIC
- ₸ fossil. siltstone, limestone

M.-U. DEVONIAN
- Dsh sil. arg., chert, shale
- Dss silty shale, siltstone
- Dls fossil. limestone

SILURIAN
- S siltstone
- Sls limestone, chert

M. ORDOVICIAN-SILURIAN
- OS shale, siltstone

U. CAMBRIAN-L. ORDOVICIAN
- €O phyllitic mudstone

SYMBOLS

thrust fault · mineral occurrence · park boundary · overturned syncline

Figure 2 Geology of the southwest corner of Kwadacha Wilderness Park.

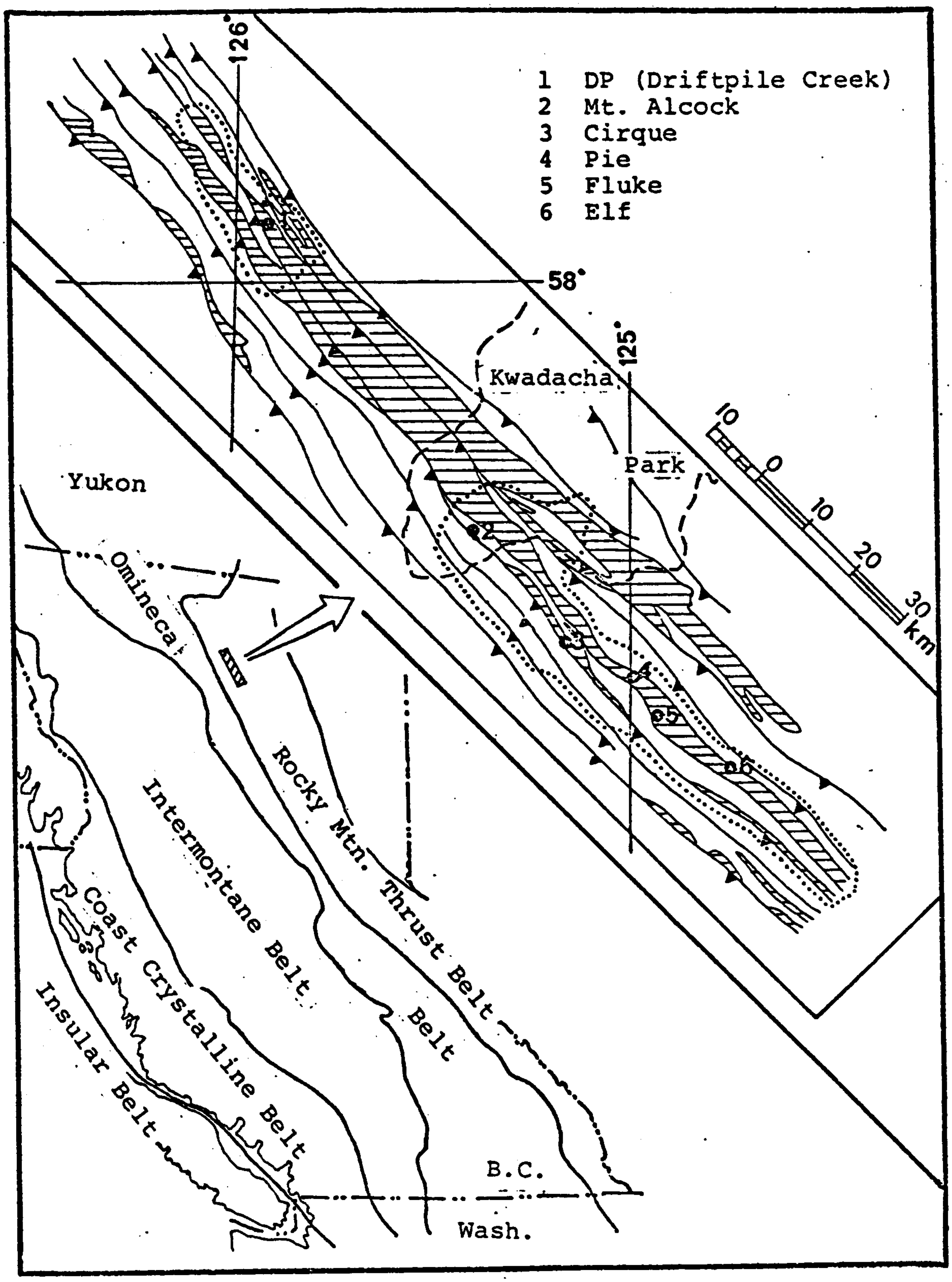


Fig.3 Location and tectonic setting of the 1979 Gataga project area. Inset shows limit of mapping (dotted line), major thrust faults, distribution of Devonian black clastics (lined) and location of major shale hosted Ba-Pb-Zn occurrences

comprised of a grey blocky weathering unit of interbedded limestone and chert (map unit Sls). No significant mineral occurrences have been found in Silurian age rocks of the project area.

Middle Devonian (unit Dls)

On Mt. Luke, and in the area southeast of the Kwadacha River, Silurian siltstone is unconformably to disconformably overlain by grey micritic limestone containing Middle Devonian fossil assemblages. This unit is correlated with platformal carbonates of the Dunedin Formation which are host to significant Pb-Zn deposits in the Robb Lake area, approximately 125 km southeast of Kwadacha Park. A few isolated Zn showings of unknown economic potential also occur in Dunedin limestone at the Pie claims, located 24 km southeast of the park. The Dunedin limestone exposed within the park is relatively thin and discontinuous along strike and was probably deposited very close to the platform margin. No sulphide occurrences were noted within this unit.

Middle-Upper Devonian (unit Dss)

East and west of Mt. Luke, Silurian siltstone is disconformably overlain by laminated black silty shale and argillite with thin siltstone and sandstone interbeds (map unit Dss). This unit is interpreted to be the basinal equivalent of the Dunedin limestone and is tentatively correlated with the Besa River Formation. Unit Dss apparently thins rapidly away from the limestone contact.

A few thin nodular barite and pyrite horizons have been located within this unit elsewhere in the project area but none were noted within Kwadacha Park.

Unit Dsh

Unit Dss is overlain by, and in places may grade laterally into, siliceous argillite, chert and carbonaceous black shale of the Middle to Upper Devonian Gunsteel "Formation" (map unit Dsh). This formation underlies the area between Mt. Alcock and Mt. Luke and the valley between Mt. Holben and ranges to the east (Figure 3). This is the unit of economic interest, containing all of the major shale-hosted barite-Pb-Zn occurrences known in the project area (Figure 1). One of these deposits, namely the Cirque, is located 22 km southeast of Mt. Alcock and has been extensively explored by drilling. To date drill indicated reserves - in-place of 18 million tonnes containing 2.3% Pb, 7.9% zn, and 49 grams/MT with an additional drill inferred geological reserve of approximately 15 million tonnes have been announced by the Cyprus Anvil/Hudson's Bay Oil and Gas joint venture. Within Kwadacha Park a Pb-Zn-Ag bearing massive barite horizon, very similar to that at the Cirque, is located on the east side of Mt. Alcock. In addition, several laminated pyrite horizons were noted in Gunsteel shale exposed in the valley east of Mt. Holben.

Triassic

Brown to orange weathering dolomitic siltstone with limestone turbidite interbeds underlies the area east of Mt. Luke. These rocks appear to be preserved within a synclinal keel and apparently disconformably overlie Gunsteel shale. Although lithologieally similar to the Silurian siltstone unit, these rocks are easily distinguished by their Upper Triassic fossil content. No significant sulphide mineralization was noted within this unit.

MT. ALCOCK Ba-Pb-Zn-Ag OCCURRENCE (94F/11)

A prominent white weathering kill zone, composed of angular blocks of dark grey bedded barite, occurs on the ridge northeast of Mt. Alcock. This showing is contained within a fault-bounded wedge of Gunsteel shale surrounded by Silurian siltstone. The barite horizon is apparently 25 to 30 metres thick and dips from 45 to 75 degrees to the southwest. Within the barite horizon is a 2-3 m thick zone containing fine diffuse bands of galena and sphalerite. Assays of selected grab samples collected from this zone are listed below:

Sample No.	Ag(ppm)	Ba%	Cu%	Pb%	Zn%
AL-1	24	50.5	0.002	13.0	0.11
AL-2	17	49.3	0.002	10.8	1.41
AL-3	15	50.3	0.001	8.4	2.41
AL-4	20	50.8	0.001	10.0	4.81
AL-5	15	51.8	0.002	6.8	1.07

The Mt. Alcock mineralization is finer-grained and more banded than that at the Cirque, suggesting less recrystallization has taken place at Mt. Alcock. Metal ratios are also different, with the Mt. Alcock occurrence being predominantly Pb and the Cirque predominantly Zn. Combined Pb-Zn grades are very similar between the two deposits.

At the Cirque deposit barren massive barite grades into Pb-Zn-bearing barite over a short distance. This may also be the case at Mt. Alcock where there appears to be a significant increase in sulphide content going down dip and along strike towards the southwest. Unfortunately, in this direction the barite horizon dips into the hillside and is not exposed beyond the barite kill zone. Diamond drilling is necessary to evaluate this area and to adequately define the tonnage and grade of the deposit as a whole.

CONCLUSIONS AND RECOMMENDATIONS

Much of the southwest corner of Kwadacha Park is underlain by the Gunsteel Formation of Middle to Upper Devonian age. This formation is host to strataform, shale-hosted barite Pb-Zn occurrences and areas underlain by these rocks are considered to have relatively high mineral potential. One such occurrence, Mt. Alcock, is known within Kwadacha Park and others may be present.

Examination of the Mt. Alcock showing suggests it is contained within a fault-bounded wedge of Gunsteel shale. The only adequate way to evaluate the economic potential of this showing is by diamond drilling. Soil sampling and an EM survey would also be useful but not conclusive as to whether an economically viable deposit exists or not. A regional silt sampling program would help to evaluate areas of the park underlain by Gunsteel shale.

PARCEL B

LINDQUIST LAKE
GOLD-SILVER-TUNGSTEN PROSPECT
(DEER HORNE MINE)

TWEEDSMUIR RECREATION AREA

TWEEDSMUIR RECREATION AREA

LINDQUIST LAKE SITE - PARCEL "B"

ONE POST CLAIMS

XK 1012	XK 1214
XK 1014	XK 1412
XK 1212	XK 1414

1. INCLUDES AREA NOTED AS 1. - SURVEYS CANCELLED. 1976· SEP· 30

2. EXCLUDES AREA NOTED AS 2.- EXISTING MINERAL TITLES. SEE MTR MAP NO. 93E/6W

OVERVIEW OF THE LINDQUIST LAKE
GOLD-SILVER-TUNGSTEN PROSPECT
(DEER HORN MINE)
(93E/6)

INTRODUCTION

The Lindquist Lake gold-silver-tungsten prospect (MINFILE No.093-19,20,21) is located in the Tweedsmuir Recreation Area at the western tip of Whitesail Lake (Figure 1). The deposit was previously contained within Tweedsmuir Provincial Park, however following a study of the area by the Wilderness Advisory Committee (1985/86) and development of a park master plan (Ministry of Environment and Parks, 1987) the Tweedsmuir Recreation Area was established and the Lindquist Lake area zoned for integrated resource use. The Recreation Area designation was made pursuent to Section 19 of the Mineral Tenure Act to allow for the acquisition of mineral titles in the area.

This report has been compiled by staff of the Geological Survey Branch to illustrate the history, geology and mineral resources of the prospect and to provide the background information necessary to develop work proposals for the Lindquist Lake gold-silver-tungsten deposit. Information has been taken from documents available to the public (Minister of Mines Annual Reports, MINFILE, Geological Survey Branch publications, etc.). A complete bibliography on the deposit is included.

LOCATION AND ACCESS

The Lindquist Lake prospect is located in isolated and rugged terrain on the margin of the Coast Ranges of west-central British Columbia . The area is accessible by helicopter from Smithers or Houston, 165 and 125 kilometres to the north respectively. Surface access to the area is currently gained from Burns Lake by 60 kilometres of pavement to Ootsa Landing and then by all-weather gravel road to the Alcan boat launch at Andrews Bay, a further 30 kilometres to the west. A boat is then required to reach the western end of Whitesail Lake where the old exploration and mining roads lead from the lake to the workings. The current status of this final 10 kilometres of exploration road built in the 1950's is unknown. Winter tote roads could be developed along the long lake system.

The showings occur between an elevation of 1280 metres (4200 feet) and 1525 metres (5000 feet) on the southern slope of Lindquist Peak; this mountain extends from an elevation of 880 metres (2900 feet) at Lindquist Lake to 1770 metres (5800 feet) at the peak. Most of the showings lie above timberline and water supply is reportedly good up to 1310 metres (4300 feet) (Papezik, 1957).

A flooding reserve exists around the major lakes of the area for the Kemano power development and Alcan smelter. The reserve allows for a maximum allowable flooding to 914 metres (3000 feet); if this were to occur a waterway would connect Lindquist Lake and Whitesail Lake.

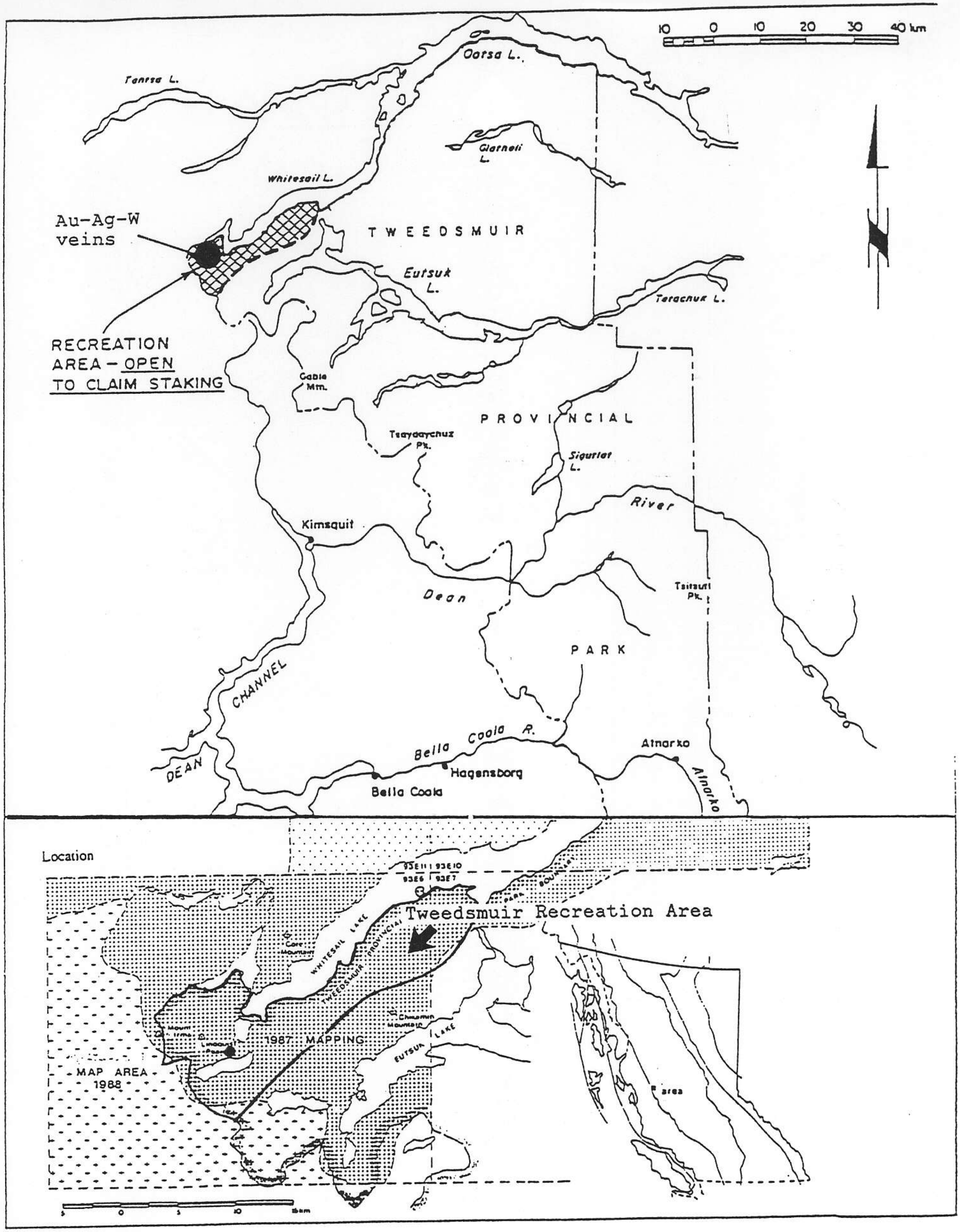


FIGURE 1: LOCATION OF LINDQUIST LAKE PROSPECT

PREVIOUS WORK / HISTORY

The discovery of scheelite mineralization about 1 kilometre southeast of Lindquist prompted staking of the original Harrison claim group in 1943. Additional claims were staked in 1944 when gold and silver values were detected in veins during an examination of the property by F.R. Joubin. Pioneer Gold Mines Ltd. optioned the claims and completed an extensive trenching and diamond drilling program (13,000 feet), however the option was allowed to lapse after 3 years. Deer Horn Mines Ltd. acquired the titles in 1950. Between 1953 and 1955 a road was constructed from Whitesail Lake to the property and over 1500 feet of underground workings were developed on the veins. A further 7700 feet of diamond drilling were completed during this time. No further work was recorded until 1967 when the Granby Mining Company Ltd.conducted further geological mapping and completed 15 trenches totalling 5000 feet

The mineral claims expired in 1975, title reverted to the crown and all legal surveys were cancelled. Since this time no further work has been allowed as the area was within Tweedsmuir Provincial Park.

Duffel (1959) provided the first compilation of the regional geology of the Whitesail Lake area. The same area was later remapped and the results published in a preliminary map by Woodsworth (1980). The Geological Survey Branch initiated a 3-year 1:50,000 mapping program in the Whitesail Lake area in 1986; the Lindquist Lake area was covered in 1987 (Diakow and Koyanagi, 1988a,b).

LOCAL GEOLOGY

The Lindquist Lake area is located along the contact of the Coast Plutonic Complex and the Intermontane Belt. The boundary between these tectonic divisions is characterized by northeast-directed thrust faults in this area (Diakow and Koyanagi, 1988). The Coast Plutonic Complex comprises amphibolite and greenschist facies metamorphic rocks and synkinematic plutons that have been thrust onto volcanic and sedimentary rocks of the Intermontane Belt. Late Cretaceous and Tertiary post-orogenic plutons cut the older rocks and structures. The mineralized quartz veins of the Lindquist Lake prospect are hosted primarily within foliated intrusive and metavolcanic rocks and are associated with thrust faults.

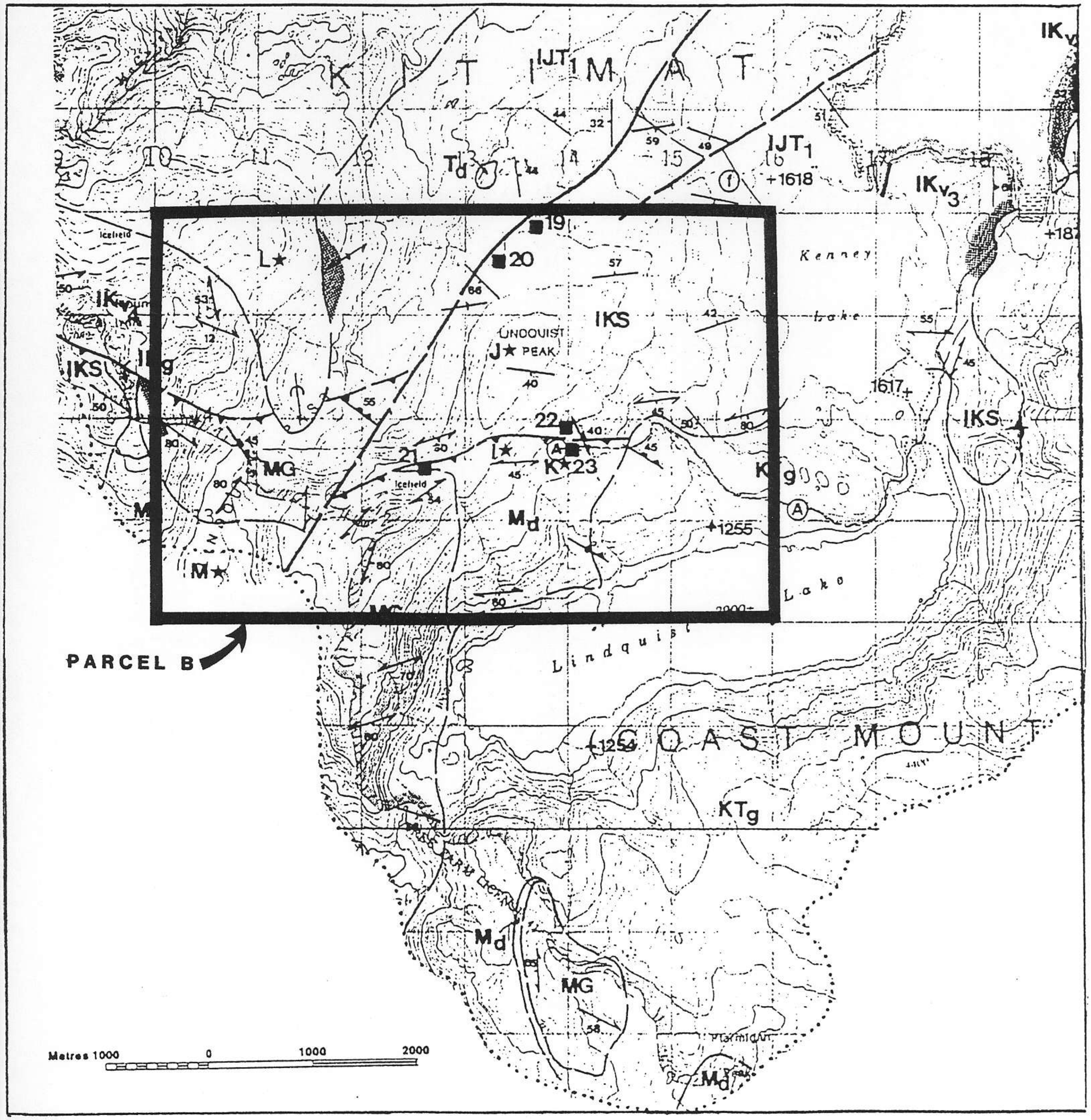
Figure 2 presents the geology of the Lindquist Peak area as mapped by Diakow and Koyanagi (1988a,b) and much of the following discussion is taken from their description of the area.

Layered Rocks

Gamsby Group

The oldest rocks on the property are assigned to the Gamsby Group (MG), an informal name for metavolcanic and metasedimentary rocks exposed near the eastern margin of the Coast Plutonic Complex in the Whitesail Lake map area (Woodsworth, 1978). These rooks are confined to a narrow belt south and west of Lindquist Lake, where they structurally overlie the Skeena Group or are intruded by Coasts plutonics. They comprise a succession of intermediate and

FIGURE 2
GEOLOGY IN THE VICINITY OF LINDQUIST LAKE
(after Diakow and Koyanagi, 1988b)



LEGEND

QUATERNARY

Qal	*Alluvium*

TERTIARY

EE	ENDAKO GROUP: *Basalt, flows, fresh aphyric texture*
EO	OOTSA LAKE GROUP: (1) *Andesite flows, coarse-bladed plagioclase porphyry* (2) *Rhyolite flows, quartz and biotite phenocrysts*

UPPER CRETACEOUS (?)

uKv	*Andesitic flows, ± augite – biotite – hornblende porphyry; light green lapilli tuff; polymictic conglomerate with abundant intrusive clasts*

MID-CRETACEOUS

lKS	SKEENA GROUP: *Argillite, siltstone, micaceous sandstone*

LOWER CRETACEOUS (?)

lKv	*Andesitic and basaltic flows, augite-bearing, crowded plagioclase and amygdaloidal texture; grey lapilli tuff polymictic conglomerate with abundant intrusive clasts*

MIDDLE JURASSIC

BOWSER LAKE GROUP

mJA	ASHMAN FORMATION: *pyritic argillite, siltstone and minor chert*

MIDDLE AND LOWER JURASSIC

HAZELTON GROUP

mJS	SMITHERS FORMATION: (1) *Feldspathic sandstone, siltstone and minor polymictic conglomerate* (2) *Tuffaceous sediments gradational with maroon ash and lapilli tuff*
lJT	TELKWA FORMATION: (1) *Maroon ash and lapilli tuff, intervening basalt to rhyolite flows; well bedded* (2) *Dark green andesitic flows and pyroclastic rocks; locally foliated*

PRE-JURASSIC

MG	GAMSBY GROUP: *Tuffs and flows regionally metamorphosed to greenschist grade, associated syntectonic diorite (Md)*

INTRUSIONS

TERTIARY

Tg	*Granodiorite and quartz monzonite: equivalent to Nanika and Quanchus intrusions*

LATE CRETACEOUS AND/OR TERTIARY

KTd	*Porphyritic diorite plugs and sills; equivalent to Kasalka intrusions*

LATE CRETACEOUS

lKg	*Equigranular granodiorite and porphyritic granite; equivalent to Bulkley intrusions*

PRE-JURASSIC

Md	*Foliated quartz diorite*

Mineral Prospects
(Minfile Number)

- *1 DEER HORN – HARRISON (093E 019, 020, 021)
- *2 RED BIRD (093E 026)
- *3 CHIKAMIN MOUNTAIN (093E 027, 028, 029, 030, 031, 033, 034, 069)
- *4 CORE MOUNTAIN (093E 032, 067, 114, 116)

Symbols

- GEOLOGIC BOUNDARY
- INTRUSIVE CONTACT
- FAULT
- THRUST FAULT
- Qal BOUNDARY
- 56 BEDDING ORIENTATION
- LIMIT OF GEOLOGICAL MAPPING
- TWEEDSMUIR PROVINCIAL PARK BOUNDARY

▲A	Chikamin Mountain	▲E	Mount Haven
▲B	Lindquist Peak	▲F	Mount Irma
▲C	Core Mountain	▲G	Mount Musclow
▲D	Arete Mountain	▲H	Sias Mountain

mafic tuffs, flows and schists associated with a dioritic pluton. The contact between the diorite and metavolcanic rocks is not exposed but is thought to be a fault. The age of these strata is at least upper Triassic, but may be as old as upper Paleozoic (van der Heyden, 1982).

The strata have been regionally metamorphosed to greenschist grade. Deformation is defined by a pronounced penetrative foliation with a moderately steep southerly dip in the metavolcanic rocks. The foliation in dioritic rocks appears to be related to the same deformational event that affected the metavolcanic rocks. It becomes more pronounced, changing the rock into a mylonite, closer to the major thrust fault separating the diorite from the younger rocks.

Skeena Group

Skeena Group strata (lKs) consist of alternating grey and black sandstone, siltstone and argillite beds with sedimentary features common to proximal turbidites. A penetrative foliation is pronounced in argillaceous beds. Bedding and cleavage relationships indicate local overturning.

These rocks form the footwall of the southerly inclined thrust fault separating them from Gamsby Group rocks.

Intrusive Rocks

Foliated quartz diorite (Md) is spatially associated with Gamsby Group metamorphic rocks and is found at the lowest structurally level of this succession. The thrust fault places it atop Skeena Group rocks near Lindquist Peak. The diorite hosts mineralized quartz veins in several localities, including the original Harrison veins, at or near the thrust decollement. Sericitic alteration develops with the mineralization in the developed veins. Dykes of a younger granodiorite cut the foliated diorite.

Coarse grained granodiorite of a Tertiary (KTg) age cuts all the older rocks and the mineralized thrust fault near the property.

Structure

The thrust fault south of Lindquist Peak separates a western penetratively deformed domain comprising the Gamsby Group from an eastern domain relatively undeformed but extensively block-faulted younger rocks. This fault is traceable from the southwest ridge of Lindquist Peak to Mount Irma, a distance of approximately 6 kilometres. The fault trace is concealed by talus south of Lindquist Peak but can be projected obliquely downslope through the mineralized workings. The detachment plane dips 20 degrees south, subparallel to bedding, increasing to about 50 degrees south at the old workings. Several excellent exposures of the decollement are characterized by mylonitic structure.

MINERALIZATION

The quartz veins at Lindquist Lake consist of two mineralized zones, hosted in foliated diorite, that coalesce downdip on the main vein. The zones include a main vein striking west and dipping south that is traceable for 370 metres, and a subsurface contact zone of quartz stringers in quartz-sericite-altered diorite adjacent to the contact with sedimentary rocks. Gold is found in native form and with tellurides within the quartz vein system. Minor quantities of arsenopyrite, galena, sphalerite, chalcopyrite and scheelite have also been identified (Papezik, 1957).

Underground work has identified a 330 metre (1075 feet) section of the main vein averaging 7.7 grams per tonne (0.255 ounce per ton) gold and 216 grams per tonne (6.3 ounces per ton) silver over an average vein width of 2.9 metres (9.5 feet). This structure appears to coalesce with the contact zone at a depth of 200 feet. The contact zone has been developed only to a limited extent by diamond drilling; a section of this zone 221 metres (725 feet) long averages 13.9 grams per tonne (0.407 ounces per ton) gold and 420 grams per tonne (12.24 ounces per ton) silver over an average of 2.7 metres (8.7 feet) (Buckles, 1954).

RESERVES

Main Zone: Based on the above figures the main zone appears to contain an undiluted reserve of approximately 154,000 tonnes (170,000 tons) at the above stated grade. The extent of the zone laterally is still undefined.

Contact Zone: No vertical dimension has been documented for the contact zone, however the above figures indicate a reserve of 475 tonnes (525 tons) per vertical foot. A similar 200 foot vertical projection provides another 95,000 tonnes of reserves. This zone remains undefined in three dimensions.

BIBLIOGRAPHY

Bacon, W.R. (1956): Whitesail Lake, *Minister of Mines, B.C.*, Annual Report, 1955, pages 25-27.

British Columbia Ministry of Energy, Mines and Petroleum Resources, Minister of Mines Annual Reports: 1944-G175-G177, 1945- A71, 1946- A89, 1952- A98, 1953- A94, 1954- A95, 1955- 25-27, 1958- 73, 1967-114.

British Columbia Ministry of Energy, Mines and Petroleum Resources, Assessment Report 50.

Buckles, H.R. (1954): The Deer Horn Property, *Western Miner and Oil Review*, November, pages 83-85.

Diakow, L.J. and Mihalynuk, M. (1987a): Geology of the Whitesail Reach and Troitsa Lake Areas, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Open File 1987-4.

Diakow, L.J. and Mihalynuk, M. (1987b): Geology of the Whitesail Reach and Troitsa Lake Map Areas, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork, 1986, Paper 1987-1, pages 171-179.

Diakow, L.J. and Koyanagi, V. (1988a): Stratigraphy and Mineral Occurrences of Chikamin Mountain and Whitesail Reach Map Areas, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork, 1987, Paper 1988-1, pages 155-168.

Diakow, L.J. and Koyanagi, V. (1988b): Geology of Chikamin Mountain Map Area, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Open File 1988-2.

Duffel, S. (1959): Whitesail Lake Map-area, British Columbia, *Geological Survey of Canada*, Memoir 299, 119 pages.

Holland, S.S. (1944): Harrison Group, *in* British Columbia Ministry of Energy, Mines and Petroleum Resources, *Property File*.

Holland, S.S. (1945): Whitesail Lake Area, *Minister of Mines, B.C.*, Annual Report, 1944, pages 175-178.

Holland, S.S. (1946): Whitesail Lake Area, *Minister of Mines, B.C.*, Annual Report, 1945, pages 71-72.

Papezik, V.S. (1957): Geology of the Deer Horn Prospect, Omineca Mining Division, British Columbia, Unpublished M.Sc. Thesis, *The University of British Columbia*, 85 pages.

Woodsworth, G.J. (1978): Eastern Margin of the Coast Plutonic Complex in Whitesail Lake Map-area, British Columbia, *in* Current Research, Part A, *Geological Survey of Canada*, Paper 78-1A, pages 71-75.

Woodsworth, G.J. (1980): Geology of Whitesail Lake (93E) Map-area, *Geological Survey of Canada*, Open File Map 708.

van der Heyden, P. (1982): Tectonic and Stratigraphic Relations between the Caost Plutonic Complex and Intermontane Belt, West-central Whitesail Lake Map Area, British Columbia, Unpublished M.Sc. Thesis, *The University of British Columbia*, 172 pages.

Young, P.E. (1954): Report on the Property of Deer Horn Mines Limited, Deer Horn Mines Ltd. Prospectus; *in* British Columbia Ministry of Energy, Mines and Petroleum Resources, *Property File*.

PROPOSED BUDGET - YEAR I
FOR PARCEL ____________________

1. Geological Surveys, Map & Report Preparation & Related Costs	$
2. Geophysical Surveys (line-kilometres) Ground Magnetic.......................................$ Electromagnetic.......................................$ Induced Polarization.......................................$ Radiometric.......................................$ Seismic.......................................$ Other.......................................$ Airborne.......................................$____________ $	$
3. Geochemical Surveys (no. of samples analysed for____________________) Soil.......................................$ Silt.......................................$ Rock.......................................$ Other.......................................$____________ $	$
4. Drilling Surface__________m @ $ .... = $ Underground__________m @ $ .... = $____________ $	$
5. Related Technical Studies Sampling/Assaying.......................................$ Petrographic.......................................$ Mineralogic.......................................$ Metallurgic.......................................$____________ $	$
6. Preparatory/Physical Line/Grid (kilometres).......................................$ Trenching (linear metres).......................................$____________ $	$
7. Tunnelling, Drifting, Other Lateral Excavation	$
8. Other Exploration Development Costs (attach detailed schedules) ....$ ....$ ....$____________ $	$
Total Expenditures	$