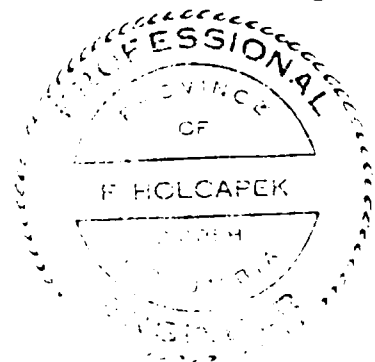


092F/2.11

SUMMARY REPORT  
on the  
CREAM SILVER MINES PROPERTY  
BUTTE LAKE,  
VANCOUVER ISLAND, B.C.  
for  
CREAM SILVER MINES LTD (NPL)

April 30, 1985  
Vancouver, B.C.

F. Holcapek P.Eng.  
Consultant Geologist



*Copy held under 110 I*



HOLCAPEK ENGINEERING LTD.  
CONSULTING GEOLOGISTS & ENGINEERS

## CONTENTS

	Page
SUMMARY AND CONCLUSION.....	I
RECOMMENDATIONS.....	II
COST ESTIMATE.....	II
1-00 INTRODUCTION.....	1
2-00 LOCATION AND ACCESS.....	1
3-00 TITLE AND OWNERSHIP.....	1
4-00 PHYSIOGRAPHY.....	2
5-00 HISTORY.....	2
6-00 REGIONAL GEOLOGY.....	3
6-10 STRATIGRAPHY.....	3
6-20 STRUCTURAL GEOLOGY.....	4
6-30 MINERAL DEPOSITS.....	5
6-40 DISCUSSION OF REGIONAL GEOLOGY.....	5
7-00 DETAIL GEOLOGY - BUTTLE LAKE.....	6
7-10 STRATIGRAPHY.....	6
7-20 STRUCTURAL GEOLOGY.....	7
7-30 MINERAL DEPOSITS.....	8
7-40 ALTERATION.....	10
8-00 EXPLORATION TARGETS.....	11
REFERENCES.....	13
CERTIFICATE.....	15

## MAPS

MYRA FALLS MINE OREBODIES  
CROSS SECTION OF THE H-W MINE  
GEOLOGICAL SKETCH MAP OF VANCOUVER ISLAND

SUMMARY REPORT  
on the  
CREAM SILVER MINES PROPERTY  
BUTTLE LAKE,  
VANCOUVER ISLAND, B.C.  
for  
CREAM SILVER MINES LTD (NPL)

SUMMARY AND CONCLUSION:

Cream Silver Mines Ltd. (NPL) owns 180 mineral claim located south of Buttle Lake, in Strathcona Park, Vancouver Island, B.C.

From 1968 to 1970 the claim group was investigated by geological mapping, trenching, prospecting and rock sampling and geochemical surveying. The work completed outlined several target areas warranting further investigation.

From 1971 to 1984, the property was under option to Westmin Resources Inc. During this period geological mapping and correlation of the geological setting to the Myra Mine to the north was completed. An Induced Polarization survey and limited diamond drilling tested the extension of the Price showing in the vicinity of Thelwood Creek.

The moratorium on mining in Provincial Parks includes Strathcona Park, and hence the Cream Silver claim group.

The property is underlain by a Permian sequence consisting of the Buttle Lake Formation, the transitional argillaceous tuff sequence and the Myra Formation consisting of three rhyolite units. The lower and middle rhyolites are known to host massive volcanogenic sulfide deposits.

On the Cream Silver property several target areas for further investigation are indicated:

1. Geochemical anomalies along Price Creek.
2. Drinkwater fault - massive float associated with sericite schist.
3. Float area south of Price Lake.
4. Extension of H.W. and Price zone along the northern part of the property.



RECOMMENDATIONS:

The following 3 phased exploration program is recommended. Execution of Phase 2 and Phase 3 depend on the results of the preceeding phase.

1. Compilation of all geological data and selection of areas for detailed mapping.
2. Detailed geological mapping of scale of 1:1000 using traverses for ground control, with special attention to delineate alteration zones and areas underlain by acidic volcanics.
3. Rock geochemistry in area of special interest - sericite schist zones, Drinkwater fault, and south of Price Lake.
4. Location of geochemical anomalies and checking of geology.
5. Geophysical survey - electromagnetic pulse type in selected areas. and/or Induced Polarization survey.
6. Trenching and/or diamond drilling as warranted.

COST ESTIMATE:

Phase I:

1.	Compilation of geological data, area selection	allow	\$ 2,000.00
2.	Detailed geological mapping	allow	\$ 5,000.00
3.	Relocation of geochemical anomalies and old grid	allow	\$ 5,000.00
4.	Rock geochemistry over areas of seritic schist rhyolites or hydrothermal alteration	allow for 800 samples	\$ 15,000.00
5.	Engineering, supervision etc.	allow	\$ 5,000.00
			\$ 32,000.00
		20% contingency	\$ 6,400.00
		Total Phase I	\$ 38,400.00



Phase II:

1. Geophysical surveys - 25km (approx.), pulse electromagnetic on grid basis	allow	\$ 20,000.00
2. Induced Polarization survey (10km)	allow	\$ 10,000.00
3. Follow up geochemical survey (20km) allow for 400 samples		\$ 10,000.00
4. Initial diamond drilling (2,000 ft)	allow	\$ 80,000.00
5. Engineering, supervision etc.	allow	\$ 10,000.00
		\$ 130,000.00
20% contingency		\$ 26,000.00
Total Phase II		\$ 156,000.00

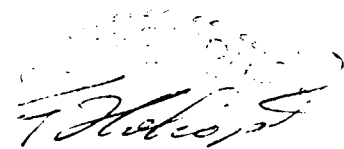
Phase III:

Will consist of diamond drilling  
(5,000 ft. initially) allow \$ 250,000.00

Total Phase I	\$ 38,000.00
Total Phase II	\$ 156,000.00
Total Phase III	\$ 250,000.00

Total all phases: \$ 444,000.00

Respectfully submitted



F. Holcapek, P.Eng.  
Consultant Geologist

April 30, 1985  
Vancouver, B.C.



### 1 - 00 INTRODUCTION:

Cream Silver Mines Ltd. holds 180 contiguous mineral claims, located according to 2 post staking, in Strathcona Provincial Park, 6 miles south of Buttle Lake, adjoining Westmin Resources Ltd. property.

From 1964 to 1970 the company carried out exploration consisting of various geophysical surveys, geochemical surveys, geological mapping, trenching, sampling, and limited diamond drilling.

In 1971 Westmin Resources Ltd. optioned the claim group and conducted exploration consisting of an Induced Polarization survey and diamond drilling along the common boundary (north part of the claims at Thelwood Creek), geological mapping and prospecting of the claim group.

Since 1971, mining and exploration in Strathcona Park has been stopped by the Provincial Government and is allowed only by special permission. The mineral claims, located prior to the moratorium on mining in the park, are still in good standing.

This report is based on the writers past work in the district, on the company's mineral claims (1968 - 1970), and literature research.

### 2 - 00 LOCATION AND ACCESS:

The claims lie between Thelwood and Price Creeks, from 3 to 6 miles south of Buttle Lake in central Vancouver Island. Co-ordinates near the centre of the claim group are 125°33' west Longitude, 49°30' north Latitude.

Access is by road from Campbell River to the south end of Buttle Lake then by foot trail, a long and difficult trip. Preferably, access can be gained by helicopter from Campbell River, a distance of approximately 40 miles, to the centre of the claim group, or by fixed wing aircraft to Bedwell Lake, one mile west of the claims. From there they are reached by foot trail which climbs approximately 1000 feet to the centre of the claims.

The northeast corner, on which the most recent program was completed, is accessed from the south end of Buttle Lake by an old logging road for approximately two miles, and then by foot trail for a distance of one mile.

### 3 - 00 TITLE AND OWNERSHIP:

The Cream Silver Mines Ltd.'s (NPL) property is situated in the Port Alberni Mining Division, and consists of the following full and fractional claims:

Stan 1 - 22	Bear 1 - 20	X 1 - 23
Elk 1 - 6	Bear 25 - 42	D 1 - 18
Cream 1 - 18	Cream 1E - 6E	H 1 - 6
Price 1 - 3	Cross 1 - 2	F 1 - 28

#### 4 - 00 PHYSIOGRAPHY:

Topography in the area is rugged, with elevations varying from 1500 - 5000 feet above sea-level.

The high part of the claims consists of rock outcrops or rubble.

The low part of the claims is covered by dense forest. In this section outcrops are limited to creeks or areas of sudden change in slope. Slide areas are common along the western tributaries of Price Creek, covering large sections of the main valley with boulders and rock rubble. These sections are nearly impassable due to the thick growth of alders and brush.

#### 5 - 00 HISTORY:

Records indicate silver-bearing veins were first discovered in the area of Cream Lake in either 1939 or 1940 when Pioneer Gold Mines conducted surface exploration on the Cream, and possibly other veins to the west. During the 1940's claims were held in the area by a Mr. Sherwood.

Mr. F.A. Lang staked the Cream 1 - 12 claims in 1964 and has added the remaining claims in subsequent years.

During 1966 an aeromagnetic survey was conducted over the property by Klyceptor Surveys Ltd. indicating several areal and linear anomalies.

Ground magnetic and electromagnetic surveys were conducted over the southern portion of the claims by Rolston Electronics Services in August, 1967, but did not respond to the known veins.

Geological mapping at a scale of 1 inch = 250 feet was also carried out in the southern portion of the claims during September, 1967 by Mr. C.B. Selmser of Geo Cal Ltd.

From 1964 to 1970 Cream Silver Mines Ltd. conducted considerable trenching on several narrow vein structures in the vicinity of Cream, Turquoise and Sugar Lakes, followed by geological mapping, prospecting and geochemical survey concentrated along the Thelwood Creek and Price Creek Valley.

In 1970 the Provincial Government invoked a moratorium in respect to mining in provincial parks. This effectively stopped all further exploration.

In 1971 Westmin Resources Ltd., optioned the property and from 1971 - 1984 completed geological mapping over the claim group, additional geochemical sampling, an Induced Polarization survey followed by diamond drilling along the northern boundary, Thelwood Creek.

6 - 00 REGIONAL GEOLOGY:

The Sicker Group includes the entire Paleozoic rock sequence of Vancouver Island. The unit is composed of basic and acidic volcanic rocks, clastics, and minor carbonates. The unit is overlain by the Vancouver Group's Karmutsen Formation, consisting of basic volcanic flows at Buttle Lake; but at southern outcrop areas, Cowichan-Horne Lake, Nanoose area, by the Nanaimo Group sediments.

6 - 10 STRATIGRAPHY:

Late Cretaceous: Nanaimo Group: clastic sediments, sandstones, conglomerates.

Early and (?) Middle Jurassic: Island Intrusions: Granodiorite, monzonite, quartz-monzonites, quartz-diorite, diorites.

Late and (?) Middle Triassic: Vancouver Group

Upper Triassic: Karmutsen Formation: Basalt to Andesitic volcanics pillow lavas, flows, fragmental minor tuffs, interbedded thin limestone bands in uppermost part of the formation.

Argillites, rhyolite flows, tuffs carrying banded sulfides, pyrrhotite, chalcopyrite, pyrite, galena, sphalerite, up to 2m thick.

Paleozoic: Sicker Group

Middle Pennsylvanian to Early Permian: Buttle Lake Formation: 150 - 450m limestone, calcarenite, crinoidal, commonly recrystallized, interbedded with subordinate or equal thicknesses of calcareous siltstone and chert, some diabase sills.

Mississippian:  
(Transition Zone) Sediment - Sill Unit: Thinly bedded to massive argillite, siltstone and chert with interlayered sills of diabase.











Devonian and/or older: Myra Foramtion: 600 to 900m acidic to rhyodacite banded tuff, breccia and (?) lava, thinly bedded to massive argillite, siltstone, chert.





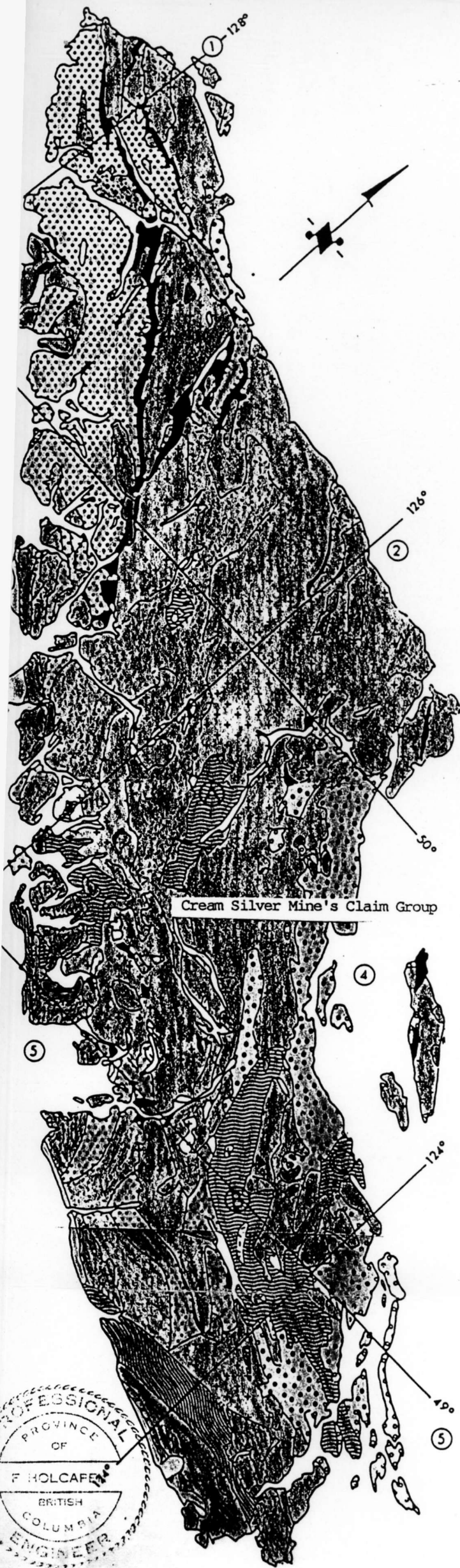
Figure 1.  
Geological sketch map of Vancouver Island.

## LEGEND

	CARMANAH GROUP	MIDDLE TERTIARY
	CATFACE INTRUSIONS	EARLY TO MIDDLE TERTIARY
	METCHOSIN VOLCANICS	EARLY TERTIARY
	NANAIMO GROUP	LATE CRETACEOUS
	QUEEN CHARLOTTE GROUP KYUQUOT GROUP	LATE JURASSIC TO EARLY CRETACEOUS
	LEECH RIVER FORMATION PACIFIC RIM COMPLEX	
	ISLAND INTRUSIONS	EARLY AND (?) MIDDLE JURASSIC
	BONANZA GROUP	EARLY JURASSIC
	VANCOUVER GROUP PARSON BAY FORMATION QUATSINO FORMATION	LATE AND (?) MIDDLE TRIASSIC
	KARMUTSEN FORMATION	
	SICKER GROUP	PALEOZOIC
	METAMORPHIC COMPLEXES	JURASSIC AND OLDER

- ① ALERT BAY—CAPE SCOTT, 92 L—102 I  
(G.S.C. PAPER 74—8)
- ② BUTE INLET, 92 K (IN PREPARATION), O.P. MAP 345
- ③ NOOTKA SOUND, 92 E (IN PREPARATION)
- ④ ALBERNI 92 F (G.S.C. PAPER 68—50)
- ⑤ VICTORIA, 92 B, C (FIELD WORK IN PROGRESS;  
SEE G.S.C. PAPERS 75—1A, p. 21—26;  
76—1A, p. 107—111, 77—1A, p. 287—294.)

- A — BUTTLE LAKE UPLIFT  
B — COWICHAN—HORNE LAKE UPLIFT  
C — NANOOSE UPLIFT



Nitinat Formation: metabasaltic lavas, pillowed or agglomeritic, commonly with large conspicuous uraltitized pyroxene phenocrysts and amygdules of quartz and dark green minerals, minor massive to banded tuff.

#### 6 - 20 STRUCTURAL GEOLOGY:

The Sicker Group has been involved in a complex tectonic history. Folding, normal and transcurrent faulting and repeated intrusions are evident.

The oldest deformation known is best exposed at Buttle Lake and consists of asymmetrical folding, ie, Westmin Mine's asymmetric southwest verging anticline.

Similar folding is indicated in the Cameron Nitinat area and on Salt-spring Island.

Sediments of the Buttle Lake Formation appear to be less folded than the older members of the Sicker Group but this could be caused by compositional differences.

The Vancouver Group overlying the Sicker Group also appears less intensively folded. In general the thick sequence of basaltic lava shows gentle monoclinal folding and domed structures.

Muscovite from phyllitic quartz porphyry was collected for K-Ar dating and yielded a Jurassic date suggesting a dynamothermal metamorphic event at that time. The main folding of the Sicker occurred concurrent with Jurassic emplacement of the Coast Intrusion.

Major faulting occurred during the Tertiary time after deposition of the Cretaceous Nanaimo Group. The faults are northwesterly trending and have substantial displacement. Transcurrent movement is indicated but has not been proven.

Two sets of north-northeasterly striking faults have been identified. The first set may predate the northwesterly ones. The second set may be related second order splays.

The Sicker Group has been affected by several intrusive events:

1. The Tyee Intrusion, Devonian, believed to have been emplaced concurrently with the extrusion and deposition of the Myra Formation.
2. Diabase and gabbro dykes, late Triassic, related to extrusion of Karmutsen lavas.



3. Island Intrusions, Early Jurassic, forming elongated bodies of granodiorite, diorite and minor agmatite.

4. Light colored dykes and sills, early Tertiary, consisting of hornblende plagioclase porphyry intruding Sicker Group rocks in the Cameron - Nitinat area.

#### 6-30 MINERAL DEPOSITS:

Several types of mineralization have been noticed within the Sicker Group:

1. Massive sulphide deposits of the Kuroko type within the Myra Formation at Buttle Lake and Mt. Sicker.

2. Veins carrying gold and base metals in the China Creek area, or veins and shears carrying silver, sphalerite and galena south of Buttle Lake.

3. Manganese deposits in cherty tuffs of the Myra Formation north of Lake Cowichan.

4. Massive sulfides within cherty argillites or rhyolite bands between the Buttle Lake Formation and Karmutsen pillow lavas, southwest of Price Lake.

#### 6 - 40 DISCUSSION OF REGIONAL GEOLOGY:

Studies of Paleozoic rocks on Vancouver Island, St. Elias Mt. Yukon, Wrangell Mountains Alaska, San Juan Islands, Washington, East Klamath Mountains Oregon, and Shasta District California, suggest that Sicker Group equivalent rocks have been identified in each district and have been established to represent parts of a Paleozoic volcanic arc terrane. Further, it is believed by some authors that the Western Insular Belt of the Cordillera ("Wrangellia") originated farther south and has been emplaced in its current position in Jurassic or Early Cretaceous time.

Mesozoic tectonic history (Davis et al 1978) of the western Cordillera was "controlled by right lateral motion of Pacific plates along and obliquely beneath the continental margin". Further, the same review restates the observation that all Paleozoic depositional and tectonic trends in central and southern California are cut by probably early Mesozoic transform faults. The suggestion that the truncated or cut off Paleozoic miogeosyncline and arc terrane were shifted northward and incorporated in the northern Cordillera has to be considered.

The possibility of the northward movement is enhanced by the apparent similarity in the middle to late Paleozoic terrane of Vancouver Island and eastern Klamath Mountains (Shasta District).



VANCOUVER ISLAND

Buttle Lake Formation

Bedded to massive calcarenite,  
crinoidal limestone. chert;  
calcareous siltstone; 150-450m  
Middle Pennsylvanian to  
Early Permian - - - - -

Sediment-Sill Unit

Bedded argillite, siltstone,  
chert; diabase sills - - - - -

Myra Formation

Bedded siliceous siltstone,  
argillite, rhyodacite tuff and  
breccia, quartz porphyry;  
600-900m Late Devonian to  
Early Mississippian

Nitinat Formation

Basaltic uralite-porphyry,  
agglomerate and pillow lava,  
actinolite-chlorite-albite  
schist

SHASTA DISTRICT

McCloud limestone

Thin to thick-bedded  
fossiliferous limestone  
with chert nodules;  
150-800m Early Permian  
and (?) Late Pennsylvanian

Kennett Formation

Siliceous siltstone, tuff;  
thick lenses of limestone  
in upper part; 0-12m;  
Middle Devonian

Balaklala Rhyolite

Porphyritic and  
non-porphyritic rhyolite and  
rhyolitic pyroclastic rocks;  
300m+-; Middle Devonian

Copley Greenstone

Greenstone, keratophyre,  
pyroclastic rocks

7 - 00 DETAIL GEOLOGY - BUTTLE LAKE:

Detailed stratigraphy and lithology is essentially based on data by  
Westmin Resources Ltd. as identified within the mine area.

7 - 10 STRATIGRAPHY:

Early to Middle Jurassic: Island Intrusion - Bedwell Intrusive: Por-  
phyritic microgranodiorite, diorite, dacite and  
agmatite.

Late and Middle Triassic: Vancouver Group

Upper Triassic: Karmutsen Formation: Volcanic flows, pillow lavas,  
thinly bedded rhyolites, andesites and argillites  
and banded sulfides in basal sections.

Paleozoic: Sicker Group

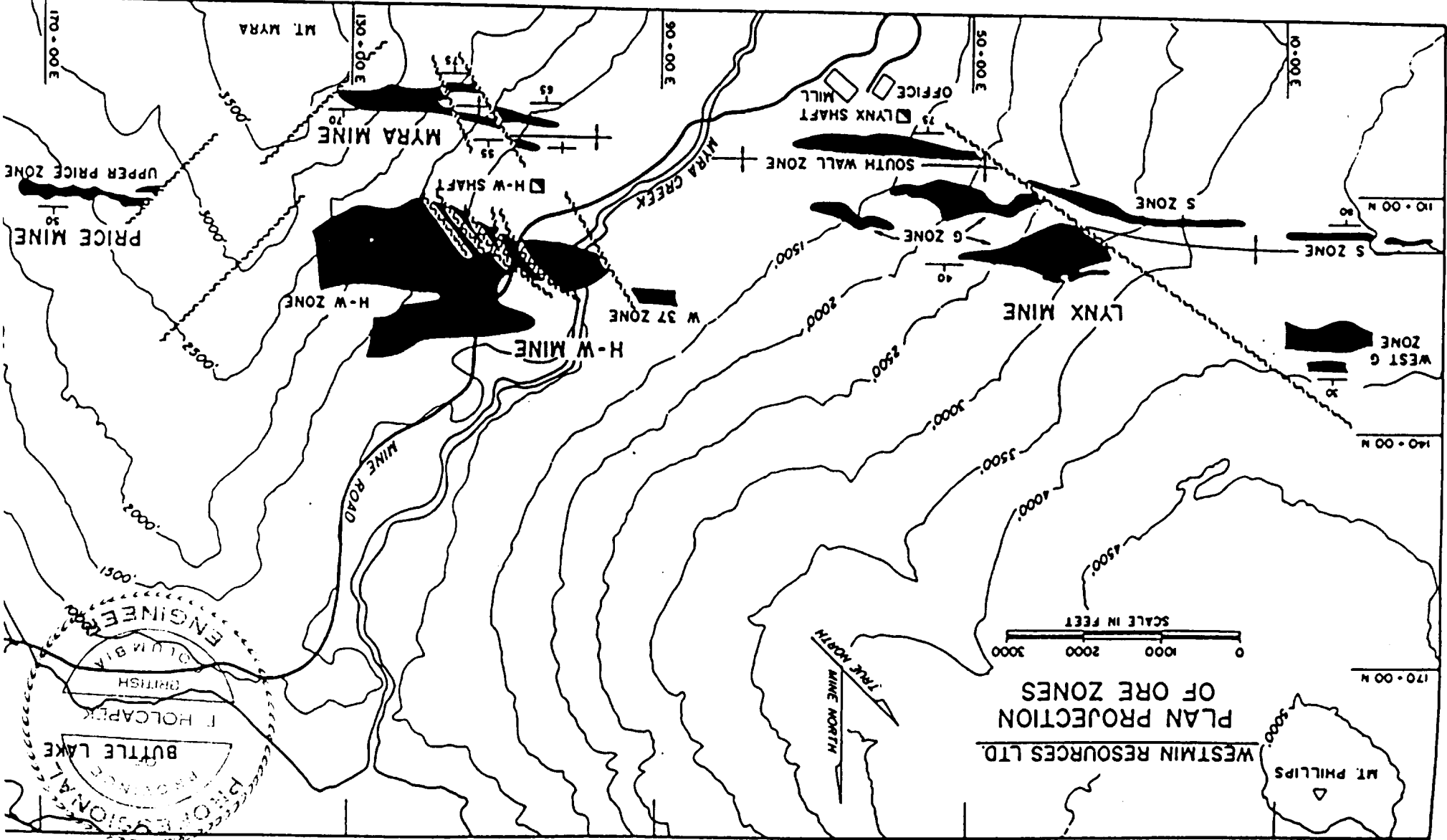
Middle Pennsylvanian: Buttle Lake Formation: Biomicrite limestone,  
coraline, crinoidal limestone, micrite, ribbon  
chert. 800 ft (?)



WESTMIN RESOURCES LTD.  
PLAN PROJECTION  
OF ORE ZONES

SCALE IN FEET  
0 1000 2000 3000

TRUE NORTH  
MINE NORTH



Late Devonian - Early Mississippian: Myra Formation: Dacite agglomerate and dacite lapilli tuffs. Fragments from 15 mm (lapilli) to 15cm (agglomerate) constitute 60% of the rock. Fragments are porphyritic andesite, and aphanitic, medium grey rhyolite. Thin beds of dacite lithic tuff often show graded bedding. 800 ft (?)

Cherty Bedded Tuffs: very thin bedded, cream to light grey to purple, aphanitic cherty tuff. No fragments visible. Common hairline fractures filled with calcite, quartz, and occasional pyrite. Cross bedding sometimes found. (300 ft)

Dacite Lapilli Tuff: Fragments of rhyolite, dacite and porphyrite andesite, ranging in size from 2 mm to 15 mm are found in chloritized dacite matrix. The fragments comprise at least 70% of the rock. 1000 ft

Rhyodacite and Minor Flows: Porphyritic rhyodacite flow, plagioclase phenocrysts up to 4mm across in green aphanitic matrix, dark grey aphanitic rhyodacite and rhyolite flows.

Rhyolite to dacite breccia in areas of sulfide mineralization.

#### 7 - 20 STRUCTURAL GEOLOGY:

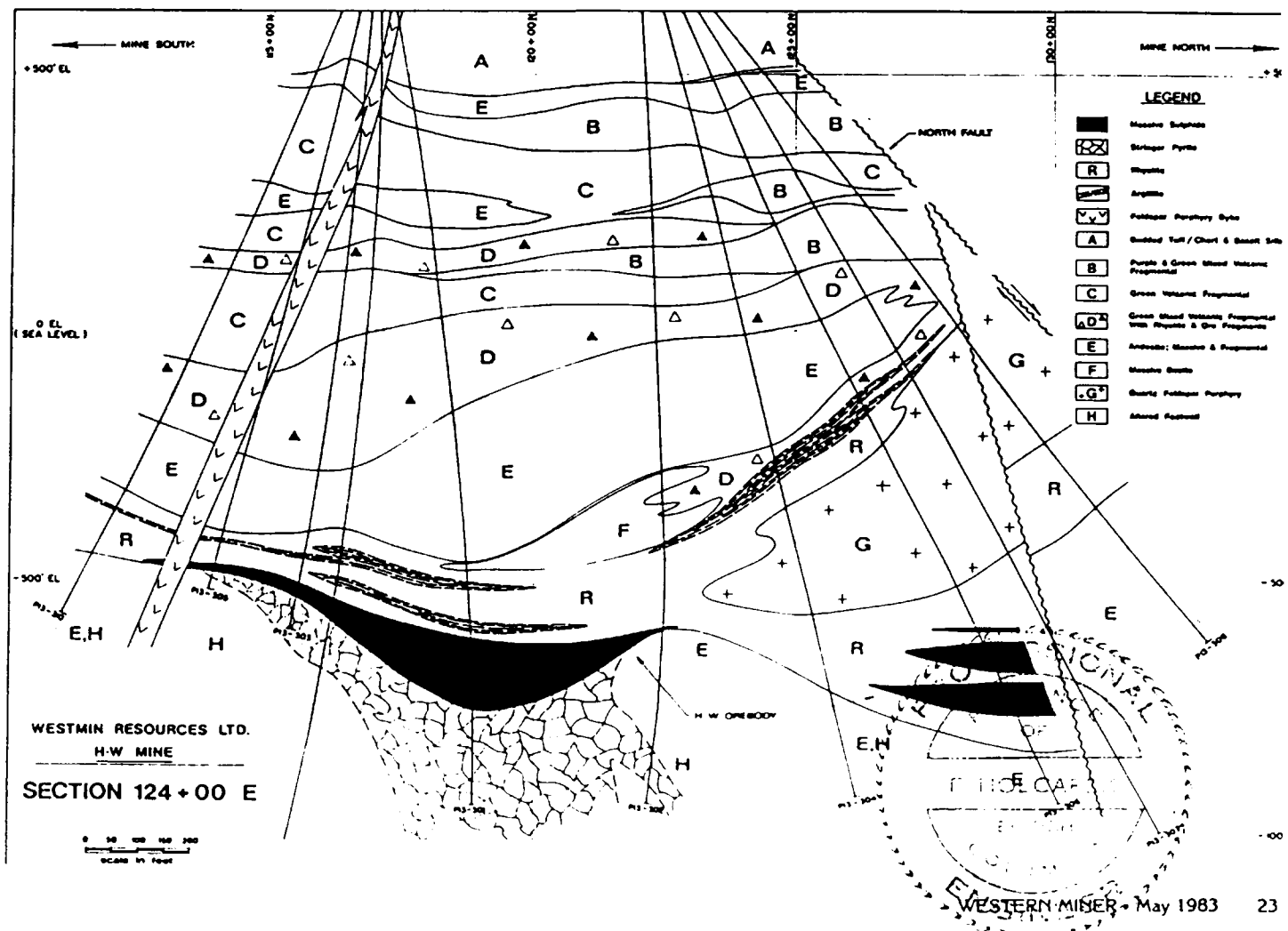
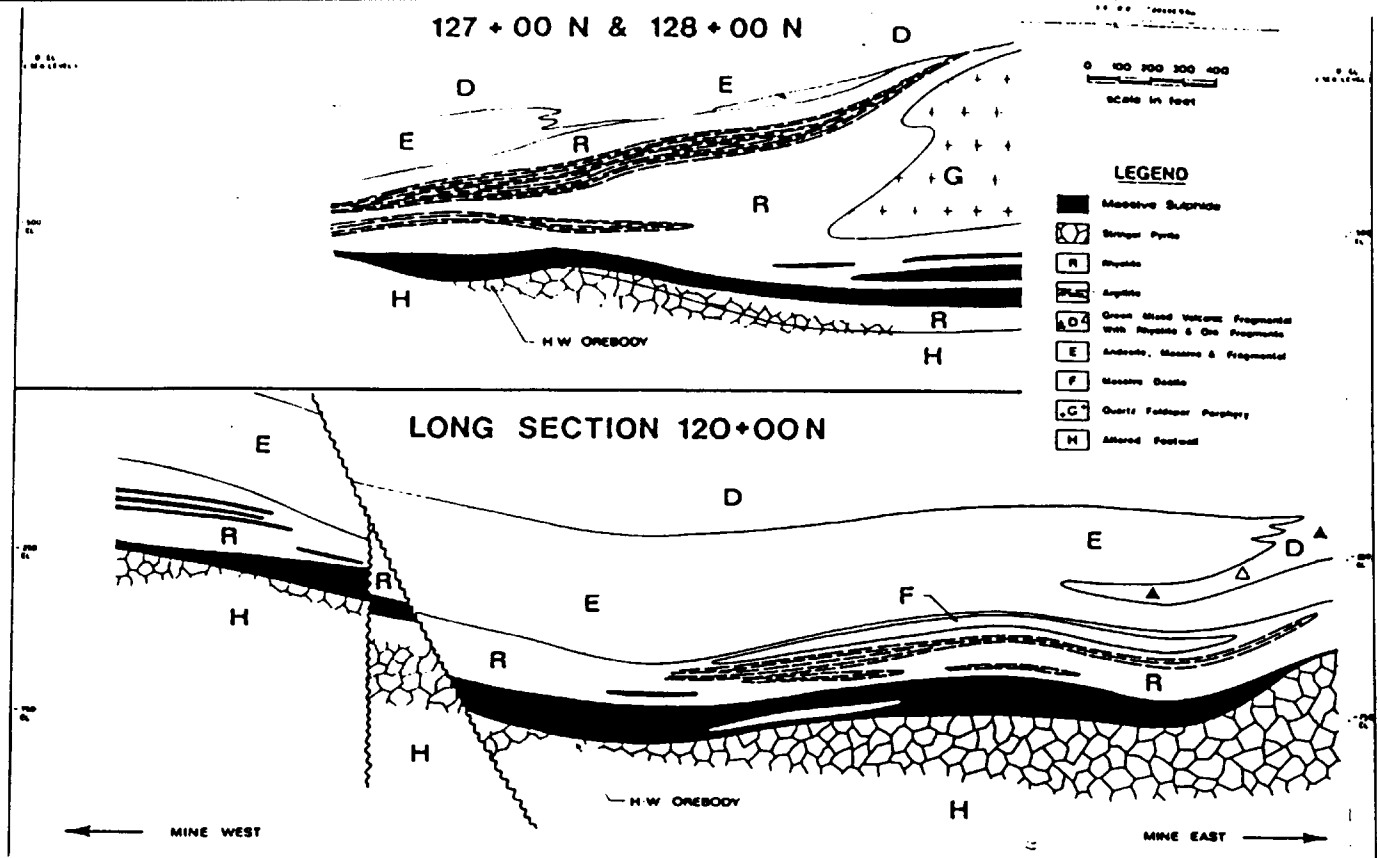
In the Buttle Lake area all outcropping rock units have been affected by both folding and faulting.

The Buttle Lake limestone outlines a large southeasterly trending and plunging anticline. Secondary folds have been observed along the eastern limb within the limestone.

Within the Myra Formation, "Mine sequence" folding appears to be more complex. The rhyolites outline an asymmetrical fold with the south limb dipping from 50° SW to 70° NE (overturned), average 40° NE. Trend of the fold axis is northwest.

Detailed structural information from the massive dacite agglomerates and lapilli tuffs is sketchy. The units appear to have a consistent strike of N 35° E and dip 40° SW.

Graded bedding within the Cherty Tuff sequence indicates that the fold limbs are right side up i.e. not overturned, although in the Sugar Lake area structural and stratigraphic data encountered suggest a possible recumbent anticline with axis trending north and dips to the west.



Strong shearing of the same attitude has affected all rock types west of Sugar Lake.

Several directions of faulting have been observed with the major trends being westerly and northerly. Both sets of faults offset the ore zones of Westmin Resources.

The westerly trending faults appear to have net slip movement of approximately 2800 ft (Price ore zone) with a vertical component of 1000 ft.

South of Buttle Lake major westerly trending faults are indicated by mapping completed by Westmin Resources Ltd.

1. Price Fault: cutting through the X claims along the northern part of the property. 2000 ft net slip movement, 1000 ft vertical displacement.

2. In the middle of the Cream claims offsetting the Buttle Lake limestone, south side to the northeast with an apparent displacement of 3,500 ft horizontal and 1900 ft in elevation difference suggesting the southern block has been uplifted.

3. This fault passes through Coffee Lake and through the southern limits of Cream Lake. Apparent horizontal displacement is 1000 ft southside to the east and about 1000 ft in elevation, south block lifted up.

4. The Drinkwater fault passes through Bedwell Lake, Tourquoise Lake and Love Lake. Indicated apparent displacement is about 9000 ft horizontal, south block to the east and up. The large indicated horizontal movement appears to be a combination of actual displacement and erosional level of the southern segment of the fold limb.

A northerly trending fault is suggested by Scott (1972) passing from Drinkwater Creek through Cream Lake. No detail data is available.

#### 7 - 30 MINERAL DEPOSITS:

At Buttle Lake and on the Cream Silver Mines claim several different types of mineral occurrences have been investigated:

##### 1. Vein and Fracture Filling:

This type of mineral showing was extensively investigated by Cream Silver on top of Price Ridge.

The minerals consist of sphalerite, galena, pyrite and pyrrhotite carrying variable amounts of precious metals, gold and silver. At Cream Lake owyheeite, tetrahedrite, and pyragyrite are the main silver minerals within the high grade section.





At Sugar Lake, the mineralization of interest was gold associated with pyrite. In general the mineralization was localized along narrow shear zones or fractures. Gouge is abundant. The main gangue minerals are quartz, siderite and calcite. Quartz was found to be banded, and shows comb structure with open spaces filled by carbonates or sulphides.

2. Sulfide bands associated with the Upper Sedimentary Section of Buttle Lake Formation.

Banded massive sulfides consisting of pyrrhotite, sphalerite, galena, chalcopryrite and pyrite bands within argillites or rhyolitic tuffs was found south of Price Lake, and within the cirque at the head of Price Creek. The high grade Cu-Zn-Pb-Ag sulfides were found as float, but bands up to 1m thick of pyrrhotite and pyrite have been observed in place.

3. Massive siliceous sulfides within sericite schist.

Within the Drinkwater Fault, a large siliceous sulfide boulder carrying chalcopryrite, galena, sphalerite, pyrite, pyrrhotite with silver and low gold values was found. The host rock within the area is a sericite schist - rhyolite (?) of the Myra Formation (?). In the same area and to the north pyrite disseminated in sericitic schist has been found.

The importance of these mineralized areas has not been established.

4. Massive sulfides within tuffaceous rhyolite or rhyolite breccia.

Along Thelwood Creek, at the northern boundary of the claim group, Westmin completed an Induced Polarization Survey followed by drilling. The drilling showed that the area was underlain by the Myra Creek Formation, rhyolites and rhyolite tuffs, the host unit for the Westmin ore deposits. The intersected mineralization was low grade and occurred within tuffs and/or argillaceous tuffs. This area is the southward and faulted (upward and to east) extension of the Paramount and Lynx zone.

If there is no marked change in the structural setting, then the rhyolite and rhyolitic breccia which host the Westmin massive sulfides will continue onto the Cream Silver Mines claim block.

The W.H. deposits being developed at present, lie approximately 2000 ft east of the Lynx Zone and about 1,500 ft below the valley floor. The Price fault not only offsets the Lynx, Paramount and Price deposits but also the W.H. deposit. This will bring the extension of the W.H. zone 500 ft below the valley floor (1,000 ft vertical movement), and will increase the potential of bringing the lower ore bearing rhyolites upward into easier exploration range.



7 - 40 ALTERATION:

The Kuroko Type massive sulfide deposits in the type locality have well developed alteration zoning, and zoning of sulfides depending on position in respect to the vent zone. Further, well developed stringer-feeder zones have been recognized.

Alteration varies from the center of mineralization outwards from:

a) Sericite - chlorite zone masking kaolinite adjacent to sulfide deposits. Stringer zone  $\text{SiO}_2$  enriched.

b) Sericite - chlorite transitional zone mixed layer and montmorillonite zone forms an alteration halo around the ore deposits.

The outer montmorillonite zone and the inner sericite - chlorite zone, both expand outwards, upwards and laterally as far as the hydrothermal activity and sediments continue.

c) On a regional basis zeolitic diagenesis affected the acidic tuffs away from the sulfide deposits.

d) Kuroko alteration affected the zeolite zoning and the analcime - calcite zone was formed by reaction with clinoptilolite - mordenite tuffs with the hydrothermal solution.

e) Mg alteration is characteristic in all alteration zones.

f) K alteration is prominent within the sericite - chlorite and transitional mixed layer zone.

g) Ca metasomatism is evident in the montmorillonite zone but is depleted from the sericite - chlorite transitional zone.

h) Na is leached from all zones.

The ore can be divided into:

Siliceous or stringer ore - feeder zone and lowest level in stratiform sulfide layer.

Yellow ore - dominantly chalcopyrite and pyrite forming the lower half of stratiform deposits.

Black ore - galena, sphalerite and barite rich, forming the upper part of the ore zone.

Lenses or thin layers of ferruginous cherts are often overlaying the ore zone. Gypsum and/or anhydrite occur as lenticular or irregular masses



between the stockwork and the stratiform ore bodies or adjacent to the stratiform ore.

At Westmin's Buttle Lake deposits the alteration zones have been partly obliterated by regional metamorphism. It was found that the ore zone was enclosed by an envelope of sericite - chlorite alteration - sericite schist. The host rock is a rhyolite to rhyolite breccia overlain by argillaceous, black tuffs. The barite and gypsum zone has not been recognized, but zoning in the stratiform deposits and stringer zone is similar to that at Kuroko.

In the Mt. Sicker area cherty manganese deposits related to the Myra Volcanic Formation have been identified.

#### 8 - 00 EXPLORATION TARGETS:

The geological setting and results of past work suggest several areas which merit additional work:

1. Geochemical surveys completed during 1969 - 1972 indicate several Cu - Zn anomalies along Price Creek and Thelwood Creek.

The Price Creek anomalies were checked by Westmin and interpreted to be caused by excess base metal content in the underlying rock units. It has not been established if the anomalies are caused by leakage along structural zones, or by base metal enrichment within the sedimentary sequence, or are part of a halo surrounding the favourable Myra Formation Rhyolites.

At Thelwood Creek drilling located low grade sulfide concentrations (Zn, Cu) within the argillaceous black tuffs and rhyolite flows. Westmin's interpretation suggests a possible distal volcanogenic environment for sulfide deposition.

2. Faulting along the southern limits of the Price showing (middle rhyolite), and the W.H. deposits (lower rhyolites), moves the favourable units approximately 1,000 ft. (south side) upwards, and hence, possibly within detection range of geophysical surveys.

3. Float was found along the Drinkwater fault-trace associated with sericitic schist (altered rhyolites). The sulfides found appear to have been derived from the yellow siliceous ore part of a volcanogenic deposit.

4. Massive banded sulfide float was found associated with thin bedded argillite - rhyolite bands derived from the Upper Sedimentary Sequence of the Buttle Lake Formation.

Several sulfide bands consisting of pyrrhotite, pyrite and minor chalcopryrite have been found in place in the cirque south of Price Lake.



All of the above targets will need checking and follow up exploration work. Further, work by Westmin Resources Ltd. to date, has defined three rhyolite horizons within the Myra Formation. Each of the horizons has sulfide potential, but only the middle and lower rhyolite units have been found to carry economic sulfide deposits.

April 30, 1985  
Vancouver, B.C.



REFERENCES

- Cream Silver Mines' Files: Miscellaneous maps, notes, etc. accumulated over the years.
- Date, J: 1974. Dacite and Rhyolite Associated with the Kuroko Mineralization in Geology of Kuroko Deposits Mining Geology Special Issue No.6.
- Duval, D: Feb.7,1985. Aberford discovery on Vancouver Island in Northern Miner.
- Eastwood, G.E.P: 1979. Sicker Project (92B/16E). B.C.M.E.M.Pet.Res. Paper 1979-1, p.38-40.
1980. Sicker Project - Mount Richards Area (92B/13E). B.C.M.E.M.Pet.Res. Paper 1980-1. p.49-51.
- Franklin, Lydon, and Sangster: 1981. Volcanic Associated Massive Sulfide Deposits in Economic Geology 75th Anniversary Volume, 1981. p.605.
- Guber, A.L. and Ohmoto, H: 1982. Sedimentary and Structural Setting, Kuroko Ore Formation, Hokuroku District, Japan. Am. Ass. Pet. Geologists, Bull, v66, pp. 575 (abstract).
- Hayakawa N, Shimada T, Suzuki S: 1974. Geology of the Aizu Metalliferous District, Northeast Japan in Geology of Kuroko Deposits p.19-27.
- Hodgron, C.J. and Lydon, J.W: 1977. Geological Setting of Volcanogenic Massive Sulfide Deposits and Active Hydrothermal Systems: Some Implications For Exploration. CIM Bull, v70, p.95.
- Holcapek, F: Jan.14,1970. Report on Geological and Geochemical Surveys on the Cream Lake Property of Cream Silver Mines Ltd. (NPL), by Agilis Exploration Services Ltd.
- Oct.9,1970. Report on the Geochemical Survey on the Cream Lake Property of Cream Silver Mines Ltd. (NPL), by Agilis Exploration Services Ltd.
- Iijima, A: 1974. Clay and Zeolitic Alteration Zones Surrounding Kuroko Deposits in the Hokuroku District, Northern Akita, as Submarine Hydrothermal - Diagenetic Alteration Products in Geology of Kuroko Deposits. p.267-291.
- Muller, J.E: 1980. The Paleozoic Sicker Group Of Vancouver Island, B.C. G.S.C. Paper 79-30, 21 pages.


- Ishira, S.(Ed): 1974. The Geology of Kuroko Deposits. Society of Mining Geologists of Japan, Mining Geology Special Issue No.6, p.435.
- Knoll, K: Nov.1984. Westmin Resources Ltd. Canadian Mining Journal.
- Lapierre H, Albarede F, Cabanis B, Coulon C: 1985. Early Devonian Volcanism in the eastern Klamath Mountains, California: evidence for an immature island arc. Can.J.Earth Sci. V.22,p.214-227.
- Philp, R.H.D: Oct. 4,1968. Report on the Cream Silver Property Vancouver Island, B.C., of Cream Silver Mines Ltd (NPL). by Agilis Exploration Services Ltd.
- Reed, Mark H: 1984. Geology, Wall-Rock Alteration, and Massive Sulfide Mineralization in a Portion of the West Shasta District, Calif. in Economic Geology V.79 p.1299-1318.
- Sato T, Tanimura S, Ohtagaki T: 1974. Geology and Ore Deposits of the Hokuroku District, Akita Prefecture in Geology of Kuroko Deposits, Mining Geology Special Issue, No.6 p.11-17.
- Sato, T: 1974. Distribution and Geological Setting of the Kuroko Deposits in Geology of Kuroko Deposits, Mining Geology Special Issue, No.6 p.1-7.
- Scott, C.H: Sept.12,1972. Report on the Geological Mapping of Part of the Stan Claim Group by Western Mines Ltd.
- Nov. 6,1972. Report on the Geological Mapping of Part of the B.E.M. Claim Group. Cream Silver Project, by Western Mines Ltd.
- Stevenson, John S: 1944. Geology and Ore Deposits of the China Creek Area Vancouver Island, British Columbia. Report of the Minister of Mines. p.A142-G161
- Walker, R.R: 1983. Ore Deposits of the Myra Falls mine site. Western Miner. p.22-25.
- Western Miner: May 1983. Westmin Resources Ltd.: Profile of Progress. in Western Miner. p.10-20.
- Wilbur, D.E: July 1971. Report on the Geochemical Survey of Part of the B.E.M. Claim Group.
- Sept.15,1971. Report on the Geological Mapping of the Cross and Price Claims - Upper Price Creek.

CERTIFICATION

I, Ferdinand Holcapek of 510-475 Howe Street, Vancouver, B.C., certify that:

1. I am a graduate of the University of British Columbia with a B.Sc. degree in Geology in 1969.
2. I am a member in good standing of the Association of Professional Engineers of British Columbia, registration 8962.
3. I have practiced my profession, since graduation, in Canada, United States of America, Australia, Mexico and Central America.
4. I have supervised and executed exploration programs from 1968 to 1970 on the property.
5. This report is based on my experience within the district, exploration completed on the claim group under my direction, and literature search.
6. I hereby give my consent to the inclusion of the above report into a statement of material fact or a prospectus of the company.
7. No portion or summary of this report may be used without the written approval of Holcapek Engineering Ltd.
8. I have not received, nor do I expect to receive any interest directly, or indirectly, in the securities or properties of Cream Silver Mines Ltd. (NPL).

April 30, 1985  
Vancouver, B.C.

  
F. Holcapek P.Eng.  
Consultant Geologist



HOLCAPEK ENGINEERING LTD.  
CONSULTING GEOLOGISTS & ENGINEERS