Anyox Project
BC-91-3

GEOLOGICAL, GEOCHEMICAL, AND GEOPHYSICAL REPORT
on the
ANYOX PROPERTY
Skeena Mining Division
Latitude 55°25′ North
Longitude 129°50′ West
N.T.S. 103-P/5 West
British Columbia

August 16, 1994

on behalf of
TVI COPPER INC.
Calgary, Alberta

by
James W. Davis, P.Geol., F.GAC, P.Geo.
C.H. Aussant, P.Geol., F.GAC, P.Geo.

TAIGA CONSULTANTS LTD.
#301, 1000 - 8th Avenue S.W.
Calgary, Alberta T2P 3M7

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INTRODUCTION

Taiga Consultants Ltd. was contracted by TVI Copper Inc. to conduct an exploration program on the Anyox property located within the Boundary Range of the Coast Mountains of British Columbia (Figure 1). The exploration program was directed at locating mineralization beyond the immediate Hidden Creek Mine area. A cursory examination was completed over the entire property area. A number of the mineralized occurrences documents in the literature were briefly examined.

The exploration program consisted of reconnaissance prospecting, geological mapping, and litho-geochemical sampling. In addition, two grids were emplaced covering the basalt/argillite contact over the Redwing target area. The grids were covered by geophysical (VLF-EM, magnetometer) surveys.

Location and Access

The Anyox property (Figure 2) is located on N.T.S. map-sheet 103-P/15 West in the Skeena Mining Division. The centre of the property lies at 55°25′ North latitude and 129°50′ West longitude, on Observatory Inlet, approximately 160 km north of Prince Rupert, B.C.

Access to the area is by helicopter, float-equipped aircraft, or boat from Prince Rupert. The nearest road access is at Kitsault, 25 km to the east at the head of Alice Arm.

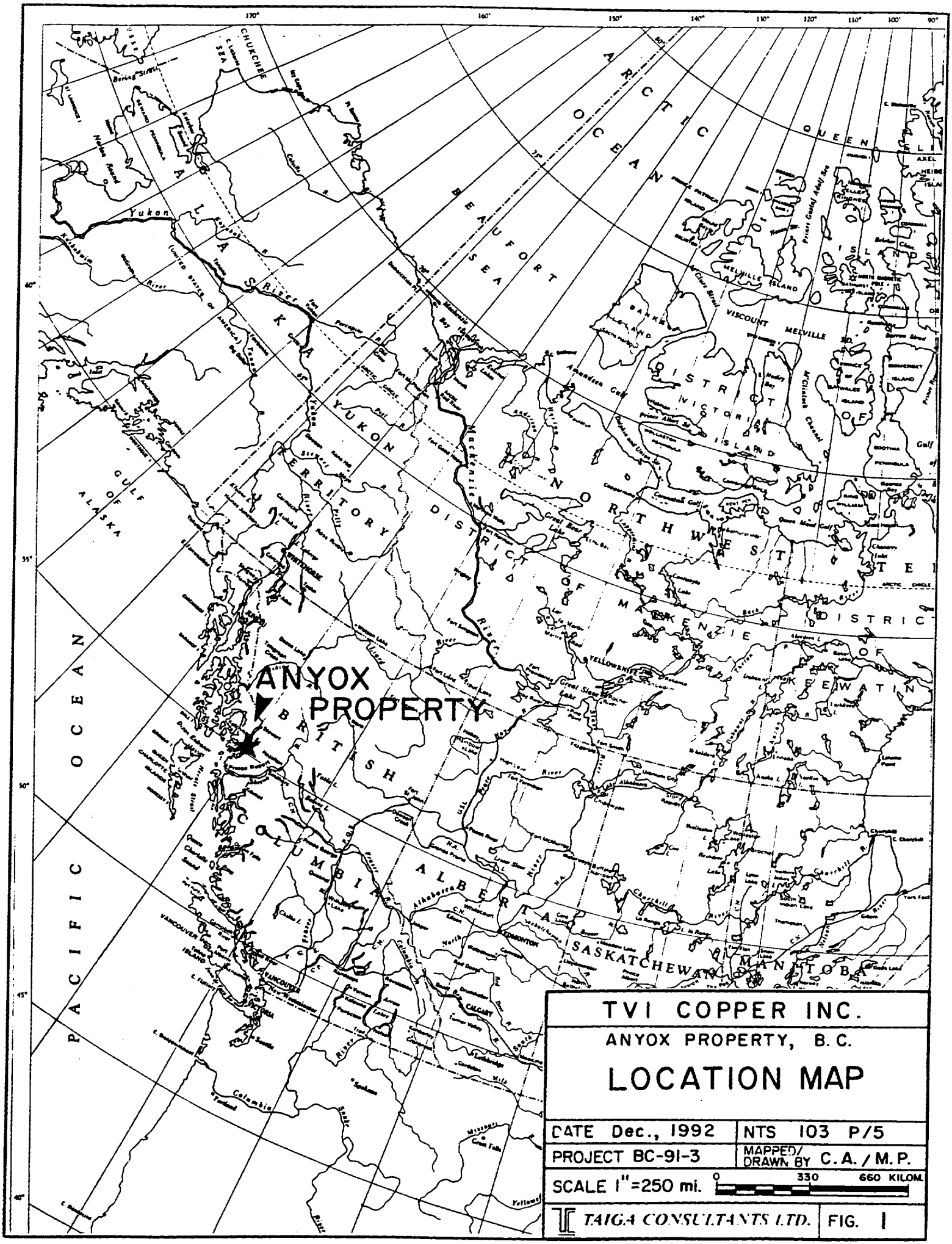
Claim Status

The Anyox property is comprised of Crown-granted mineral claims and located mineral claims. Crown-granted mineral claims are acquired by Letters Patent issued by the Crown in right of the Province of British Columbia, and grant to the holder all minerals (other than coal and petroleum) on or under the subject land. In order to maintain the Crown-granted mineral claims in good standing, the holder is required to pay the annual assessed property taxes. Located mineral claims are valid for one year after the date of recording if staked prior to 1988, or the date of closure when staked after 1988; and may be renewed from year to year either by performing and recording exploration and development work amounting to $100 in each of the first three years and $200 in each of the fourth and subsequent years in respect of each unit comprising a claim or by making a cash payment. Failure to pay in lieu or to perform representative work will cause a claim to lapse. The located mineral claims which comprise part of the Anyox property are required to be renewed at various dates during the period April 25, 1995 to December 1998. Provided no property taxes are outstanding and the claims comprising the Anyox property remain in good standing, the property area is as summarized in Table 1.

Physiography

The Anyox property is located within the Boundary Range of the Coast Mountains of British Columbia. This is a region of sharp craggy ridges and broad U-shaped glacially carved valleys. The highest point in the area is Mount Clashmore at 5509 feet (1675 m) on the northwest boundary of the property, down to sea level at Granby Bay.

Treeline in the area is at approximately 3000 feet (1000 m). Tree cover consists of a new growth of pine and alder following a fire which devastated the area in 1947.

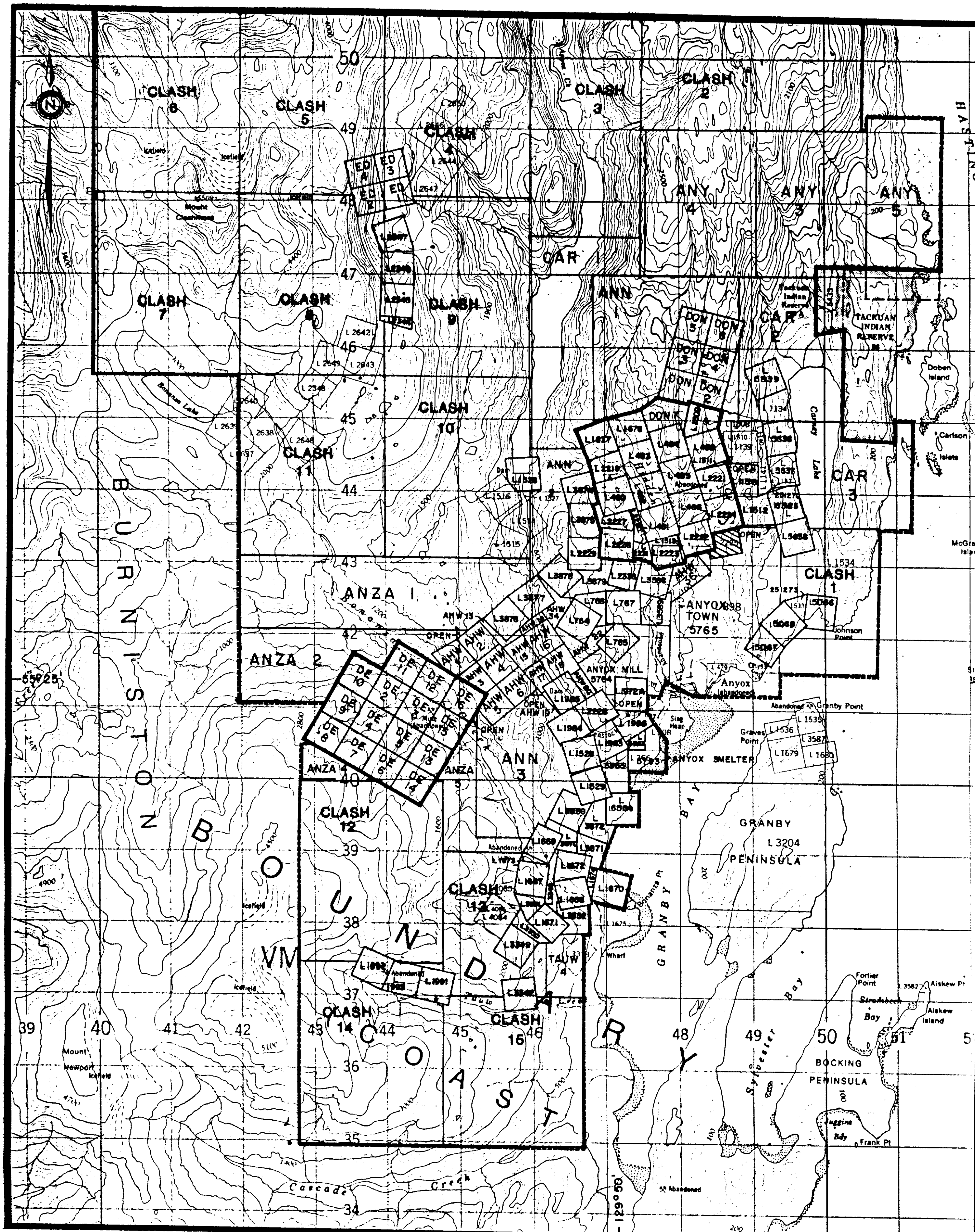


TVI COPPER INC.

ANYOX PROPERTY, B.C.

LOCATION MAP

DATE Dec., 1992	NTS 103 P/5
PROJECT BC-91-3	MAPPED/DRAWN BY C.A. / M.P.
SCALE 1" = 250 mi.	0 330 660 KILOM.
TAIGA CONSULTANTS LTD.	FIG. 1



TVI OPTION AREAS

PROPERTY BOUNDARY

EXCLUDED FROM PROPERTY AREA

1 0 1 2 3 4 Kilometers

1 : 50,000

CLAIM LOCATION MAP

FIG. 2

Table 1 - Claims Status

HIDDEN CREEK

purchase agreement dated December 18, 1991

22 Crown-grants
registered owner of the subsurface rights : TVI Copper Inc.
annual assessed property taxes due date : June 1

Lease Name	Lot No.	Lease Name	Lot No.
Alpha	486	Kenneth	488
Balsam	2221	Manson	485
Buffalo	2230	Maple Leaf	2223
Bunker	2222	May Day	1677
Dolly Fr.	1513	May Flower Fr.	2219
Donald	483	Maypole	1676
Gamma	480	McKinley	484
Hemlock Fr.	1511	Ottawa	1509
Hooter	2224	Revenge	482
Kaien	2226	Rudge	481
Kaien Fr.	2231	Rupert	2227

DOUBLE ED

purchase agreement dated December 18, 1991

15 Two-Post Mineral Claims located on Double Ed Occurrence
registered owner : Travel Ventures Inc.

Claim Name	Old Tenure Record No.	Tenure	hectares	Expiry Date
Double Ed 2-5	14559-562	254595-596	100	Jun.16 1998
Double Ed 6	14958	254610	25	May 27 1998
Double Ed 7	14957	254609	25	May 27 1998
Double Ed 8	14956	254608	25	May 27 1998
Double Ed 9-10	14944-945	254604-605	50	May 27 1998
Double Ed 11-12	14954-955	254606-607	50	May 27 1998
Double Ed 13-16	15462-465	254624-627	100	Oct.28 1998
			375 hectares	

1 Two-Post Mineral Claim located at the Hidden Creek Mine
registered owner : Travel Ventures Inc.

Claim Name	Old Tenure Record No.	Tenure	hectares	Expiry Date
Don 7 Fr.	19992	254804	25	Sep.13 1998

Additional Claims

additional claims agreement dated December 18, 1991

48 Crown-grants
registered owner of the subsurface rights : Moss Management Inc.
annual assessed property taxes due date : June 1

Lease Name	Lot No.	Lease Name	Lot No.
Amur Fr.	3350	John Bull	3876
Aria	1986	John Bull No.1	3877
Balsam	768	John Bull No.3	3878
Blue Jay	3874	Lakanian Fr.	1512
Blue Bird	3342	Long Shot	3352
Bonanza	1667	Missing Link	1138
Bonanza Fr.	3348	Moana	1670
Boulder	2338	Monarch	1526
Brenau Fr.	1674	Mountain Goat	2346
Cayuse	2229	Nabob Fr.	3589
Cedar	764	Nephin Fr.	3872
Clark	3869	North Star	1668
Commodore	3588	Princess Louise	1671
Crystal	1972-A	Quince	1984
Cypress	765	Regina	1985
Drum Lummon Fr.	3879	Rex	1983
Eagle	2347	Rob Roy	3871
Emerald	1672	St.Denis	3349
Emma	1669	Spruce	767
Emma Fr.	1673	Stark Fr.	2344
Ground Hog	2345	Starlight *	1528
Homestake No.1	1529	Sunset	2228
Iron Bug	3875	Vadso Fr.	3351
Jimm Fr.	3870		

Note:
Lot 1528 except Blocks 1+2 : Thomas McRostie registered owner in fee
Lot 1528 Blocks 1 + 2 : Niho Land & Cattle Co. Ltd. registered owner in fee

3 Crown grants
registered owner of subsurface rights : 331609 B.C. Ltd.
annual assessed property taxes due date : June 1

Lease Name	Lot No.
Red Fraction	1993
Redwing	1992
Red Jacket	1991

31 Two-Post Mineral Claims
registered owner : Moss Management Inc.

Claim Name	Old Tenure Record No.	Tenure	hectares	Expiry Date
AHW 1-6	39162-167	255379-384	150	Dec.16 1998
AHW 13-20	39174-181	255385-392	200	Dec.16 1998
AHW 22 Fr	39182	255393	25	Dec.16 1998
AHW 34 Fr, 36 Fr	39191, 39193	255394-395	50	Dec.16 1998
Don 1-6	19986-991	254798-803	150	Sep.13 1998

17 Modified Grid Claims
registered owner : Moss Management Inc.

Claim Name	Old Tenure Record No.	Tenure	Units	hectares	Expiry Date
Anyox Smelter	5763	251642	2	50	Jan.26 1998
Anyox Mill	5764	251643	10	250	Jan.26 1998
Anyox Town	5765	251644	15	375	Jan.26 1998
Ann 1	6243	251899	20	500	Jun.25 1998
Ann 2	6244	251900	8	200	Jun.25 1998
Ann 3	6245	251901	12	300	Jun.25 1998
Car 1	6485	252011	18	450	Oct.20 1998
Car 2	6486	252012	12	300	Oct.20 1998
Car 3	6487	252013	15	375	Oct.20 1998
Tauw 4	6498	252024	4	100	Oct.20 1998
Anza 1	6500	252026	16	400	Oct.20 1995
Anza 2	6501	252027	12	300	Oct.20 1995
Anza 4	6503	252029	2	50	Oct.20 1998
Anza 5	6504	252030	12	300	Oct.20 1995
Any 3	6507	252033	12	300	Oct.20 1998
Any 4	6508	252034	12	300	Oct.20 1998
Any 5	6509	252035	10	250	Oct.20 1998
			192	4,800 hectares	

15 Modified Grid Claims
registered owner : TVI Copper Inc.

Clash 1	325148	12	300	Apr.25 1995
Clash 2	325149	18	450	Apr.27 1995
Clash 3	325150	18	450	Apr.27 1995
Clash 4	325151	20	500	Apr.27 1995
Clash 5	325152	20	500	Apr.27 1995
Clash 6	325153	20	500	Apr.27 1995
Clash 7	325154	20	500	Apr.27 1995
Clash 8	325155	20	500	Apr.28 1995
Clash 9	325156	20	500	Apr.28 1995
Clash 10	325157	20	500	Apr.28 1995
Clash 11	325158	20	500	Apr.28 1995
Clash 12	325159	20	500	Apr.28 1995
Clash 13	325161	12	300	Apr.28 1995
Clash 14	325160	20	500	Apr.28 1995
Clash 15	325162	16	400	Apr.28 1995
		276	6,900 hectares	

The total area of two-post claims and Crown grants is included within the area given for the overlapping modified grid claims.

REGIONAL GEOLOGY

The Anyox area lies within the Boundary Ranges of the Coast Mountains of British Columbia. The general geology consists of Jurassic volcanic and sedimentary rock units preserved as roof pendants within the late Cretaceous to early Tertiary Coast Plutonic Complex which is in turn intruded by Oligocene or younger dykes. Contact metamorphism has elevated Jurassic units to lower greenschist facies. Structurally, the area has been cut by major strike-slip, normal, and thrust faults. Several phases of folding have deformed the Jurassic succession.

The most recent regional mapping of the area was done by Grove (1986) from which Figure 3 and the accompanying Table of Formations have been abstracted.

The oldest rock units mapped in the Anyox area are the pillow lavas, flows, volcanic breccia, and minor sediments belonging to the lower Jurassic Unuk River Formation. This formation is succeeded by andesitic to basaltic pillow lavas and broken pillow breccia belonging to the middle Jurassic Betty Creek Formation. The Betty Creek Formation is one of the principal host units of the Hidden Creek Mine at Anyox. Siltstone, greywacke, and sandstone units which overlie the Betty Creek have been assigned to the Middle Jurassic Salmon River Formation, the other host for massive sulphide deposits at Anyox.

This Jurassic succession was intruded in late Cretaceous to Eocene time by the Coast Pluton Complex and are preserved as roof pendants within this series of intrusives. The composition of these plutonic rocks consists primarily of granodiorite, quartz diorite, quartz monzonite, and minor granite.

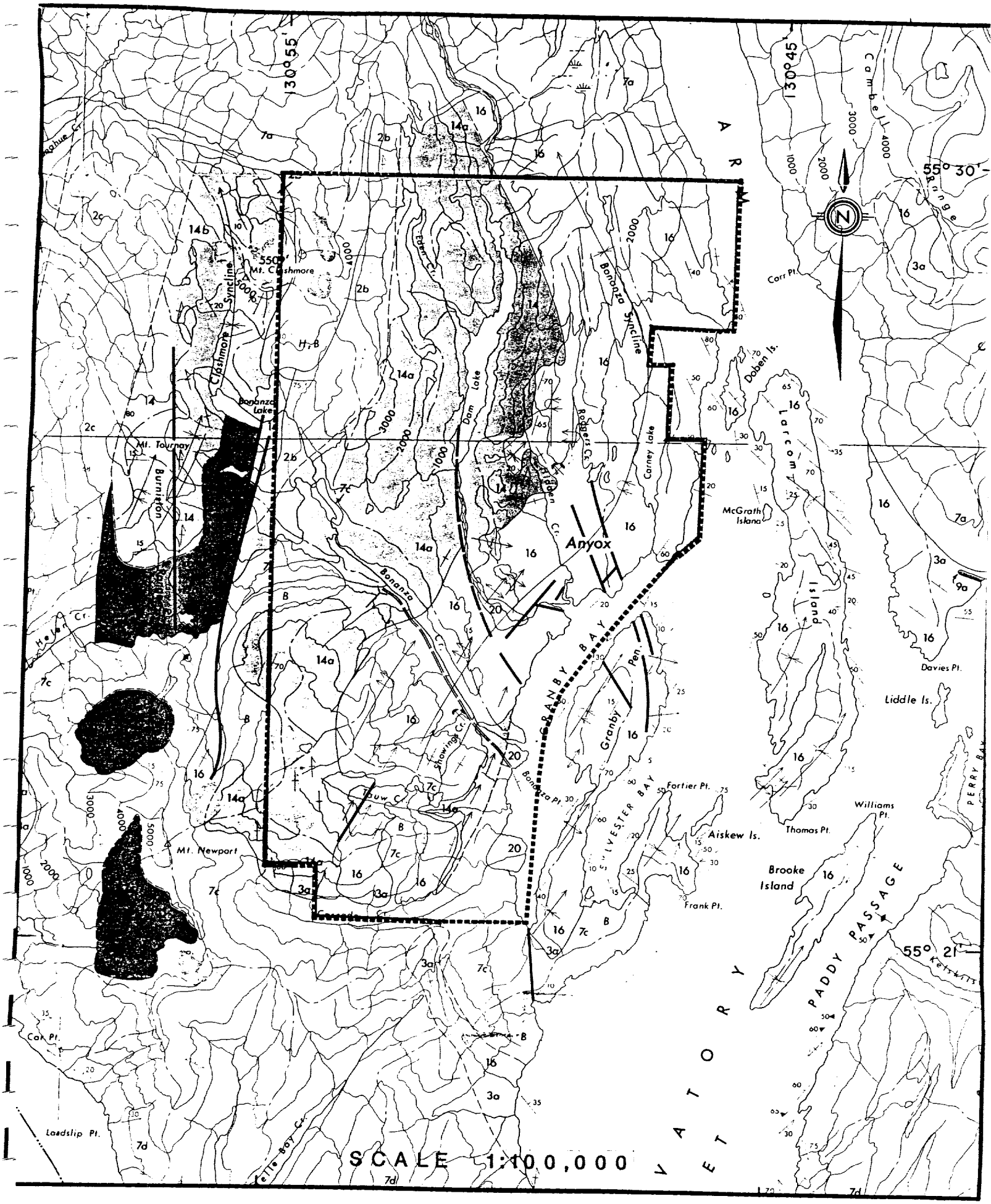
Oligocene and younger dykes and sills cut all the older rock units. The dykes and sills consist of diorite, quartz diorite, granodiorite, and gabbro.

Structurally, the area has been cut by numerous faults and deformed by multi-phased folding. Three types of faulting appear to be present in this region: strike-slip, normal, and thrust. Genetically, they are probably all interrelated. Major north to north-northeast trending right-lateral strike-slip faults are present. These faults are located primarily offshore in the elongate canals, arms, and passages which mark this region. Secondary right-lateral strike-slip faults splinter off the major structure at about 30°. One such fault is well documented along Falls Creek in the immediate Anyox area. Thrust faults are indicative of a compressional regime developed within crustal plates defined by strike-slip faults. Normal faulting represents late relaxation of this compressional regime.

The fold geometry of this region is dominated by large north trending asymmetric to overturned folds. Superimposed on these folds are minor east-west trending cross folds such as observed at the Hidden Creek Mine. There is probably a genetic relationship between thrust faulting and major folds in that at progressively higher levels, thrust faults pass into overturned folds which pass into asymmetric folds.

PROPERTY GEOLOGY

The Unuk River Formation units mapped on the property consist of tholeiitic basalt with minor sub-alkaline basalt. These units consist of pillow lavas, pillow breccia, flow breccia, and tuff. Minor chert and argillite beds are locally present and represent local breaks in the cycle of volcanism. These cherts are



REGIONAL GEOLOGY

FIG. 3

LEGEND

SEDIMENTARY AND VOLCANIC ROCKS

QUATERNARY

RECENT

CENOZOIC

20 — UNCONSOLIDATED DEPOSITS; RIVER FLOODPLAIN, ESTUARINE, RIVER CHANNEL AND TERRACES, ALLUVIAL FANS, DELTAS AND BEACHES, OUTWASH, GLACIAL LAKE SEDIMENTS, TILL, PEAT, LANDSLIDES, VOLCANIC ASH, HOTSPRING DEPOSITS

19 — BASALT FLOWS (a), CINDERS, ASH (b)

PLEISTOCENE AND RECENT

18 — BASALT FLOWS

JURASSIC

HAZELTON GROUP

UPPER JURASSIC

NASS FORMATION

17 — SILTSTONE, GREYWACKE, SANDSTONE, SOME CALCARENITE, ARGILLITE, CONGLOMERATE, MINOR LIMESTONE, MINOR COAL (INCLUDING EQUIVALENT SHALE, PHYLLITE, AND SCHIST)

MIDDLE JURASSIC

SALMON RIVER FORMATION

16 — SILTSTONE, GREYWACKE, SANDSTONE, SOME CALCARENITE, MINOR LIMESTONE, ARGILLITE, CONLOMERATE, LITTORAL DEPOSITS

15 — RHYOLITE, RHYOLITE BRECCIA, CRYSTAL AND LITHIC TUFF

BETTY CREEK FORMATION

14 — PILLOW LAVA, BROKEN PILLOW BRECCIA (a); ANDESITIC AND BASALTIC FLOWS (b)

13 — GREEN, RED, PURPLE, AND BLACK VOLCANIC BRECCIA, CONLOMGERATE, SANDSTONE, AND SILTSTONE (a); CRYSTAL AND LITHIC TUFF (b); SILTSTONE (c); MINOR CHERT AND LIMESTONE (INCLUDES SOME LAVA (+14)) (d)

LOWER JURASSIC

UNUK RIVER FORMATION

GREEN, RED, AND PURPLE VOLCANIC BRECCIA, CONGLOMERATE, SANDSTONE, AND SILTSTONE (a); CRYSTAL AND LITHIC TUFF (b); SANDSTONE (c); CONGLOMERATE (d); LIMESTONE (e); CHERT (f); MINOR COAL (g)

11 — PILLOW LAVA (a); VOLCANIC FLOWS (b)

MESOZOIC

TRIASSIC

UPPER TRIASSIC

TAKLA GROUP (?)

10 — SILTSTONE, SANDSTONE, CONGLOMERATE (a); VOLCANIC SILTSTONE, SANDSTONE, CONLOMGERATE (b); AND SOME BRECCIA (c); CRYSTAL AND LITHIC TUFF (d); LIMESTONE (e)

PLUTONIC ROCKS

OLIGOCENE AND YOUNGER

CENOZOIC

DYKES AND SILLS (SWARMS), DIORITE (a); QUARTZ DIORITE (b); GRANODIORITE (c); BASALT (d)

EOCENE (STOCKS, ETC.) AND OLDER

8 — QUARTZ DIORITE (a); GRANODIORITE (b); MONZONITE (c); QUARTZ MONZONITE (d); AUGITE DIORITE (e); FELDSPAR PORPHYRY (f)

7 — COAST PLUTONIC COMPLEX: GRANODIORITE (a); QUARTZ DIORITE (b); QUARTZ MONZONITE, SOME GRANITE (c); MIGMATITE – AGMATITE (d)

JURASSIC

MIDDLE JURASSIC AND YOUNGER ?

MESOZOIC

6 — GRANODIORITE (a); DIORITE (b); SYENODIORITE (c); MONZONITE (d); ALASKITE (e)

LOWER JURASSIC AND YOUNGER ?

DIORITE (a); SYENOGABBRO (b); SYENITE (c)

TRIASSIC

UPPER TRIASSIC AND YOUNGER ?

DIORITE (a); QUARTZ DIORITE (b); GRANODIORITE (c)

HORNBLENDE PREDOMINANT . . . . . H
BIOTITE PREDOMINANT . . . . . B

METAMORPHIC ROCKS

TERTIARY

3 — HORNFELS (a); PHYLLITE, SCHIST (b); SOME GNEISS (c)

JURASSIC

2 — HORNFELS (a); PHYLLITE, SEMI-SCHIST, SCHIST (b); GNEISS (c); CATACLASITE, MYLONITE (d); TACTITE (e)

TRIASSIC

1 — SCHIST (a); GNEISS (b); CATACLASITE, MYLONITE (c)

HORNBLENDE OR AMPHIBOLE DEVELOPED . . . . . H
BIOTITE DEVELOPED . . . . . B
POTASSIUM FELDSPAR DEVELOPED . . . . . K

AREA UNMAPPED

SYMBOLS

ADIT . . . . .
ANTICLINE (NORMAL, OVERTURNED) . . . . .
BEDDING (HORIZONTAL, INCLINED, VERTICAL, CONTORTED)
BOUNDARY MONUMENT . . . . . △
CONTOURS (INTERVAL 1,000 FEET) 5000
FAULT (DEFINED, APPROXIMATE) . . . . .
FAULT (THRUST) . . . . .
FAULT MOVEMENT (APPARENT) . . . . .
FOLD AXES, MINERAL LINEATION (HORIZONTAL, INCLINED)
FOSSIL LOCALITY . . . . . Ⓕ
GEOLOGICAL CONTACT (DEFINED, APPROXIMATE) . . . . .
GLACIAL STRIAE . . . . .
GRAVEL, SAND, OR MUD . . . . .
HEIGHT IN FEET ABOVE MEAN SEA LEVEL . . . . . •6234'
INTERNATIONAL BOUNDARY . . . . .
JOINT SYSTEM (INCLINED, VERTICAL) . . . . .
MARSH . . . . .
MINING PROPERTY . . . . .
RIDGE TOP . . . . .
SCHISTOSITY (INCLINED, VERTICAL) . . . . .
SYNCLINE (NORMAL, OVERTURNED) . . . . .
TUNNEL . . . . .
VOLCANIC CONE . . . . .

Compilation and geology by E. W. Grove, 1964 to 1970, with assistance by N. H. Haimila and R. V. Kirkam, 1966 and James T. Fyles, 1967
Geology of the Alice Arm area by N. C. Carter, 1964 to 1968.

KILOMETRES 0 10 KILOMETRES

TABLE 2

interpreted as exhalitive events and are closely tied to the development of volcanogenic massive sulphide deposits within the mafic volcanic succession.

The hiatus between final cessation of volcanism and the onset of sedimentation is locally marked by chert development, especially in the Hidden Creek Mine area where 30 to 75 m of chert has been observed. Again, there is a direct correlation between these exhalitive cherts and massive sulphide deposition. Locally, chert has been recrystallized leading to the development of secondary quartz veins.

The Betty Creek Formation overlying the mafic volcanics consist of a flysch sequence of deep-water fine-grained shale and siltstone with minor carbonate and coarse clastic units. These units are estimated to be about 700 m thick. Locally, these units have been metamorphosed to argillite, phyllite, and graphitic schist by metamorphism or hydrothermal alteration.

Granodiorite is the principal intrusive rock which is exposed on the Anyox property. Small stocks, dykes, and sills of gabbro are the oldest recognized small-scale intrusives. Other dykes and sills are composed of andesite, hornblendite, felsite, and lamprophyre.

Structurally, a major right-lateral strike-slip fault is projected to extend along the west side of Observatory Inlet across the base of Granby Peninsula through Granby Bay to Hastings Arm. This structure is inferred from both fold and fault geometry adjacent to the projected trace of this fault. Second-order strike-slip faults have been mapped. The best documented fault of this class is the Falls Creek Fault along which a 365 m right-lateral displacement has been mapped with a vertical displacement of 150 m. There appears to be a concentration of such faults within sedimentary rocks between the Hidden Creek Mine and Carney Lake.

Thrust faults are undoubtedly present on the property. The existence of these faults is surmised from the geometry of the major north-south trending folds. These folds change from asymmetric folds to overturned folds back to asymmetric folds along their axial traces. It is likely that, at depth, the volcanic rocks are overthrust towards the east. The overturned fold at the Hidden Creek Mine may well be due to overthrusting of a competent volcanic sheet over more ductile sedimentary rock units. Thrusting may also be present along the volcanic/metasedimentary contact in the southwestern part of the property. In this area, a number of dips have been mapped, indicating the sedimentary rock units have been overturned along the volcanic contact; i.e., sediments dip under the volcanics in clear violation of the law of superposition. East-west trending tear faults could be expected along the flanks of thrust sheets.

Normal faults trend predominantly toward either the northeast or northwest forming a conjugate shear set.

Major asymmetric to overturned folds trends toward the north-northeast. Smaller scale east-plunging cross folds intersect these major folds at nearly right angles. Genetically, these cross folds may represent either warping of thrust sheets or a later compressional event.

Pre-metamorphic hydrothermal alteration has affected to a variable degree the immediate area around all known mineral massive sulphide deposits in the Anyox area. Characteristically, these altered rock units contain chlorite, thin quartz veins, and weak disseminated sulphides. Sharp (1980) reported that "Microscopically, the altered basalt has minor to abundant chlorite, actinolite, pyrite, pyrrhotite, chalcopyrite, magnetite, extensively saussuritized plagioclase phenocrysts or grains, plus tiny quartz-albite veinlets." According to Grove (1986): "The Hidden Creek orebodies are enveloped in a thin film-like zone of quartz-sericite schist which varies in thickness from a few metres to tens of metres."

Sedimentary and volcanic rock in the Anyox area have been metamorphosed to lower to upper greenschist facies by regional metamorphism. In addition, contact metamorphism is present adjacent to later intrusive bodies. Cataclastic deformation has affected a broad zone within metasediments in the northwest part of the property. This has produced strongly foliated phyllite and schist in this band of metasediments.

HISTORY OF EXPLORATION

The Hidden Creek deposit was staked by prospectors in 1901 who in the same year sold the property to the Hidden Creek Copper Company. In 1910, the property was purchased by Granby Consolidated Mining, Smelting and Power Company. The mine was developed and the smelter was put into operation in 1914. Direct smelting ore was mined until 1925 when the mill was completed. After 1928, additional ore came from the Bonanza Mine via tram between the mine and smelter.

The mine closed on August 1, 1935, and was purchased by Cominco on October 25, 1935. All useable equipment was salvaged by Cominco, and transported to Trail, British Columbia.

The exploration work done by Granby Mining Co. was confined almost entirely to finding the extensions of the known orebodies and no attempts were made at area exploration. The Granby Mining Co.'s deep drilling, while apparently rather haphazard, was nevertheless quite extensive and there are few large areas adjacent to or below the known orebodies which have not been explored to some extent.

Exploration work has been carried on sporadically in the Anyox area since 1936 by Cominco and several different joint venture partners. Most of Cominco's work was completed in the general Hidden Creek Mine area between the Hidden Creek mine and Falls Creek. In addition, a substantial amount of work was done on the Double Ed and Eden properties, remote from the mine. Little exploration was done in the Bonanza and Redwing areas beyond a small amount of cursory mapping.

When Cominco acquired the Granby property, and after a brief examination, it was decided that the best chances for new ore lay outside the immediate mine area, at other points on or close to the contact. The 1937 surface drilling campaign was originally laid out to test the greenstone area west of the #3 orebody. This program, which consisted of 12,072 feet (3,680 m) of surface drilling in ten holes, intersected fair amounts of low-grade copper mineralization. In 1938, the upper parts of the mine were re-opened and 7,795.4 feet (2376 m) of underground drilling and 3,325.5 feet (1,014 m) of drifting and crosscutting on four levels was done.

The underground work showed a large block of chlorite schist, weakly and erratically mineralized with veinlets of chalcopyrite and pyrrhotite in the stringer zone of the #3 orebody. No continuity could be established for the occasional sections of slightly higher grade material, and the general average was far too low to be of any economic interest.

After a brief geological investigation in 1939 upon the completion of the exploration program above, it was recognized that the broad geological picture accepted up until that time was incorrect. The orebodies, rather than being contact replacement bodies around the margins of an intrusive greenstone mass, were structurally controlled deposits at or near an extrusive greenstone contact with younger

argillites. The possibility of the orebodies being explained in terms of folding and faulting was the new model for interpretation of the deposits.

Ventures Ltd. held a lease and option on the entire property from 1942 to 1944. During this period, a small amount of surface drilling was done in two areas. One area lay immediately west of the glory holes at Hidden Creek, while the other lay to the southwest of the mine where sulphide boulders are found. The Ventures engineer suggested that there were possibilities of 20,000,000 tons of 0.40% Cu present.

Another option on the Anyox power plant to B.C. Minerals & Resources Development Company was terminated in 1948.

A detailed geological study was undertaken spasmodically from 1950 to 1952 based on the geological concept of the importance of structure in controlling the ore zones. The Double Ed and Eden discoveries were made in 1952.

A comprehensive study was made of old Granby data by Cominco during this period. Some detailed mapping was done in the mine area and in the area extending southwesterly towards Falls Creek. Local areas near the contact were covered by an EM survey. A small amount of diamond drilling was done in two separate areas in 1952, one on an inferred favourable structure in the Cedar Quartz area, and the other on an inferred favourable structure in the Granby anomaly area. No significant sulphide mineralization was indicated by this drilling.

Exploration in 1953 was confined chiefly to detailed mapping and surface drilling on the Double Ed property. Mapping and a limited EM survey were completed on the Eden property. Some cursory mapping was done around the Bonanza Mine and the general Anyox area. About 4,000 feet (1,200 m) of drilling was completed at the Double Ed property with very encouraging results.

Exploration in 1954 consisted mainly of drilling and detailed geological work on the Double Ed and Eden properties. About 16,000 feet (4,900 m) of additional surface drilling was done on the Double Ed property and 4,000 feet (1,200 m) on the Eden.

Results of drilling on the Double Ed in 1954 were somewhat less encouraging than those of 1953. Copper grades were generally lower, but continuity of ore shoots was demonstrated over a vertical extent of about 1,000 feet (300 m). Drilling on the Eden indicate ore-grade material in the mineralized zone but the potential for substantial tonnage appeared very limited.

A program of EM surveying was carried out over broad sections of the area extending from the Hidden Creek Mine to Falls Creek and from Falls Creek towards the Bonanza Mine. This survey also covered the Double Ed area, the Eden area, and sections of the contact between the Double Ed and Redwing properties.

The EM survey indicated a number of apparently attractive anomalies, particularly in the area extending southwesterly from the Mine to Falls Creek. This survey did outline fairly well certain known orebodies, including the Eden, Double Ed, and the Hidden Creek Mine #7 orebody.

Cominco's claim holdings in 1954 covered the entire contact area between Hidden Creek and the Redwing property. The Redwing property was optioned in 1954, but after a small amount of mapping,

the option was dropped. An aerial photographic survey was completed with 1000 scale, 200 scale, and selected 100 scale topographic maps prepared.

In 1955, detailed mapping with some local EM surveying was done in the general mine area and along the contact belt extending southwesterly from the mine to Falls Creek. The purpose of this work in part was to try to correlate the 1954 EM anomalies with geological features.

The 1955 detailed geological mapping program brought out a picture of folding in the argillites which was assumed to reflect local favourable structures at the underlying argillite/greenstone contact. Correlation was shown in some cases between assumed favourable structures and EM anomalies. Mapping suggested that cross folding may be important in localizing orebodies.

In 1956, 11,740 feet (3,578 m) of drilling in 12 holes was done in four local areas selected as being the most favourable on the basis of the 1955 mapping and the EM survey. Areas drilled were the Cedar Quartz, the Granby anomaly, the Mayflower, and the Gamma area.

Drilling in the Cedar Quartz and Granby anomaly and Mayflower areas in a general way confirmed the structural interpretations but no significant mineralization was encountered. EM anomalies were attributed to the presence of graphite in the argillites. An exception was the drilling in the Gamma area which intersected weak sulphides in a broad strong north-south shear zone.

The drilling in the Cedar Quartz area was unsuccessful in testing the plunging greenstone at depth along an east-west trending cross fold. The failure to intersect the greenstone/sediment contact was attributed in part to the extreme deviation of drill holes.

The 1957 work was in part a follow-up of the 1956 program. The purpose of this program was to test by drilling the down-plunging extension of the Cedar Quartz fold where it would be involved with the inferred southerly extension of the Gamma shear zone. The calculated depth of the target zone was about 1,400 feet (427 m) and a vertical hole was drilled to test the zone of interest. One hole was abandoned at about 1,100 feet (335 m) owing to its extreme deviation from course. A second hole, from near the same collar position, was drilled to a depth of 1,825 feet (556 m) and did not intersect greenstone. The second hole also deviated a considerable amount from its planned trajectory.

During 1959 and 1960, a low-level adit and cross cut were driven to facilitate deep drilling of the Double Ed orebody. An exploration program consisting of 14,224 feet (4,335 m) of drilling in 33 holes was carried out early in 1960. This work firmed up but did not greatly increase the previous reserve calculations. Reserves stood at 1,350,000 tons of indicated and 825,000 tons of inferred ore grading 1.3% Cu for the Double Ed. The possibility of extending this orebody was not eliminated by the 1960 drilling program but was severely restricted. Reserves at the Double Ed property were deemed inadequate to support an independent operation but might be considered as an adjunct to a larger operation in the Anyox area.

In 1960, Cominco had the information on the Hidden Creek area reviewed. This review indicated the plausibility of a theory of ore control put forward in 1952, which indicated that shearing associated with overthrust faulting might be a secondary control in the mine area. Accordingly, drilling two deep holes along the projection of the Hidden Creek anticline and thrust were proposed, commencing 1,500 feet (457 m) north of the #5 orebody.

In 1961, two holes (totalling 4,913 feet/1500 m) were drilled respectively 1,500 and 2,000 feet (457 and 610 m) north of the #5 orebody. In 1963, a third hole (2,898 feet/883 m) was drilled from the same position as the second 1961 hole but at a steeper angle. These three holes intersected significant widths of siliceous alteration at the argillite/greenstone contact but little or no sulphide mineralization.

None of these holes intersected the contact along the favourable overturned portion of the easterly limb of the Hidden Creek anticline. A number of additional holes would be required to clarify the structural picture. Hole deviation in this area was a serious problem and none of the holes intersected the contact in the positions originally planned. Drilling in this area did not fully test the ideas as originally conceived. Detailed geological mapping was completed over the Bonanza Mine and the Redlight anomaly areas in 1967.

A study was completed on the leaching possibilities at the Hidden Creek Mine in 1973. A study of the Granby and Cominco records indicated 20 million tons of material in a contiguous block grading 0.46% Cu of which 11 million tons grading 0.43% Cu lies above the 150-foot level. They concluded that not enough copper was available for leaching or could be extracted economically from currently broken material in the Mine. However, the indicated unbroken reserves represent a substantial economic potential if the method of extraction can be determined.

Work in 1976 consisted of geological mapping and rock geochemistry in the vicinity of the Hidden Creek and Bonanza Mines. Similar exploration was also completed along a 10-mile section of the basalt/argillite contact away from the mine sites. Reconnaissance traverses were spaced 500 to 1,500 feet (150 to 457 m) apart. A total of 1,167 rock samples were collected. This program delineated 14 target areas for future exploration.

Ground magnetic surveys were run over two areas, one just west of the '2/3' ore pit to cover the basalt/argillite contact, and the other over Redlight showing.

In 1981, 5.5 line km of Induced Polarization and magnetometer surveys were completed immediately west of the Hidden Creek Mine. Consistently high chargeability values were detected over the entire survey area. Six zones of low resistivity were detected, coincident with local magnetic highs. 359 soil and 42 rock samples were collected from the grid area, yielding numerous anomalous copper values.

A total of 16 drill holes were completed in the vicinity of the Hidden Creek Mine in 1982 by the Cominco-Mitsui joint venture. This drilling led to the identification of several new mineralized zones under the #1 orebody. Erratic values, ranging from 0.4% to 2.0% Cu over drill lengths of between 6 m to 24 m were intersected in drill holes 82-4, -5, -6, and -16. Two mineralized intersections were obtained to the north of the old mine workings (i.e., 24.1 m grading 0.3% Cu in hole 82-8; and 6.1 m grading 2.5% Cu, 0.5% Zn, 100.4 g/t Ag, and 1.8 g/t Au in hole 82-9). Also in 1982, a helicopter-borne Questor INPUT EM survey was flown over the property.

Work by Mitsui included a review and compilation of the old data. In 1983, Wright Engineers Limited, working on behalf of Mitsui, estimated remaining ore reserves at Hidden Creek to be 77 million tonnes grading 0.55% Cu equivalent. There appeared to be some doubt as to the reliability of these ore reserves, and a decision was made by Cominco to computerize the available data and attempt to calculate a new reserve for the Hidden Creek deposit.

Commencing in September 1983, available diamond drill, geological, and assay data were computerized using Cominco's GeoRes program. Previously mined areas were outlined, digitized, and incorporated into the computer data file. From this work, a potential Mineralized Ore Reserve was calculated. Potential reserves for the Hidden Creek area, calculated to a maximum depth of -200 feet (-60 m) are estimated to be 50,000,000 tons grading 0.60% Cu using a peripheral cut-off grade of 0.2% Cu with a tonnage factor of 10.5 pounds per cubic foot (equivalent to a Sp. Gr. of approximately 3.1).

Less than one-third could be mined by open-pit methods with reasonable strip ratios. In the area of the '2/3' zone, there is approximately 8,000,000 tons of good grade material (approximately 0.70% Cu that may be amenable to open pitting. An additional 3-5 million tons of open-pittable material may be present in the hanging wall of the '1/5' zone.

A program of line cutting, geological mapping, and ground geophysics was undertaken in August and September of 1987, managed by Cominco and funded by Timothy Mt. Ltd. as joint venture partners. This program consisted of 70 km of line cutting along which geological mapping and geophysical surveying (UTEM 30.7 km; magnetometer 25.7 km) were completed. This program was focused on and around the Hidden Creek glory holes and the area of the North Hidden Creek target.

The program revealed numerous weak to moderate EM conductors and two very strong conductors. One of these strong conductors occurred southeast of the Hidden Creek #6 zone in an area where cherts (the host rock for some of the Hidden Creek deposits) cropped out along the valley of Hidden Creek and where several chalcopyrite-sphalerite surface showings had been located. Research revealed this area to have been a focus of both surface and shallow underground exploration by Granby with some discontinuous copper mineralization being encountered (the #8 deposit). No previous deep drilling was documented in this area.

The second very strong conductor showed a close spatial coincidence with the surface projection of the mineralized intersection in hole 82-9, the North Hidden Creek zone. This conductor extended for one km north of this intersection within an area of exposed hanging wall sediments.

As a consequence of the discovery of the two strong geophysical conductors associated with favourable geology, a program of drill testing was undertaken in October and November, 1987. A total of 1,517 m of NQ core was drilled in six holes. One hole (A87-1) tested the depth potential of the strong conductor and coincident showings southeast of the #6 glory hole (#8 zone). The other five holes (A87-2 to -6) tested in the vicinity of the 82-9 North Hidden Creek intersection and the northerly strike extension of this strong conductor.

The drilling did not succeed in extending the mineralized zones discovered in 1982. The UTEM anomaly was found to correspond to a barren graphitic shear zone; no significant mineralization was found near the #1, 5, or 6 zones.

In 1987, Cominco compiled sections and plans of the Hidden Creek deposits in order to analyze the potential for further ore at depth. This work focused mainly on the '1/5' orebody.

In 1988, a structural analysis of the Hidden Creek Mine area was completed. Four phases of deformation were identified, where the first one is the strongest and involves thrusting and strong asymmetric folding. Later phases created open superposed cross folds and normal fault displacements.

In addition, Cominco and Prospectors Airways Ltd. completed a program of line cutting, geological mapping, and diamond drilling. This program consisted of 8 km of grid north of the previous North Hidden Creek grid, and 6 km of grid around the Bonanza Creek and Redlight anomaly.

Detailed geological mapping was completed in four main areas, the Bonanza Mine, the Bonanza Creek South, the Upper Dam Lake, and the Rambler Quartz vein areas. A total of 3,656 m (11,992 feet) of diamond drilling in seven holes was completed at the North Hidden Creek, Bonanza, and Redlight areas. However, no significant mineralization was found.

A helicopter-borne magnetic/electromagnetic/VLF survey by Aerodat Ltd. was completed over the area for Cominco in 1988 using 200 m line spacing. The area around the Hidden Creek Mine was found to have the best INPUT anomalies.

In 1990, under a multi-party agreement, Cominco's interest in the Anyox project was sold to Moss Management Ltd., and Boston Financial Corporation (BFC) acquired the option of Prospectors Airways.

Glanville Management Ltd. was retained by BFC to review and update a Preliminary Economic Analysis of the Anyox project, first completed by Glanville in 1988, and to make appropriate recommendations.

They concluded that a substantial mineral inventory potentially amenable to open-pit mining was present, of which approximately 12 to 15 million tons is mineable at a stripping ratio of 2:1 and with a copper grade of 0.70% to 0.75%, with better than historical average grades of gold and zinc.

In 1992, Beacon Hill Consultants Ltd. completed a preliminary evaluation of the Hidden Creek Mine. This investigation indicated that an open pit mining operation with a conventional mill located adjacent to the open pit could be utilized to recover a portion of the remaining ore reserves from this mine. Beacon Hill concluded that the indicated mineable reserve was 26,700,000 tons grading 1.08% copper, 0.005 ounces of gold, and 0.30 ounces of silver per ton.

In the fall of 1992, Taiga Consultants Ltd. undertook an exploration program on the Anyox property on behalf of TVI Copper Inc. The objective of this exploration was to review existing copper occurrences with particular attention to occurrences located in the vicinity of the Hidden Creek Mine area.

Four grids (Gamma, Contact East, Contact West, Eden) were emplaced on the property. Geological mapping, lithogeochemical sampling, soil geochemical sampling, and geophysical (VLF-EM, magnetometer) surveying were completed over each of the grids. The focus of this exploration effort was to define targets for a proposed drilling program early in 1993.

The winter 1993 exploration program completed on behalf of TVI Copper Inc. consisted of both development and exploratory drilling. Pulse EM surveying was completed on 8 of the 10 exploration drill holes and along selected grid lines.

The development drilling consisted of 11 drill holes totalling 1,400.6 m (4,595 feet) designed to increase confidence in the indicated open-pit reserves as outlined by Beacon Hill Consultants Ltd., and to obtain samples for geochemical testing. The results from this drilling were inconclusive.

The exploration drilling consisted of 10 drill holes totalling 2,855.4 m (9,368 feet). Hole 93-E-1 tested the area down-rake of the #5 Zone. The other 9 holes tested a number of relatively shallow exploration targets located to the west of the Hidden Creek Mine.

Hole 93-E-1 was successful in penetrating the overturned limb of the box fold as postulated. The drill hole penetrated a wide alteration zone which appears similar to the alteration associated with the #4 orebody, and a 1.6 foot sulphide zone near the upper argillite/basalt contact. No mineralization or alteration was encountered in the area of the overturned limb.

Three of the remaining drill holes (93-E-6, -9, -15) tested alteration and known copper mineralization on the east side of the Gamma and Gamma East occurrences. This drilling intersected a wide zone containing minor to 0.5% chalcopyrite, the best intersection being 32 feet grading 0.19% Cu. The Pulse EM survey indicates the fracture-filling structure continues along strike and down dip. The drilling and geophysical data indicate these holes penetrated a stringer zone beneath a potential massive sulphide ore body. The other 6 holes (93-E-2 to -5, -7, -8) did not intersect any significant mineralization.

OCCURRENCES

Mines

Hidden Creek Mine. The Hidden Creek Mine (Figure 4) operated from 1914 to 1935 on ten levels, from 630 feet above sea level to 885 feet below sea level. There was no appreciable development below the -130 foot level. Prior to closing the operation in 1935, mining procedures were attempted which resulted in extensive damage to the mine system. Access is now restricted to surface exposures in the glory holes and to limited mine workings.

Total ore production was 24,010,235 tons averaging 1.57% Cu. The grade of ore mined at the end of operations was 1.05% Cu. Zinc was not recovered, the slag pile from the smelter averaged about 1% Zn and 0.2-0.4% Cu. On the basis of old Granby drilling (1910-1935), Cominco drilling in 1937 and Cominco/Mitsui drilling in 1982, large volumes of copper mineralized rock are known to occur below and peripheral to the ores mined out by Granby. In 1984, an inferred mineral potential of 50,000,000 tons of 0.6% Cu was calculated for the Hidden Creek deposits. Less than one-third of this inferred potential is mineable by open-pit methods with reasonable stripping ratios.

The presence of old glory holes and open stopes further complicates any open-pit mining plans and economics. The continuity of both significant sulphides with low-grade copper and the ore host rocks to depth, leaves open the possibility of higher grade copper lenses below the limits of previous development and exploration, i.e., about 1000-2000 feet (300-600 m) below surface. Eight massive cupriferous sulphide bodies comprise the Hidden Creek deposit. The most important of these (the #1, #4, #5, and #6 orebodies) are distributed over a strike length of 1.5 km and are known to depths in excess of 500 m. The previously exploited bodies vary in plunge from sub-vertical (the #6 zone) to moderately westward (the #1 and #5 zones).

The #1, #4, #5, and #6 orebodies are located at the interface between footwall basaltic flows and hanging wall turbiditic sedimentary rocks, and are intimately associated with cherty chemical sediments. The #2 and #3 orebodies are located to the west, stratigraphically below the #1, #4, and #5 zones, and are

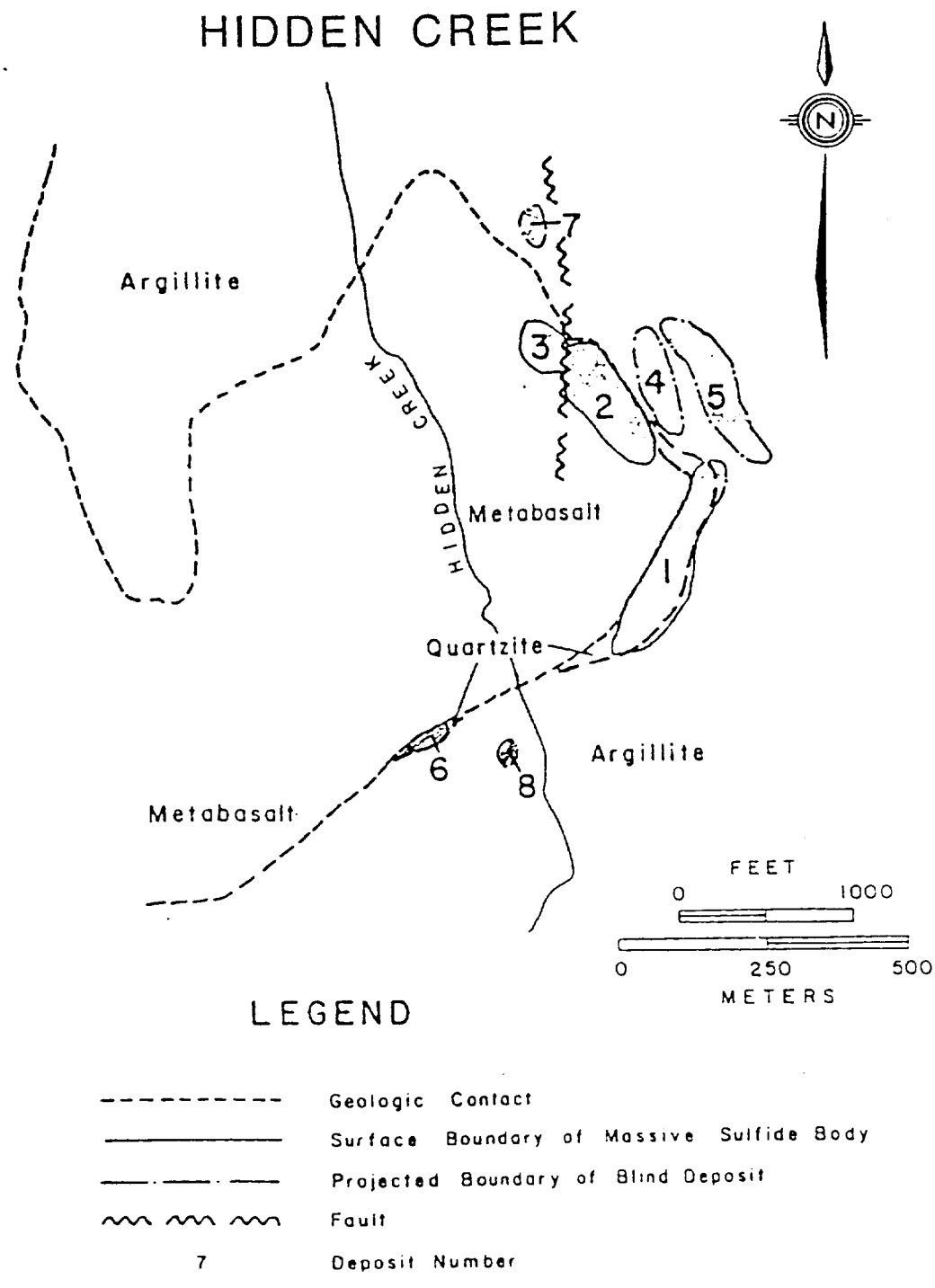


Figure 4 Location of massive sulfide deposits at Hidden Creek prior to mining. From SHARP (1980).

hosted by the 'footwall' volcanics. Zone 7, which has not been exploited, and Zone 8, which has had limited production, occur in 'hanging wall' turbiditic sedimentary rocks. The #7 zone is located 400 m north of orebodies #2 and #3, whereas the #8 zone is found in the general area between the #1 and #6 orebodies. The following tonnages and grades were produced from the #1 to #8 orebodies:

Body	Vertical Range	Tons Shipped	% Cu
1	750' to -535' level	9,898,538	1.548
2	800' to 150' level	6,921,586	1.480
3	700' to -130' level	3,192,505	1.144
4	700' to 530' level	463,632	1.117
5	800' to -130' level	2,922,900	2.267
6	500' to -130' level	535,345	2.192
8	300' to 150' level	9,945	.685
slide	surface	65,784	1.130
	TOTAL	24,010,235	1.567

The following excerpt from Hanson (1935) summarizes the eight sulphide bodies comprising the mine (note amphibolite is actually metabasalt):

> The #1 orebody was a large, lenticular mass of heavy sulphide extending 1200 feet down dip. Its greatest strike length on any one level was 1500 feet and its greatest width was 250 feet. The northern two-thirds of the body has a north strike and the southern third a southwest strike. The upper part of the body was vertical, but lower down it dipped west at about 70°, and near the bottom the angle of dip was 50°. Everywhere the attitude of the body conformed to the contact between the amphibolite and the sediments, and very closely if not exactly on strike and dip of the sediments. The upper part of the body was the best ore. Downwards the body ended in amphibolite into which it projected in the form of fairly blunt wedges of low-grade pyritic ore. The body lay mainly in the outer part of a silicified zone about 300 feet thick. Silicification of the walls is strong below the level of commercial ore. The bounding silicified sediments consist mainly of quartz but contain some sericite, chlorite, biotite, and sulphides. The amphibolite is also somewhat silicified and consists of quartz, sericite, actinolite, chlorite, epidote, biotite, and sulphides. The #1 orebody was made up of several closely spaced bodies separated by thin bands of silicified argillite or amphibolite.
>
> In order of abundance, the ore minerals are pyrite, pyrrhotite, chalcopyrite, and magnetite. Pyrrhotite was most abundant in the upper part of the body. Along the amphibolite hanging wall, curves or rolls in the shearing were the loci of small ore shoots containing more than the ordinary amount of chalcopyrite. Along the footwall side, due to the presence of many narrow discontinuous ribbons of argillite, the ore was commonly somewhat leaner than elsewhere.
>
> Orebodies #2 and #3 lie within the amphibolite a short distance east of the amphibolite/argillite contact. They lie in a shear zone striking north and dipping steeply west. Both are steeply inclined. #3 crops out at surface where its eastern boundary is a fault dipping at a high angle to the east. Underground, the #3 body (because it is inclined to the west) departs from the fault. It is up to 175 feet wide, 600 feet long, and extends to a depth of 900 feet. The #2 orebody lies east of the easterly dipping fault and extends down to the fault against which it ends. The #2 orebody is up to 175 feet wide and is about 600 feet long. It is the upper part of the #3 orebody, cut off and downthrown by the fault. The movement along the fault has amounted to about 300 feet vertically and 200 feet in a southerly direction.
>
> Wallrock alteration in the case of the #2 and #3 orebodies consists almost entirely of the development of chlorite, and the amount of alteration is very slight compared with that

connected with orebodies lying along the contact. The ore of #2 and #3 bodies is characteristically a dark greenstone schist ribboned with sulphide bands and lenses lying parallel to the shearing. The ore minerals in order of abundance are pyrrhotite, chalcopyrite, pyrite, and magnetite. The ore averages 2%-3% copper and is of higher grade than the ore of the #1 orebody. Magnetite is more plentiful than in the orebodies at the contact and makes up about 3% of the ore.

The #4 orebody was discovered by diamond drilling. The body was 100 feet thick and extended 500 feet down dip. Its maximum length along the levels was 600 feet. It lay along the contact with a broad bulge at the top and tapered to a thin wedge at the bottom where it ended in silicified amphibolite. The dip at the top is 10° to 60°E under the argillite roof. The wallrocks are strongly silicified, and alteration of rock is as intense where the orebody is narrow as where it is wide, as at the top. The orebody consisted of sulphide like the #1 orebody. Pyrite and pyrrhotite were about equally abundant and were much more plentiful than chalcopyrite. Shoots of pure pyrrhotite occurred on the upper side of the body at the greenstone/argillite contact.

The #5 orebody was discovered by diamond drilling. It was 180 feet wide and extended 700 feet down dip. Its maximum length along the mine levels was 500 feet. It lay along the contact between amphibolite and argillite, and the main part was situated where the dip of the argillites changes. The upper part of the body dips east, the lower part dips west, and the intervening greater part is vertical. At its north end, the orebody splits in two, the eastern part extending parallel to the bedding into slightly silicified argillite. Below, the body enters amphibolite and by a decrease in the chalcopyrite content grades into a large pyritic body. The ore is much like that of the #4 and #1 bodies, being heavy sulphide in which pyrrhotite is common in the upper part but in which pyrite and pyrrhotite are both plentiful. The amphibolite and argillite of the wallrock are intensely silicified.

The #6 orebody lies along the contact and in the southern part of the favourable structure. It has a maximum width of 70 feet, a depth down dip of 300 feet, and a length along the levels of 500 feet. The body strikes northeast and is vertical, but at a depth of 150 feet turns somewhat and enters sheared amphibolite to the northwest. It ends downward at a fault dipping 45°W. Silicification of the wallrocks is strong where the body lies along the contact but is not present around the ore where it lies in amphibolite, the wallrock alteration in those parts having resulted in the formation of chlorite. The ore is of the usual heavy sulphide contact type except in that part of the body lying in amphibolite where it consists of a greenstone ribboned with bands and lenses of sulphides.

The #7 orebody is of the contact type and lies north of the #4 body. It has not yet been mined, but appears to be much smaller than the others nearby.

The #8 orebody is of the contact type and lies just east of the #6 body. It appears to be entirely composed of uncommercial ore.

According to Bancroft (1918), zincblende occurs as small high-grade pockets within the massive orebodies. The #5 orebody reportedly carried higher values in precious metals and zinc than the other orebodies, the zinc content probably grading between 1% and 2%. The #7 orebody is known only from five drill holes, indicating a tonnage of 150,000 tons grading 0.46% Cu.

The #8 orebody was partially tested by Granby with underground work from the shaft and was also drilled from surface. Ore-grade copper over narrow widths was outlined. Electromagnetic work by Cominco indicated two good conductors in this area. The westerly conductor, near the #6 orebody, closely reflects the known mineralization. The easterly conductor extends into the southwest corner of the #1

orebody. It is a persistent anomaly but no mineralization is known in its vicinity. Neither of these conductors were drilled by Cominco.

Bonanza Mine. The Bonanza Mine (Figure 5), situated 2 miles south of Anyox, operated from 1929 to 1935, producing 714,192 tons averaging 2.51% Cu. The ore was shipped by aerial tram to Anyox. South of the creek, 100% of the ore was removed, leaving only the dykes for pillars, using an open stope method. North of the creek, the ore was mined until it pinched and turned downwards at the metabasalt/argillite contact. At closure, 11,708 tons of 1.76% Cu, 0.0047 oz/ton Au, and 0.40 oz/ton Ag were estimated to remain in the Bonanza Mine.

The Bonanza deposit consists of a flattened pipe-like lens severed by the creek and terminated at the northerly end by a fairly steep normal fault which has apparently dropped any extension of the orebody to greater depths. It plunges at a shallow angle to the north below the pillow lava/siltstone contact near the axis of the Hidden Creek syncline.

The orebody had a strike length of 750 m, a thickness of up to 40 m, and a width of up to 120 m. The deposit is cut by several dyke swarms and intruded by Tertiary intrusives near the north end. The northern limit of the Bonanza deposit was a fault, leaving open the possibility for further ore north of the fault offset. Movement of this fault is uncertain; however, according to Sharp (1980), the fault may have a minimum displacement of 300 m vertically.

The high (150 m) and very steep slopes on the north side of Bonanza Creek render impossible shallow surface drill testing of the northern extension of the Bonanza deposit beyond the fault.

Deposits

Double Ed ore deposits. The Double Ed deposits, discovered by prospecting in 1952, were tested by 21,000 feet of surface diamond drilling (25 holes) in 1953 and 1954; and by adit cross cut and 14,224 feet of underground drilling (33 holes) in 1959 and 1960. The deposits consist of two zones, which combined show a drill-indicated resource of 1,355,000 tons of 1.3% Cu and 0.6% Zn, and a drill-inferred resource of 825,000 tons of 1.3% Cu and 0.6% Zn. The zones remain open to depth with scope for further limited tonnage of similar grade.

The Double Ed Cu/Zn deposits consist of massive to disseminated cupriferous sulphides enclosed in metabasaltic rocks. The massive sulphide bodies form layers and lenses which are intercalated with altered basaltic and sedimentary rocks which were slightly deformed probably during the regional tectonic episode. The mineralized strata are conformable with their metavolcanic host rocks, hence form a stratabound and a stratiform deposit.

The ore zones are closely associated with schistose structures developed locally within the volcanic rocks and are confined to the footwall side of a prominent east-west fault. Drilling indicates two distinct ore zones which are designated at the #1 and #2 orebodies. The #1 orebody is fairly well defined as a single unit by surface and drill hole data. The #2 orebody consists of two distinct parts: an upper northerly striking part which may in reality consist of a series of discontinuous lenses; and a lower part apparently continuous in itself but striking northeasterly. All ore zones dip steeply to the west or northwest and rake vertically. A geological plan at the 500 level suggests that the #1 and #2 orebodies occupy opposite limbs of a steeply plunging fold.

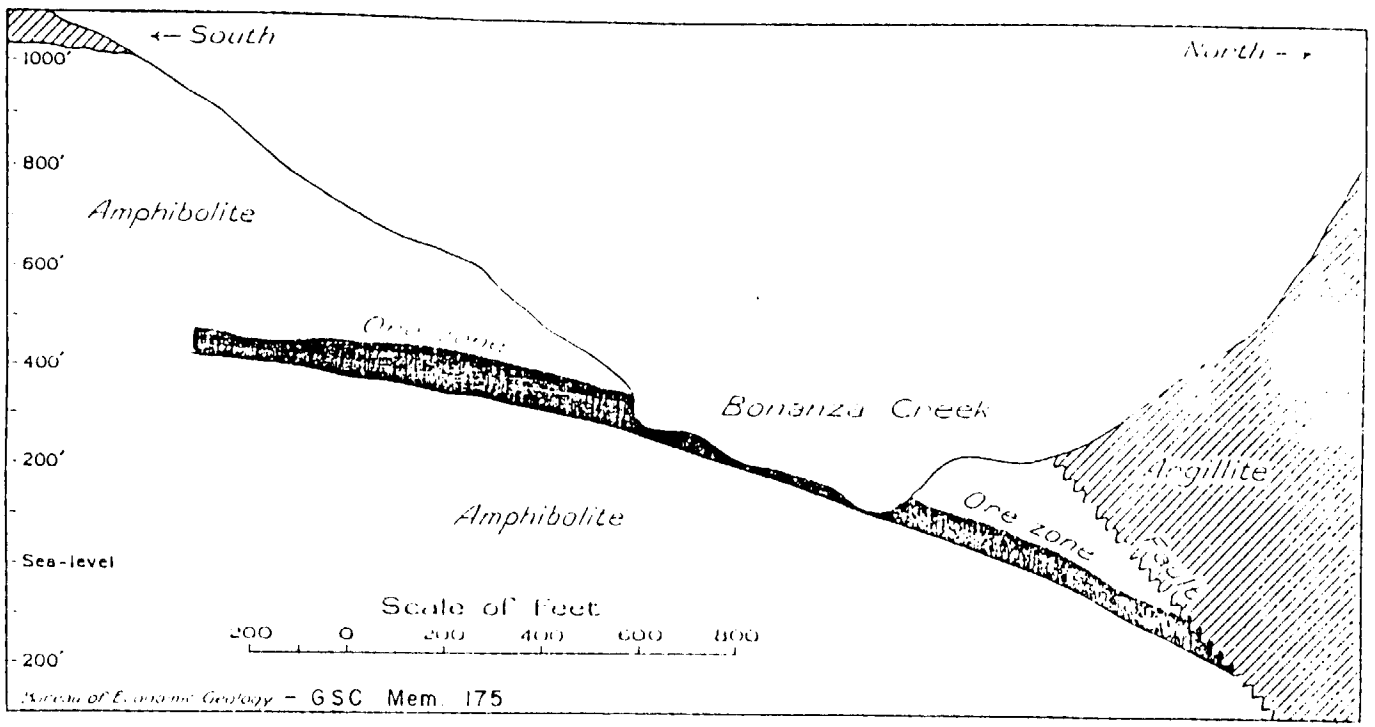


Figure 5 Vertical section through the Bonanza ore zone.

The #1 orebody, which has considerable variation in grade, is continuous from surface at 1500 feet to an elevation of 200 feet, a total range of 1300 feet. The #2 orebody is interpreted as being made up of two zones, an upper zone which is continuous from surface at 1650 feet to an elevation of 1100 feet, and a lower zone which extends from an elevation of 800 feet to a tested elevation of 300 feet.

Both zones are confined to the footwall side of the Main Fault located towards the north. The upper portions of both ore zones terminate abruptly at this fault. Although the position of the fault at depth can only be inferred, the underground drilling indicates that the ore, again confined to the footwall of the fault, does not extend to it.

Eden deposit. The Eden deposit, located 5 miles northwest of Anyox, was discovered by prospecting in 1952. Two distinct subparallel lenses of sulphide mineralization occur localized within a shear zone in basalt. In 1954, 4,182 feet of diamond drilling indicated a resource of 175,000 tons of 1.3% Cu and 1.9% Zn in these two zones with negligible possibilities for extension. The lenses are stratigraphically about 50 feet apart.

Lower Lens	135,000 tons	1.3% Cu	1.3% Zn	29 feet thick
Upper Lens	40,000 tons	1.9% Cu	2.9% Zn	17 feet thick

Redwing deposit. The Redwing deposit (Figure 6) was first located in 1909 by Joseph McGrath. The geological setting of the Redwing deposit is very similar to that of the Double Ed and the Bonanza zones in that it lies in quartz-biotite actinolite-chlorite schists 100 to 200 m below the basalt/sediment contact. The Redwing ore zones were explored by a 120-foot adit and three underground holes in 1911. In 1964, a further three holes were drilled from the old adit, while in 1965, a lower adit 184 feet long was driven and five holes totalling 570 feet were drilled from it. Two shoots of massive sulphide are currently defined within a schistose unit containing lower values of disseminated sulphides. The pipe-like shoots are 10 to 25 feet wide, 50 feet long, and are traceable up and down plunge for 150 feet between the adits.

The small size of the shoots in very precipitous terrain has resulted in a lack of exploration to date despite the very prospective geology. The average grade of the massive sulphides is between 1.5% and 2.5% Cu with a copper:silver ratio of 1:1 and gold values averaging between 0.02 and 0.05 oz/ton. Zinc values are not always assayed but appear to be between 1.5% and 4.0%.

The estimated reserves at the Redwing deposit are 181,440 tonnes grading approximately 2% Cu with significant precious metals and zinc values (0.035 oz/ton Au, 2.5 oz/ton Ag, 2.7% Zn) (*George Cross News Letter*, March 27, 1967).

Showings

Sax Showing. Over 1% copper occurs in a 3-foot wide bed. Vertical-loop EM covered the Sax showing area but no conductors were located.

North Hidden Creek Showing. The North Hidden Creek showing is located 1000 feet north of the Hidden Creek Mine and consists of two massive sulphide intersections obtained in 1982, both of which are in an area not previously explored by diamond drilling. These intersections occur above the basalt/argillite contact in hanging wall sedimentary rock units not previously recognized as prospective for massive sulphides on this property. The best intersection was 20 feet of 2.5% Cu, 0.5% Zn, 0.05 oz/ton Au, and 2.9 oz/ton Ag (Hole 82-9). This intersection is just south of a large hanging wall quartz veined zone that is similar to that seen in the Hidden Creek Mine area.

REDWING

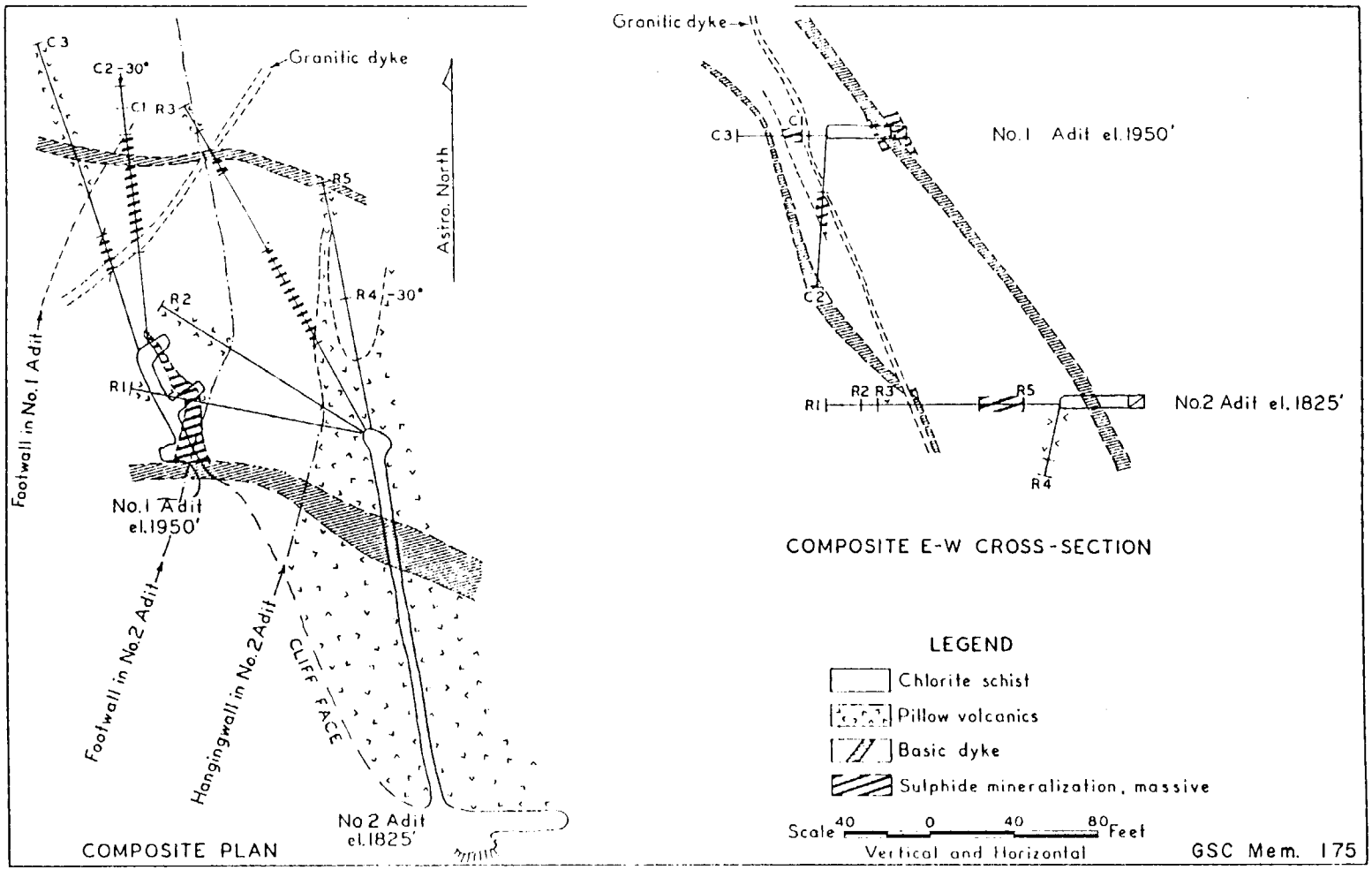


Figure 6 Canusa Mines Limited. Plan and section of the Redwing property.

A UTEM survey completed in 1987 revealed a very strong conductor showing a close spatial coincidence with the surface projection of the mineralized intersection in DDH 82-9. In 1987-88, six more drill holes were completed in this area but failed to intersect mineralization.

Occurrences

Gamma area. Weak EM anomalies occur in an area of sheared metabasalt where surface cuts and previous drilling showed minor sulphides. Granby's drilling, confined to a very limited area, intersected 1% Cu over 15- to 30-foot intervals. Drilling in 1956 intersected wide widths of low-grade mineralization. Continuity of intersections could not be established. Average grade was estimated at 0.2% Cu.

West Shear Zone. The potentially favourable sheared area between Hidden Creek and the Gamma showing has remained virtually untested. Pods and small lenses of sulphide mineralization occur on the surface in well sheared and somewhat contorted metabasalt. Seven surface holes were drilled by Granby on the Gamma showing immediately to the east of the western argillite salient. This drilling indicated a considerable amount of low-grade and some 1.5%-2.0% copper-bearing material. Surface drilling was carried out by Cominco in 1938 and 1939 and by Ventures in 1942 to the west and southwest of the #3 orebody. This drilling indicated a generally low-grade but wide mineralized shear which was considered in part to be a new zone. Recent electromagnetic work indicates the presence of conducting material in the vicinity of the old Granby drilling area. Although electromagnetic anomalies are common in the Anyox area, in most cases they have been confined to the argillites and immediate contact zone. Within the metabasalt, however, no significant anomalies have occurred other than those associated with sulphide bodies, such as the Double Ed and Eden deposits. This fact strengthens the possibility of an ore occurrence in the West Shear Zone.

N.W. Bonanza. The N.W. Bonanza target is an extension of the mineralization from the Bonanza Mine, located immediately north of the 200-foot level adit. Here, Granby drilling indicates a northward trending, shallowly dipping trough of biotitic pyroclastics that carries 1.2% copper. This trough is at least 200 feet wide (similar to the main mine), about 16 feet thick, and is open to the north. A 7-foot thick horizon of bedded pyrite and sphalerite forms the top of the Bonanza deposit, suggesting possibilities for significant zinc values not recorded in production figures for this deposit.

Emma / Homestake. Metabasalt boulders up to one metre in diameter containing copper ore are reported from the Homestake group of claims (Hanson, 1935) (MINFILE occurrence #244).

Geological/Geophysical Targets

This section describes previously defined geological/geophysical target areas developed by Granby, Cominco and other past property holders in the Anyox area.

Granby Anomaly area (also referred to as the Contact Anomaly area). Geophysical work by Granby (Lundberg), Whitmore (1952), and Heddle (1954) showed two parallel anomalies in this area. Two vertical holes, drilled in 1952 directly over the indicated position of the northerly conductor, intersected the underlying argillite/metabasalt contact but no significant sulphide mineralization. The favourable looking structure was again tested by one hole (C-6) in 1956. It verified the structure but did not intersect any mineralization or accompanying alteration. The electromagnetic anomalies were thought to be due to graphite.

Mayflower area. Drilling in 1956 tested an EM anomaly in argillite which was felt to reflect an underlying metabasalt/argillite contact. The contact was encountered but no mineralization found.

Cedar Quartz area. The Cedar Quartz area is located 2,600 feet southwest of the Hidden Creek Mine and shows an east-plunging anticlinal feature with associated footwall and hanging wall alteration zones that are similar to the Hidden Creek Mine area. In addition, Cu and S rock geochemical anomalies in the hosting chert unit and an untested EM conductor (2,500 feet long), along the metabasalt/argillite contact, are of interest. The EM conductor has not been tested by drilling and in places the overburden is highly limonitic, indicating the presence of massive sulphides. Two holes drilled in 1952 tested the contact zone on the crest and north limb of the fold a short distance east of the surface trace. Neither hole intersected significant sulphide mineralization but did indicate the attitude of the plunging structure. Drilling by Cominco in 1956 was done to intersect the main contact several hundred feet and 1100 feet (C-5) down-plunge of the anticlinal structure. Results were discouraging; however, the chert in hole C-5 showed possibly anomalous and anomalous copper and zinc values.

Bonanza Extension area. The Bonanza ore zone lies within a biotite-chlorite-actinolite-quartz schist unit some 100 m below the metabasalt/sediment contact. The schist is exposed for 1,250 feet in Bonanza Creek with some sulphides apparent throughout; however, the ore zone proper occurs as a 250-foot wide zone in the middle of the schist exposure. The orebody pinches out to the south and is faulted off to the north. The high (150 m) and very steep slopes on the north side of Bonanza Creek render impossible shallow surface drill tests for the northern extension of the Bonanza beyond the fault. Drilling in 1988 attempted to reach the Bonanza Mine horizon within the basalt on the north side of the Bonanza Fault. The results were unsatisfactory since the metabasalt/sediment contact was not reached after drilling 718.5 m of sediment.

Redlight area. The Redlight anomaly is located 4500 feet north of the Bonanza Mine. Here, quartz veinlets and veins (containing disseminated pyrrhotite, pyrite, sphalerite, and chalcopyrite) occur in an area of bleached argillite about 2000 x 1700 feet. These quartz veinlets are similar to those seen in the hanging wall argillites at the Hidden Creek Mine and may represent a leakage halo from massive sulphides at depth. A ground magnetic survey completed in 1976 did not delineate any magnetic zones. The survey did not provide supporting evidence for a domal structural feature that was postulated to bring the favourable metabasalt/argillite contact close to the surface.

Drilling in 1988 intersected sediments and intrusions, the sediments generally folded with varying but usually intense degrees of silica alteration, quartz veining, bleaching, and calcite-flooded bands. The metabasalt/sediment contact was not reached after drilling 871 m of sediments. The alteration anomaly appears likely to be related to granitic rocks of the area, since most granite/argillite contacts are bleached in the same way as in the alteration anomaly area.

Contact Anomaly area (east-west conductor east of Falls Creek). A strong EM anomaly occurs along the inferred position of the metabasalt/sediment contact between the Cedar Quartz showing and Lower Dam Lake. Owing to the lack of outcrop, no interpretation of its possible relationship to structure can be made. The anomaly is cut off sharply at the lake by faulting and does not extend into the area underlain by argillite on the west side. The anomaly is again picked up toward the north along the displaced extension of the contact on the west side of the lake. The contact and related anomaly have been displaced 3,000 feet to the north by the Falls Creek Fault. The anomaly here can be traced southwest along the general position of the contact for about 1,600 feet. The contact is intermittently exposed on the west side of the lake. No detailed mapping has been completed as yet. Very minor amounts of sulphide mineralization occur along the contact zone but no conductive concentrations were observed. The usual

structural complexities of the contact zone can be seen in the argillites. The general contact appears to be overturned with the sediments dipping under the volcanics. This conductor may be due to graphitic material in the argillite or massive sulphides at or near the contact. Unlike most anomalies related to graphitic argillite, this one is very persistent and the indicated position did not shift when tested from a number of transmitter positions. Accordingly, this anomaly is thought to have somewhat more merit than the majority of the others. No surface indications of mineralization are revealed along the surface trace of the conductor; however, the contact is poorly exposed.

Bonanza South 1 area. The Bonanza South 1 target is found 3,500 feet south of the Bonanza Mine. Geological mapping has shown a red biotitic tuff unit striking 020° and dipping about 15°W that contains pyrite, pyrrhotite, and chalcopyrite (about 1200 ppm copper). Trace zinc and lead values are anomalous and compare favourably to the values found in the peripheral parts of the Bonanza Mine. The strike length of the biotitic horizon and its true thickness are obscured by overburden and talus. It is possible that this horizon may correlate with the mineralized horizon at the south end of the Bonanza Mine, which thins to less than 10 feet thick (still with some +1% copper) but does not die out.

Hidden Creek 1 area. The Hidden Creek 1 target occurs along the basalt/argillite contact about 1000 feet west of the '2/3' pit. Here the footwall basalts are highly chloritized, veined by quartz, and carry widespread pyrite, pyrrhotite, and chalcopyrite. Rock geochemical values are strongly anomalous for copper with spotty lead and zinc anomalies. The chert unit is at least 8 feet thick and contains pyrite, pyrrhotite, chalcopyrite (960 ppm copper), and red biotite. Hanging wall argillites are veined by quartz that contain disseminated pyrite and chalcopyrite. This target exhibits all the features of alteration and geochemistry that are indicative of mineralization in the Hidden Creek Mine area. Sufficient room exists for a '1/5' deposit (11 millions tons of 1.9% copper). It appears that no Granby or Cominco holes have previously tested this area.

Hidden Creek 2 area. The Hidden Creek 2 area is located along the west side of the '2/3' pit. Drilling and underground work by Cominco between 1936 and 1938 indicated 20 million tons of low-grade copper mineralization (0.46% copper) in a steeply dipping zone. This mineralization is open to depth and along strike to the south. It is intriguing that within the low-grade zone is a higher grade area (about 1% copper) that offers a potential of greater than 5 million tons if the zone shows good continuity with depth. This zone may be continuous with the 1% copper intersections obtained from the Gamma area (1000 feet to the south-southeast) in 1956.

Hidden Creek 3 area. The Hidden Creek 3 target is located 2,500 feet north-northeast of the Hidden Creek Mine. Drilling in 1961 and 1963 (holes C-19, 20, 21) by Cominco intersected the basalt/argillite contact but failed to encounter significant mineralization; however, an examination of the logs and sampling of the cherty sediments at the contact in C-21 show some interesting trends. The thickness of the cherty and basaltic pyroclastic horizon is apparently similar in all three holes but only in hole C-21 is sericite abundant. Geological mapping and major element geochemistry at the Hidden Creek Mine has indicated that sericite in cherts is only abundant near bedded massive sulphides (i.e., less than 1,000 feet from significant mineralization). The trace metal content from the cherty horizon in hole C-21 is anomalous for copper and lead (same as the Hidden Creek Mine area), and indeed, some chalcopyrite has been identified. No similar trace metal data exists for holes C-19 and C-20. The footwall basalts in holes C-19 and C-20 show minor quartz veining and biotite, while hole C-21 shows abundant quartz veining and biotite for at least 400 feet into the footwall basalts. All the above data point to a dying of the favourable features northward from the Hidden Creek Mine with a renewal in the C-21 area, perhaps a new vent area is indicated.

Mac 1 area. The Mac 1 area is located 9,000 to 10,000 feet north of the Double Ed deposit. Here chloritized basaltic pyroclastics (often with interbedded chert) contain widespread disseminated chalcopyrite, pyrrhotite, and pyrite. These units strike to the northeast (dip 50°W), and are from 30 to 100 feet thick. Locally, +1% copper occurs in a 3-foot wide bed at the Sax showing and in a 6-inch bed 3500 feet to the north of the Sax showing. Vertical-loop EM covered the Sax showing area but no conductors were located. Rock geochemical copper values in cherts and basaltic pyroclastics north of the Sax mineralization show strong anomalies but the favourable association of lead and zinc anomalies is lacking. Nevertheless, it is still recommended that these horizons north to the Eden showing be examined and mapped, since Grove (1986) has reported massive cupriferous sulphide boulders in this area that are not like those found at the Eden property. This indicates a more local source of the boulder may be found in the Mac 1 area.

Mac 3 area. The Mac 3 target is located 4,000 feet north-northeast of the Double Ed deposit. Here the main contact is tightly folded with footwall basalts showing possibly anomalous copper values which are similar to those found in the peripheral areas of the Hidden Creek Mine. Alteration is patchy in the basalts and include weak quartz veining and chloritization. Basaltic pyroclastics are present and consist of tuffs and agglomerates with pods, lenses, and layers of chert. Minor amounts of pyrrhotite, pyrite, and chalcopyrite occur in both the cherts and basaltic pyroclastics, and account for the possibly anomalous copper values (no lead or zinc anomalies in the rocks). No EM surveys have been done on this target. It is clear that many features of rock type, alteration, and rock geochemistry occurring at this target that are reminiscent of the peripheral areas of the Hidden Creek Mine.

Bonanza South 2 area. The Bonanza South 2 target is located 3,000 feet south of the Bonanza Mine. Here anomalous lead values are found in an area 1,000 x 500 feet of unaltered pillow basalts (copper and zinc values are background). This may reflect a mineralized horizon at depth.

Bonanza South 3 area. The Bonanza South 3 area is located 4,000 feet south-southeast of the Bonanza Mine. Cherts and basaltic pyroclastics along the basalt/argillite contact in this area are anomalous for copper; however, they contain no cherty material between pillows or anomalous copper values have been identified thus far.

Bonanza South 4 area. The Bonanza South 4 target occurs along the basalt/argillite contact, 2,000' south of the Bonanza Mine. Cherts in this area are anomalous for copper, but the footwall basalts are unaltered and contain no rock anomalies for copper. It is interesting that this area is 300 feet stratigraphically above the south end of the Bonanza Mine and the possibility exists that the anomalous copper values represent mobilization of copper from the mine. However, a dispersion halo from a mineralized centre under the Bonanza syncline cannot be ruled out.

Double Ed South area. The Double Ed South target is located at the basalt/argillite contact, 1,500' southwest of the Double Ed deposit. Of interest is a basaltic pyroclastic unit (500 x 500 feet) containing fragments of basalt 9 x 2 inches with a few scattered anomalous copper values. These rocks are gossaned (few percent pyrite and pyrrhotite), and weakly chloritized. Overlying cherts contain background contents of copper, lead, and zinc; however, the basalts below the pyroclastic unit contains quartz veins with minor amounts of chalcopyrite (700 ppm copper). This target is of marginal interest; however, it does emphasize the need for more mapping along the basalt/argillite contact southward to the Redwing deposit.

Double Ed West area. The main feature of interest at the Double Ed West target (3,000 feet west of the Double Ed deposit) is a 100-foot thick basaltic pyroclastic horizon which contains pyrrhotite and

chalcopyrite (520 ppm copper). Footwall basalts contain cherty pods between the pillows (with up to 1700 ppm copper) and quartz veins.

Upper Dam Lake area. The Upper Dam Lake target is located 12,000 feet north of the '2/3' pit. Here moderate quartz veining occurs in footwall basalts with one possibly anomalous copper value. Two samples of chert are possibly anomalous (70 ppm against less than 53 ppm background). Minor basaltic tuff with red biotite are also present.

Knob Hill area. No geological description is available. There is said to be a magnetic high over this copper showing.

Quartz Vein Occurrences

An auriferous quartz vein (0.09 oz/ton Au in a grab sample) was sampled in 1989 by C. Marotte located in turbiditic rocks 50 m north of the site of the former Anyox general store, which suggests that potential for this type of mineralization may exist elsewhere on the property.

Black Bear. A quartz vein 12 feet wide containing a minor amount of molybdenite has been traced for 500 feet. At another location, quartz gashes and stringers are exposed for a considerable width.

Deadwood. The mineral occurrence occupies a shear zone in metabasalt. This shear zone strikes north and has been traced for 1,500 feet. The zone contains quartz stringers and sparsely disseminated chalcopyrite and pyrrhotite.

Quartz. A quartz vein up to 18 feet wide lies in argillite and parallels the bedding of the sediments. The vein has been traced by open cuts for 2,000 feet. It consists of milky quartz generally barren but locally containing minor pyrrhotite, chalcopyrite, and other sulphides.

Golskeish Quarry. This deposit was mined for several years primarily as a supply of quartz flux for the smelter at Anyox. Production began in 1919 and continued to 1930. Total production was 50,890 tons yielded 4,831 ounces of gold and 26,443 ounces of silver. The deposit is a quartz vein about 6 feet wide in argillite. The quartz is milky white and is sparsely mineralized with pyrite, sphalerite, galena, arsenopyrite, and other sulphides.

Ground Hog Quarry. Located on the south side of the head of Granby Bay is a quartz vein about 8 feet wide occurring in argillite. The vein is mineralized with pyrite and sphalerite, and contains gold and silver values.

Goldleaf. The mineral occurrence consists of quartz veins ranging from a few centimetres to one metre wide, generally conformable to the attitude of the surrounding sedimentary rocks. The veins are sparsely mineralized with patches of galena, sphalerite, chalcopyrite, and pyrrhotite. In 1939, 5 tons were mined yielding 7 ounces of gold and 2 ounces of silver.

Rambler Quarry. The large Rambler quartz vein was mined for quartz flux up to 1924. The vein does not contain any significant precious or base metals.

Granby Point / Reserve Quarry. At Granby Point, quartz veins in argillite were mined for flux by Granby. Total production was 62,040 tons yielded 5,795 ounces of gold, 196,260 ounces of silver, 174 pounds of copper, and 949 pounds of lead.

Larcom Island Quartz Quarry. Quartz veins have been noted but there is no geological description available of the occurrence.

Molly Mack. The main mineralized showing is at sea level west of Frank Point and immediately south of the contact between the Coast Intrusions and the sedimentary rocks to the north. South and west of the showing, leucocratic quartz monzonite porphyries of the Coast Intrusions form low ridges and weather to a uniform near-white. Phenocrysts (2 mm) of anhedral glassy quartz and euhedral feldspars make up most of the rock, with muscovite as the dominant mafic mineral. Sedimentary rocks in the area have been metamorphosed to a biotite-quartz hornfels and are cut by numerous 1-foot wide sills of fine-grained quartz monzonite near the contact. The main zone of molybdenite mineralization is confined to a small area of biotite-rich granite within the quartz monzonite porphyries. The granite (consisting essentially of anhedral quartz, subhedral perthitic potash feldspar, and coarse flakes of biotite) contains irregular inclusions of hornfelsed sediments, and is cut by lenses of quartz monzonite porphyry and fine-grained felsite dykes. Coarse-grained molybdenite mineralization within this zone occurs along the biotite cleavages and near the margins of 1-foot wide quartz veins and lenses. The zone is oriented in a north-south direction and measures 4 x 10 feet. A chip sample from the zone assayed 12.7% MoS_2 with trace amounts of copper and lead. A few specks of molybdenite were noted in the intrusive rocks to the north and south of the main showing.

Molly May - East, West, and South. Molybdenite mineralization occurs in quartz monzonite porphyries. No geological description is available, but appears similar to the Molly Mack.

ORE DEPOSIT MODEL

It has been firmly established that the orebodies of the Anyox area belong to a class of volcanogenic massive sulphide deposits referred to as Besshi type. This type of deposit is characterized by similarities in the nature of the host lithologies, mineralogy, alteration, and genesis. It is these characteristics which allow modelling of these deposits. Such modelling is a useful tool in the exploration of undiscovered orebodies in the Anyox area (Figure 7).

The lithologic criteria for these deposits is that they occur at or near the contact between tholeiitic to sub-alkaline volcanic rock unit and overlying pelitic sedimentary rocks. The contact is often marked by the presence of an exhalitive chert horizon associated with the development of massive sulphide orebodies. The Hidden Creek orebodies are developed mainly along this contact, although ore occurs below this horizon hosted by mafic volcanics and above this horizon in the sedimentary sequence. The Double Ed, Bonanza, Redwing, and Eden are examples of deposits hosted by basaltic rock (Figure 7); the Hidden Creek North is an example of a sediment-hosted deposit.

From an exploration perspective, this contact zone has and should continue to receive intensive exploration attention. It is important to note that multiple ore deposits characterize other Besshi type mining districts world wide.

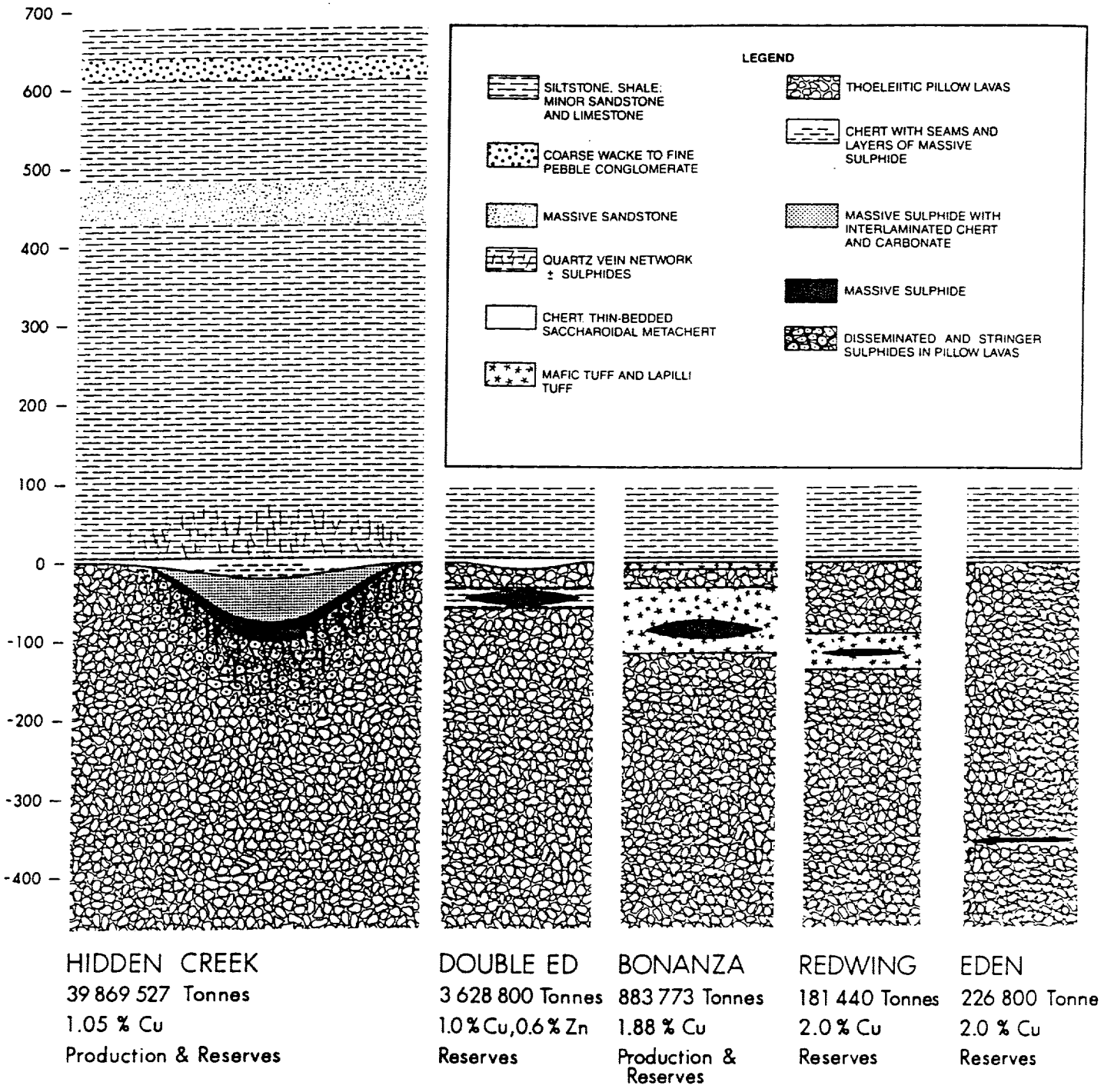


Figure 7 Schematic stratigraphic columns through five deposits (including compilation from Sharp, 1980).

The mineralogy of the massive sulphides is simple, consisting of chalcopyrite and sphalerite. Gangue sulphides include pyrite and pyrrhotite. Other gangue minerals include magnetite, titanomagnetite, ilmenite, quartz, calcite, epidote, chlorite, sericite, biotite, actinolite, tremolite, and hornblende. Ore grades for Besshi type deposits range from 0.7% to 4.5% copper and from 0.5% to 5.6% zinc, with silver, gold, and occasional cobalt values. The Hidden Creek mine produced an overall grade of 1.567% copper with minor silver and gold values; no attempt was made to recover zinc.

The entire Anyox area has been metamorphosed to upper greenschist facies by regional thermal metamorphism. Hydrothermal alteration of host lithologies occurs within and adjacent to mineralized orebodies, and provides excellent criteria for the location of new ore deposits. This alteration consists of chlorite, thin quartz veins, actinolite, magnetite, and sulphides.

The generation of Besshi type massive sulphides is understood to be hydrothermal solutions circulating through basalt around a sea floor rift system. These solutions leach metals and vent these metal-rich solutions on the sea floor which combine with sea water sulphate and precipitate base metal sulphides adjacent to these vents. Silica is vented simultaneously, leading to the formation of chert marker horizons characteristic of these systems. The alteration observed is the result of the leaching process. The longer a vent system is active, before being choked off by either volcanic flows or sedimentation, the larger the resultant deposit. This trend can be observed at Anyox in that the largest massive sulphide deposit developed during the hiatus between the cessation of volcanic activity and the subsequent burial of the vent area by sedimentation. Deposits stratigraphically either above (Hidden Creek North) or below (Double Ed, Bonanza, Redwing, Eden) are substantially smaller in size.

In summary, the ideal setting for the development of additional deposits is near or preferably at the basalt/sediment contact, where chert development and alteration can be observed along with sulphide mineralization.

EXPLORATION APPROACH

Historically, most of the known ore deposits at Anyox were discovered by prospecting. Prospecting along and adjacent to the critical contact should be completed especially in the more remote parts of the property. Detailed geological mapping and geochemical sampling, to identify chert and alteration, and to acquire mineralized samples for analysis would be essential. Geophysics have not been very effective to date in identifying target areas. The presence of numerous graphitic conductors in the sedimentary package tends to obscure the geophysical signature of massive sulphides along the contact zone. Magnetic surveys respond to basalt and post-ore structures which again make identification of target areas difficult. Down-hole geophysics should be used in conjunction with all future drilling. One geophysical technique not employed to date which may prove useful is gravity. The density contrast of massive sulphide orebodies may be sufficient to allow detection by gravity surveys.

It is a truism that the best place to find new deposits is near old mines. This priority should be given to target areas in the vicinity of the known deposits. Two such areas have been identified thus far and they are Hidden Creek North and Gamma. All have had limited drilling with some encouragement. They should be evaluated further prior to additional drilling. The second-priority areas would consist of re-evaluation of all known showings or new showings developed by reconnaissance prospecting, geological mapping, and geochemical sampling.

EXPLORATION PROGRAM

A six-person field crew was mobilized to the Anyox property on July 27, 1994. This exploration program was directed at locating mineralization beyond the immediate Hidden Creek Mine area. With this mandate, helicopter-supported reconnaissance prospecting was completed over the entire property area. A number of the mineralized occurrences (documented in the literature or previously noted by Taiga) were examined. Two grids were emplaced covering the basalt/argillite contact over the Redwing deposit. Geophysical (VLF-EM, magnetometer) surveys were completed over each of the grids.

The VLF-EM survey was completed at 25 m intervals with a Geonics EM-16 using the Seattle Washington transmitter. The magnetometer survey was completed at 12.5 m intervals with the magnetometer readings corrected to a common datum.

A total of 88 rock samples were collected and sent to TerraMin Research Labs Ltd. in Calgary Alta for Au, Ag, Cu, Zn, and Pb analyses. Sample locations and results are shown on the accompanying map; rock sample descriptions, analytical results, and laboratory procedures are presented in the Appendix.

Mr. Rob Macdonald, from the Mineral Deposit Research Unit of the University of British Columbia, who is doing research on volcanogenic massive sulphide deposits of the Cordillera, accompanied the crew during the first week of this exploration program. Helicopter support and field personnel were made available to him in order for Mr. Macdonald to visit outlying deposits (Redwing, Eden, Bonanza) and other areas of interest (Mt. Clashmore) to further his research.

EXPLORATION RESULTS

Reconnaissance prospecting was completed over a large part of the property, concentrating on the newly acquired CLASH 1 to 15 mineral claims. Stringer type copper mineralization was located in outcrop and float in several areas on the property. Numerous quartz veins were sampled to determine their gold potential, but yielded negligible assays. A summary of the exploration and results follows.

CLASH 1 mineral claim

Two man-days of reconnaissance prospecting were completed on this claim. This claim is underlain entirely by argillite occasionally intruded by narrow quartz veins. One sample (S-6) from a 40 cm wide quartz vein was collected from the claim but yielded negligible results.

CLASH 2 & 3, ANY 4 mineral claims

Three man-days of reconnaissance prospecting were completed in this area, concentrated primarily along the volcanic/sedimentary contact. Chert beds up to 7 m wide with 1-2% disseminated pyrite and trace chalcopyrite were located. Several quartz veinlets with disseminated pyrite and minor chalcopyrite mineralization were found in the argillite near the volcanic contact.

Several Aerodat conductors occur in the vicinity of the Upper Dam Lake area, located on the ANY 4 claim. Reconnaissance prospecting in this area located a one-metre wide limonite stained zone composed of argillite containing quartz veinlets with 1% disseminated chalcopyrite and pyrite. A grab sample (S-20) yielded 0.31% copper.

CLASH 4, 5, 8, & 9 mineral claims

Previous exploration programs on the CLASH 4 claim located, along the northern claim boundary, silicified basaltic boulders, samples of which assayed up to 1.84% copper. This area was extensively prospected during the current exploration program in an attempt to located the source of this mineralized float. Several additional boulders of quartz-flooded andesite were found, samples of which assayed up to 0.80% copper. However, the source of these boulders was not located. Further claim acquisition north of the CLASH 4 is recommended.

Additional exploration in this area is necessary, particularly along the steep and rugged west side of the valley, to fully evaluate the significance of this mineralization.

Siliceous and quartz-flooded andesite with disseminated pyrite and chalcopyrite was located near the central part of the CLASH 4 claim. Grab samples assayed up to 3.1% copper.

Numerous quartz veinlets and stringers with disseminated chalcopyrite and sphalerite occur over a wide area to the east of the Eden deposit. Although samples yielded significant copper and zinc (up to 1.71% Cu, 1.3% Zn), the size and frequency of this veining down-grades the significance of this occurrence. The samples from this area yielded only background gold values.

Prospecting traverses along the ridge on the CLASH 5 claim and across the CLASH 8 and 9 claims did not locate any important mineralization. Quartz veins sampled contained background gold values.

CLASH 6 & 7 mineral claims

Government mapping and assessment records indicate a large chert horizon on Mount Clashmore (CLASH 6 claim). Reconnaissance prospecting and mapping found the area to be underlain by a succession of volcanic and sedimentary rocks. Chert beds were located near the volcanic/sedimentary contact. Several sulphide-rich boulders were located on the western boundary of the CLASH 7 claim by Rob Macdonald. The presence of bedded exhalitive chert horizons at the sedimentary/volcanic contact is geologically encouraging. Further claim staking west of these claims is recommended on this basis.

CLASH 10 & 11, ANZA 1 mineral claims

Extensive reconnaissance prospecting was completed in the area of the Mac #1 / Sax showings. Stringer type copper mineralization was located in outcrop and float throughout the southeastern part of the CLASH 11 claim and the southwestern edge of the CLASH 10 claim. Analysis of grab samples yielded values ranging from 0.19% to 3.6% copper.

A 1- to 5-metre wide zone of limonite-stained siliceous andesite with disseminations and stringers of chalcopyrite and pyrite was found near the centre of the CLASH 10 claim. Samples assayed up to 5.5% copper, 0.86% zinc, and 2.65 oz/ton silver.

Additional exploration is necessary in these areas to fully evaluate the potential of the mineralization located. This mineralization bears a striking resemblance to that found previously in the drilling on the Gamma zone.

Numerous quartz veins with disseminated pyrite, chalcopyrite, pyrrhotite, and sphalerite were located throughout the CLASH 11 claim. Samples yielded up to 1% copper and 1.65% zinc, but only background gold values. The limited extent of this mineralization is not considered encouraging.

One small adit was located near the west boundary of the CLASH 11 claim. This adit investigated a pyrrhotite-enriched zone in andesite adjacent to a 4-metre quartz vein. Samples yielded minor (0.12%) copper values.

CLASH 12 mineral claim

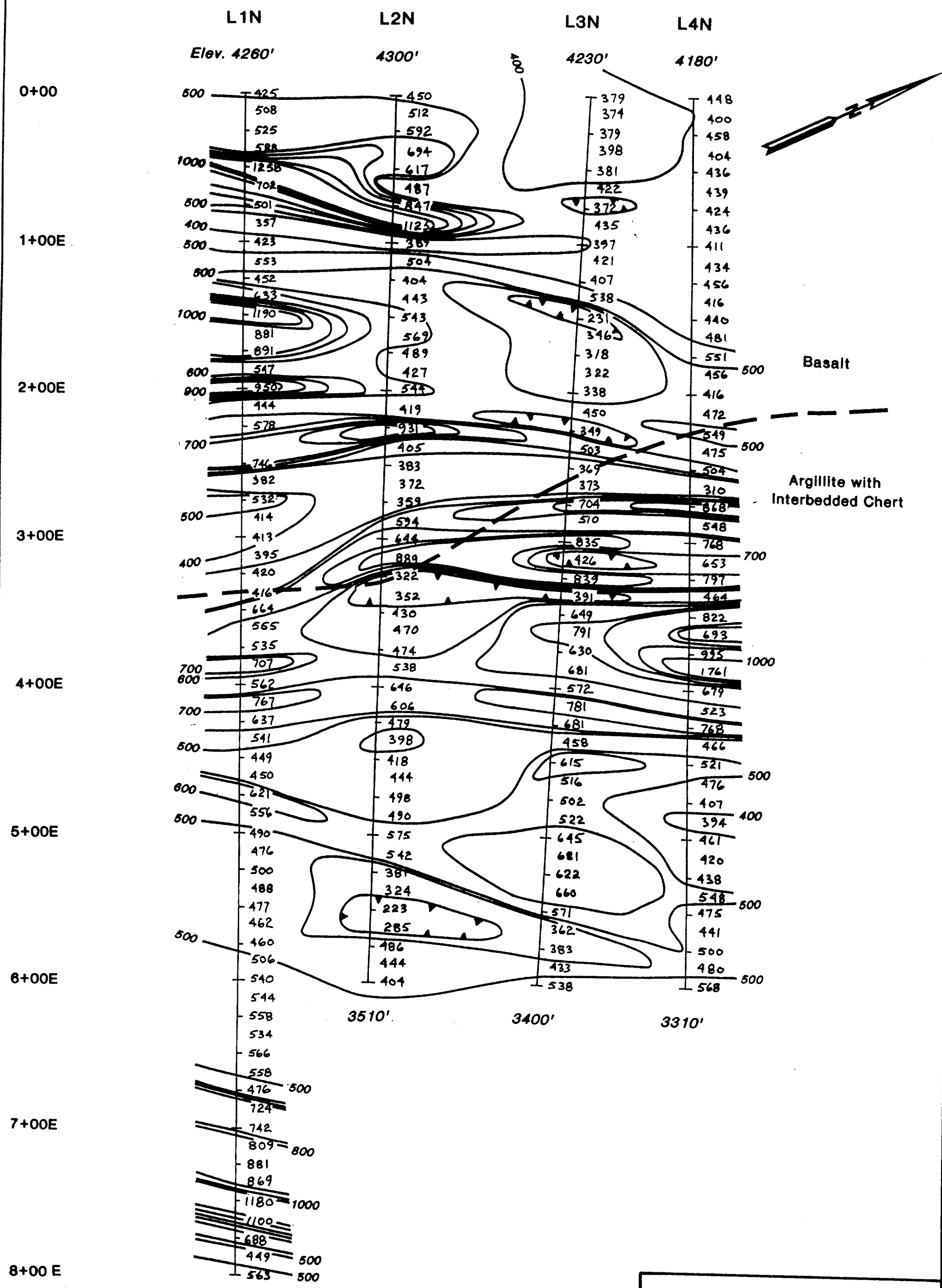
Several prospecting traverses were completed across the CLASH 12 claim, with particular attention directed at the basalt/argillite contact extending from the Double Ed to the Redwing deposit. Minor copper mineralization was found in two locations, as small stringers and clots of chalcopyrite in siliceous andesite adjacent to the contact. Samples (D-13, S-8, S-9) assayed up to 0.44% copper and 0.75% zinc.

A small flag-and-compass grid was emplaced covering the basalt/argillite contact along the cliff edge above the Redwing deposit (2.6 line km). VLF-EM and magnetometer surveys were completed over the grid.

The magnetometer survey (Figure 8) displayed an erratic signature over the grid area with values ranging from 57,200 to 58,300 gammas. There was no marked contrast in the magnetic signature between the areas underlain by basalt versus the area underlain by argillite with interbedded chert. This erratic signature may be caused by underlying discontinuous massive sulphide lenses similar to those found in the Redwing deposit.

The VLF-EM survey results are presented in profile format on Figure 9. Two parallel, very strong, north-south trending conductors were delineated within the argillite, approximately paralleling the bedding. This conductor may be delineating either a graphitic horizon within the argillite or an extension of sulphide mineralization from the Redwing.

Several quartz veins with disseminated pyrite, chalcopyrite, sphalerite, and minor galena were located. Samples yielded values up to 1.95% Cu, 0.26% Pb, and 1.68% Zn. One quartz vein sample (C-4) from a 5 m wide vein intruding pillow basalt yielded 2760 ppb Au (0.08 oz/ton). The remaining veins sampled contained background gold values.



LEGEND

Instument: Scintrex MP-2

Operator: C. Aussant

Contour Interval: 100 gammas

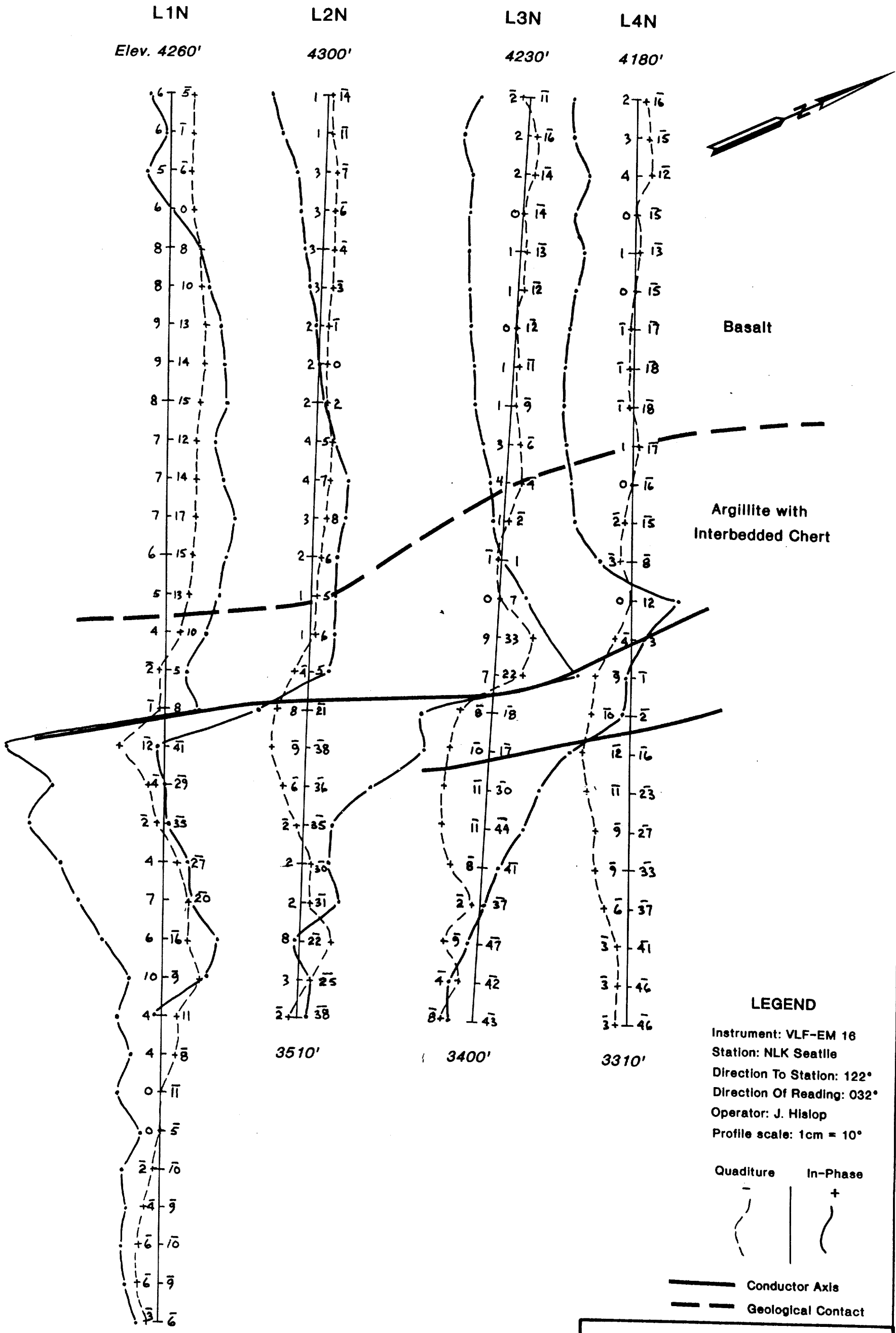
All readings 57,000 gammas plus

Geological Contact

CLASH 12 CLAIM
REDWING NORTH GRID

MAGNETOMETER SURVEY

DATE AUG./94	NTS 103P/15.
PROJECT BC-91-3	MAPPED/DRAWN BY C.A.
SCALE 1:2500	
TAIGA CONSULTANTS LTD.	FIG. 8



LEGEND

Instrument: VLF-EM 16
Station: NLK Seattle
Direction To Station: 122°
Direction Of Reading: 032°
Operator: J. Hislop
Profile scale: 1cm = 10°

Quadiature (−) | In-Phase (+)

Conductor Axis

Geological Contact

CLASH 12 CLAIM
REDWING NORTH GRID
VLF-EM SURVEY

DATE AUG./94	NTS 103P/15
PROJECT BC-91-3	MAPPED/DRAWN BY C.A.
SCALE 1:2500	
TAIGA CONSULTANTS LTD.	FIG. 9

CLASH 14 mineral claim

The Redwing deposit was explored in 1911 and again in 1965 by two adits from which several holes were drilled. This work defined two shoots of massive sulphides within a schistose unit. The pipelike shoots are 10 to 25 feet wide, 50 feet long, and traceable for 150 feet between the adits.

These workings were briefly examined during the current exploration program. The upper adit was not accessible, due to its location on a cliff face. Minor massive pyrite float was noted below the mouth of the adit. The lower adit extends north to northeast, into the cliff face. It was driven into basaltic volcanic rocks cutting an 8 m (25-foot) chert bed, striking 250° with a vertical dip, within the volcanics near the end of the adit. No mineralization was observed in the lower adit.

Reconnaissance prospecting was completed across the southern part of the CLASH 14 claim, directed at investigating the basalt/argillite contact south of the Redwing deposit, and an Aerodat conductor previously delineated in the area.

Interbedded weakly foliated, limonite-stained, pyritic, grey to black, siliceous argillite and chert occur at the basalt contact. The sulphide-enriched zone extends 50 to 75 metres from the contact with narrow pyritic layers paralleling bedding at 332°/70°E with occasional small reversals of the dip. No mineralization was noted in this contact zone. Evidence of a previous grid over this area was found.

A small flag-and-compass grid was emplaced covering the basalt/argillite contact (1.275 line km). VLF-EM and magnetometer survey were completed over the grid.

The magnetometer survey (Figure 10) displayed a quiet signature over the grid area with background values of 57,300 gammas. A weak north-south trending positive magnetic response parallels the basalt/argillite contact. This area is underlain by rusty weathered, pyritic, interbedded argillite and chert.

The VLF-EM survey results are presented in profile format on Figure 11. A very strong northwest/southeast trending conductor was delineated cutting across the basalt/argillite contact and the bedding. The significance of this conductor was not determined. This conductor may be delineating an underlying mineralized zone or a cross-cutting shear. Additional work (including drilling) would be required to determine the cause or significant of this conductor.

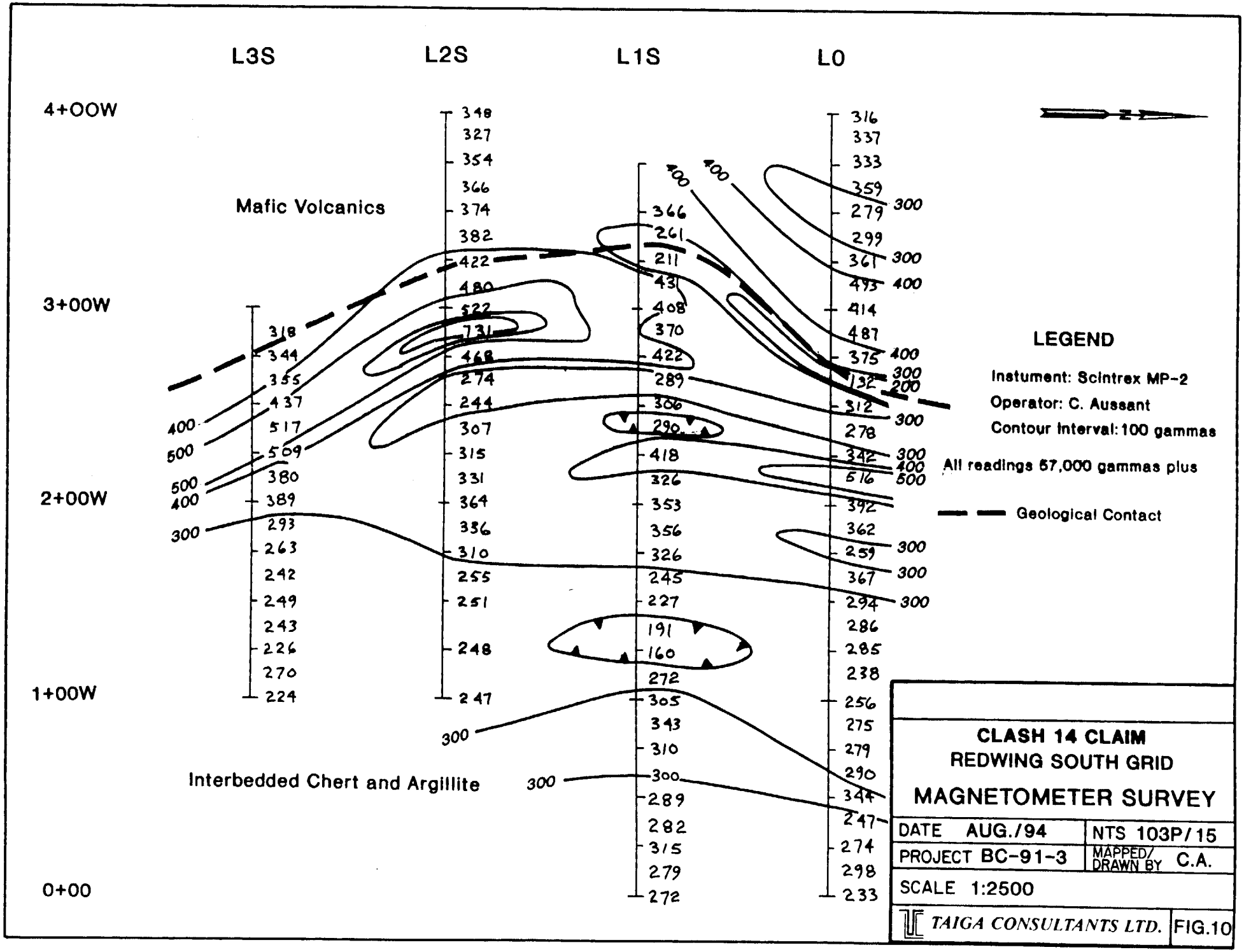
The Aerodat conductor previously delineated in the area was found to coincide with the contact between argillite and leucocratic quartz diorite.

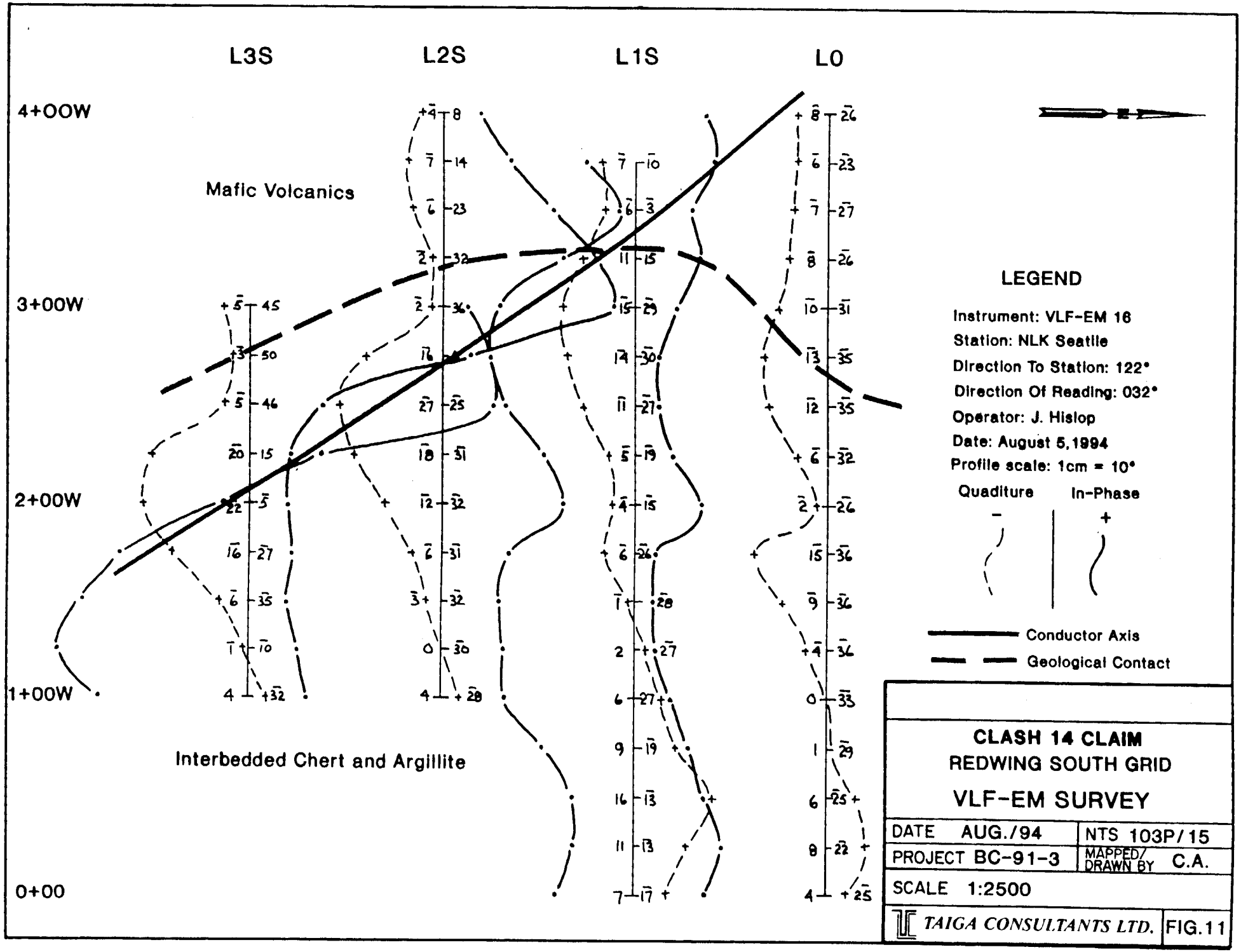
CLASH 13 mineral claim

A limited amount of reconnaissance prospecting was completed over the CLASH 13 mineral claim. Minor chalcopyrite and sphalerite were located in siliceous pyritic argillite south of the Bonanza Mine.

CLASH 15 mineral claim

Two man-days of reconnaissance prospecting were completed on this claim. No significant mineralization was located. Several Aerodat conductors occur in the centre of the claim. Prospecting over this area


L3S
L2S
L1S
L0
4+00W
3+00W
2+00W
1+00W
0+00
Mafic Volcanics
Interbedded Chert and Argillite
LEGEND
Instument: Scintrex MP-2
Operator: C. Aussant
Contour Interval: 100 gammas
All readings 57,000 gammas plus
Geological Contact
CLASH 14 CLAIM
REDWING SOUTH GRID
MAGNETOMETER SURVEY
DATE AUG./94
NTS 103P/15
PROJECT BC-91-3
MAPPED/DRAWN BY C.A.
SCALE 1:2500
TAIGA CONSULTANTS LTD.
FIG.10


L3S
L2S
L1S
L0
4+00W
3+00W
2+00W
1+00W
0+00
Mafic Volcanics
Interbedded Chert and Argillite
LEGEND
Instrument: VLF-EM 16
Station: NLK Seattle
Direction To Station: 122°
Direction Of Reading: 032°
Operator: J. Hislop
Date: August 5,1994
Profile scale: 1cm = 10°
Quadiature
In-Phase
Conductor Axis
Geological Contact
CLASH 14 CLAIM
REDWING SOUTH GRID
VLF-EM SURVEY
DATE AUG./94
NTS 103P/15
PROJECT BC-91-3
MAPPED/DRAWN BY C.A.
SCALE 1:2500
TAIGA CONSULTANTS LTD.
FIG.11

located several pyritic chert and argillite horizons with minor disseminated chalcopyrite. Several quartz stringers and veins occur in the area containing minor amounts of copper, lead, gold, and silver.

Double Ed deposits

Brief reconnaissance prospecting was completed in the area of the Double Ed deposits. Additional mineralized areas were not located.

Knob Hill / Emma-Homestake

Basaltic boulders up to one metre in diameter containing copper ore are reported from the old Homestake claims and a reported magnetic high over the Knob Hill copper showing. Reconnaissance prospecting in this area did not re-located any of the boulders or the Knob Hill showing.

Sundog showing

Exploration completed in 1992 located several mineralized sulphide boulders west of the Hidden Creek Mine. Brief reconnaissance prospecting was completed west and north of this area but failed to locate any additional mineralized boulders.

On L.3874, located north of the Sundog showing immediately west of the 1992 Gamma grid, an outcrop of silicified cherty andesite with disseminated pyrrhotite and chalcopyrite was located. A grab samples yielded 0.65% copper. Old pieces of Ax drill core were found immediately east of this outcrop. This drilling probably dates back to Granby Mining. The results from this drilling are not known.

SUMMARY AND RECOMMENDATIONS

The summer 1994 exploration program completed on the Anyox property was directed at locating mineralization beyond the immediate Hidden Creek Mine area, concentrating on the newly acquired CLASH 1 to 15 mineral claims. The exploration consisted of reconnaissance prospecting, geological mapping, and lithogeochemical sampling. Two reconnaissance grids were emplaced in the Redwing target area, and geophysical (VLF-EM and magnetometer) surveying was completed covering the basalt/argillite contact.

Stringer type copper mineralization was located in outcrop and float in several areas on the CLASH 10 and 11 claims. Samples collected from these areas yielded up to 5.5% copper, 0.86% zinc, and 2.65 oz/ton silver. Additional investigation is necessary in order to determine the significance of this mineralization. This work should consist of grid emplacement covered by soil geochemical sampling, geophysical (VLF-EM, magnetometer) surveying, and detailed geological mapping, along with further prospecting and lithogeochemical sampling.

Several mineralized quartz flooded mafic volcanic boulders were located along the north boundary of the CLASH 4 mineral claims. Samples assayed up to 0.80% copper. The source of the boulders was

not located. Additional exploration is necessary in this area to fully evaluate the potential of this mineralization.

Exploration along strike from the Redwing deposit on the CLASH 12 and 14 claims located weak copper and sulphide mineralization and alteration along the basalt/argillite contact. Limited geophysical coverage across this contact delineated weak magnetic anomalies and strong EM conductors. Additional exploration is warranted.

Numerous quartz veins were sampled throughout the property area to determine the epithermal gold potential of the area. Most of the samples yielded background gold values. The best result was 0.08 oz/ton Au from a 5-foot vein located immediately west of the CLASH 12 claim. These results indicate a minimal potential for gold mineralization exists in the area.

The presence of bedded exhalitive chert units on the CLASH 7 + 8 claims and toward the west of these claims at the volcanic/sedimentary contact is considered geologically encouraging for the discovery of massive sulphide mineralization in this area. Additional claims should be acquired west of the CLASH 7 + 8 claims, and more exploration should be conducted to fully evaluate these favourable horizons.

CERTIFICATE - J. W. Davis

I, James Wilson Davis, of 116 MacEwan Drive N.W. in the City of Calgary in the Province of Alberta, do hereby certify that:

1. I am a Consulting Geologist with the firm of Taiga Consultants Ltd. with offices at Suite 301, 1000 - 8th Avenue S.W., Calgary, Alberta.

2. I am a graduate of St.Louis University, B.Sc. Geology (1967) and M.Sc. Geology (1969), and I have practised my profession continuously since graduation.

3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta and of the Association of Professional Engineers and Geoscientists of the Province of British Columbia; and I am a Fellow of the Geological Association of Canada.

4. I am a co-author of the report entitled "Geological, Geochemical, and Geophysical Report on the Anyox Property, Skeena Mining Division, British Columbia", dated August 16, 1994.

DATED at Calgary, Alberta, this 16th day of August, 1994

PERMIT TO PRACTICE
TAIGA CONSULTANTS LTD.
Signature
Date Oct 12, 1994
PERMIT NUMBER: P 2399
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

Respectfully submitted,

J. W. Davis, M.Sc., P.Geol., F.GAC, P.Geo.

PROFESSIONAL GEOSCIENTIST
PROVINCE OF BRITISH COLUMBIA
J. W. DAVIS

PROFESSIONAL GEOLOGIST
JAMES W. DAVIS
ALBERTA

GEOLOGICAL ASSOCIATION OF CANADA · FELLOW · GEOLOGICAL

CERTIFICATE - C. H. Aussant

I, Claude Henry Aussant, of 31 Templebow Way N.E. in the City of Calgary in the Province of Alberta, do hereby certify that:

1. I am a Consulting Geologist with the firm of Taiga Consultants Ltd. with offices at Suite 301, 1000 - 8th Avenue S.W., Calgary, Alberta.

2. I am a graduate of the University of Calgary, B.Sc. Geology (1976), and I have practised my profession continuously since graduation.

3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta and of the Association of Professional Engineers and Geoscientists of the Province of British Columbia; and I am a Fellow of the Geological Association of Canada.

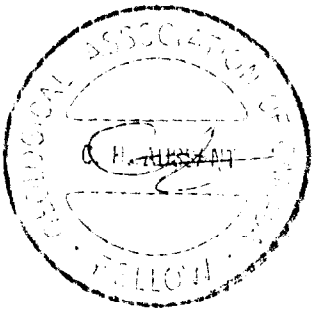
4. I am a co-author of the report entitled "Geological, Geochemical, and Geophysical Report on the Anyox Property, Skeena Mining Division, British Columbia", dated August 16, 1994.

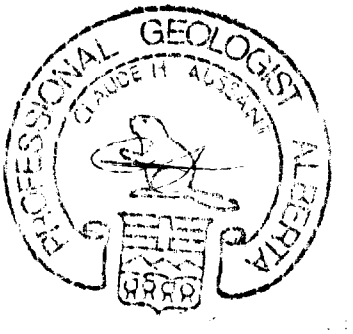
5. I do not own or expect to receive any interest (direct, indirect, or contingent) in the property described herein nor in the securities of **TVI Copper Inc.** in respect of services rendered in the preparation of this report.

DATED at Calgary, Alberta, this 16th day of August, 1994

Respectfully submitted,

C. H. Aussant, B.Sc., P.Geol., F.GAC, P.Geo.





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various internal company reports

APPENDIX

Summary of Personnel

Summary of Expenditures

Rock Sample Descriptions

Certificates of Analysis

Analytical Techniques

SUMMARY OF PERSONNEL

Name / Address	Position	Dates Worked	Man Days
C.H. Aussant, P.Geol. Calgary, Alberta	Project Geologist	Jul.27 - Aug.9	14 days
J.M. Hislop Edmonton, Alberta	Senior Prospector	Jul.27 - Aug.9	14 days
S. Hardlotte LaRonge, Saskatchewan	Senior Prospector	Jul.27 - Aug.9	14 days
B. Charles LaRonge, Saskatchewan	Senior Prospector	Jul.27 - Aug.9	14 days
D.D. Dancer Calgary, Alberta	Senior Prospector	Jul.27 - Aug.9	14 days
J. Forest Prince Rupert, BC	Helicopter Pilot	Jul.27 - Aug.9	14 days
R. Macdonald Vancouver, BC	U.B.C. Geologist	Jul.27 - Aug.1	6 days
			90 days

ROCK SAMPLE DESCRIPTIONS

HR-94-1 outcrop CLASH 11 - south claim line 1.48% Cu
pyroclastic?, limonite-stained, gossaned, siliceous, with 3% disseminated chalcopyrite, trace malachite staining; zone of mineralization ranges from 0.5 to 1.5 m wide, exposed for 20 m, 042°/70°W, located on top of knoll

HR-94-2 outcrop CLASH 11 - south claim line 0.97% Cu
pyroclastic?, limonite-stained, gossaned, siliceous, with quartz flooding with 2% disseminated pyrite, chalcopyrite

HR-94-3 outcrop CLASH 11 - south claim line; high-grade sample 2.60% Cu
limonite-stained quartz and siliceous massive sulphides, 4% chalcopyrite as disseminations and stringers; this zone has frequent sulphide-rich lenses throughout

HF-94-4 float CLASH 11
quartz vein, white and beige quartz with clots of magnetite and pyrite, boulder traced to a gossan 10 m wide exposed for 40 m, area contains numerous quartz veins up to 1 m wide in pyroclastics?, 040°/70°W

HR-94-5 outcrop CLASH 11 3.6% Cu
andesite, green, rusty weathered, sheared, containing small clots of massive pyrite and chalcopyrite along siliceous discontinuous bands, gossaned area 7 m wide exposed for 50 m, cut by quartz veinlets up to 10 cm wide paralleling foliation, 054°/88°W

HR-94-6 outcrop CLASH 11 0.19% Cu
andesite, greenish grey, rusty weathered, siliceous; with disseminated pyrrhotite, strongly magnetic, 056°/70°W, rusty zone 20 cm wide

HF-94-7 float L.1677, NW Gamma leases not assayed
quartz vein in siliceous andesite

HF-94-8 float ANN 1 claim not assayed
quartz vein, limonite stained, rusty weathered

HF-94-9 subcrop CLASH 8
andesite, grey, limonite stained, siliceous; strongly magnetic, disseminated pyrrhotite

HR-94-10 outcrop CLASH 8
quartz vein, limonite stained, sheared; <1% disseminated pyrite, 0.5 m wide exposed for 20 m, 045°/60°W

HF-94-11 float CLASH 11, north boundary 0.36% Cu, 0.12% Zn, 0.11% Pb
quartz vein, grey to white, limonite stained; with small pockets of pyrite with minor chalcopyrite

HF-94-12 float CLASH 11, north boundary 0.64% Cu, 1.64% Zn, 0.14% Pb
quartz vein, grey, limonite stained, with 1-2% chalcopyrite, pyrite, sphalerite

HR-94-13 outcrop CLASH 11, north boundary; possible source of HF-94-11,12 0.15% Zn
quartz vein, mottled grey, with <1% scattered disseminated pyrrhotite, vein 0.5 to 1 m wide exposed for 8 m, 090°/76°N

HR-94-14 outcrop CLASH 12; high-grade sample 0.14% Cu
quartz vein, white to beige, with coatings and stringers of chalcopyrite and pyrite along fractures, limonite stained, vein 5-10 m wide

HR-94-15 outcrop CLASH 12; same vein as HR-94-14
quartz vein, white to beige, bull quartz, strike 008°

HR-94-16 outcrop CLASH 12
andesite, biotitic, moderately well foliated, with occasional quartz veinlets, weakly magnetic, 1% disseminated pyrrhotite (should be near contact, assayed for background values), 018°/82°W

HR-94-17 outcrop CLASH 4 not assayed
andesite, quartz flooding 0.6 m wide exposed for 8 m, pyrite crystals scattered in the quartz, limonite stained

HR-94-18 outcrop CLASH 4
quartz vein, 1 m wide strike 045°, limonite stained, 3% disseminated pyrite

HF-94-19 float CLASH 4 0.12% Cu
andesite, quartz flooded, 4% disseminated chalcopyrite

HF-94-20 float CLASH 4 0.68% Cu
andesite, quartz flooded, siliceous, 3% disseminated pyrite

HF-94-21 float CLASH 13
chert, grey, 3-5% disseminated pyrite

HR-94-22 outcrop CLASH 13
argillite, dark grey, siliceous, quartz flooded, disseminated pyrite

HR-94-23 outcrop CLASH 13, L.3350
white quartz veinlet in grey argillite, veinlet ~4 cm wide with <1% disseminated pyrite, minor chalcopyrite, 340°/12°E

HR-94-24 outcrop CLASH 13, L.3350 0.22% Zn
argillite, grey, siliceous, 5% disseminated pyrite, trace chalcopyrite

HF-94-25 float CLASH 4
andesite, green, weakly foliated, 3% disseminated pyrite, spotty pyrrhotite

HF-94-26 float CLASH 4 0.80% Cu
andesite, green, weakly foliated, with lenses and disseminations of pyrite paralleling foliation and minor quartz stringers with 3-5% disseminated pyrite

HF-94-27 float CLASH 14 0.16% Cu
andesite, greyish green, 3% pyrite as stringers and disseminations, occasional quartz veinlets, minor quartz flooding

HF-94-28 float CLASH 14
andesite, grey-green, weakly chloritic, 1% pyrite as stringers and disseminations, trace chalcopyrite

HR-94-29 outcrop CLASH 4
gabbro, 3 m wide, 3-5% disseminated pyrrhotite, minor pyrite along fracture planes, 008°/45°E

HF-94-30 float CLASH 4 0.43% Cu
basalt, massive, with blebs of pyrite and chalcopyrite up to 0.25 cm

HF-94-31 float CLASH 4
andesite, green, massive, 2% disseminated pyrrhotite; chalcopyrite lining fracture planes

HR-94-32 outcrop CLASH 4
andesite, green; frequent quartz stringers and pyrite stringers, minor chalcopyrite, 345°/44°W

HR-94-33 outcrop CLASH 4 0.41% Cu
white quartz vein in andesite; quartz containing 3% disseminated clots pyrite and occasional clots chalcopyrite; andesite adjacent to veining with disseminated pyrite and minor chalcopyrite; vein 15 cm wide; one of several sulphide-enriched veins

HF-94-34 float CLASH 4
andesite, siliceous; 2% disseminated pyrite, minor chalcopyrite, occasional white quartz stringers

HR-94-35 outcrop CLASH 4
andesite, quartz flooded; minor disseminated pyrrhotite and pyrite adjacent to the quartz in the andesite

BF-94-01 float CLASH 11 1.68% Cu
andesite, grey, siliceous; disseminated pyrite, occasional chalcopyrite stringers; limonite stained

BF-94-02 float CLASH 11 0.56% Cu
andesite, grey, siliceous; chalcopyrite stringers in both the quartz and andesite; quartz flooded

BR-94-03 outcrop CLASH 11 0.39% Cu
quartz vein containing scattered clots of chalcopyrite intruding grey siliceous andesite with 2% disseminated pyrite; quartz vein beige containing clots of pyrite and chalcopyrite; stained area 2 m wide, 7 m long

BR-94-04 outcrop CLASH 11 not assayed
gabbro dyke, grey, strongly magnetic, 3-5% disseminated pyrrhotite, fine-grained, rusty weathered, 5 m wide

BR-94-05 outcrop CLASH 11 2.8% Cu, 0.25% Zn
andesite, siliceous, fractured, sheared, rusty weathered; frequent quartz veinlets and stringers, containing numerous large clots of pyrite, minor chalcopyrite; zone 2 m wide exposed for 10 m

BR-94-06 outcrop CLASH 11 0.70% Cu
bull quartz, white to beige; with centimetre size clots of pyrite crystals; chalcopyrite associated with the pyrite clots; clots are occasionally deeply oxidized dark blue; vein 10 cm wide exposed for 5 m

BR-94-07 outcrop CLASH 12 not assayed
argillite, dark grey, limonite stained, siliceous, <1% disseminated pyrite

BF-94-08 float CLASH 15
argillite, quartz flooded, <1% disseminated pyrite and pyrrhotite

BR-94-09 outcrop CLASH 15
argillite, rusty weathered, siliceous, gneissic; 1% disseminated pyrite, minor chalcopyrite, zone 2 m wide

BR-94-10 outcrop CLASH 2
chert, quartz flooded, 1-2% disseminated pyrite, trace chalcopyrite, 7 m wide exposed for 50 m

BF-94-11 float CLASH 11 1% Cu
quartz vein with 4% disseminated chalcopyrite; intruding grey-green andesite

BR-94-12 outcrop ANZA 1
quartz vein, limonitic, minor disseminated chalcopyrite, <1% pyrite; intruding andesite, 2 m wide exposed for 10 m

S-94-01 outcrop CLASH 11 0.23% Zn
white bull quartz vein, with small scattered pyrite clots; intruding grey metavolcanic?, strike 185°/W, width not determined, exposed intermittently for 35 m

S-94-02 outcrop CLASH 11 0.73% Zn
quartz vein, mottled grey and white, with pyrite as stringers and disseminations

S-94-03 outcrop CLASH 11 0.15% Cu, 1.08% Zn
quartz vein, mottled grey and white, with pyrite as stringers and disseminations, occasional chalcopyrite stringers

S-94-04 outcrop CLASH 11, old adit 0.12% Cu
andesite, grey, very magnetic, 3-5% disseminated pyrrhotite; pyrrhotite stringers, minor chalcopyrite

S-94-05 outcrop CLASH 11, adjacent to old adit (S-94-04) 0.60% Zn
quartz vein, mottled grey and white, 3-4 m wide, 210°/vertical, with 3-5% disseminated pyrite, chalcopyrite, pyrrhotite, sphalerite

S-94-06 outcrop CLASH 1
quartz vein, white to beige, limonite stained, scattered stringers and clots of pyrite, 026°/40°E 40 cm wide

S-94-07 outcrop CLASH 12
quartz vein, beige-grey-white, limonite stained, 5-10% pyrite and pyrrhotite stringers and disseminations

S-94-08 outcrop CLASH 12 0.15% Cu, 0.75% Zn
gossan, extremely altered limonitic rock; quartz stringers with disseminated pyrite, spotty malachite staining; zone 1 m wide, occurs in grey andesite

S-94-09 outcrop CLASH 12, same location as S-94-10 0.25% Cu
gossan, north edge, limonitic rock, sulphide-enriched,zone 2 m wide

S-94-10 outcrop CLASH 12, same location as S-94-9
south edge of gossan, andesite, grey, very magnetic, 5% disseminated pyrrhotite, minor chalcopyrite, very calcareous, zone 2 m wide

S-94-11 outcrop CLASH 12
massive pyrite lenses at least 4 cm wide, in calcite; probably in a shear associated possibly with a diabase dyke, minor chalcopyrite in the carbonate

S-94-12 float CLASH 12 not assayed
argillite, black, rusty stained, disseminated pyrite, minor pyrrhotite, local source on cliff 50 m upslope

S-94-13 outcrop CLASH 12
quartz vein, mottled grey and white, limonite stained, ~5% disseminated pyrite and pyrrhotite in the quartz

SR-94-14 outcrop CLASH 15
chert layer, limonite stained; in argillite, 3% disseminated pyrite

SR-94-15 outcrop CLASH 15
argillite, dark grey, well banded, 10% disseminated pyrite throughout, with additional concentrations paralleling bedding

SR-94-16 outcrop CLASH 15 0.26% Cu
quartz vein, white, limonite stained, scattered clots of pyrite, minor chalcopyrite; 2 parallel veins 25 cm, 50 cm wide, 325°/vertical

SR-94-17 outcrop CLASH 15; high-grade 0.085 oz/ton Au, 7 oz/ton Ag, 0.21% Pb
massive pyrite lens 20 cm long, in a quartz vein, 326°/vertical

SR-94-18 outcrop CLASH 3
quartz veinlet, ~4 cm wide, rusty stained, in argillite; trace chalcopyrite

SR-94-19 outcrop ANY 4
argillite, greenish grey, cherty, 1% disseminated pyrite

SR-94-20 outcrop ANY 4 0.31% Cu
argillite, limonite stained, gossaned over at least 1 m wide; containing quartz veinlets with 1% disseminated chalcopyrite and pyrite

SR-94-21 outcrop CLASH 4 0.77% Cu
andesite, dark grey, quartz flooding with 3-5% disseminated pyrite

SR-94-22 outcrop CLASH 4 3.1% Cu
andesite, pale green, siliceous, with disseminated pyrite and chalcopyrite

SR-94-23 outcrop CLASH 4
andesite, green, siliceous, chloritic; with disseminated and crystalline pyrite throughout

D-94-01 outcrop CLASH 11
quartz vein, mottled grey and white, clots and stringers of pyrite, 5-10 cm stringer, occasional widenings to 3 m, 210° strike

D-94-02 outcrop CLASH 11, same vein as D-94-01
quartz vein, mottled grey and white, pyrite stringers, fractures are limonite stained

D-94-03 outcrop CLASH 11, same vein as D-94-01,02
quartz vein, massive bull quartz, white, collected from widening in vein

D-94-04 outcrop CLASH 11 not assayed
quartz veinlet intruding andesite

D-94-05 outcrop CLASH 11 not assayed
quartz vein, massive, white, intruding andesite, biotitic along contact

D-94-06 outcrop CLASH 11 not assayed
andesite, dark grey, 1% pyrite and pyrrhotite as disseminations and stringers, spotty magnetic

D-94-07 outcrop CLASH 10 1.71% Cu, 0.86% Zn, 0.88 oz/ton Ag
andesite, limonite stained, siliceous, pyrite stringers, minor chalcopyrite; zone 10 cm to 5 m wide

D-94-08 outcrop CLASH 10, same zone as D-94-7 5.5% Cu, 0.46% Zn, 2.65 oz/ton Ag
andesite? gossan, limonite stained, spotty malachite staining, chalcopyrite and pyrite clots, chalcopyrite stringers, one metre wide

D-94-09 outcrop CLASH 10
andesite, grey, limonite stained, siliceous, spottily magnetic, disseminations of fine pyrite and pyrrhotite, trace chalcopyrite

D-94-10 outcrop CLASH 10, old pit 2.3% Cu
andesite, limonite stained, quartz flooded, 2% chalcopyrite stringers in the andesite and disseminated chalcopyrite in the quartz

D-94-11 outcrop CLASH 12 0.25% Cu, 1.68% Zn, 0.26% Pb, 2.63 oz/ton Ag
high-grade sample, quartz vein, limonite stained, 2-3 m wide exposed intermittently for 75 m, 360°/vertical; stringers of chalcopyrite and pyrrhotite with pockets of massive sulphides

D-94-12 outcrop CLASH 12 not assayed
andesite, grey-green, calcareous, cut by quartz-carbonate veinlets; host rock from vein at D-94-11

D-94-13 outcrop CLASH 12 0.44% Cu
andesite, grey, siliceous; with small stringers and clots of pyrite and chalcopyrite, limonite stained 1-2% chalcopyrite; near argillite/basalt contact

D-94-14 float CLASH 12 0.22% Zn
quartz vein, white, limonite stained, with stringers and disseminations of pyrite; intruding black argillite

D-94-15 outcrop CLASH 12 0.19% Zn
quartz vein, white, 3 cm wide, 1% disseminated pyrite; intruding black argillite; several parallel quartz veins in a zone striking 020°

D-94-16 < no sample >

D-94-17 float CLASH 4
andesite, green, 5% disseminated pyrite, crystalline, occasional quartz as small veinlets and flooding; numerous boulders in area, local source on cliff

D-94-18 outcrop CLASH 4
andesite, green, quartz flooded, 10% disseminated pyrite, layers of semi-massive sulphides

D-94-19 outcrop CLASH 9, north boundary 1.71% Cu, 1.05% Zn, 1.2 oz/ton Ag
quartz as veinlets and flooding, grey to beige, 1-2% disseminated chalcopyrite associated with the quartz; in grey altered andesite?

D-94-20 outcrop CLASH 9, same area as D-94-19 0.52% Cu, 1.18% Zn
quartz as veinlets and flooding, white to grey, chalcopyrite associated with the quartz. Hand sample : quartz veinlet stockwork throughout, 1% chalcopyrite, <1% sphalerite

D-94-21 outcrop CLASH 4 0.56% Cu, 1.3% Zn
quartz veinlet stockwork and flooding with associated disseminated chalcopyrite and pyrite, in weakly sheared green-grey andesite

D-94-22 outcrop CLASH 9
andesite, grey-green, siliceous, 1-2% disseminated pyrite; intruded by grey quartz veinlets; 4x4 m outcrop on edge of knoll

D-94-23 outcrop CLASH 9 1.26% Cu, 0.93% Zn, 0.88 oz/ton Ag
quartz vein, grey, 10-15 cm wide, limonite stained, disseminated pyrite and chalcopyrite; intruding siliceous andesite with disseminated pyrite

D-94-24 outcrop CLASH 9, same zone as D-94-23 0.11% Cu, 0.12% Zn
quartz vein, ~8 cm wide, 2% disseminated pyrite, minor sphalerite; rusty zone 2-3 m wide from which this sample was taken

C-94-1 outcrop L.3874, west of Gamma grid 0.65% Cu
andesite, silicified, cherty, 5-10% disseminated pyrrhotite, sections with 3-5% chalcopyrite, rusty weathered, pale to medium grey on fresh surface.
20 m west, another outcrop, rusty weathered chert, highly altered 1-3% Po; apparent trend of mineralized unit ~58°; 20 m east, old pieces of Ax drill core

C-94-2 outcrop CLASH 5
white quartz, greyish greenish, sucrosic, rusty weathered, 3-5% disseminated pyrite, trace chalcopyrite, numerous discontinuous beds up to 10 m wide, minimum width 2 m; cuts chloritic diorite; occasional mafic dykes; vein orientation 0°-40°/dipping 40°-70°W; frequent mafic dykes closely associated with the veining; quartz weakly colour banded

C-94-3 outcrop CLASH 5
quartz vein, grey, rusty weathered, 40 m wide traceable for 100 m, 1-3% disseminated pyrite; frequent subparallel veins of similar dimensions, 10 m width separated ~100 m; intruding chloritic diorite; these large discontinuous quartz veins are highly fractured with two generations of quartz emplacement

C-94-4 outcrop CLASH 12, west boundary 0.08 oz/ton Ag, 1.95% Cu
large quartz vein, up to 5 m wide extending across the entire slope 300+ m, trending 057°, sucrosic, spotty malachite staining disseminated throughout, occasional azurite staining, minor disseminated pyrite; intruding pillow basalt

C-94-5 outcrop CLASH 14
argillite, well banded light and dark grey, pyrite layers parallel to bedding 332°/70°E, contact zone between basalt and argillite; sulphide-enriched rusty weathered zone at the contact 50-75 m wide consists of interbedded chert and siliceous grey to black argillite

TERRAMIN RESEARCH LABS LTD.

ANALYTICAL REPORT

Taiga Consultants Ltd.

Claude Aussant

Date: August 19, 1994

Job No: 94-117

Project: BC-91-3

P.O. No:

35 Rock

Signed: _____

14-2235 30th Avenue N.E., Calgary, Alberta,T2E 7C7
Phone (403) 250-9460 Fax (403) 291-7064

TERRAMIN RESEARCH LABS Ltd.

Job#: 94-117

Project: BC-91-3

Sample Number	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm
C-94- 1	36	6.60	6500	3	690
C-94- 2	8	0.19	107	1	23
C-94- 3	14	0.25	17	9	12
C-94- 4	2760	8.00	19500	133	350
C-94- 5	8	0.44	126	1	72
BF-94- 1	122	23.0	16800	1	290
BF-94- 2	10	1.26	5600	1	45
BF-94- 8	6	0.14	92	1	75
BF-94- 11	22	3.60	10000	1	1430
BR-94- 3	28	1.51	3900	1	61
BR-94- 5	90	25.0	28000	2	2500
BR-94- 6	216	11.3	7000	1	300
BR-94- 9	12	2.70	840	1	73
BR-94- 10	22	1.24	830	2	52
BR-94- 12	30	0.31	410	5	740
D-94- 1	8	0.06	24	1	27
D-94- 2	16	0.13	97	1	18
D-94- 3	12	0.04	9	1	7
D-94- 7 R	52	30.0	17100	1	8600
D-94- 8 R	850	91.0	55000	4	4600
D-94- 9 R	8	0.50	172	2	95
D-94- 10 R	148	14.6	23000	1	300
D-94- 11 R	264	90.0	2500	2600	16800
D-94- 13	18	15.5	4400	25	340
D-94- 14 R	8	1.58	104	10	2200
D-94- 15 R	4	0.48	79	1	1860
D-94- 17 F	4	0.10	26	1	161
D-94- 18 R	16	0.22	42	1	87
D-94- 19 R	180	41.0	17100	630	10500
D-94- 20 R	42	12.5	5200	54	11800
D-94- 21 R	46	7.30	5600	3	13000
D-94- 22 R	30	2.50	160	590	400
D-94- 23 R	12	30.0	12600	39	9300
D-94- 24 R	16	4.30	1110	6	1170
HF-94- 4	2	0.12	47	2	14
HF-94- 9	24	0.35	89	1	98
HF-94- 11	66	16.1	3600	1110	1190
HF-94- 12	50	12.3	6400	1370	16400
HF-94- 19	550	12.2	1150	2	152
HF-94- 20	120	4.30	6800	1	50

Job#: 94-117

Project: BC-91-3

Sample Number		Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm
HF-94- 21		2	0.37	71	5	57
HF-94- 25		2	0.18	75	3	39
HF-94- 26		186	6.80	8000	1	116
HF-94- 27		32	1.06	1640	1	114
HF-94- 28		8	0.90	990	1	177
HF-94- 30		76	4.50	4300	1	175
HF-94- 31		4	0.16	260	2	67
HF-94- 34		4	0.08	32	1	136
HF-94- 35		4	0.11	153	1	76
HR-94- 5		104	12.20	36000	1	114
HR-94- 6		8	0.63	1850	1	183
HR-94- 10		2	0.24	48	52	32
HR-94- 13		6	0.52	370	157	1540
HR-94- 14		90	3.30	1360	52	59
HR-94- 15		14	0.08	51	4	14
HR-94- 16		26	0.15	185	3	92
HR-94- 18		18	0.49	126	78	94
HR-94- 22		10	0.65	51	6	105
HR-94- 23		8	0.41	510	2	14
HR-94- 24		4	0.50	55	2	2200
HR-94- 29		6	0.15	149	2	44
HR-94- 32		20	0.82	880	1	73
HR-94- 33		30	4.80	4100	3	120
S-94- 1		10	0.21	146	12	2300
S-94- 2		12	2.90	320	420	7300
S-94- 3		22	2.50	1500	22	10800
S-94- 4		18	0.69	1160	3	157
S-94- 5		16	0.99	920	14	6000
S-94- 6		8	0.42	30	2	380
S-94- 7		44	0.42	600	3	26
S-94- 8		108	15.70	1490	14	7500
S-94- 9		44	10.60	2500	124	127
S-94- 10		16	0.80	620	10	370
S-94- 11		40	1.60	123	13	58
S-94- 13		8	1.70	195	1	94
SR-94- 14		2	1.03	135	1	960
SR-94- 15		2	0.89	60	3	75
SR-94- 16	QV	36	10.60	2600	27	56
SR-94- 17		2920	240.00	340	2100	24
SR-94- 18		20	3.80	470	19	70

Job#: 94-117

Project: BC-91-3

Sample Number	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm
SR-94- 19	4	0.58	370	3	16
SR-94- 20	6	3.60	3100	1	146
SR-94- 21	106	5.60	7700	1	122
SR-94- 22	180	21.0	31000	5	520
SR-94- 23	6	0.60	350	1	100

TERRAMIN RESEARCH LABS LTD.

ANALYTICAL REPORT

Taiga Consultants Ltd.

Claude Aussant

Date: August 31, 1994

Job No: 94-124

Project: BC-91-3

P.O. No:

3 Rock

Signed: _____

14-2235 30th Avenue N.E., Calgary, Alberta,T2E 7C7
Phone (403) 250-9460 Fax (403) 291-7064

TERRAMIN RESEARCH LABS Ltd.

Job#: 94-124

Project: BC-91-3

Sample Number	Au ppb	Ag ppm	Cu %	Pb ppm	Zn ppm
HR-94-1	222	26.0	1.48	14	190
HR-94-2	426	42.0	0.97	69	210
HR-94-3	58	15.1	2.60	10	200

TERRAMIN RESEARCH LABS LTD.
14-2235 - 30th Avenue N.E. Calgary, Alberta T2E 7C7
(403)[illegible]
250

SAMPLE PREPARATION

Soil and sediment samples are dried and sieved through 80 mesh nylon screen (maximum particle size 200 microns).

Rock or drill core samples are crushed to approximately 1/8" in a jaw crusher, riffled to obtain a representative sample, and pulverized to 150 mesh (100 micron particle size).

TERRAMIN RESEARCH LABS LTD.
14-2235 - 30th Avenue N.E. Calgary, Alberta T2E 7C7
(403) 276-9600
250-9460

FIRE ASSAY/AA METHOD FOR GOLD AND SILVER
PLATINUM AND PALLADIUM

Approximately 1 assay ton of prepared sample is fused with a litharge flux charge to obtain a lead button. The button is cupelled down to a precious metal prill which is then dissolved in aqua regia. The resulting solution is analysed by atomic absorption spectrophotemetry to determine the precious metals.

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14-2235 - 30th Avenue N.E. Calgary, Alberta T2E 7C
(403) 2
250-946

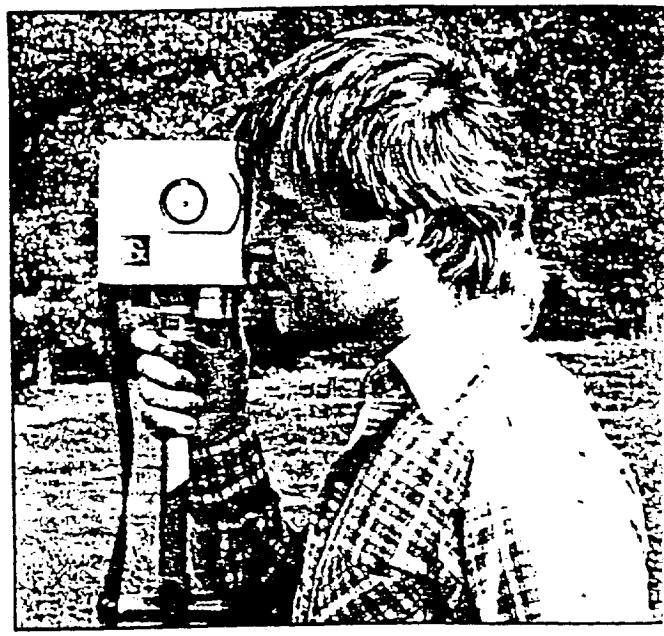
ANALYTICAL METHODS FOR BASE METALS

Cd, Cr, Co, Cu, Fe (soluble), Pb, Mn (soluble), Mo, Ni, Ag, Zn

A portion of the prepared sample is digested in hot nitric/perchloric acid mixture, or hot aqua regia (nitric/hydrochloric acids).

Elements are determined by atomic absorption spectrophotometry.

VLF EM



EM16

One of the most popular and widely used electromagnetic instruments, the EM VLF receiver makes the ideal reconnaissance EM. This can be attributed to its reliability, operational simplicity, compactness and mutual compatibility with o reconnaissance instruments such as portable magnetometers and radiometric de tors.

The VLF method of EM surveying, pioneered by Geonics, has proven to be a sim economical means of mapping geological structure and fault tracing. The applicat are many and varied, ranging from direct detection of massive sulphide conduc to the indirect detection of precious metals and radioactive deposits

FEATURES

- The EM16 is the only VLF instrument that measures the quad phase as we the in phase secondary field. This has the advantage of providing an addi piece of data for a more comprehensive interpretation and also allows a m accurate determination of the tilt angle.
- The secondary fields are measured as a ratio to the primary field making measurement independent of absolute field strength
- The EM16 is the only VLF receiver that can be adapted to measure resistivity.

Specifications

MEASURED QUANTITY	In-phase and quad-phase components of vertical netic field as a percentage of horizontal primary (i.e. tangent of the tilt angle and ellipticity)
SENSITIVITY	In-phase : ±150% Quad-phase : ± 40%
RESOLUTION	±1%
OUTPUT	Nulling by audio tone. In-phase indication from mec ical inclinometer and quad-phase from a graduated
OPERATING FREQUENCY	15-25 kHz VLF Radio Band. Station selection con means of plug-in units.
OPERATOR CONTROLS	On/Off switch, battery test push button station sel switch, audio volume control, quadrature dial, no meter.
POWER SUPPLY	6 disposable 'AA' cells
DIMENSIONS	42 x 14 x 9 cm
WEIGHT	Instrument: 1.6 kg Shipping : 5.5 kg

EM16

Pioneered and patented exclusively by Geonics Limited, the VLF method of electromagnetic surveying has been proven to be a major advance in exploration geophysical instrumentation.

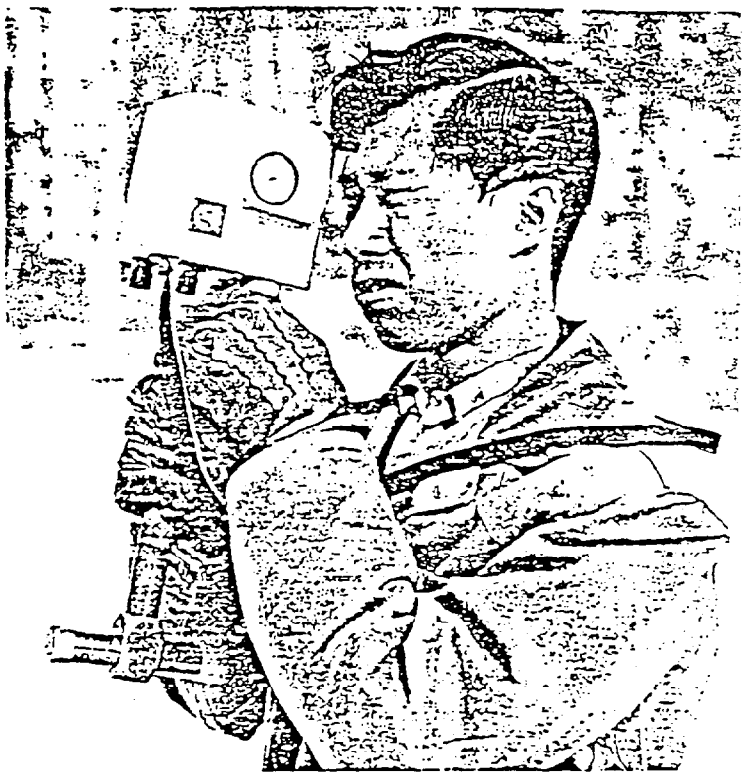
Since the beginning of 1965 a large number of mining companies have found the EM16 system to meet the need for a simple, light and effective exploration tool for mining geophysics.

The VLF method uses the military and time standard VLF transmissions as primary field. Only a receiver is then used to measure the secondary fields radiating from the local conductive targets. This allows a very light, one-man instrument to do the job. Because of the almost uniform primary field, good response from deeper targets is obtained.

The EM16 system provides the *in-phase* and *quadrature* components of the secondary field *with the polarities indicated.*

Interpretation technique has been highly developed particularly to differentiate deeper targets from the many surface indications.

Principle of Operation
The VLF transmitters have vertical antennas. The magnetic signal component is then horizontal and concentric around the transmitter location.

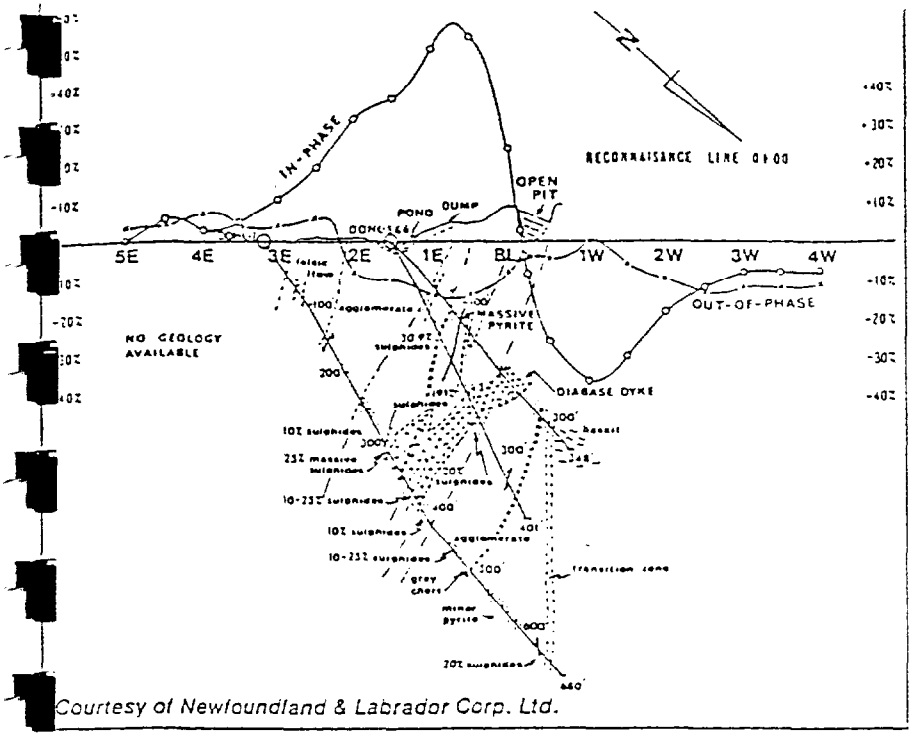


Specifications

Source of primary field	VLF transmitting stations.
Transmitting stations used	Any desired station frequency can be supplied with the instrument in the form of plug-in tuning units. Two tuning units can be plugged in at one time. A switch selects either station.
Operating frequency range	About 15-25 kHz.
Parameters measured	(1) The vertical in-phase component (tangent of the tilt angle of the polarization ellipsoid). (2) The vertical out-of-phase (quadrature) component (the short axis of the polarization ellipsoid compared to the long axis).
Method of reading	In-phase from a mechanical inclinometer and quadrature from a calibrated dial. Nulling by audio tone.
Scale range	In-phase ± 150%; quadrature ± 40%.
Readability	± 1%.
Reading time	10-40 seconds depending on signal strength.
Operating temperature range	—40 to 50° C.
Operating controls	ON-OFF switch, battery testing push button, station selector, switch, volume control, quadrature dial ± 40%, inclinometer dial ± 150%.
Power Supply	6 size AA (penlight) alkaline cells. Life about 200 hours.
Dimensions	42 x 14 x 9 cm (16 x 5.5 x 3.5 in.)
Weight	1.6 kg (3.5 lbs.)
Instrument supplied with	Monotonic speaker, carrying case, manual of operation, 3 station selecte plug-in tuning units (additional frequencies are optional), set of batterie
Shipping weight	4.5 kg (10 lbs.)

GEONICS LIMITED Designers & manufacturers of geophysical instruments

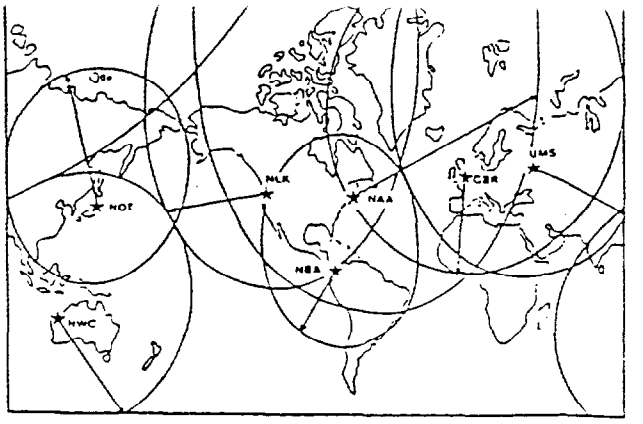
2 Thorncliffe Park Drive
Toronto/Ontario/Canada
M4H 1H2
Tel: (416) 425-1821
Cables: Geonics



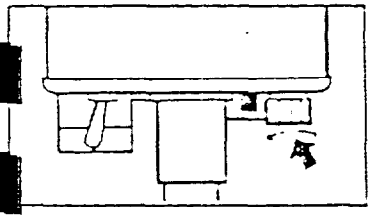
Courtesy of Newfoundland & Labrador Corp. Ltd.

EM 16 Profile over Lockport Mine Property, Newfoundland

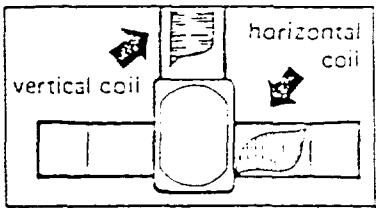
Additional case histories on request.



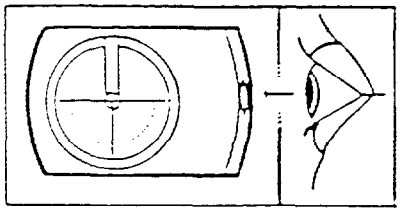
Areas of VLF Signals
Coverage shown only for well-known stations. Other reliable, fully operational stations exist. For full information regarding VLF signals in your area consult Geonics Limited. Extensive field experience has proved that the circles of coverage shown are very conservative and are actually much larger in extent.



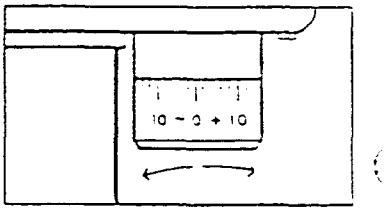
Station Selector
Two tuning units can be plugged in at one time. A switch selects either station.



Receiving Coils
Vertical receiving coil circuit in instrument picks up any vertical signal present. Horizontal receiving coil circuit, after automatic 90° signal phase shift, feeds signal into quadrature dial in series with the receiving coil.



In-Phase Dial
shows the tilt-angle of the instrument for minimum signal. This angle is the measure of the vertical in-phase signal expressed in percentage when compared to the horizontal field.



Quadrature Dial
is calibrated in percentage markings and nulls the vertical quadrature signal in the vertical coil circuit.

By selecting a suitable transmitter station as a source, the EM 16 user can survey with the most suitable primary field azimuth.

The EM 16 has two receiving coils, one for the pick-up of the horizontal (primary) field and the other for detecting any anomalous vertical secondary field. The coils are thus orthogonal, and are mounted inside the instrument "handle".

The actual measurement is done by first tilting the coil assembly to minimize the signal in the vertical (signal) coil and then further sharpening the null by using the reference signal to buck out the remaining signal. This is done by a calibrated "quadrature" dial.

The tangent of the tilt angle is the measure of the vertical in-phase component and the quadrature reading is the signal at right angles to the total field. All readings are obtained in per centages and do not depend on the absolute amplitude of the primary signals present.

The "null" condition of the measurement is detected by the drop in the audio signal emitted from the patented resonance loudspeaker. A jack is provided for those preferring the use of an earphone instead.

The power for the instrument is from 6 penlight cells. A battery tester is provided.

SCINTREX MBS-2

Total Field
Magnetic Base Station

Function

The MBS-2 is a compact, portable, self powered, total field magnetic base station which incorporates the MP-2 Portable Proton Precession Magnetometer. It is designed and constructed to operate for extended periods at remote locations under a variety of environmental conditions. The resolution is one gamma.

The MBS-2 may be used as a base station for ground and airborne magnetic surveys, in observatories as well as for land, air and sea mobile surveying

Visual digital display and analogue strip chart outputs are integral to the MBS-2. In addition, analogue and digital outputs are provided for external recording. Internal or external power supplies may be used.

Variable sampling intervals from 2 seconds to 10 minutes plus externally triggered response coupled with selectable recorder chart speeds and selectable analogue sensitivity permit a full range of settings for any monitoring situation.

The MBS-2 is supplied complete with MP-2 Magnetometer,recording control console, 50 metre sensor cable, sensor, non-magnetic tripod, one roll of chart paper, connectors, carrying case, and instruction manual. Optional accessories offer the flexibility of employing the MP-2 as a field portable survey unit.

Features

One gamma sensitivity and accuracy over the range of 20,000 to 100,000 gammas.

Operates in very high gradients, to 5000 gammas per metre.

Internal D cell power supply allows approximately 80 hours of operation. Alternatively, external power sources can be used.

Light Emitting Diode digital display for total field, lamp test and battery test.

Analogue recording output is switch selectable at 10, 100 or 1000 gammas full scale.

Digital output for interfacing with cassette or computer compatible magnetic tape recorders.

Automatic sampling intervals are variable from two seconds to ten minutes. Alternatively manual or remote clock commands can be used for any sampling interval greater than two seconds.

Timing pulse output allows synchronization of the MBS-2 with a remote recording system.

Timing pulses are automatically shown each ten minutes on the analogue strip chart.

Automatic stepping ensures no off-scale analogue traces.

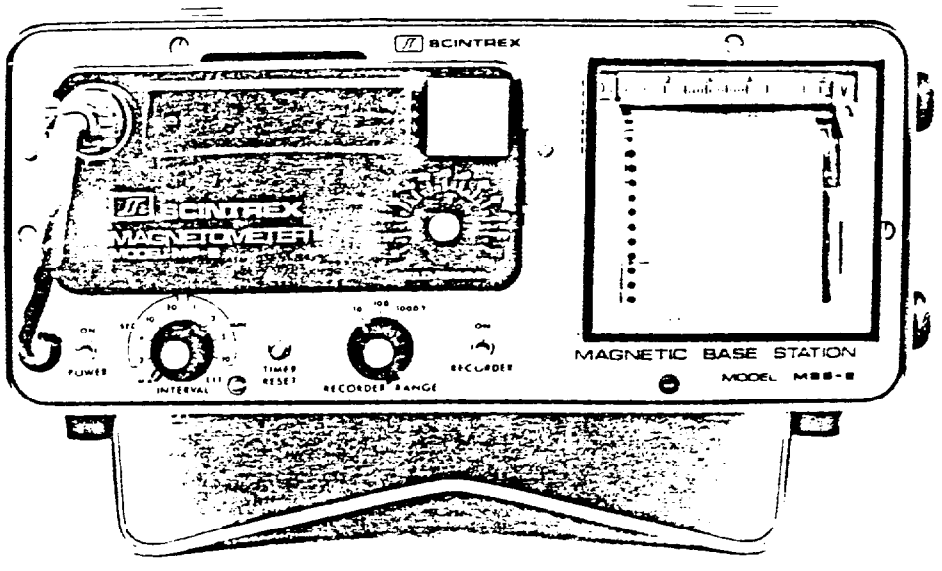
Reset feature allows precise initiation of recording to synchronize with airborne or other systems.

Unique no-glare polarized reflector permits easy reading in bright sunlight.

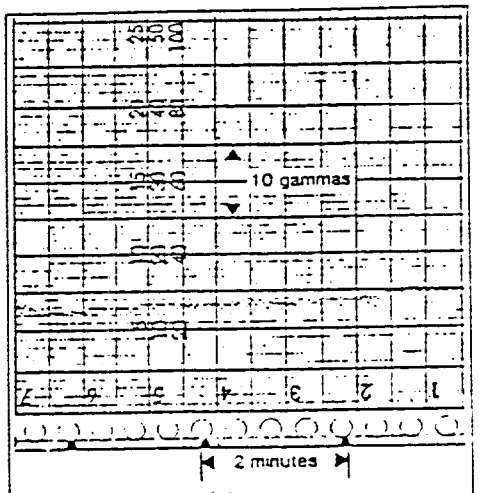
Indicator light warning of excessive gradient, ambient noise or electronic failure.

Rugged, all metal housing for rough field use.

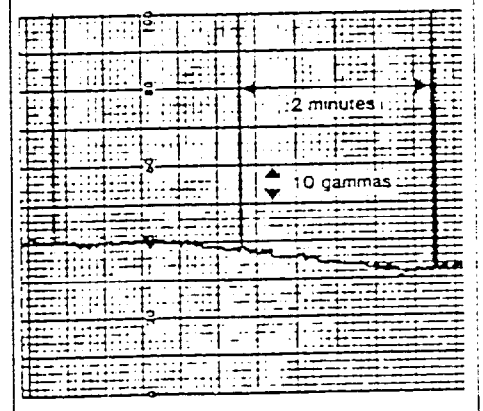
MP-2 magnetometer plus optional accessories kit can be used as a field portable survey unit.



Technical Description of MBS-2 Total Field Magnetic Base Station



internal analogue recorder



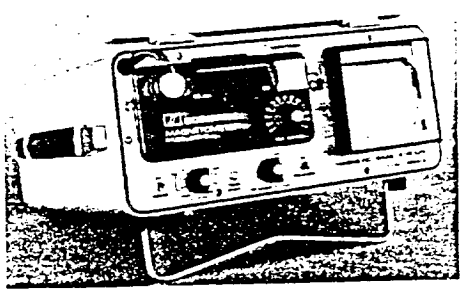
external analogue recorder

Total Field Accuracy	±1 gamma over full operating range
Operating Range	20,000 to 100,000 gammas in 25 overlapping switch selectable steps
Gradient Tolerance	Up to 5000 gammas/metre
Sensor	Omnidirectional, shielded, noise-cancelling, dual coil
Sampling Rate	Internal control: switch selectable every 2, 4, 10, 30 seconds or 1, 2, 10 minutes. External control: manual command or by external clock at any rate longer than 2 seconds. For external trigger, a positive transition from 0 to +4V or greater initiates one reading.
Clock Accuracy and Stability	±10 ppm over full temperature range.
Visual Outputs	5 digit light emitting diode numerical display lasting 0.1 seconds in automatic recycle mode and 1.7 seconds in manual mode. Internal strip chart recorder with 65 mm chart width and 100 or 600 mm/hr chart speed. Inkless recording. Switch selectable at 10, 100 or 1000 gammas full scale.
External Outputs	5 digit, 1-2-4-8 BCD DTL, TTL compatible (2 loads) with 0.5 msec. 5V pulse for synchronization of MBS-2 and external recorder. Analogue recorder output of 1V at 1 mA max. Switch selectable for 10, 100 or 1000 gammas full scale.
Time Marker	A 1.5 second pulse every 10 minutes generates a time mark on the internal or on external analogue recorders. For an external analogue recorder, a switch to ground is provided (NPN transistor, 40V max 250 mA max.). No side pen is required for continuously writing recorders as the pen returns to zero at every event mark. Intervals of less than 10 minutes are optional
Sensor Cable	50 m length is standard
Power Requirement	The internal batteries of the MP-2, (8 "C" cells) are used to power all functions of the MBS-2. This power source lasts approximately 80 hours, at 25°C and a once per minute sampling interval. An external 10 to 32V DC supply may alternatively be used. Current drain is approximately 0.9A during polarize time and 35 mA during standby, depending upon supply voltage.
Battery Test	Digital readout of normalized internal battery voltage activated by touching switch.
Operating Temperature Range	Console: 0 to 50°C Sensor: −35 to 50°C
Dimensions	Console: 140 mm x 310 mm x 390 mm Sensor: 80 mm diameter x 150 mm length Tripod: 130 mm extended length
Weights	Console: 7.7 kg Sensor with cable: 5.5 kg Tripod: 1.5 kg
Shipping Weight	Approximately 18 kg
Optional Accessories	Sensor monopod, harness, sensor backpack and 2 m sensor cable allow field portable survey use of MP-2 magnetometer. See MP-2 specification sheet.

Complete Geophysical Instrumentation and Services

Scintrex Limited
222 Snidercroft Road
Concord (Toronto) Ontario
Canada L4K 1B5
Tel: (416) 669-2280
Telex: 06-964570
Cable: Scintrex Toronto

Technical Description of MP-2 Portable Proton Precession Magnetometer



MBS-2 Magnetic Base Station

MP-2 in Operation with Back Pack Sensor

Resolution	1 Gamma
Total Field Accuracy	±1 Gamma over full operating range
Range	20,000 to 100,000 gammas in 25 overlapping steps
Internal Measuring Program	Single reading — 3.7 seconds. Recycling feature permits automatic repetitive readings at 3.7 second intervals
External Trigger	External trigger input permits use of sampling intervals longer than 3.7 seconds
Readout	5 digit LED (Light Emitting Diode) readout displaying total magnetic field in gammas or normalized battery voltage
Digital Output	Multiplied precession frequency and gate times
Base Station Mode	MP-2 console slips into a base station module which provides external triggering as well as digital and analogue outputs. The complete unit is called the MBS-2 Magnetic Base Station
Gradient Tolerance	Up to 5000 gammas/meter
Power Source	8 alkaline "D" cells provide up to 25,000 readings at 25°C under reasonable signal/noise conditions (less at lower temperatures). Premium carbon-zinc cells provide about 40% of this number
Sensor	Omnidirectional, shielded, noise-cancelling dual coil, optimized for high gradient tolerance
Harness	Complete for operation with staff or back pack sensor
Operating Temperature Range	−35°C to −60°C
Size	Console, with batteries: 80 x 160 x 250mm Sensor: 80 x 150mm Staff: 30 x 1550mm (extended) 30 x 600 mm. (collapsed)
Weights	Console, with batteries: 1.8 kg Sensor: 1.3 kg Staff: 0.6 kg
Standard Accessories	Sensor, Staff, Cable, Harness, Carrying Case, Manual
Shipping Weight	Approximately 9.5 kg

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I GENERAL INFORMATION

1.1 Introduction

The MP-2 is a portable one gamma proton precession magnetometer suitable for field survey or basestation use. The total intensity of the magnetic field is measured and displayed on a five digit light emitting diode (LED) readout within 3.7 seconds. As no leveling is required a rapid survey is possible to a high accuracy anywhere on the earth. An optional low temperature kit converts the instrument easily for winter use. The sensor is either staff mounted, or carried in a backpack. Two separate attachment joints orient the sensor for either polar or equatorial use.

The carrying case is designed to serve as a shipping or storage container and should contain the following items:

1 console
1 sensor with cable
1 staff (in lid)
1 harness
1 manual
8 alkaline batteries
8 carbon-zinc batteries
1 spare sensor cable

Options

2 Battery Cables
1 Battery Case

Reasonable care in handling should be exercised as this is a high precision instrument.

1.2 Magnetic Environment

Figure 1 shows the total intensity of the earth's magnetic field in kilogammas (kγ). Comparing the magnitude of these values with those on the range switch of the MP-2 indicates that the instrument has a world wide range. The contours on Figure 1 are, however, undisturbed background values which might be altered considerably by anomalies. This should be considered when selecting the proper tuning range after entering an unknown area.

Superimposed on the map are two dashed horizontal lines marked ±45°. These are the contours of 45° inclination of the total field. It should be remembered that toward the poles the strongest component of the earth's field is vertical, while between the lines, in equatorial regions, the horizontal component is most important.

as outlined in Section 3.2.

For accurate measurements, the sensor has to be exposed to a "clean" magnetic environment. Objects carried by the operator such as metal parts on clothing, knives, or pencils are frequently magnetic and can severely affect the results, especially when the sensor is carried in the backpack.

To establish if an object is magnetic, the sensor is set up in a stationary position and the readings compared first with the object removed and then with the object in the position with respect to the sensor in which it is to be carried. Various orientations of the object should be tried as certain positions may not affect the reading.

II SPECIFICATIONS

The MP-2 has the following specifications:

Resolution	1 Gamma
Total Field Accuracy	±1 Gamma over full operating range
Range	20,000 to 100,000 gammas in 25 overlapping steps.
Internal Measuring Programme	Single reading - 3.7 seconds. Recycling feature permits automatic repetitive readings at 3.7 seconds intervals.
External Trigger	External trigger input permits use of sampling intervals longer than 3.7 seconds.
Display	5 digit LED (Light Emitting Diode) readout displaying total magnetic field in gammas or normalized battery voltage.
Data Output	Multiplied precession frequency and gate time outputs for basestation recording using interfacing optionally available from Scintrex.
Gradient Tolerance	Up to 5000 gammas/metre
Power Source	8 alkaline "D" cells provide up to 25,000 readings at 25°C under reasonable signal/noise conditions (less at lower temperatures). Premium carbon-zinc cells provide about 40% of this number.
Sensor	Omnidirectional, shielded, noise-cancelling dual coil, optimized for high gradient tolerance.

Specifications - cont'd:

Harness	Complete for operation with staff or back pack sensor.
Operating Temperature Range	-35°C to +60°C
Size	Console, with batteries: 80 x 160 x 250 mm. Sensor: 80 x 150 mm. Staff : 30 x 1550 mm. (extended) 30 x 600 mm. (collapsed)
Weights	Console, with batteries: 1.8kg. Sensor: 1.3kg Staff : 0.6kg

TVI Copper Inc.
Clash 1 Mineral Claim

Summary of Expenditures

Pre-Field (logistics)			
crew,gear,groceries, transportation		pro rata	53.16
Mob/Demob		pro rata	231.12
Field Personnel			
Project Geologist	1 days @ $ 425 /day		425.00
Senior Prospector	1 days @ $ 325 /day		325.00
Junior Prospector	1 days @ $ 290 /day		290.00
Equipment Rentals			
¾-ton van, generator, radio telephone, walkie-talkies, mag base station with portable mags, VLF-EM, chainsaws		pro rata	162.72
Camp Support		pro rata	170.64
Aircraft Support			
Helicopter		pro rata	751.20
Fixed-Wing		pro rata	52.80
Miscellaneous			
Disposables, fuel, communications, freight		pro rata	78.72
Gecchemical Analyses			
Au,Ag,Cu,Pb,Zn	1 rock @ $16.75		16.75
Post-Field		pro rata	200.16
		SUB-TOTAL	2,757.27
Administration	@ 10%		275.73
		GRAND TOTAL	$3,033.00

TVI Copper Inc.

Group 1 -

Clash 2,3; Any 4; Car 1; Ann 1 Mineral Claims

Summary of Expenditures

Pre-Field (logistics)			
crew,gear,groceries, transportation		pro rata	380.98
Mob/Demob		pro rata	1,656.36
Field Personnel			
Project Geologist	1.5 days @ $ 425 /day		637.50
Senior Prospector	5.0 days @ $ 325 /day		1,625.00
Junior Prospector	5.0 days @ $ 290 /day		1,450.00
Equipment Rentals			
¾-ton van, generator, radio telephone, walkie-talkies, mag base station with portable mags, VLF-EM, chainsaws		pro rata	1,166.16
Camp Support		pro rata	1,222.92
Aircraft Support			
Helicopter		pro rata	5,383.60
Fixed-Wing		pro rata	378.40
Miscellaneous			
Disposables, fuel, communications, freight		pro rata	564.16
Geochemical Analyses			
Au,Ag,Cu,Pb,Zn	4 rocks @ $16.75		67.00
Post-Field		pro rata	1,434.48
		SUB-TOTAL	15,966.56
Administration	@ 10%		1,596.66
		GRAND TOTAL	$17,563.22

TVI Copper Inc.

Group 2 -
Clash 12,13,14,15; Anza 4,5;
Double Ed 2,3,4,5,7,8,9,10 Mineral Claims

Summary of Expenditures

Pre-Field (logistics)			
crew,gear,groceries, transportation		pro rata	398.70
Mob/Demob		pro rata	1,733.40
Field Personnel			
Project Geologist	5.5 days @ $ 425 /day		2,337.50
Senior Prospector	9.5 days @ $ 325 /day		3,087.50
Junior Prospector	8.0 days @ $ 290 /day		2,320.00
Equipment Rentals			
¾-ton van, generator, radio telephone, walkie-talkies, mag base station with portable mags, VLF-EM, chainsaws		pro rata	1,220.40
Camp Support		pro rata	1,279.80
Aircraft Support			
Helicopter		pro rata	5,634.00
Fixed-Wing		pro rata	396.00
Miscellaneous			
Disposables, fuel, communications, freight		pro rata	590.40
Geochemical Analyses			
Au,Ag,Cu,Pb,Zn	25 rocks @ $16.75		418.75
Post-Field		pro rata	1,519.20
		SUB-TOTAL	20,935.65
Administration	@ 10%		2,093.57
		GRAND TOTAL	$23,029.22

TVI Copper Inc.

Group 3 -

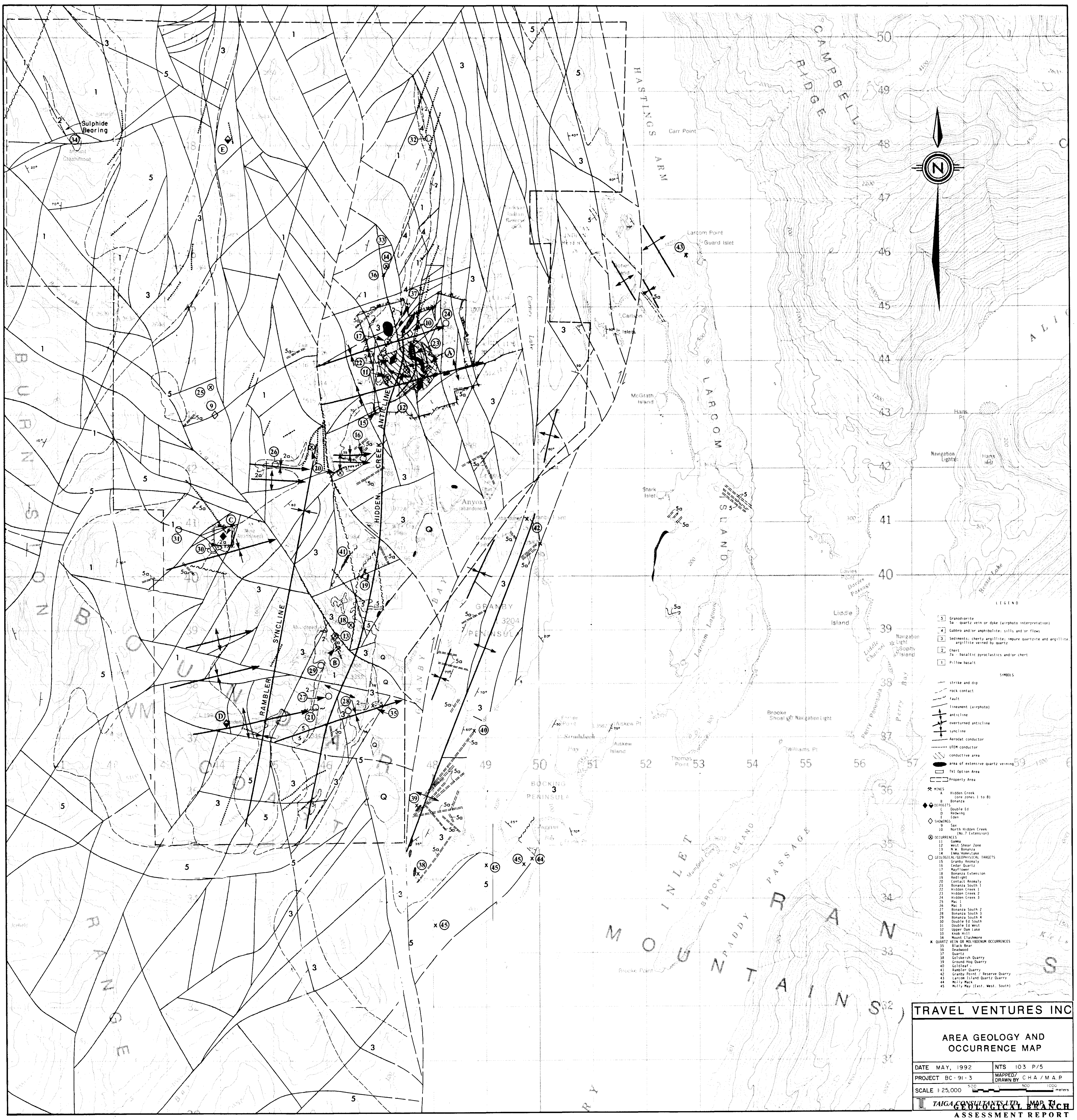
Clash 8,10,11; Anza 1,2; Ann 2 Mineral Claims

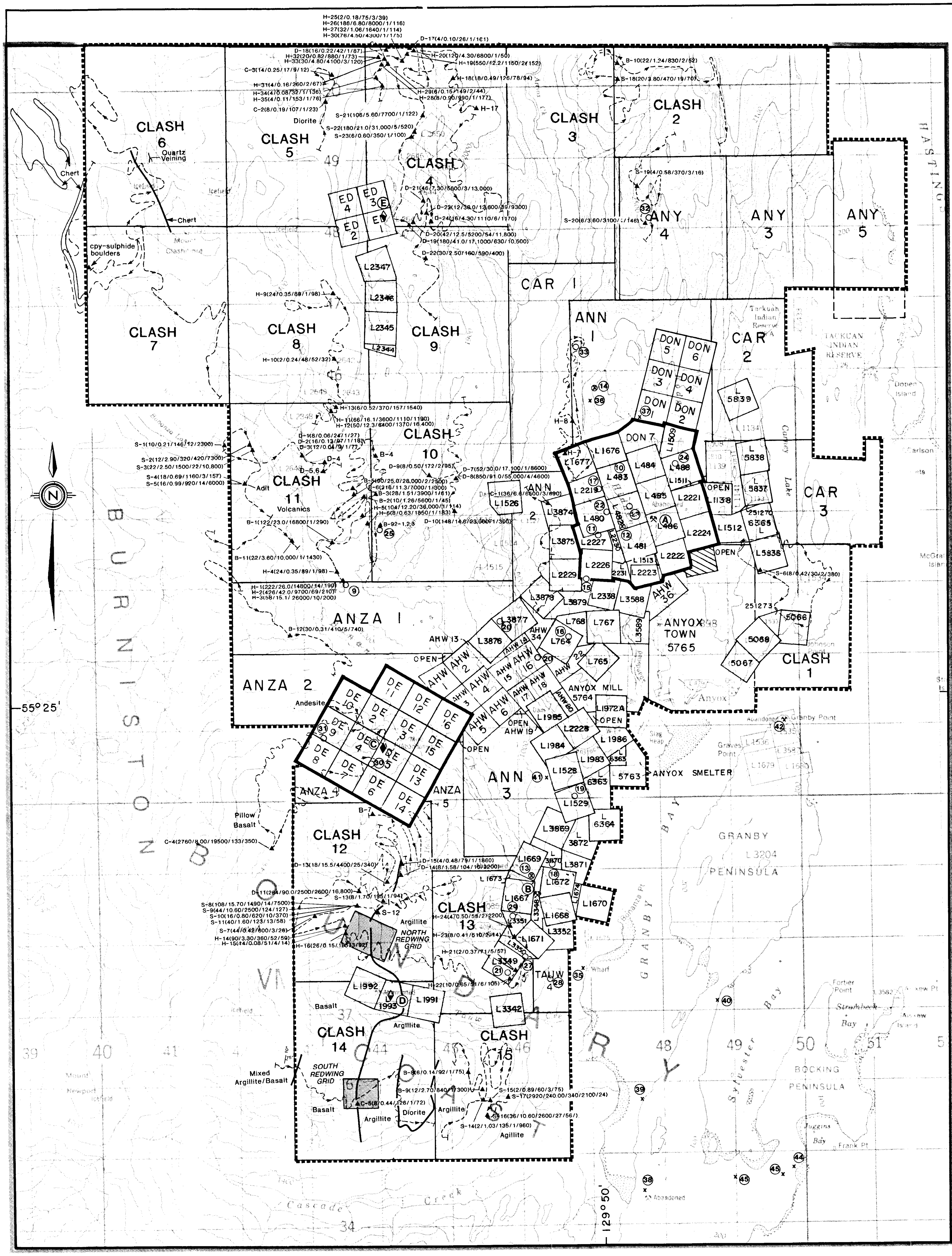
Summary of Expenditures

Pre-Field (logistics)			
crew,gear,groceries, transportation		pro rata	525.28
Mob/Demob		pro rata	1,948.96
Field Personnel			
Project Geologist	2.5 days @ $ 425 /day		1,062.50
Senior Prospector	5.0 days @ $ 325 /day		1,625.00
Junior Prospector	8.5 days @ $ 290 /day		2,465.00
Equipment Rentals			
¾-ton van, generator, radio telephone, walkie-talkies, mag base station with portable mags, VLF-EM, chainsaws		pro rata	1,371.76
Camp Support		pro rata	1,485.12
Aircraft Support			
Helicopter		pro rata	7,729.60
Fixed-Wing		pro rata	472.40
Miscellaneous			
Disposables, fuel, communications, freight		pro rata	689.76
Geochemical Analyses			
Au,Ag,Cu,Pb,Zn	31 rocks @ $16.75		519.25
Post-Field		pro rata	1,749.28
		SUB-TOTAL	21,643.91
Administration	@ 10%		2,164.39
		GRAND TOTAL	$23,808.30

TVI Copper Inc.
Group 4 -
Clash 4,5,6,7,9 Mineral Claims
Summary of Expenditures

Pre-Field (logistics)			
crew,gear,groceries, transportation		pro rata	443.00
Mob/Demob		pro rata	1,926.00
Field Personnel			
Project Geologist	3.5 days @ $ 425 /day		1,487.50
Senior Prospector	7.5 days @ $ 325 /day		2,437.50
Junior Prospector	5.5 days @ $ 290 /day		1,595.00
Equipment Rentals			
¾-ton van, generator, radio telephone, walkie-talkies, mag base station with portable mags, VLF-EM, chainsaws		pro rata	1,356.00
Camp Support		pro rata	1,422.00
Aircraft Support			
Helicopter		pro rata	6,260.00
Fixed-Wing		pro rata	440.00
Miscellaneous			
Disposables, fuel, communications, freight		pro rata	656.00
Geochemical Analyses			
Au,Ag,Cu,Pb,Zn	27 rocks @ $16.75		452.25
Post-Field		pro rata	1,668.00
		SUB-TOTAL	20,143.25
Administration	@ 10%		2,014.33
		GRAND TOTAL	$22,157.58





LEGEND - MAP

- Property boundary
- Claim boundary
- Grid locations
- Prospecting traverse
- ▲ B-5(90/25.0/28,000/2/2500) Sample site and number — Au ppb/Ag ppm/Cu ppm/Pb ppm/Zn ppm
- Geological contact

LEGEND - OCCURRENCES

MINES
- A Hidden Creek
- B Bonanza

DEPOSITS
- C Double Ed
- D Redwing
- E Eden

SHOWINGS
- 9 Sax
- 10 North Hidden Creek

OCCURRENCES
- 11 Gamma
- 12 West Shear Zone
- 13 N.W. Bonanza
- 14 Emma/Homestake

GEOLOGICAL/GEOPHYSICAL TARGETS
- 15 Granby Anomaly
- 16 Cedar Quartz
- 17 Mayflower
- 18 Bonanza Extension
- 19 Redlight
- 20 Contact Anomaly
- 21 Bonanza South 1
- 22 Hidden Creek 1
- 23 Hidden Creek 2
- 24 Hidden Creek 3
- 25 Mac 1
- 26 Mac 3
- 27 Bonanza South 2
- 28 Bonanza South 3
- 29 Bonanza South 4
- 30 Double Ed South
- 31 Double Ed West
- 32 Upper Dam Lake
- 33 Knob Hill

QUARTZ VEIN or MOLYBDENUM OCCURRENCES
- 34 Mount Clashmore
- 35 Black Bear
- 36 Deadwood
- 37 Quartz
- 38 Golskeish Quarry
- 39 Ground Hog Quarry
- 40 Goldleaf
- 41 Rambler Quarry
- 42 Granby Point/Reserve Quarry
- 43 Larom Island Quartz Quarry (off map area)
- 44 Molly Mack
- 45 Molly May (East, West, South)

GEOLOGICAL BRANCH
ASSESSMENT REPORT

23,582

TVI COPPER INC.

PROPERTY MAP, GRID LOCATIONS, RECONNAISSANCE PROSPECTING TRAVERSES & SAMPLE LOCATIONS

DATE	NTS 103 P/5
PROJECT BC-91-3	MAPPED/DRAWN BY C.A.
SCALE 1:25,000	500 0 500 1000m
TAIGA CONSULTANTS LTD	MAP 1