ASSESSMENT REPORT ON THE TWIN GROUP

(Twin 1 - 3, KE 1 Fr., JM 1 - 5, and JM 6 Fr.)

Kamloops Mining Division
British Columbia

NTS : 82M/4W
Latitude : 51° 08' North Longitude : 119° 47' West

Owners : Apex Energy Corporation
717 - 602 West Pender Street
Vancouver, B.C. V6B 1P2

United Lincoln Resources Inc.
1020 - 800 West Pender Street
Vancouver, B.C. V6C 2V6

Operator : Homestake Mining (Canada) Limited
1000 - 700 West Pender Street
Vancouver, B.C. V6C 1G8

Author : J. S. Bozek
Date : February 28, 1990

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1.0 SUMMARY

The Twin property consists of 10 claims totalling 1150 hectares and is located in the Kamloops Mining Division in South-Central British Columbia, approximately 60 km northeast of Kamloops.

The area is underlain by weakly metamorphosed volcanic and sedimentary rocks of the Paleozoic Eagle Bay Formation. The Eagle Bay consists of 4 structurally emplaced assemblages which were deformed and metamorphosed during the Jurassic-Cretaceous (Schiarizza and Preto, 1987). Locally, the Twin property is underlain by the Rea Assemblage which consists predominately of mafic volcanic rocks, and minor altered volcanics and chemical sediments, volcanic-derived wackes and fine grained clastic sediments.

The property has seen sporadic exploration since 1936. Exploration has concentrated on a sulphide-bearing quartz-carbonate vein (the Twin Mountain vein) which has been reportedly traced through surface trenching, underground workings, soil geochemistry, geophysical surveys and diamond drilling for a distance of 4.5 km. A small Au-rich massive sulphide lens (Twin 3 lens) was discovered in 1987 through diamond drilling. This lens occurs within the Rea zone stratigraphy which crosses the southeast portion of the Twin 3 claim. The Rea Gold Discovery lens and the Kamad 7 massive sulphide lens are also hosted within the Rea zone.

A small trenching program, designed to test the western extension of the Twin Mountain Zone, was conducted in the fall of 1989. Two of three trenches intersected alteration and veins characteristic of the Twin Mountain Zone. No anomalous precious or base metal results were returned.

2.0 INTRODUCTION

2.1 Scope of Report

This report summarizes the exploration work completed on the Twin Mountain Property by Homestake Mining (Canada) Ltd. during the period of November 15 to 20, 1989.

2.2 Property Definition

The Twin property consists of the Twin 1 to 3 claims, the KE fraction, the JM

claims and the JM fraction, totalling 46 units or 1150 hectares. Details of the claims are summarized below:

CLAIM	RECORD NO.	UNITS	EXPIRY DATE
Twin 1	2403	18	02-13-1995
Twin 2	2404	12	02-13-1995
Twin 3	2405	9	02-13-1995
KE 1 Fr.	6521	1	02/19/1991
JM 1	6515	1	02/19/1994
JM 2	6516	1	02/19/1994
JM 3	6517	1	02/19/1994
JM 4	6518	1	02/19/1994
JM 5	6519	1	02/19/1994
JM 6 Fr.	6520	1	02/19/1994

The Twin property was acquired by Homestake Mining (Canada) Ltd. from Esso Minerals Canada in 1989. All of the claims are 100% owned by Homestake who are currently earning an interest in the property from Apex Energy Corp. and Lincoln Resources.

2.3 Location, Access and Physiography

The Twin Property is located in the Kamloops Mining Division of South-Central British Columbia. The claims are situated approximately 25km east-southeast of the town of Barriere and 60km northeast of Kamloops (Fig. 2.1).

There is good road access to the claims from Skwaam Bay on Adams Lake. The Adams West logging road is followed north for 8.5km to the Samatosum (or Sam) access road turn-off. This road gains elevation rapidly through a series of switchbacks as it heads northwest, away from Adams Lake. The Samatosum access road joins up with the 3200 logging road which crosses the claim boundary.

The Claims lie on the southwestern slopes of Twin Mountain and span an elevation range from 1340m to 1675m. Despite this gain in elevation, much of the property has a subdued relief that is typical of the Interior Plateau. Drainage is primarily to the southwest via Homestake Creek and several parallel seasonal run-offs.

Vegetation on the property consists of pine and spruce forest at higher elevations with lesser stands of poplar and balsam. At lower elevations, much of the property has been clear-cut logged.

The climate is semi-arid and typical of the southern interior of British Columbia. Summers are hot and dry with mean temperatures in the high 20's °C. Winters are cold with average snowfalls in the 100 to 150cm range at the property elevation.

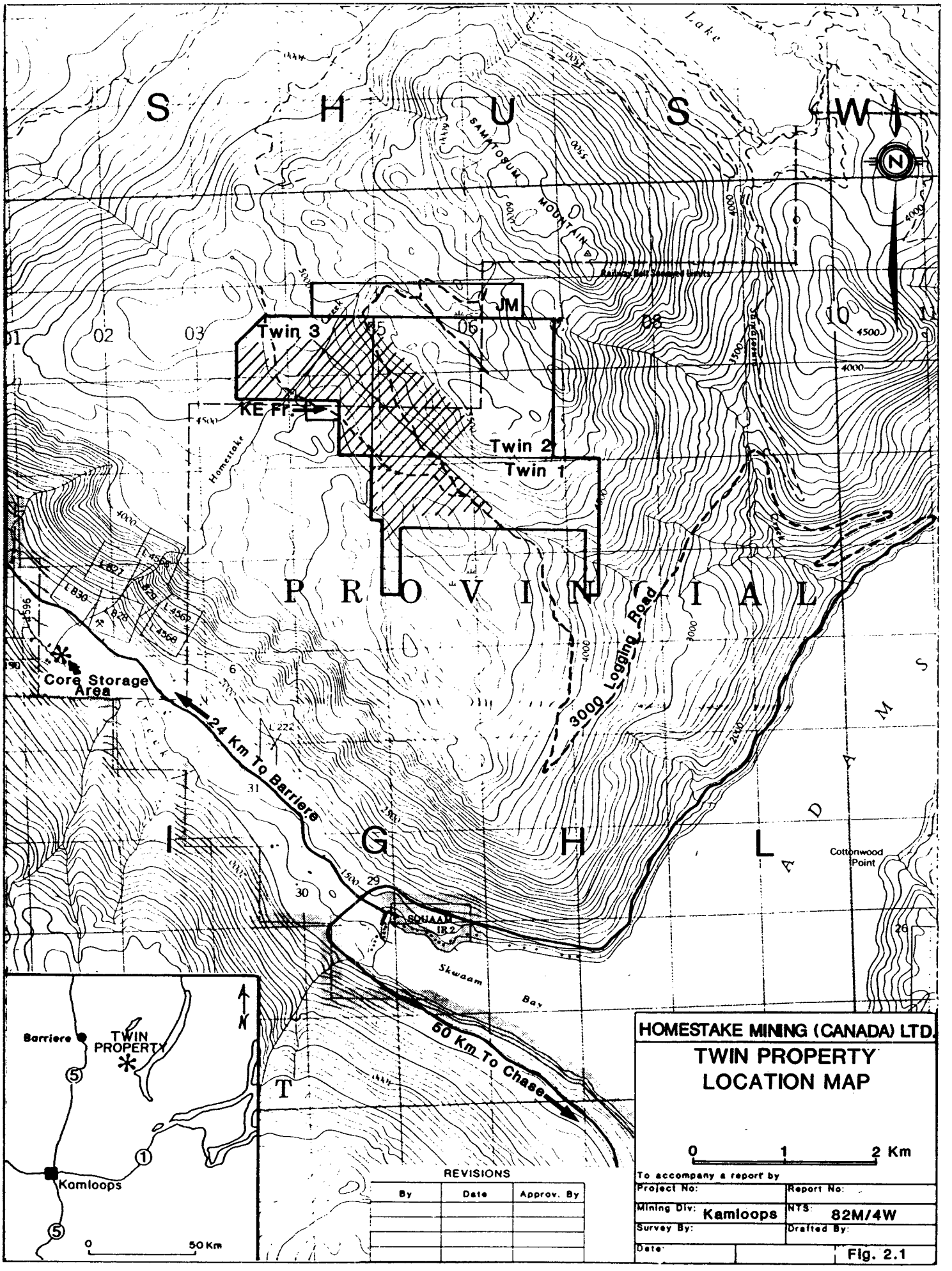
3.0 EXPLORATION HISTORY

The Adams Lake region has received attention since the early 1920's. Early exploration efforts were concentrated around several small massive sulphide and vein occurrences. The Twin Mountain occurrence, a Pb-Zn bearing vein, was discovered in 1936 and has since been explored sporadically by several operators.

The earliest documented work on the Twin Mountain occurrence was in 1936 when Henry Height and Associates from Barriere excavated 12 hand trenches across a 3m wide dolomite vein enclosed by quartz-sericite altered mafic volcanic rocks. The vein was found to contain significant amounts of Pb, Zn and Ag with traces of Au. Assay results of 6 samples reportedly ranged from trace to 0.5 oz/t Au, trace to 5.0 oz/t Ag, 0 to 36.5% Pb and 0 to 3.7% Zn (BCMMAR., 1936, p. D39).

The property was optioned to Camoose Mines Limited by C.C. Keller of Louis Creek in 1952. During that year two exploration adits were driven into the Twin Mountain vein and 7.5km of access road from Skwaam Bay was constructed. The mineralized dolomite vein was encountered in the western adit and was followed 30m to the northwest and 34m to the southeast by underground drifting.

The property was re-staked by C.C.Keller in 1966 and optioned to Sinmax Mines Ltd. A surface exploration program, consisting of a cut grid, soil geochemistry, geophysics and underground mapping and sampling was conducted. In 1969 Sinmax Mines Ltd. prospected the claims, and excavated 15 trenches. The Twin Mountain vein was reportedly traced for a distance of 4 kms, but metal values were highly variable and erratically distributed.



REVISIONS

By	Date	Approv. By

HOMESTAKE MINING (CANADA) LTD.

TWIN PROPERTY LOCATION MAP

To accompany a report by

Project No:	Report No:
Mining Div: Kamloops	NTS: 82M/4W
Survey By:	Drafted By:
Date:	Fig. 2.1

The Twin 1 to 3 claims were staked for Apex Energy Corp. in 1980 by Mr C. Graf. A program consisting of geological mapping, soil geochemistry and geophysics was conducted over the showings in 1981 and 1982 by Nevin Sadlier-Brown, Goodbrand Ltd. on behalf of Apex Energy Corp.

Following the discovery of the Rea Gold massive sulphide lens in 1982, Lincoln Resources entered an option agreement with Apex Energy Corp. to work on the Twin property. A grid was established over the property and a soil geochemical survey was carried out.

In 1984, Corporation Falconbridge Copper acquired the property from Lincoln Resources with the aim of exploring the southeasterly strike extension of the newly discovered Rea zone. Geological mapping (1:2500) in conjunction with rock geochemical and Max-Min II and VLF-EM geophysical surveys were completed. Two diamond drill-holes (DDH's AA1 AND AA2) failed to intersect the target horizon. Corporation Falconbridge Copper terminated their option in April 1985. Lincoln Resources Inc. conducted a limited fill-in soil geochemical survey that year.

In 1986 J.D. Blanchflower undertook an extensive exploration program on the Twin Claims on behalf of Lincoln Resources Inc. and Apex Energy Corp. The program included re-establishment of the 1983 grid, and the addition of 15.5 km of new grid. The grid was soil sampled, rock sampled and mapped at a 1:5000 scale. Genie EM (fixed source) and trenching was subsequently completed on the Rea Horizon.

In December 1986 Esso Minerals Canada optioned the property from Lincoln Resources Inc. and Apex Energy Corp. Early in 1987 Esso Minerals conducted a geophysical (VLF-EM) survey over geochemical target areas identified by Blanchflower the previous summer. This was followed by a 2269m diamond drill program which discovered a small gold-rich massive sulphide lens on the Rea zone on the Twin 3 claim (Heberlein, 1988). Work by Esso in 1988 included 1278m of diamond drilling on the Rea zone and detailed surface mapping of the Twin 2 and Twin 3 claims. In 1989 the property was acquired by Homestake Mining (Canada) Ltd.

4.0 GEOLOGY

4.1 General Geology

The reader is referred to the 1987 Final Report (Heberlein, 1988) and Schiarizza and Preto (1987) for a description of the regional geology.

Figure 4.1 illustrates the modified geology of the area. The stratigraphy can be divided into four thrust-bounded assemblages, each characterized by a unique internal stratigraphy and uniform facing direction. A correlation chart (Fig. 4.2) modified from Schiarizza and Preto schematically illustrates the relative structural position of each assemblage.

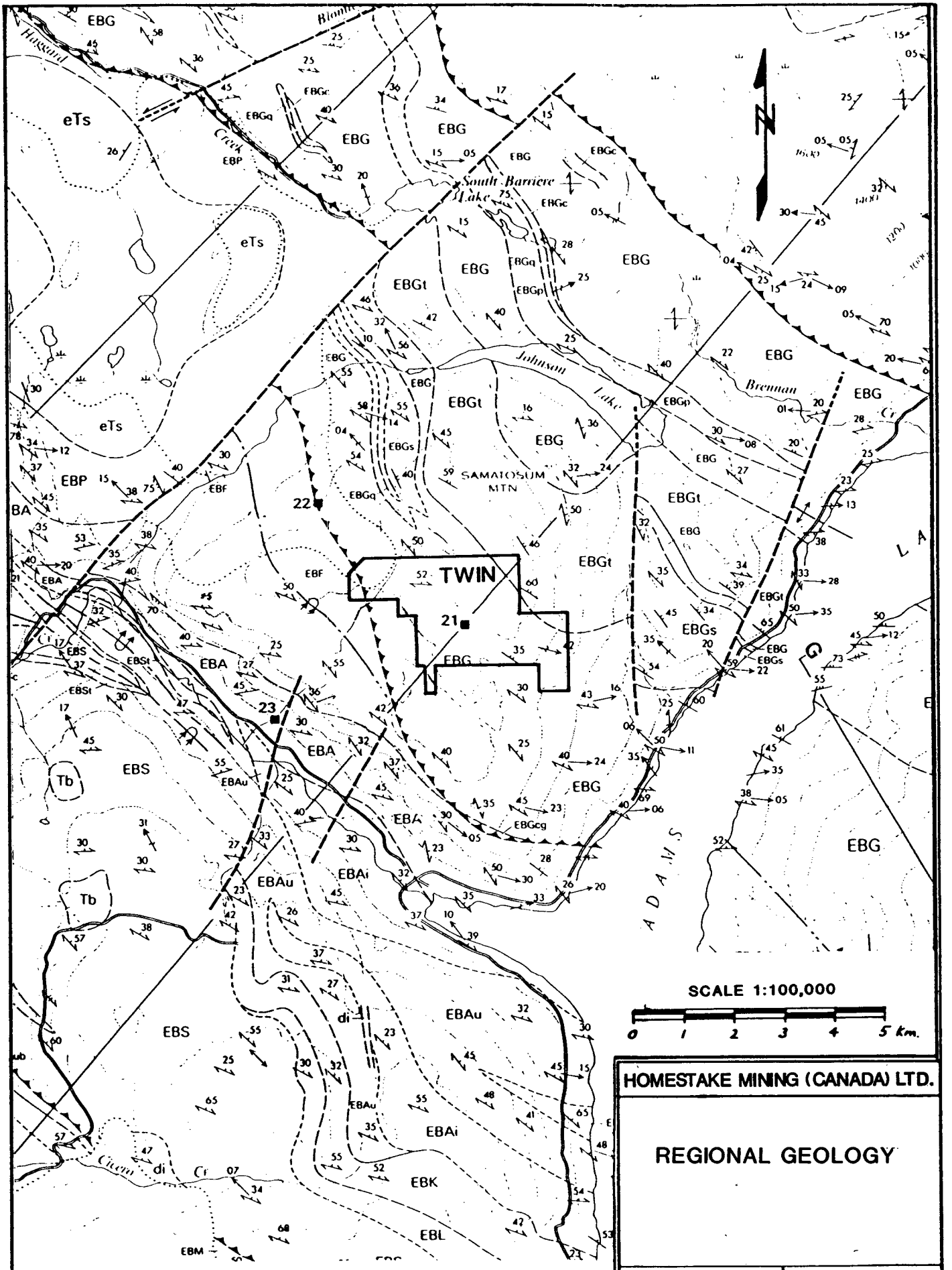
4.1.1 The Rea Assemblage

The Twin property is underlain entirely by rocks of the Rea Assemblage. These rocks correspond to Schiarizza and Preto's thrust slice 2 (Unit EBG - Fig. 4.1). The assemblage consists of a structurally inverted sequence of mafic pyroclastics and flows (Unit R_{mv} - Fig. 4.2) that contain a prominent limestone marker (the Tshinakin Limestone) which outcrops just to the north of the claims.

The mafic series is structurally underlain (stratigraphically overlain) by a 350m thick sequence of clastic sediments (Unit R_{qw} - Fig. 4.2) that are informally termed the Rea sediments. They are typified by quartz wacke, siltstone and argillite. Massive sulphide mineralization at the Rea Gold, Samatosum and Twin 3 occurrences is hosted at the mafic-volcanic sediment contact (Heberlein, 1988).

4.1.2 Plateau Assemblage

The Plateau Assemblage lies immediately to the south of the Rea Assemblage and correlates with Schiarizza and Preto's Unit EBF. The succession is right-way-up and consists of three stratigraphic units; a lower intermediate volcanic unit (P_{ci} - Fig. 4.2), a middle mafic volcanic unit (P_{mv}) and an upper felsic volcanic unit (P_{fv}). Argillites (P_{ar}) occur at several levels in the succession but comprise only a small fraction of the stratigraphy.



NOTE: GEOLOGY IS TAKEN FROM B.C.M.E.M.P.R. PRELIMINARY MAP No. 56 COMPILED BY PAUL SCHIARIZZA & V.A. PRETO.

HOMESTAKE MINING (CANADA) LTD.

REGIONAL GEOLOGY

Project No.	Mining Div. Kamloops
NTS. 82M/4W	Drawn by:
Date:	Fig. No. 4.1

LEGEND

TERTIARY OR QUATERNARY

Tb — *Olivine basalt*

MIOCENE OR PLIOCENE

mTb — *Plateau lava: olivine basalt*

EOCENE

KAMLOOPS GROUP

SKULL HILL FORMATION

eTs — *Andesite and basalt; includes minor amounts of mudstone and shale in the vicinity of Alex and Haggard Creeks*

CHU CHUA FORMATION

eTc — *Sandstone, shale, conglomerate, coal*

CRETACEOUS OR TERTIARY

qp — *Quartz-feldspar porphyry*

CRETACEOUS

BALDY BATHOLITH, RAFT BATHOLITH, AND RELATED ROCKS

Kg — *Granite and granodiorite; Kgp – includes abundant pegmatite as well as foliated granitic rocks of possible older age*

QUESNEL TERRANE

UPPER TRIASSIC AND (?) LOWER JURASSIC

NICOLA GROUP

UPPER TRIASSIC OR LOWER JURASSIC

TrJv — *Augite porphyry breccia*

UPPER TRIASSIC

TrI — *Dark grey limestone*

SLIDE MOUNTAIN TERRANE

DEVONIAN TO PERMIAN

FENNELL FORMATION

UPPER STRUCTURAL DIVISION

uFb — *Grey and green pillowed and massive metabasalt; minor amounts of basaltic breccia, tuff, diabase, gabbro and chert*

uFc — *Grey and green bedded chert*

LOWER STRUCTURAL DIVISION

lFc — *Grey and green bedded chert, cherty argillite, slate and phyllite*

lFb — *Grey and green pillowed and massive metabasalt; minor amounts of basaltic breccia and tuff*

lFg — *Gabbro, diorite, diabase*

lFp — *Light to medium grey quartz-feldspar porphyry rhyolite*

lFs — *Light to dark grey sandstone, siltstone, slate, phyllite and quartzite; minor amounts of limestone, chert and quartz-feldspar phyllite (metatuff)*

lFcg — *Intraformational conglomerate; clasts derived exclusively from Fennell Formation lithologies*

lFu — *Undivided; mainly lFc, lFg and lFb, but may include any or all of above rock types*

KOOTENAY TERRANE

LOWER CAMBRIAN (AND OLDER ?) TO MISSISSIPPIAN

EAGLE BAY ASSEMBLAGE (EBP TO EBH)

MISSISSIPPIAN

EBP — *Dark grey phyllite and slate with interbedded siltstone, sandstone and grit; lesser amounts of conglomerate, limestone, dolostone, chlorite-sericite-quartz schist, quartzite and metatuff;* EBPl – *limestone;* EBPv – *metavolcanic breccia and tuff*

DEVONIAN AND/OR MISSISSIPPIAN

EBF — *Light to medium grey, rusty weathering feldspathic phyllite, schist and fragmental schist derived from intermediate tuff and volcanic breccia; minor amounts of dark grey phyllite and siltstone;* EBFq – *light grey massive "cherty quartzite" (siliceous echelite ?);* EBFt – *feldspar porphyry, feldspathic schist, pyritic sericite-feldspar-quartz schist, metavolcanic breccia, trachyte*

DEVONIAN

EBA — *Light silvery grey to medium greenish grey sericite-quartz phyllite and sericite-chlorite-quartz phyllite derived from felsic to intermediate volcanic and volcaniclastic rocks, including pyritic, feldspathic and coarsely fragmental varieties; lesser amounts of dark grey phyllite and siltstone, green chloritic phyllite, sericitic quartzite, and pyritic chert (exhalite ?);* EBAgn – *includes orthogneiss of unit Dgn*

LOWER AND/OR MIDDLE PALEOZOIC (?) (EBM TO EBS)

EBM — *Grey and green vesicular and pillowed metabasalt, greenstone and chlorite schist; minor amounts of bedded chert, siliceous phyllite and fine-grained quartzite*

EBK — *Banded light grey and green actinolite-quartz schist and epidote-actinolite-quartz rock; lesser amounts of garnet-epidote skarn, chloritic schist and sericite-quartz schist*

EBL — *Calcareous black phyllite, dark grey limestone and argillaceous limestone*

EBS — *Grey and green phyllitic sandstone and grit, phyllite, chlorite-sericite-quartz schist, and quartzite; lesser amounts of dark grey phyllite, limestone, dolostone, green chloritic phyllite, sericite-quartz phyllite and feldspathic sericite-quartz phyllite;* EBSq – *light grey to white quartzite;* EBSc – *limestone, dolostone, marble;* EBSb – *greenstone, pillowed metabasalt, chloritic phyllite;* EBScg – *conglomerate;* EBSp – *grey phyllite and siltstone;* EBSt – *siderite-sericite-quartz phyllite and feldspathic phyllite (metatuff);* EBSa – *pyritic sericite-quartz phyllite and chloritoid-sericite-quartz phyllite*

LOWER CAMBRIAN (?) AND/OR HADRYNIAN (?)

EBQ — *Light to dark grey quartzite, micaceous quartzite, grit, chlorite-muscovite-quartz schist and phyllite; lesser amounts of calcareous phyllite, calc-silicate schist, carbonate and green chlorite schist; eastern exposures include staurolite-garnet-mica schist and amphibolite;* EBQl – *limestone;* EBQgn – *includes orthogneiss of unit Dgn, as well as sericite-quartz phyllite derived from quartz porphyry dykes and sills*

LOWER CAMBRIAN (may include older and/or younger rocks)

EBG — *Medium to dark green calcareous chlorite schist, fragmental schist and greenstone derived largely from mafic to intermediate volcanic and volcaniclastic rocks; lesser amounts of limestone and dolostone; minor amounts of quartzite, grit and light to dark grey phyllite;* EBGe – *limestone, dolostone, marble,* EBGt – *Tshinakin limestone member – massive, light grey finely crystalline limestone and dolostone;* EBGs – *dark to light grey siliceous and/or graphitic phyllite, calcareous phyllite, limestone, calc-silicate, cherty quartzite; minor amounts of green chloritic phyllite and sericite-quartz phyllite;* EBGq – *light to medium grey quartzite;* EBGp – *dark grey phyllite, calcareous phyllite and limestone; minor amounts of rusty weathering carbonate-sericite-quartz phyllite (metatuff ?);* EBGcg – *polymictic conglomerate;* EBGf – *largely hornblende-quartz-feldspar-sericite-chlorite schist (intermediate metatuff)*

LOWER CAMBRIAN AND/OR HADRYNIAN

EBH — *Light to medium grey and greenish grey quartzite, grit and chlorite-sericite-quartz schist; minor amounts of pebble conglomerate, medium to dark grey phyllite and rusty weathering dolomitic sericite-chlorite schist (metatuff ?)*

INTRUSIVE ROCKS OF KOOTENAY TERRANE

PALEOZOIC (?)

di — *Foliated diorite, quartz diorite, and gabbro*

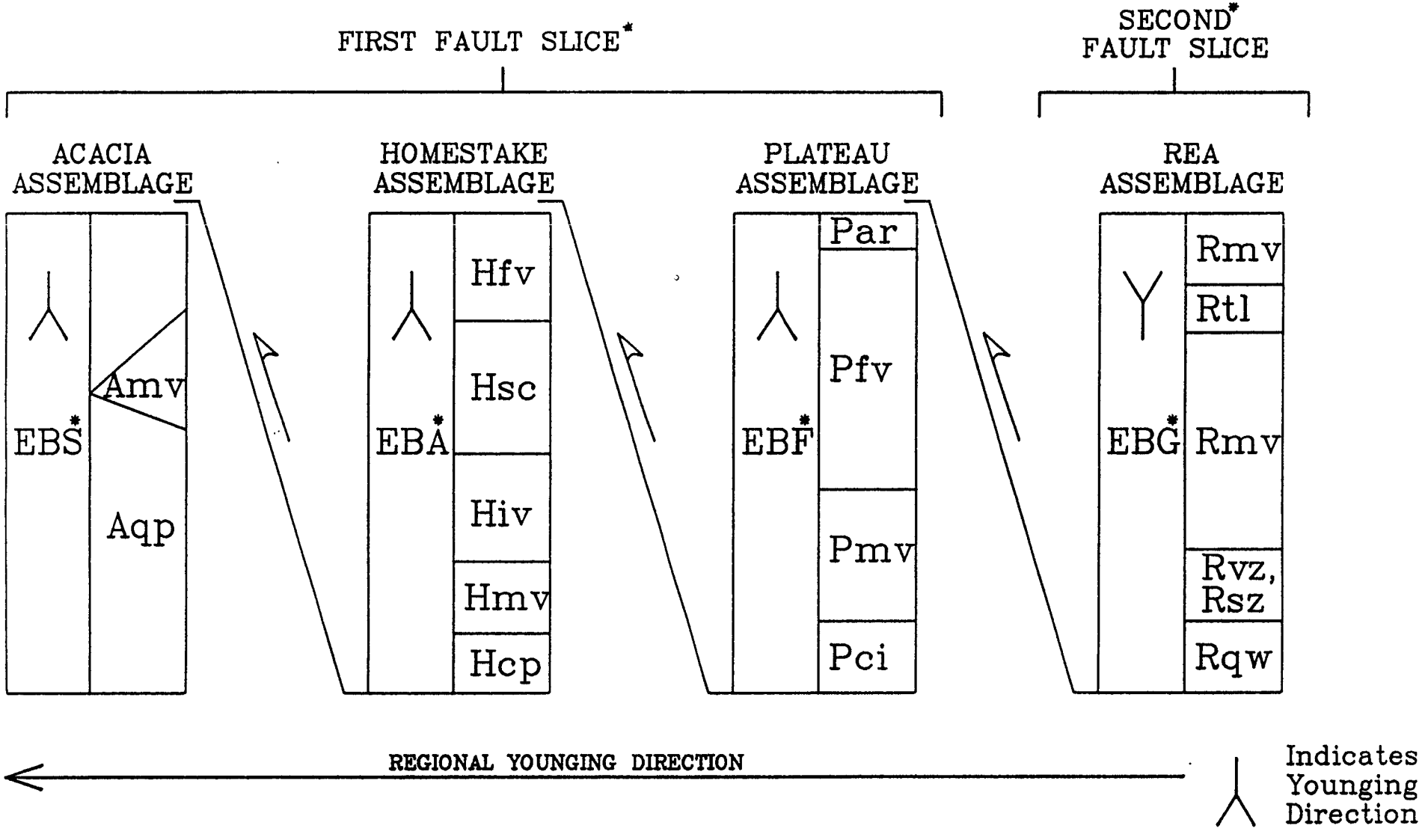
ub — *Serpentinite*

LATE DEVONIAN

Dgn — *Granite and granodiorite orthogneiss;* Dgnp – *includes sillimanite-bearing paragneiss*

Fig. 4.1a : Legend for Fig. 4.1

STRATIGRAPHIC CORRELATION CHART FOR THE TWIN AREA



* After Schiarizza & Preto (1987)

Figure 4.2

4.1.3 Homestake Assemblage

The Homestake Assemblage structurally underlies the Plateau Assemblage and consists of five distinct units. Together these constitute Schiarizza and Preto's Unit EBA (Fig. 4.2). Way-up indicators throughout the succession (graded bedding and cleavage vergence) indicate that the package is right-way-up.

4.1.4 Acacia Assemblage

Quartzite, quartz wacke, siltstone and rare argillite (Unit A_{qp} - Fig. 4.2) typify the Acacia Assemblage. They equate to Schiarizza and Preto's Unit EBS. These rocks dominate the south side of Sinmax Valley and extend for several kilometres to the southwest of the Twin property. Mafic volcanic rocks (Unit A_{mv}) make up less than 5% of the section and are represented by chlorite schists and chlorite-graphite schists (probably mafic derived sediments). The sequence is well bedded and complexly folded into southwesterly overturned, similar-style folds.

4.2 Structural Geology of the Twin Area

For a discussion of the regional structural history, the reader is referred to Schiarizza and Preto (1987).

In the Twin area, two phases of folding and three ages of faulting have been identified. Southwesterly overturned, isoclinal folds are the dominant regional structures. They are represented at all scales from macroscopic structures with wavelengths in the order of 500m to mesoscopic structures with 0.5 to 1m wavelengths. Associated with these folds is a strong axial planar foliation and slaty cleavage. Regional thrust faults are sub-parallel to this foliation indicating a possible structural relationship.

Kink folds that deform the regional foliation represent the second stage of folding. These features form steeply dipping conjugate sets with dominant axial trends to the northwest and north. They are best developed in schistose units (e.g the Rea zone and Homestake Schist). Locally, a poorly developed crenulation cleavage is associated with the kink folds. Intersection lineations (L2) between the crenulation cleavage and the regional foliation trend generally northwest and plunge at a shallow angle (5 to 10°).

4.3 Property Geology (Fig. 4.3)

The reader is referred to Graf (1981), Croft et al (1981) and Blanchflower (1987) and Heberlein (1988) for a description of the geology of the Twin property.

Three distinct northwest trending litho-stratigraphic units (R_{mv}, R_{rz}, and R_{wp}) are exposed on the Twin property. Contacts between units strike at 135° to 156° and dip from 45° to 60° to the northeast. The sequence is interpreted on the evidence of graded bedding and pillow tops, to be structurally inverted (Schiarizza and Preto, 1987) resulting in an overall younging to the southwest.

Unit R_{mv} (Fig. 4.3):

Approximately 90% of the Twin property is underlain by mafic volcanic rocks of unit R_{mv}. The succession consists mostly of interbedded mafic pyroclastics that range in grain size from fine ash to agglomerate and breccia. Lapilli tuff is the most commonly encountered lithology.

Flow rocks, comprise approximately 10% of the succession. They range in thickness from 2 to 5 metres and occur as a variety of types. The most common are massive to sparsely feldspar phyric basalt flows that sometimes exhibit well developed flow-top brecciation. Pillowed flows are relatively uncommon (<5%), however, good examples are exposed at several locations on the property. These are coarsely vesicular or amygdaloidal with quartz and calcite filling cavities.

Intermediate volcanic rocks have been found in drill-holes at the top of the mafic sequence. Although they are locally abundant, the they make up a very small portion of the volcanic stratigraphy. All occurrences are tuffaceous and include varieties of feldspar crystal tuff and lapilli tuff.

The massive volcanics are cut by semi-conformable diorite and hornblende diorite bodies that average between 20 and 40m in thickness. These units often have well developed contact aureoles and sheared margins.

Unit R_{rz} (Rea zone) - (Fig. 4.3):

The Rea zone (Unit R_{rz}) forms a virtually continuous unit that trends

from northwest to southeast across the Twin 3 claim. The unit lies at the contact between the Unit R_{mv} and the Unit R_{wp}. The reader is referred to the 1987 Twin Final Report (Heberlein, 1988) for a detailed description of the Rea Zones lithologies.

The Rea zone consists of altered volcanic, clastic and chemical sediment units that form a complexly interbedded succession. This unit is host to several volcanogenic massive sulphide bodies in the area, including the Twin 3 lens.

Unit R_{wp} (Figs. 4.3):

The Unit R_{wp} conformably overlies the Rea and Silver Zones. It is not well exposed on the property, but it has been observed extensively on the adjacent Kamad 7 claim and in drill core. The sequence consists of a monotonous succession of well-bedded, volcanic-derived wackes and fine grained clastic sediments that include graphitic argillite, siltstone, greywacke and quartz wacke, quartz pebble conglomerate, and coarse polymictic fragmentals interpreted to be debris flow deposits.

A thin (10 to 50m) sequence of intermediate to mafic tuff is sometimes observed between the Rea zone and the Unit R_{wp}.

4.3.1 Twin Mountain Zone

The Twin Mountain vein system consists of a complex zone of sub-parallel to en echelon, quartz-dolomite veins that lie within linear zones of pervasive sericitization or ankeritization of Unit R_{mv} mafic volcanics. The veins and alteration zones together form a 3.6km long, northeast dipping (foliation parallel) zone that crosses the property with a northwest-southeast trend.

The surface trace of the main Twin Mountain vein is exposed intermittently in outcrop and in a series of old trenches between - 62+00E, 3+00N and the east adit at -56+60E, 3+50N. Two key trench exposures contain well mineralized vein material (labelled T1 and T2 on Figure 4.3; Heberlein and Carmichael, 1988).

At locality T1, the vein is exposed in a 2m long trench. It consists of a 0.5 to 1.5m wide zone made up chiefly of massive, coarse-grained, white dolomite with

traces of disseminated galena and pyrite. The vein has a strike of approximately 290° and an apparent dip of 38° to the northeast. Significant sulphide mineralization is present at the footwall contact of the vein, where a sulphide rich band (to 15 cm in width) is exposed. Between 5 to 10% galena occurs as disseminations in the dolomite gangue. Sphalerite (3 to 5%) and traces of tetrahedrite and malachite are also present. Samples of the sulphide rich material returned the following values:

SAMPLE	Cu%	Pb%	Zn%	Ag g/t	Au g/t
8DTR045	0.01	10.74	1.73	46.0	0.38
*8DTR047	0.02	2.58	4.89	14.6	-

* Results converted from ICP analysis.

Wall rock material consists of a chlorite-sericite-calcite schist that is probably an altered mafic volcanic.

At locality T2, 30m uphill from the east adit, the vein is again exposed in an old trench. As at locality T1, the vein consists primarily of coarse-grained white dolomite with disseminated galena (1%), chalcopyrite (1%) and pyrite (3-5%) and has an average width of 1m. A semi-massive sulphide vein parallels the dolomite vein on its footwall side. The sulphide vein ranges from 3 to 5cm in width and contains galena (40%) and pyrite (5%) in a calcite gangue. A grab sample of this material returned 0.16 gpt Au, 50.4 gpt Ag, 0.1% Cu, 16.78% Pb% and 8.10% Zn. Host rocks consist of a weakly pyritic chlorite-sericite-schist.

Underground, the vein is well exposed in two 30m cross-cuts that branch from the West Adit. Here, the vein is 0.5 to 3.5m wide (averages 2m), strikes 290° and dips at 40° to the northeast, parallel to the foliation. It is crudely banded, with quartz, dolomite and barite being the chief gangue minerals. Sulphides vary from 5 to 40% throughout the vein. The highest sulphide concentrations occur where the vein is narrow. Here, galena (15%), sphalerite (5 to 10%), chalcopyrite (1%) and tetrahedrite (1 to 3%) are present as pods (to 20cm), and fracture fillings in the gangue material. Elsewhere, sulphides make up between 5 and 20% of the vein and occur as stringers, pods and disseminations. Representative grab samples of vein material returned the following values:

SAMPLE	Au(ppb)	Ag(g/t)	Cu (%)	Pb (%)	Zn (%)
8HTR003	132	19.4	0.13	2.01	2.35*
8HTR004	126	38.9	0.27	2.04	2.51

* Converted from an ICP determination

Wall rock alteration is most intense in the footwall. Here, the mafic volcanic host rocks are intensely sericitized to a yellow-grey sericite schist. This forms an envelope around the vein, extending up to 3m into the footwall and 25cm into the hanging-wall. Outside of the sericitized zone the wall rocks are variably dolomitized.

5.0 1989 EXPLORATION PROGRAM

5.1 Introduction

A trenching program, consisting of the excavation of three trenches by back-hoe with subsequent mapping and sampling, was completed during the period of November 15 to 20th, 1989. Excavation of the trenches was contracted to Stecon Contractors Ltd. of Chase, B.C.

Two of the trenches were designed to evaluate the western strike extension of the Twin Mountain zone as defined by a Genie-EM conductor and a linear Pb-Zn-Ag soil anomaly which trend northwesterly across the property (Fig. 7.1 - 1988 Final report by Heberlein; also Blanchflower, 1986). The third trench was designed to test the source of a second Genie conductor located 120 meters north of the Twin Mountain vein.

5.2 Results

TR-89-19: L68+00E, 3+25N - L67+70E, 3+75N

This trench tested the westerly strike extent of the Twin Mountain Zone. Figure 5.1 shows trench geology and channel sample locations with geochemical results.

The trench intersected a 15 meter wide alteration zone, consisting of ankeritized mafic volcanics, and ankerite-sericite altered volcanics. Pervasive

silicification is patchy but constitutes approximately 5% of the interval. Sericitization within the alteration zone increases towards the footwall (structural) margin of the interval. Numerous 10 to 30 cm quartz and quartz-calcite-(dolomite) veins, orientated parallel to foliation surfaces cut the zone. These veins contain sporadic mineralization with trace to 2% pyrite and traces of sphalerite and galena. The best results were obtained across a 1.5 meter chip sample from ankerite-sericite altered volcanics which returned analysis of 10 ppb Au, 1.8 ppm Ag, 600 ppb Pb and 1920 ppm Zn. Chlorite-(calcite) schists, with up to 10% pyrite, were encountered in both the hanging wall and footwall intervals.

TR-89-20: L66+15E, 3+15N - L66E, 3+75N

The Twin Mountain Zone in TR-89-20 was characterized by a 7.6 meter zone of intense ankerite-sericite alteration. The zone contains weakly mineralized quartz and quartz-dolomite veins, trending on average 305°/45-50°E. These veins range from 10 to 40 cm wide, and contain up to 5% pyrite and traces of sphalerite, galena and chalcopyrite. Figure 5.2 summarizes trench geology and analytical results. Best channel results were obtained from a 1.0 m interval which returned analysis of 145 ppb Au, 1.8 ppm Ag, 892 ppm Pb and 2065 ppm Zn. Two grab samples of quartz-dolomite vein material with traces of galena and sphalerite returned the following analysis:

Sample	Au(ppb)	Ag(ppm)	Pb(ppm)	Zn(ppm)
TR-89-20-09	20	2.4	1053	6116
TR-89-19-10	10	3.4	1054	3514

The structural hanging wall forms a sharp contact with homogeneous, weakly chloritized mafic volcanics. A gradational alteration contact into chlorite-(sericite) and quartz-sericite altered mafic volcanics occurs at the structural footwall margin of the zone.

TR-89-21: L71+33E, 4+35N - L71+00E, 4+87N

This trench was designed to test the source of a Genie conductor trending north-east across the property approximately 120 meters north of the Twin Mountain Zone. The trench intersected homogenous mafic volcanics to the north and predominately quartz-sericite and ankerite-sericite schists to the south. Bedrock was not exposed for an 8 meter section within the quartz-sericite schist due to the

development of ferricrete. A 1.8 meter gouge interval within the quartz-sericite schist may be the source of the genie conductor. No veining was noted within either the quartz-sericite or ankerite-sericite schist and no samples were collected.

6.0 CONCLUSIONS

Two trenches on the Twin Mountain zone targeted on a Genie conductor intersected alteration and veins characteristic of the Twin Mountain Zone. The trenching indicated that the Twin Mountain structure persists through to L68E, however veins are sporadic and are only weakly anomalous along the western extent of the structure. No lithologic or obvious structural features were observed in either trench to explain the source of the Genie conductor. The Twin Mountain Zone may, however, be related to a thrust fault which may not be exposed at surface.

Sample	Width(m)	Au(ppb)	Ag(ppm)	Pb(ppm)	Zn(ppm)
Tr-89-19-01	1.0	30	0.2	42	132
Tr-89-19-02	1.0	10	<0.2	46	95
Tr-89-19-03	1.0	10	0.8	204	480
Tr-89-19-04	1.0	5	3.8	338	1299
Tr-89-19-05	1.0	30	1.4	216	562
Tr-89-19-06	1.5	10	1.8	600	1920
Tr-89-19-07	1.5	10	0.4	56	470
Tr-89-19-08	1.0	5	0.4	34	255
Tr-89-19-09	1.5	5	0.6	72	271
Tr-89-19-10	1.5	40	0.6	46	292

LEGEND

- MAFV — Mafic Volcanic
- CLSH — Chlorite Schist
- MVAK — Ankeritized Mafic Volcanic
- AKSS — Ankerite-Sericite Schist
- QSSH — Quartz-Sericite Schist
- QZVN — Quartz Vein
- QCVN — Quartz-Calcite Vein
- QDVN — Quartz-Dolomite Vein

Modifiers:

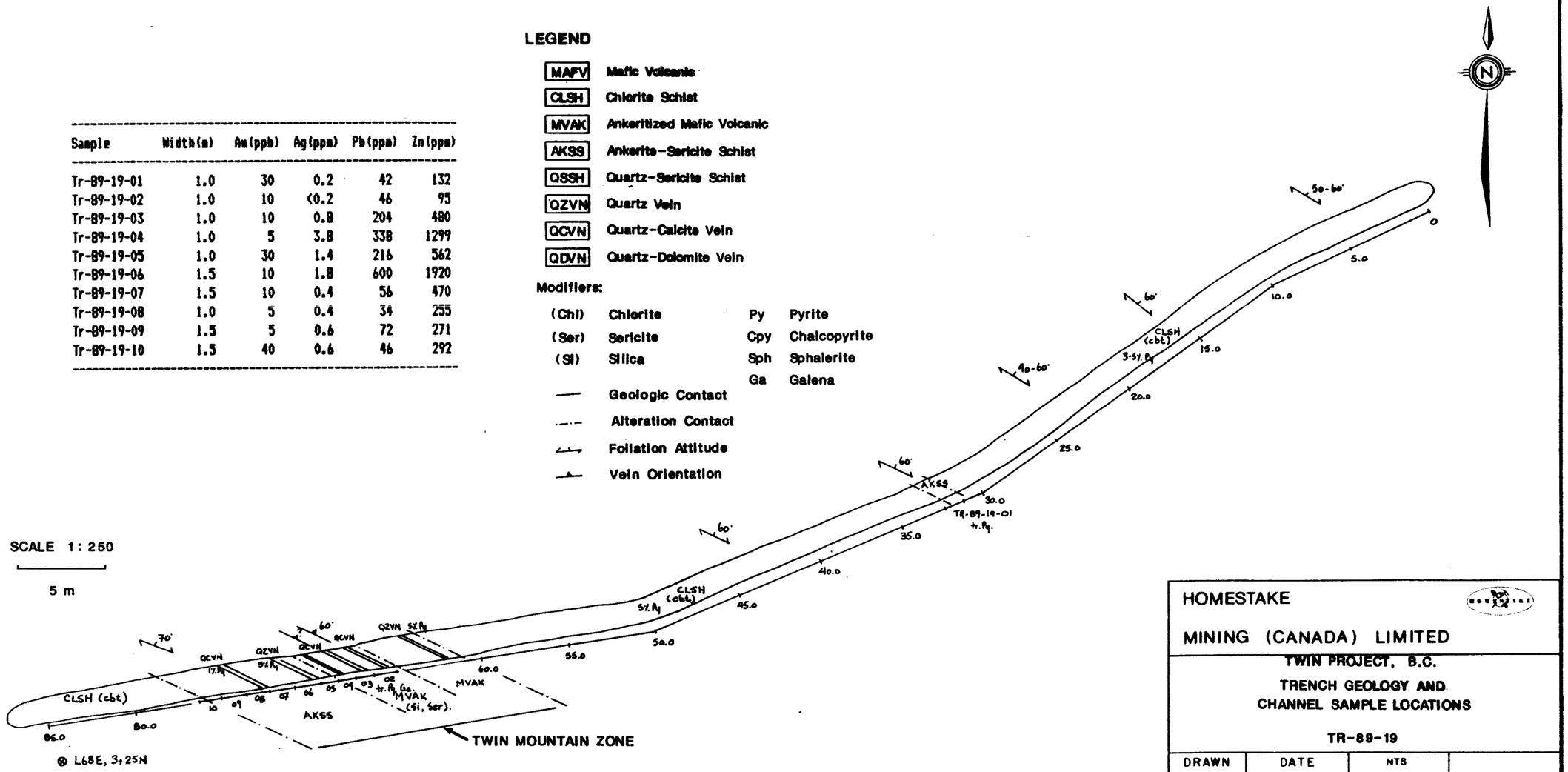
(Chl)	Chlorite	Py	Pyrite
(Ser)	Sericite	Cpy	Chalcopyrite
(Si)	Silica	Sph	Sphalerite
		Ga	Galena

— Geologic Contact

-·-·- Alteration Contact

Foliation Attitude

Vein Orientation



HOMESTAKE MINING (CANADA) LIMITED

TWIN PROJECT, B.C.

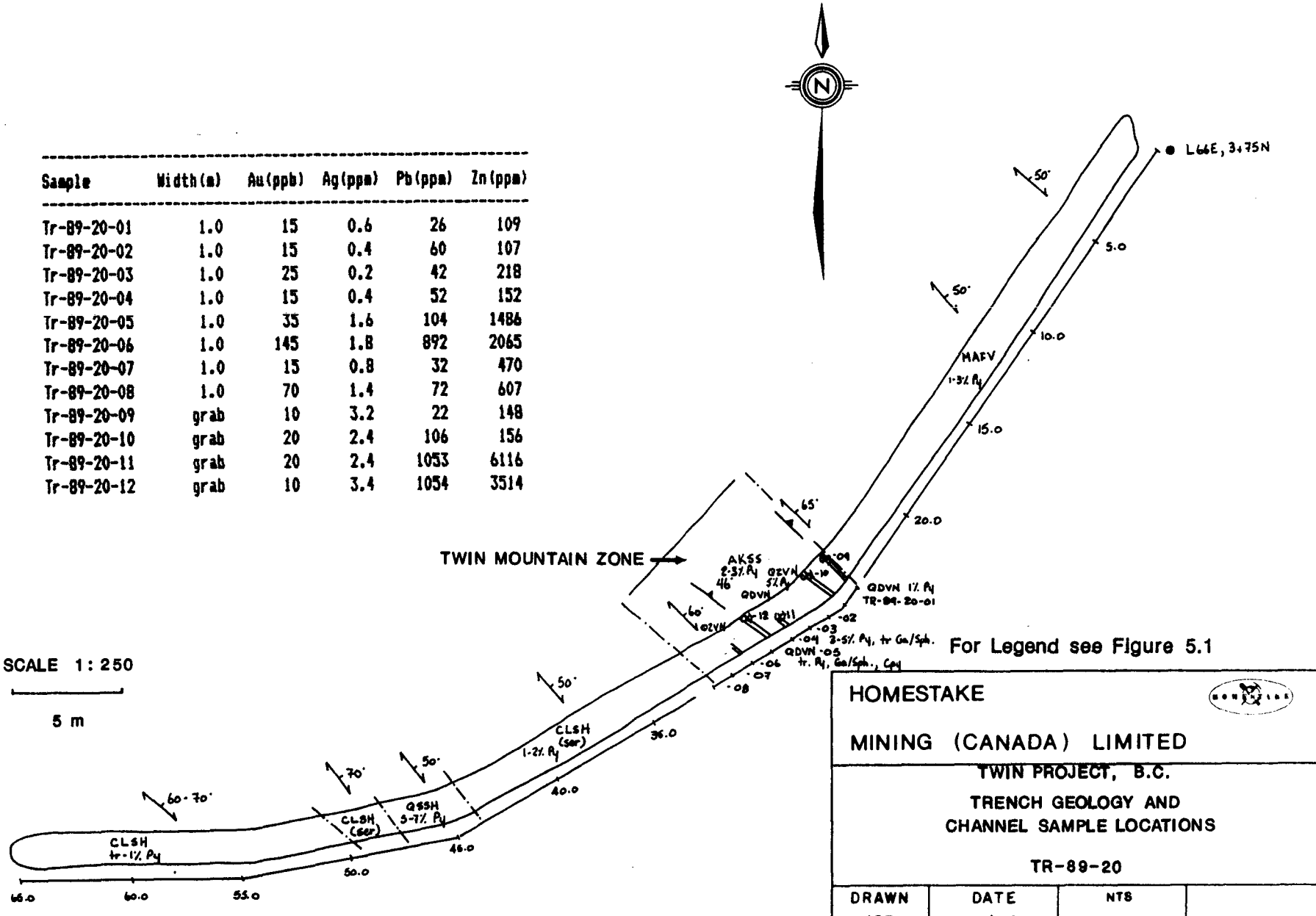
TRENCH GEOLOGY AND CHANNEL SAMPLE LOCATIONS

TR-89-19

DRAWN	DATE	NTS	
JSB	12/89	82M / 4W	Fig. 5.1

Revised

Sample	Width(m)	Au(ppb)	Ag(ppm)	Pb(ppm)	Zn(ppm)
Tr-89-20-01	1.0	15	0.6	26	109
Tr-89-20-02	1.0	15	0.4	60	107
Tr-89-20-03	1.0	25	0.2	42	218
Tr-89-20-04	1.0	15	0.4	52	152
Tr-89-20-05	1.0	35	1.6	104	1486
Tr-89-20-06	1.0	145	1.8	892	2065
Tr-89-20-07	1.0	15	0.8	32	470
Tr-89-20-08	1.0	70	1.4	72	607
Tr-89-20-09	grab	10	3.2	22	148
Tr-89-20-10	grab	20	2.4	106	156
Tr-89-20-11	grab	20	2.4	1053	6116
Tr-89-20-12	grab	10	3.4	1054	3514



For Legend see Figure 5.1

HOMESTAKE MINING (CANADA) LIMITED

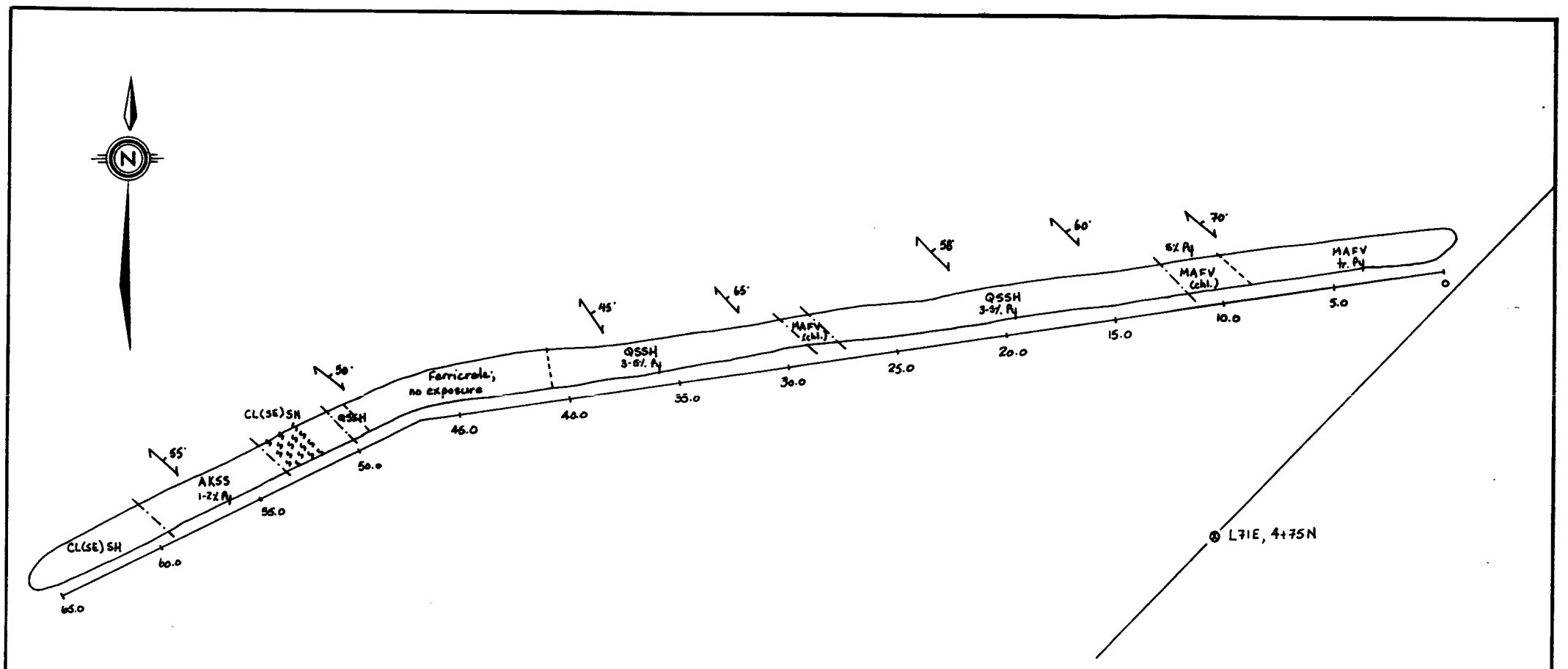
TWIN PROJECT, B.C.

TRENCH GEOLOGY AND CHANNEL SAMPLE LOCATIONS

TR-89-20

DRAWN	DATE	NTS	
JSB	12/89	82M / 4W	Fig. 5.2

Revised



For Legend see Figure 5.1

SCALE 1: 250

5 m

HOMESTAKE MINING (CANADA) LIMITED	
TWIN PROJECT, B.C. TRENCH GEOLOGY TR-89-21	
DRAWN: JSB Revised:	DATE: 12/89 NTS: 82M / 4W Fig. 5.3

7.0 REFERENCES

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APPENDIX 1 : STATEMENT OF COSTS

Salaries and Wages:	
J. Bozek - 3 field days @ $165.00 per day	$ 495.00
6 days report and map preparation @ $165.00 per day	$ 990.00
D. Ananby - 3 field days @ $100.00 per day	$ 300.00
Accommodation and Food:	
Johnson Lake Fishing Camp - 6 man days @ $45.00 per day	$ 270.00
Vehicle rental and costs:	
3 days @ $43.33 per day	$ 130.00
Physical Work:	
Rental on John Deere hoe for trench excavation as invoiced by Stecon Enterprises - 22 hrs @ $80.00 per hour	$1760.00
Rental on D6 Cat for road rehabilitation as invoiced by Sparrow enterprises - 4 hrs @ $86.00 per hour	$ 344.00
Geochemical Analysis (Eco-Tech Laboratories) :	
Sample preparation, Au geochem and 30 element ICP 26 samples @ $17.00 per sample	$ 442.00
Assays	$ 20.50
Consumables:	
Sample bags, flagging tape, drafting supplies, etc.	$ 50.00
Communications:	$ 24.00
TOTAL COST OF PROJECT :	**$4825.50**

APPENDIX 2 : ANALYTICAL RESULTS

ECO-TECH LABORATORIES LTD.
ASSAYING - ENVIRONMENTAL TESTING
10041 East Trans Canada Hwy., Kamloops, B.C. V2C 2J3 (604) 573-5700 Fax 573-4557

NOVEMBER 24,1989

CERTIFICATE OF ANALYSIS ETK 89-943

HOMESTAKE MINERALS
1000-700 W. PENDER ST.
VANCOUVER B.C.
V6C 1G8

ATTENTION: RON BRITTEN

SAMPLE IDENTIFICATION: 26 ROCK samples received November 21, 1989
PROJECT: 5710 1A / 4

ET#	Description	Au (ppb)
943 - 1	TR-89- 10-01	30
943 - 2	TR-89- 17-01	15
943 - 3	TR-89- 19-01	30
943 - 4	TR-89- 19-02	10
943 - 5	TR-89- 19-03	10
943 - 6	TR-89- 19-04	5
943 - 7	TR-89- 19-05	30
943 - 8	TR-89- 19-06	10
943 - 9	TR-89- 19-07	10
943 - 10	TR-89- 19-08	5
943 - 11	TR-89- 19-09	5
943 - 12	TR-89- 19-10	40
943 - 13	TR-89- 20-01	15
943 - 14	TR-89- 20-02	15
943 - 15	TR-89- 20-03	25
943 - 16	TR-89- 20-04	15
943 - 17	TR-89- 20-05	35
943 - 18	TR-89- 20-06	145
943 - 19	TR-89- 20-07	15
943 - 20	TR-89- 20-08	70
943 - 21	TR-89- 20-09	10
943 - 22	TR-89- 20-10	20
943 - 23	TR-89- 20-11	20
943 - 24	TR-89- 20-12	10
943 - 25	TR-89- 00-01	15
943 - 26	TR-89- 00-02	60

DISTRIBUTION:
GEOCHEMICAL RESULTS

	CHECK:
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PROJECT FILE	KAMAD 82M/01
GEOLOGIST	RB
ACCOUNTING	COPY

NOTE: < = LESS THAN
> = GREATER THAN

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HOLD FOR PICK UP - BOB CARMICHAEL
SC89/K7

ECO-TECH LABORATORIES LTD.

ASSAYING - ENVIRONMENTAL TESTING
10041 East Trans Canada Hwy., Kamloops, B.C. V2C 2J3 (604) 573-5700 Fax 573-4557

NOVEMBER 30,1989

CERTIFICATE OF ANALYSIS ETK 89-943B

HOMESTAKE MINERALS
1000-700 W. PENDER ST.
VANCOUVER B.C.
V6C 1G8

AG/PB/ZN ASSAYS

ATTENTION: RON BRITTEN

SAMPLE IDENTIFICATION: 26 ROCK samples received November 21, 1989
PROJECT: 5710 1A

ET#	Description	AG (g/t)	PB (%)	ZN (%)
943 - 26	TR-89- 00-02	50.4	1.28	1.78

NOTE: < = LESS THAN
> = GREATER THAN

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PROJECT FILE	LAMAN BOWICH
GEOLOGIST	RB
ACCOUNTING	COPY

HOMESTAKE MINERALS - ETK943A

1000 - 700 W. PENDER STREET
VANCOUVER, B.C.
V6C 168
ATTENTION: RON BRITTEN

NOVEMBER 29, 1989

VALUES IN PPM UNLESS OTHERWISE REPORTED

PROJECT: 5710 14
26 ROCK SAMPLES RECEIVED NOV. 21,1989

ET#	DESCRIPTIONS	AG	AL(%)	AS	B	BA	BI	CA(%)	CD	CO	CR	CU	FE(%)	K(%)	LA	MG(%)	MN	MO	NA(%)	NI	P	PB	SB	SN	SR	TI(%)	U	V	W	Y	ZN
943 - 1	TR-89- 10- 01	.2	.10	105	<2	10	<5	2.78	2	1	186	31	2.52	.03	<10	1.66	1065	10	.04	7	220	134	<5	<20	167	<.01	10	8	<10	4	154
943 - 2	TR-89- 17- 01	.6	.52	35	<2	20	<5	5.23	2	12	51	268	2.95	.06	<10	6.30	3136	3	.05	60	290	1046	<5	<20	172	<.01	<10	21	<10	6	346
943 - 3	TR-89- 19- 01	.2	1.37	25	<2	85	<5	.18	<1	20	313	34	7.04	.04	<10	2.34	484	3	.05	147	370	42	5	<20	12	.12	<10	83	<10	3	132
943 - 4	TR-89- 19- 02	<.2	.46	15	<2	15	<5	4.54	<1	21	68	17	3.12	.04	<10	4.12	1443	4	.05	112	90	46	5	<20	253	.01	<10	23	<10	5	96
943 - 5	TR-89- 19- 03	.8	.30	25	<2	15	<5	6.12	2	26	101	32	2.97	.07	<10	3.52	2228	3	.04	64	170	204	5	<20	239	<.01	<10	15	<10	7	480
943 - 6	TR-89- 19- 04	3.8	.52	85	<2	15	<5	5.03	6	55	135	336	6.53	.13	<10	3.43	3296	5	.04	215	470	338	55	<20	171	<.01	<10	26	10	9	1298
943 - 7	TR-89- 19- 05	1.4	.50	35	<2	10	<5	3.76	2	69	151	128	8.70	.13	<10	2.13	3029	4	.04	320	550	216	5	<20	106	<.01	10	28	10	9	562
943 - 8	TR-89- 19- 06	1.8	.36	20	<2	10	<5	3.71	8	56	128	47	7.57	.11	<10	2.65	2779	6	.04	258	370	600	5	<20	120	<.01	<10	23	10	8	1920
943 - 9	TR-89- 19- 07	.4	.98	20	<2	15	<5	3.80	2	65	217	112	7.68	.06	<10	1.99	1795	5	.04	263	480	56	10	<20	174	.01	<10	36	10	9	471
943 - 10	TR-89- 19- 08	.4	1.42	15	<2	15	<5	3.71	<1	40	273	359	7.49	.04	<10	2.61	1828	8	.04	196	450	34	5	<20	177	<.01	<10	63	<10	8	255
943 - 11	TR-89- 19- 09	.6	2.95	15	2	5	<5	1.07	<1	109	451	199	11.08	.02	<10	5.29	2344	3	.05	433	630	72	10	<20	51	.01	<10	155	<10	9	278
943 - 12	TR-89- 19- 10	.6	2.93	15	<2	15	<5	2.15	<1	85	516	136	10.96	.02	<10	5.36	2079	7	.06	394	760	46	15	<20	67	.01	<10	174	<10	8	282
943 - 13	TR-89- 20- 01	.6	.82	55	2	10	<5	3.95	<1	78	156	45	9.88	.07	<10	4.00	2679	4	.05	345	720	26	5	<20	103	<.01	<10	37	<10	9	109
943 - 14	TR-89- 20- 02	.4	.18	50	2	10	<5	4.70	<1	52	126	27	8.72	.08	<10	4.69	3079	5	.05	242	390	60	5	<20	100	<.01	<10	39	<10	9	107
943 - 15	TR-89- 20- 03	.2	.44	50	<2	10	<5	3.70	<1	65	128	15	9.18	.10	<10	3.15	1761	6	.05	326	490	42	5	<20	81	<.01	<10	39	<10	8	248
943 - 16	TR-89- 20- 04	.4	.22	55	2	15	<5	4.94	<1	63	111	31	7.77	.08	<10	5.54	2305	3	.06	266	350	52	<5	<20	175	<.01	<10	35	<10	9	153
943 - 17	TR-89- 20- 05	1.6	.37	45	<2	10	<5	4.18	12	29	105	57	5.72	.04	<10	5.17	3007	5	.05	167	260	704	5	<20	115	<.01	<10	28	10	5	1486
943 - 18	TR-89- 20- 06	1.8	.50	40	2	20	<5	5.98	13	29	96	45	6.08	.04	<10	5.69	3587	9	.04	152	200	892	5	<20	299	<.01	<10	15	10	4	2055
943 - 19	TR-89- 20- 07	.8	1.45	65	8	25	<5	5.99	2	94	226	90	11.95	.06	<10	4.64	1502	11	.05	445	540	32	15	<20	150	<.01	20	53	10	11	472
943 - 20	TR-89- 20- 08	1.4	.53	60	8	25	<5	6.31	1	92	144	54	9.89	.07	<10	4.87	1758	8	.05	458	620	72	5	<20	206	<.01	<10	41	10	11	607
943 - 21	TR-89- 20- 09	3.2	.31	20	<2	40	<5	9.20	<1	21	81	15	6.21	.03	<10	9.26	1284	8	.06	267	40	22	5	<20	299	<.01	<10	47	<10	8	108
943 - 22	TR-89- 20- 10	2.4	.14	40	8	10	<5	4.34	<1	49	130	32	13.17	.07	<10	7.39	2594	15	.04	177	100	106	5	<20	148	<.01	10	13	<10	6	126
943 - 23	TR-89- 20- 11	2.4	.11	40	2	10	<5	4.62	26	30	102	44	7.36	.05	<10	8.68	2787	13	.05	146	120	1058	15	<20	164	<.01	20	22	10	5	6118
943 - 24	TR-89- 20- 12	3.4	.14	20	2	30	<5	7.76	22	12	90	35	3.03	.03	<10	9.62	4229	17	.04	54	150	1054	5	<20	298	<.01	<10	15	10	6	3574
943 - 25	TR-89- 00- 01	5.4	.05	130	<2	45	<5	8.44	33	5	15	2079	2.26	.01	<10	12.05	5651	9	.04	9	640	1564	40	<20	194	<.01	<10	8	10	6	4805
943 - 26	TR-89- 00- 02	>30.0	1.81	75	12	10	<5	3.71	84	52	195	382	13.51	.10	<10	3.86	2618	24	.04	195	620	>10000	45	<20	71	.01	20	35	10	3	>10000

NOTE: < = LESS THAN

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JUTTA JEALOUSE
B.C. CERTIFIED ASSAYER

SC89/KAM6

STATEMENT OF QUALIFICATIONS

I, Joanne S. Bozek, do hereby certify that:

1) I am a graduate of Memorial University of Newfoundland, having been granted the degree of Bachelor of Science in Geology in 1986 and Bachelor of Science (Honours) in Geology in 1989.

2) I have practiced my profession as a geologist in mineral exploration since 1986.

3) At present I am employed as a geologist with Homestake Mineral Development Company of #1000 - 700 West Pender Street, Vancouver, B.C.

4) The work described in the accompanying report entitled "Assessment Report on the Twin Property, Kamloops Mining Division, British Columbia" and dated February 1990 was done under my supervision and with my participation.

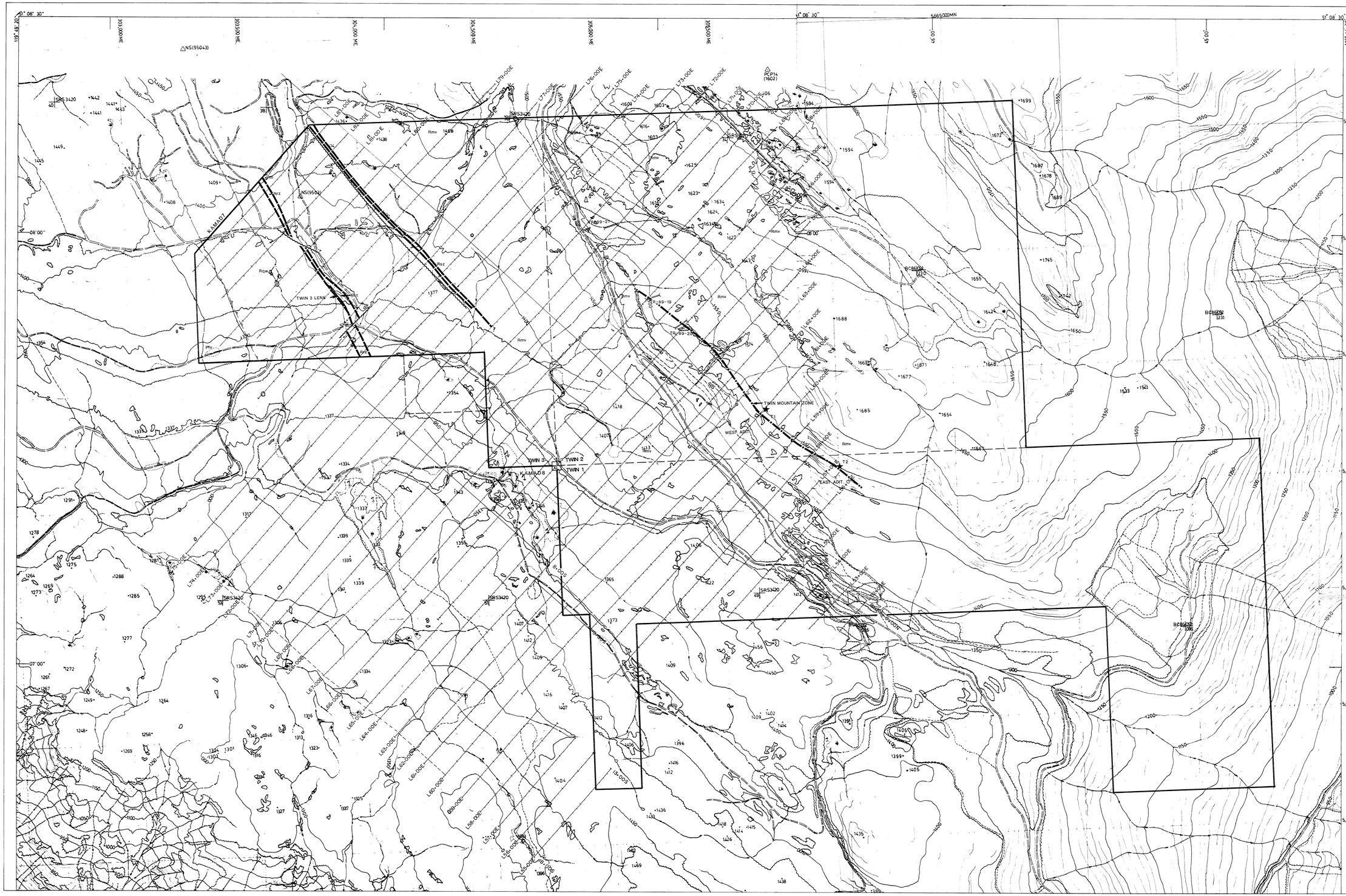
5) I am the author of the report described above.

6) I have no direct of indirect financial interest in any companies known by me to have an interest in the mineral properties described by this report, nor do I expect to receive any such interest.

DATED THIS 28th DAY OF February, 1990 AT VANCOUVER, B.C.

J.S. Bozek

Joanne S. Bozek



LEGEND

INTRUSIVE ROCKS

Di Diorite, hornblende diorite and gabbro.

VOLCANIC AND SEDIMENTARY ROCKS

PLATEAU ASSEMBLAGE:

PFv Massive to crudely interbedded felsic volcanic rocks including: Quartz-eye porphyry, quartz feldspar crystal tuff, lapilli tuff, lapilli breccia and blended dacite flow breccia.

QEPP - Quartz Eye Porphyry
QELT - Quartz Eye Lapilli Tuff
QEBR - Quartz Eye Breccia

Par Interbedded black argillite and grey to black siltstone. Graded units common.

ARGL - Argillite

PMv Massive to pillowed mafic flows, lapilli tuffs, lapilli breccias and bedded mafic sediments.

MTFL - Mafic Flow
PLBS - Pillow Basalt Flv
AXPH - Acicular Phyllite

BEA ASSEMBLAGE:

Bwp Interbedded sequence of quartz pebble conglomerate, quartz wacke, lithic wacke, siltstone and graphitic argillite.

ARGL - Argillite
QTWK - Quartz Wacke

Bxx BEA ZONE - A complexly interbedded sequence of meristhitic tuff, chert, chert breccia, argillite, pyritic silitite, massive sulphide and massive barite.

ARGL - Argillite
BART - Barite, Sulphide/Barite
PYST - Pyritic Silitite
PSTF - Pyritic Tuff
SECH - Meristhitic Chert
SETF - Meristhitic Tuff
CHBR - Massive Grey Chert

Bsz BIVEN ZONE - A structural repetition of the Bea Zone (see above for lithologies).

Bma Pervasively esheritized Bav.
Bmz Pervasively sericitized Bav.

Bmv Mafic volcanic rocks comprised of massive to pillowed flows, lapilli tuffs and breccias and mafic derived sediments.

MATF - Mafic Ash Tuff
MFTF - Mafic Tuff (General)
MFLT - Mafic Lapilli Tuff
MFBR - Mafic Breccia, Lapilli breccia, Agglomerate
MTFL - Mafic Flow (General)
PLBS - Pillow Basalt Flow
PPBS - Plagioclase Phyric Basalt
MFVL - Mafic Volcanic (General)
HORN - Hornfelsed Mafic Volcanics

GEOLOGICAL SYMBOLS

- Geological Contact (known, inferred).
- Fault (dip and sense of movement indicated)
- Thrust fault (known inferred).
- Fold axis (antiline).
- Fold axis (syncline).
- Foliation attitude.
- Bedding attitude.
- Inverted bedding.
- Mineral Occurrence
- Vein System.
- Exploration adit.
- Waste dump/tailing.
- Trench.
- Diamond drill hole.
- Claim Boundary.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,734

50 100 200m SCALE 1:5000

HOMESTAKE MINING (CANADA) LIMITED

TWIN PROPERTY, BRITISH COLUMBIA

PROPERTY GEOLOGY AND TRENCH LOCATION MAP

DRAWN	DATE	NTS	Figure 4.3
Revised:	02/90	82M/4W	