1996 SUMMARY REPORT

ON THE

FUNKEN & GROOVIN CLAIM GROUP

Located in the Dease Lake Area
Liard Mining Division
NTS 104I/5E

58° 26' North Latitude
129° 44' West Longitude

-prepared for-

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SUMMARY

The 27-unit Funken and Groovin property covers 675 hectares of rolling topography about 15 kilometres east of Dease Lake in north-central British Columbia. The Stewart-Cassiar Highway passes through Dease Lake, as does the unfinished BC Rail right-of-way. Tractor tote roads from the highway pass two kilometres north and five kilometres south of the property.

Placer gold was discovered on the creek immediately north of the Funken and Groovin claims in 1924 and a 10 metre adit was driven on the property at that time, testing a quartz-chalcopyrite vein on the south bank of Castle Creek. Noranda outlined several coincident copper-zinc soil anomalies on the property in 1978 and mapped gossanous, pyritic, felsic volcanic rocks, locating a chalcopyrite-sphalerite showing at the confluence of Squaw Creek and Little Eagle River. Noranda did further work in 1986, following up on an airborne EM anomaly coincident with the 1978 showing. Prospecting by private individuals in 1990 and 1991 located additional showings in chlorite and quartz-sericite schist with anomalous copper and zinc values. The Funken and Groovin claims were staked in June 1996 by Antioch Investments Ltd. and Jim Lehtinen, followed by limited prospecting. A total of 27 rock samples were taken for Au and 32-element ICP analysis.

The Funken and Groovin property is underlain by rocks of the King Salmon allochthon, which consists of a lower section of mafic/felsic volcanic and clastic sedimentary rocks (Kutcho Formation), and an upper section of limestone and argillaceous sedimentary rocks (Sinwa and Inklin Formations). Recent work has shown that this volcanic rock assemblage is of late Permian to early Triassic age, part of a newly defined terrane which may stretch from northern B.C. to the U.S. border. Approximately 85 kilometres to the east-southeast of the Funken and Groovin property, the Kutcho Formation hosts the Kutcho Creek volcanogenic massive sulphide bodies, the largest of which contains 17 Mt of open-pittable reserves grading 1.62% Cu, 2.32% Zn, 29.2 g/t Ag, and 0.3 g/t Au.

The Funken and Groovin property covers a section of interlayered fine graphitic sediments, mafic to felsic schists, limestone, and coarse clastic rocks of possible volcanic origin. These units strike in an east-west manner along the length of the property, with as yet unresolved structural complexity. Mineralization identified to date consists of disseminated and finely layered pyrite, chalcopyrite and lesser sphalerite in schistose volcanic rocks. Locally, chalcopyrite stringers have been deformed jointly with the foliation.

The rocks which underlie the Funken and Groovin property exhibit similarities to the geology at the Kutcho Creek massive sulphide deposits, such as:

- a thick section of felsic pyroclastic and/or volcaniclastic rocks.
- widespread pyritization of the felsic volcanic rocks.
- low grade disseminated and stringer-type chalcopyrite in chloritic schists, possibly representing a feeder zone style of alteration and mineralization.
- intercalation of volcanics with fine grained clastic sediments.
- carbonate alteration of felsic and sedimentary schistose rocks.
- presence of exhalative sedimentary rocks (iron formation).

Future exploration should consist of systematic grid-based electromagnetic, magnetic, soil geochemical and whole rock surveys. Prospecting and detailed geological mapping should focus on altered or mineralized horizons and on geochemical/geophysical anomalies. These surveys will lead to definition of trenching and/or diamond drilling targets.

1996 SUMMARY REPORT ON THE FUNKEN AND GROOVIN CLAIM GROUP

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1.0 INTRODUCTION

The Funken and Groovin claims cover several pyrite+chalcopyrite±sphalerite showings in chlorite and quartz-sericite schists within Kutcho Formation volcanic and sedimentary rocks, approximately fifteen kilometres east of Dease Lake in north-central British Columbia (Figure 1). The Kutcho Creek volcanogenic massive sulphide deposits (17 million tonnes grading 1.6% Cu, 2.3% Zn and 0.3 g/t Au) are hosted by similar stratigraphy 85 kilometres to the southeast. The Funken and Groovin property was staked in June 1996, followed immediately by limited rock sampling. This report details results from the 1996 program and summarizes previous data on the property.

2.0 LIST OF CLAIMS

The Funken and Groovin property consists of two contiguous modified grid mineral claims in the Liard Mining Division of British Columbia, as summarized in Table 2.0.1 (Figure 2). Records of the British Columbia Minerals Branch indicate that the claims are owned by Henry J. Awmack. Separate documents indicate that they are held in trust for Antioch Investments Ltd. (75%) and James Lehtinen (25%).

TABLE 2.0.1
CLAIM DATA

Claim Name	Tenure Number	No. of Units	Record Date	Expiry Year
Funken	346979	9	June 5, 1996	1999*
Groovin	346980	18	June 6, 1996	1999*
		27		

- Subject to approval of assessment work covered by this report.

3.0 LOCATION, ACCESS AND GEOGRAPHY

The Funken and Groovin property lies 15 kilometres east of Dease Lake in northwestern British Columbia, centred at 58° 26' north latitude and 129° 44' west longitude. The claims lie in the upper part of the Little Eagle River basin, covering most of the Castle Creek drainage. The property lies on the Tanzilla Plateau, characterized by rolling to steep hills, with deeply incised creek valleys. Elevations lie between 1175 metres above sea level on the Little Eagle River to approximately 1420 metres on the slopes of Dome Mountain to the east (Figure 2).

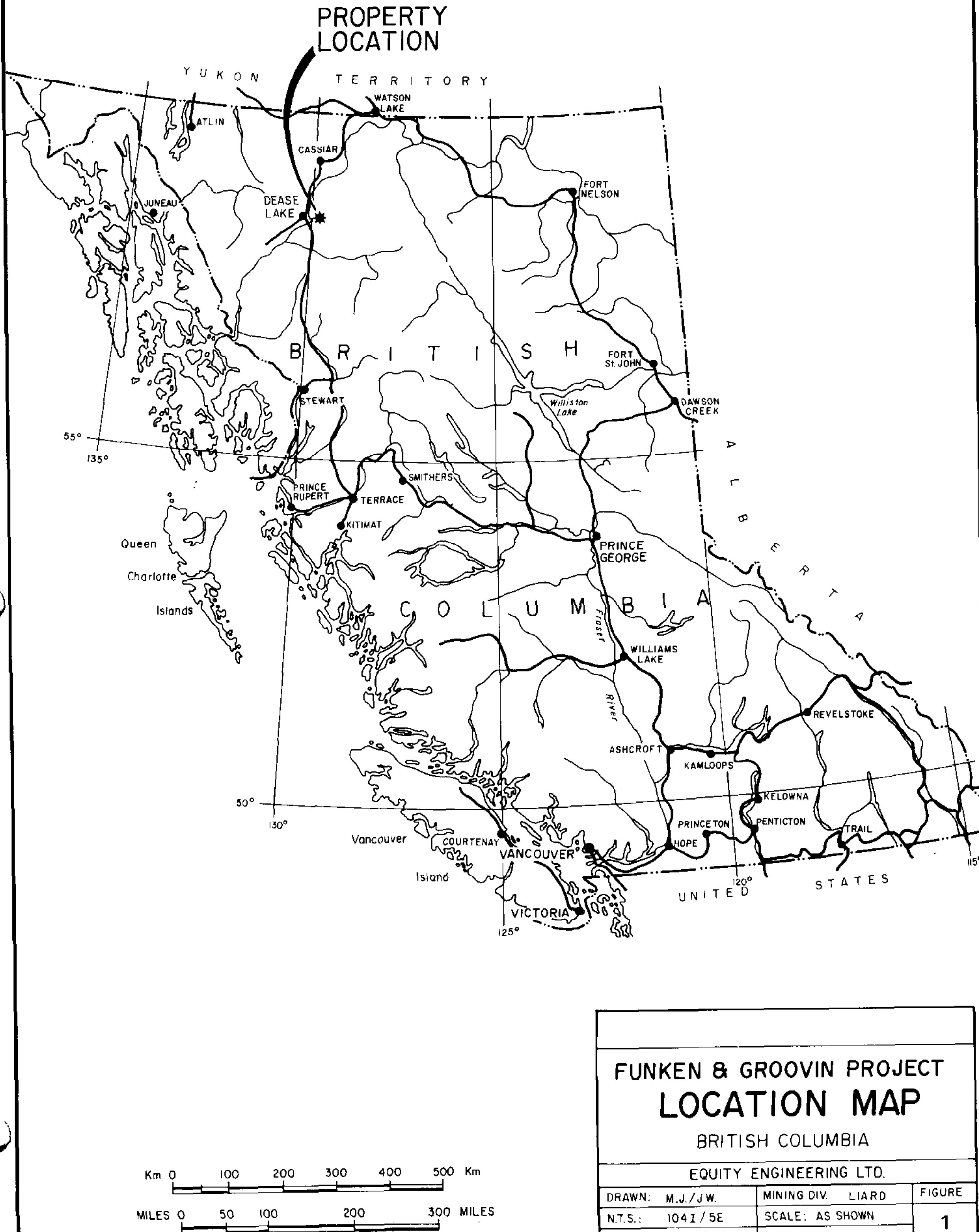
The paved Stewart-Cassiar Highway passes through Dease Lake as does the rail-bed for the unfinished B. C. Rail northern line. A rough tote road, passable by ATV, leaves the Stewart-Cassiar Highway at Dease Lake, follows Hotel Creek up to its divide with the Little Eagle River and then down to a placer operation on Goldpan Creek, 2 kilometres north of the Funken and Groovin claims. A bulldozer track follows Zuback Creek east from the highway passing about 5 kilometres south of the property.

The Funken and Groovin property is subject to a continental climatic regime, with moderate summers and cold winters. Most of the property is covered by a heavy growth of buck brush and alders with patchy spruce and balsam trees.

4.0 PROPERTY EXPLORATION HISTORY

4.1 Previous Work

The first reported work in the Funken and Groovin project area was exploration for placer gold on Goldpan Creek in 1924 (BCDM Ann. Rept., 1925). This creek has its



FUNKEN & GROOVIN PROJECT

LOCATION MAP

BRITISH COLUMBIA

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DRAWN: M.J./J.W.	MINING DIV. LIARD	FIGURE
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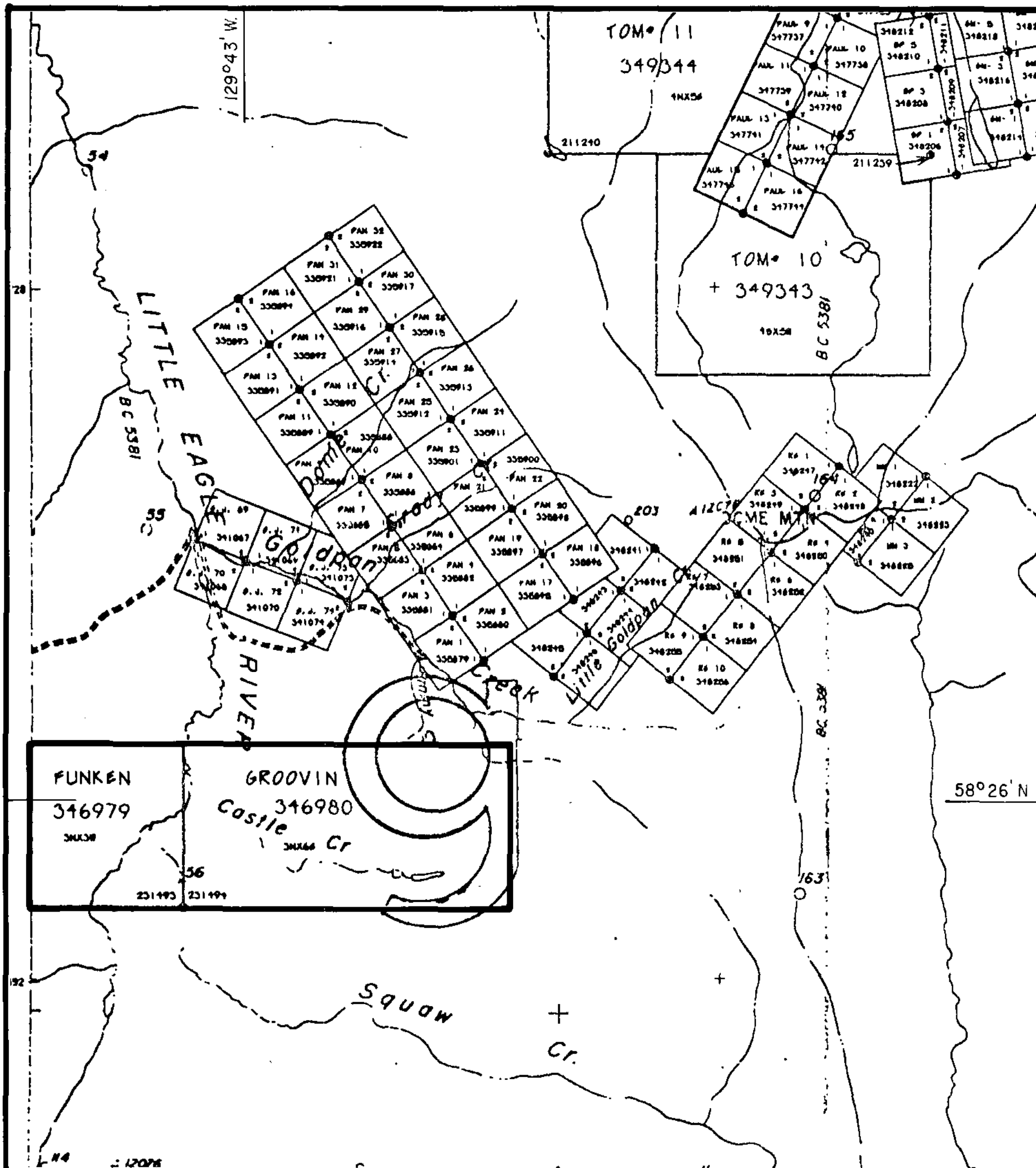

FUNKEN & GROOVIN PROJECT

CLAIM MAP

BRITISH COLUMBIA

EQUITY ENGINEERING LTD.

DRAWN: M.J./J.W.	MINING DIV.: LIARD	FIGURE
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headwaters on the northeastern corner of the Groovin claim and joins the Little Eagle River 1,800 metres downstream from the Funken claim. By 1940, 2,716 ounces of gold had been produced from Goldpan Creek, mainly from its lower portion (Holland, 1986). Quartz veins were noted on Castle Creek in 1925 and some hard rock claims staked, but no work was reported on them. It is probable that a 10 metre adit, driven into a quartz vein in pyritic rhyolite on the Groovin claim, dates from this time. Between the 1920's and 1978 there are no records of work being done on the ground covered by the Funken and Groovin claims.

In 1973, a high-grade massive sulphide boulder was found in Kutcho Creek, eighty kilometres east of the Funken and Groovin area, associated with rusty sericite schists in the eastern part of the King Salmon allochthon. This discovery led to the definition of the Kutcho Creek Cu-Zn volcanogenic massive sulphide (VMS) deposit and to increased exploration for similar VMS deposits throughout this terrane over the next decade.

In 1978, Noranda Exploration Co. Ltd. established a grid over most of the Funken and Groovin claim area with an east-west, 4.4 kilometre cut baseline and flagged cross-lines run north-south at 200 metre intervals along this baseline for a total of 35.5 line kilometres. Noranda collected a total of 782 B-horizon soil samples at 50 metre intervals along the lines, analysing them for copper, molybdenum, lead and zinc and revealing erratic high copper and zinc values. A vertical shootback EM survey was completed on 13.95 kilometres of line in the western part of the grid using an 1800 mHz frequency and a coil separation of 75 metres. The EM survey showed widespread response in the southwest and north part of the survey, but no specific conductors were highlighted. Also in this program, Noranda conducted geological mapping over about 25% of the property, identifying felsic volcanics and localized chalcopyrite mineralization (MacArthur and Bradish, 1978).

In 1986, Noranda did further geological mapping, a magnetometer survey and an SE-88 EM survey on a 2.8 kilometre reconnaissance line along the Little Eagle River in the western part of the property. This line was established to follow up a conductor identified by an airborne geophysical survey (not in the public domain). The ground geophysical survey detected several conductors, with associated magnetic responses, although none were apparently associated with mineralization. Nine rock samples were taken during the course of mapping (Maxwell and Bradish, 1987).

Maxwell and Bradish (1987) mention that Esso Minerals Canada Ltd. held the Funken and Groovin ground between the two Noranda programs, but there are no records of work being filed. An 18 unit claim was staked in the Castle Creek area in 1989 but again, no work was recorded.

The Acme 1 and 2 claims were staked in 1990 by M. Archambault, covering the same ground as the Funken and Groovin claims. Archambault and Lehtinen (1991) reported on prospecting done on these claims in 1990 and 1991. Part of the 1978 grid was refurbished by re-cutting 2.6 kilometres of baseline and flagging four cross-lines for a total of 1.45 kilometres. Their prospecting focused on previously discovered showings and geochemical anomalies identified by the earlier Noranda surveys. In addition, malachite-stained fragments were noted in a quartz-sericite schist unit west of the Little Eagle River.

4.2 1996 Exploration Program

The Funken and Groovin claims were staked by the early afternoon of June 6, 1996. The remainder of that day and the following day were spent re-sampling known occurrences and prospecting. Twenty-seven samples were taken from mineralized float and outcrop; descriptions are attached in Appendix C. These were analyzed geochemically for gold and by ICP for 32 elements at Chemex Labs in North Vancouver. One of these was also subjected to XRF whole rock analysis. Analytical certificates form Appendix D.

5.0 REGIONAL GEOLOGY

The Funken and Groovin claims lie within the King Salmon allochthon, a thrust and fault-bounded block of unknown terrane affiliation. It comprises an assemblage of Permian to Lower Jurassic volcanic and lesser intrusive rocks overlain by a sedimentary package (Barrett et al, 1996). This allochthon forms a 10-20 kilometre wide package which has been thrust southwesterly over the Stikine terrane along the King Salmon Fault and overthrust by the Cache Creek terrane to the northeast. To the east, all of these terranes have been truncated by the dextral Kutcho Fault (Figure 3).

The Kutcho Formation is a primitive island arc volcaniclastic sequence which may be more than 1000 metres thick (Thorstad and Gabrielse, 1986). Basaltic to dacitic tuff and breccia are lowermost, overlain by dacitic to rhyolitic tuff and breccia. Tuffaceous argillite, argillite and conglomerate cap the sequence. Thorstad and Gabrielse dated the Kutcho Formation at Late Triassic (210±10 Ma), based on a Rb-Sr isochron derived from eight rock samples. Subsequent U-Pb zircon geochronology of felsic rocks by Childe and Thompson (1995) yielded preliminary ages of 242-244 Ma (near the Permo-Triassic boundary).

Scattered limestone lenses in the upper Kutcho Formation conglomerates increase in abundance upward and grade into massive limestone of the Sinwa Formation, which has been dated as Norian (Late Triassic). It is a grey to white, well-foliated marble and local micrite up to 250 metres thick, commonly pyritic and fetid.

The Lower Jurassic Inklin Formation comprises 1000-1500 metres of intercalated calcareous greywacke, dark grey to black shale and siltstone and black phyllite. Its base is generally marked by conglomerate dominated by limestone and quartz-feldspar porphyry clasts derived from the underlying Kutcho and Sinwa Formations.

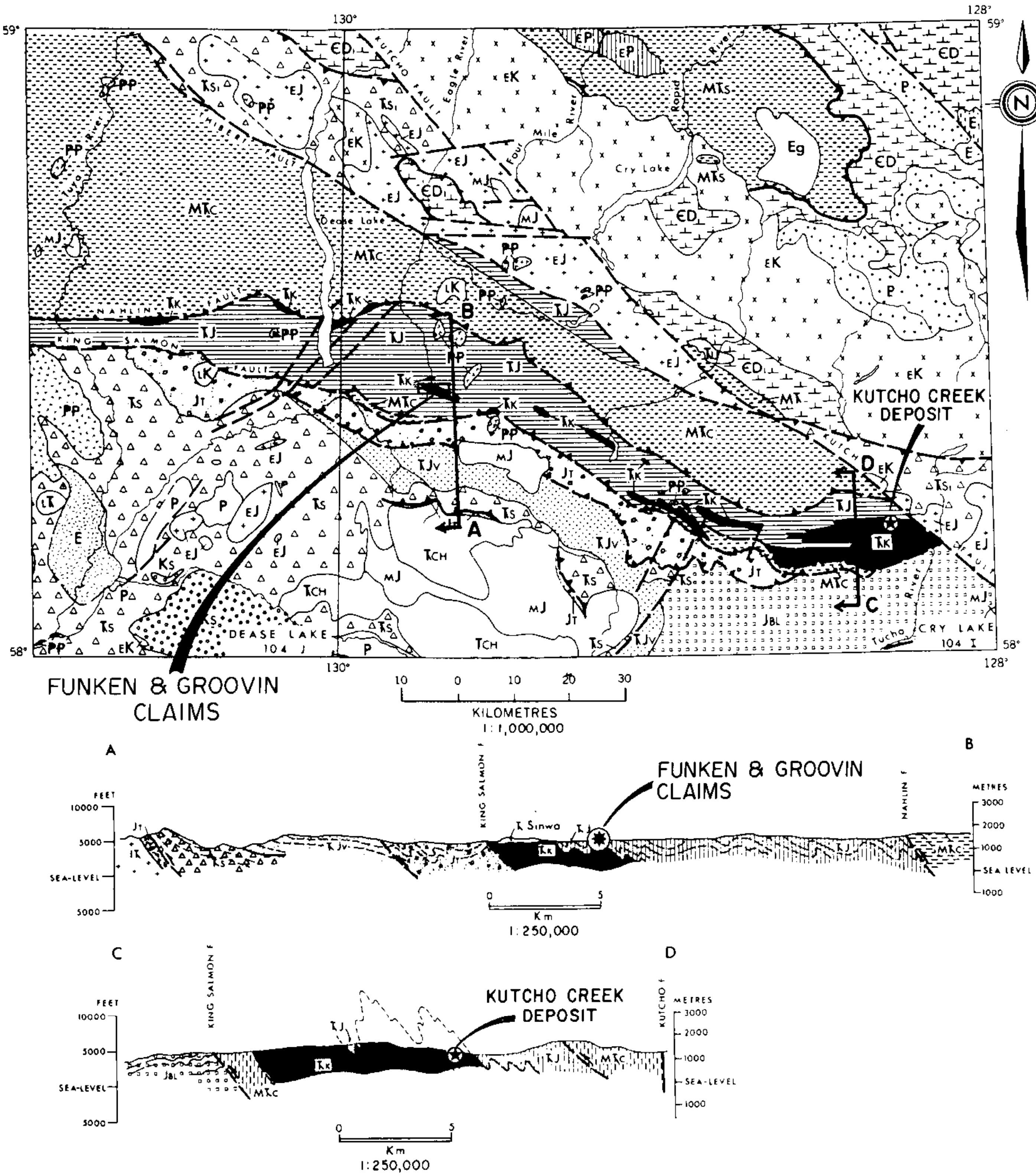
Rocks of the King Salmon allochthon were folded by southwesterly vergent, tight folds during a single phase of deformation, probably related to the thrusting that emplaced the allochthon. The intensity diminishes and the style of deformation changes to the northeast of the King Salmon Fault and to the northwest along strike (Figure 3). In the southeast, high amplitude, overturned, isoclinal folds with well-defined axial plane foliation and imbricate thrust sheets are common near the King Salmon Fault. To the northwest, open, similar-style folds predominate, axial foliation is weakly developed and imbricate zones are uncommon (Thorstad and Gabrielse, 1986). The King Salmon allochthon was regionally metamorphosed to greenschist facies during deformation.

5.1 Kutcho Creek Deposit

The Kutcho Creek volcanogenic massive sulphide (VMS) deposit, located 85 kilometres east-southeast of the Funken and Groovin property, consists of three lenses of pyritic massive sulphide which occur over a strike length of 3.5 kilometres along essentially the same stratigraphic horizon within the Kutcho Formation. The largest lens contains 17 million tonnes of open pit mineable reserves grading 1.62% Cu, 2.32% Zn, 0.3 g/tonne Au and 29.2 g/tonne Ag. The other two lenses contain an additional 11 million tonnes at a similar grade. The following description is abridged from Bridge et al (1986) and Barrett et al (1996).

The section below the immediate footwall rocks of the Kutcho Creek deposit consists of up to 2,000 metres of mafic flows and tuffs, plus dacitic to rhyolitic tuffs. The mafic flows are massive, fine-grained and non-porphyritic. Felsic tuffs are commonly quartz- or plagioclase-phyric crystal tuffs in graded cycles with minor intercalated argillite beds. No hydrothermal alteration is present.

The immediate footwall to the sulphide lenses consists of a 300 metre thick quartz-phyric lapilli tuff, commonly altered to quartz-sericite-dolomite-chlorite schist. Included within this is a 5-40 metre thick mafic ash tuff bed with dolomite porphyroblasts. The three massive



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Adapted from Thorstad and Gabrielse (1986)

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FUNKEN & GROOVIN PROJECT

REGIONAL GEOLOGY

BRITISH COLUMBIA

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N.T.S.: 104I/5E	SCALE: AS SHOWN	3
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LEGEND

(to accompany Figure 3)

PLIOCENE AND PLEISTOCENE

PP Basaltic flows, ash

EOCENE

Eg Granite, locally miarolytic
E Conglomerate, shale, siltstone, coal
  E_1 Rhyolite

CRETACEOUS

uK Granite

LOWER AND MIDDLE CRETACEOUS

Ks **Sustut Group:** sandstone, shale, conglomerate; nonmarine
LK Granite

MIDDLE JURASSIC

JBL **Bowser Lake Group:** pebble conglomerate, sandstone, shale; in part nonmarine; includes andesitic volcanic rocks in eastern part
MJ Granodiorite, monzodiorite, monzonite

LOWER JURASSIC

JT **Takwahoni Formation:** greywacke, shale, conglomerate; minor sandstone, limestone
LJ Granodiorite, diorite, monzodiorite

UPPER TRIASSIC AND LOWER JURASSIC

TJ **Sinwa and Inklin Formations:** Sinwa limestone; Inklin greywacke, phyllitic slate, conglomerate
TJv Andesitic volcanics, flows, breccia

UPPER TRIASSIC

TK **Kutcho Formation:** basaltic to rhyolitic schists (flows, breccia, crystal tuff); fine-grained volcanic sediments, basic schist; conglomerate, may be basal Inklin Formation, in part
LT Monzodiorite, granodiorite

MIDDLE AND UPPER TRIASSIC

Ts **Stuhini Group and unnamed rocks:** andesite, tuff, breccia, volcanic sandstone
  Tu Peridotite, dunite, pyroxenite
  Ts includes Upper Triassic limestone and Lower Jurassic shale, greywacke, conglomerate

MISSISSIPPIAN TO TRIASSIC

MT Greenstone, rhyolite, chlorite phyllite, tuff; age uncertain
MTs **Sylvester Group:** chert, argillite, basalt, limestone, ultramafic rocks, tonalite, diorite
MTc **Cache Creek Group:** chert, argillite, ultramafic rocks, gabbro, basalt, limestone

PERMIAN

P Limestone, greenstone, phyllite, chert
LP Diorite, granodiorite
  LP_1 *Granite; age uncertain*

CAMBRIAN TO UPPER DEVONIAN

CD/CD_1 **Atan, Kechika, Sandpile and McDame Groups:** sandstone, siltstone, shale, limestone, dolomite
  CD Mainly shelf and platform facies
  CD_1 Mainly off-shelf facies

UPPER PROTEROZOIC

P **Ingenika Group:** metamorphosed siltstone, sandstone, shale; limestone, dolomite

Geology taken from Thorstad and Gabrielse (1986).

sulphide lenses form elongated ellipsoids separated by gaps of up to 300 metres, emplaced along a 3,500 metre westerly-plunging linear trend occurring within essentially the same moderately north-dipping stratigraphic horizon. Each body consists of multiple layers of massive sulphides (dominated by pyrite, sphalerite, chalcopyrite and bornite), quartz-sericite schist with disseminated sulphides and dolomite-quartz-sericite rock. Lateral dimensions vary from lens to lens, but the maximum thickness for each is about 30 metres. The lenses commonly pinch out up-dip to the south but thicken and interdigitate with lapilli tuff and lapilli crystal tuff on their northern, down-dip edges.

Hanging wall stratigraphy is fairly complex. A quartz-feldspar crystal tuff (quartz-feldspar-sericite-chlorite-dolomite schist) unit, including a coarse volcanic breccia facies, generally overlies the sulphide lenses, pinching out downdip to the north and thickening over the lenses and southward, to a maximum thickness of 250 metres. To the north, this unit interdigitates with a quartz-phyric lapilli crystal tuff. Mafic sills and volcanics occur in clusters within the hanging wall felsic pyroclastics and increase upward into the overlying tuff-argillite unit, which is a heterogeneous assemblage of felsic tuffs and epiclastics with interbedded argillite. These are capped by a conglomerate composed of volcanic-derived clasts, which contains boudinaged lenses of limestone and argillite.

Sericitic, pyritic and dolomitic alteration with minor silicification and quartz veining accompanied the emplacement of the massive sulphide lenses; these are marked by Na depletion and variable amounts of K, Mg, Ca, Si and Fe enrichment. The stratigraphic interval which hosts the lenses is commonly altered over a thickness of 20 metres, for at least 4,000 metres beyond the three known lenses. In the footwall, the alteration extends to about 300 metres stratigraphically below and about 500 metres laterally beyond the margins of the sulphide lenses. Alteration in the hanging wall stratigraphy is less intense, extending about 200 metres above the lenses and about 100 metres beyond them.

A few features of Kutcho Creek could be useful in exploration for similar VMS deposits in the King Salmon allochthon:

- bimodal, tholeiitic volcanic sequence (possible primitive oceanic arc environment?).
- located in a thick felsic section within the highest volcanic cycle of the Kutcho Formation.
- predominance of proximal felsic volcanics.
- cluster of massive sulphide lenses along a stratigraphic horizon which is well-altered for several kilometres beyond limits of lenses.
- well-developed sericite-pyrite-dolomite footwall alteration marked by major element depletion and enrichment.
- massive sulphide subcrop is marked on surface by spotty high Cu, Zn, Pb, Mo, Ag, As and Hg soil values, due to partial masking by 1-2 metres of boulder-clay till.
- massive sulphide lenses are non-magnetic; weak anomalies along the north edge of deposit are due to mafic rocks in hanging wall.
- massive sulphide lenses are indicated by electromagnetic, induced polarization and charged potential surveys.

6.0 GEOLOGY AND MINERALIZATION

6.1 Geology

No geological mapping was carried out on the Funken and Groovin claims during the 1996 fieldwork. Figure 4 is a compilation of previous mapping by MacArthur and Bradish (1978), Maxwell and Bradish (1987) and Archambault and Lehtinen (1991). Maxwell and Bradish described the geology as follows:

> "The property is underlain by a series of intercalated felsic to intermediate volcanics and clastic sediments, which are believed to be part of the Kutcho Formation. The felsic

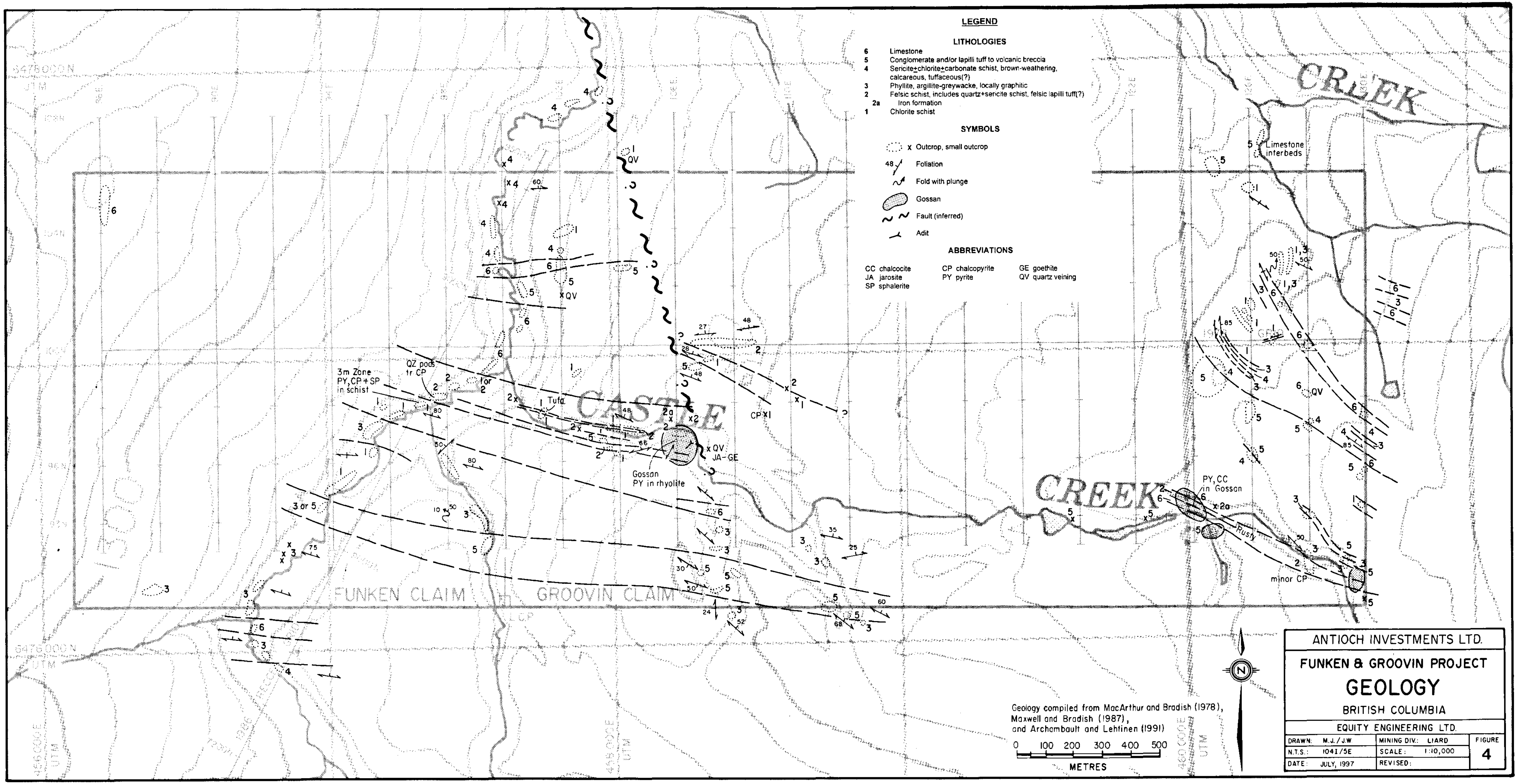
LEGEND
LITHOLOGIES
6 Limestone
5 Conglomerate and/or lapilli tuff to volcanic breccia
4 Sericite±chlorite±carbonate schist, brown-weathering, calcareous, tuffaceous(?)
3 Phyllite, argillite-greywacke, locally graphitic
2 Felsic schist, includes quartz+sericite schist, felsic lapilli tuff(?)
2a Iron formation
1 Chlorite schist
SYMBOLS
x Outcrop, small outcrop
48 Foliation
Fold with plunge
Gossan
Fault (inferred)
Adit
ABBREVIATIONS
CC chalcocite
JA jarosite
SP sphalerite
CP chalcopyrite
PY pyrite
GE goethite
QV quartz veining
CASTLE
CREEK
CREEK
3m Zone PY,CP+SP in schist
QZ pods tr CP
Tufa
Gossan PY in rhyolite
x QV JA-GE
PY,CC in Gossan
Rusty
minor CP
Limestone interbeds
FUNKEN CLAIM
GROOVIN CLAIM
LCP
6476000N UTM
6475000N UTM
486000E UTM
488000E UTM
490000E UTM
Geology compiled from MacArthur and Bradish (1978), Maxwell and Bradish (1987), and Archambault and Lehtinen (1991)
0 100 200 300 400 500
METRES
N
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FIGURE 4

volcanics [Unit 2] consist of massive buff and white cherty rhyolite. The highly schistose chlorite schists [Unit 1] represent andesitic volcanics, locally pyritic. The sediments [Units 3 and 5] include greywacke, argillite and conglomerates. The conglomerates [Unit 5] are highly schistose with rounded rhyolite, basalt and granitic fragments and some shaley clasts."

Unit 1 (chlorite schist) may have been partially derived from andesitic or mafic volcanics, as stated above. However, MacArthur and Bradish's (1978) legend includes "quartz eye chlorite schist" within this unit; it likely represents a quartz-phyric felsic flow or crystal tuff which has undergone (hydrothermal) chloritization. The chloritized quartz-eye schist likely lies along Castle Creek between 101E and 105E, where Bradish and Maxwell, in their 1986 mapping, reassigned "chlorite schist" to their "felsic volcanic unit". Similarly, "quartz-feldspar sericite schist" was included by MacArthur and Bradish in their "schistose sandstone"; it could easily be derived from a felsic crystal tuff or flow. Hematitic iron formation (Unit 2a) was discovered in 1996 near 10600E 9750N and 12450E 9450N, in close proximity to the felsic volcanics.

Unit 3 (fine clastics) and Unit 5 (conglomerate) probably correspond to the tuff-argillite and conglomerate units found at the top of the Kutcho Formation elsewhere. Unit 6 (limestone) likely belongs to the overlying Sinwa Formation, although stratigraphic and structural relations are not clear.

Rock units trend roughly east-west. Foliations also trend east-west, with most dips moderately to steeply to the north. The structural setting is not obvious; unit repetitions may be due to a combination of isoclinal folding and imbricate thrusting related to the King Salmon fault. A north-northeasterly trending fault has been inferred between lines 104E and 108E on the Groovin claim, based on the apparent offset of felsic stratigraphy and drainage lineaments.

6.2 Mineralization

A total of 27 rock samples were taken during the 1996 exploration program; hand specimen descriptions are attached in Appendix C (Figure 5). Sample 547355, with 9.33% Cu, was taken from a siliceous, sulphidic layer (or vein?) within chlorite schist near the mouth of Squaw Creek. This sample contained only low values for other base and precious metals. Archambault and Lehtinen (1991) had previously reported a quartz-sericite schist with malachite-stained fragments about 100 metres west of this sample.

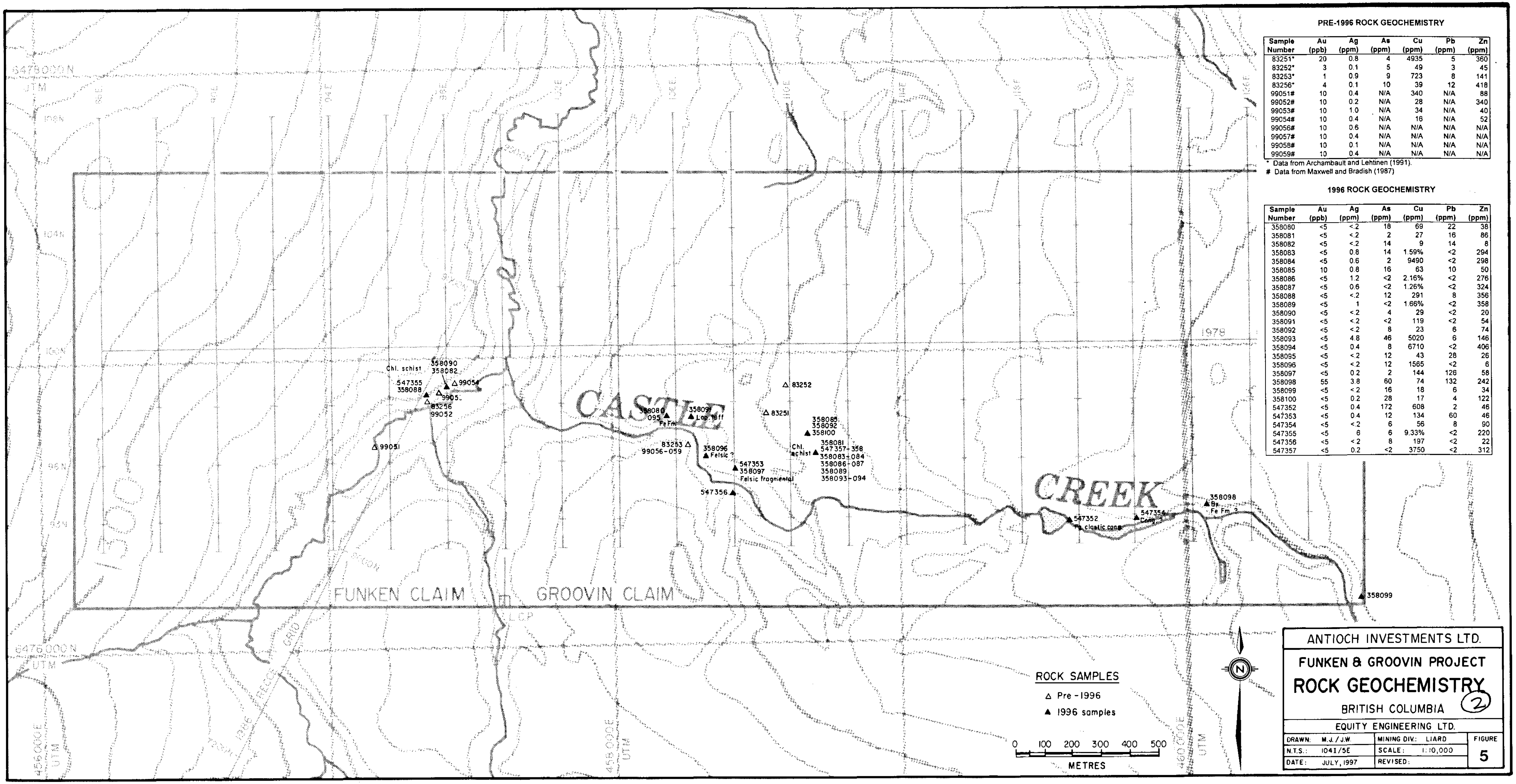
Several samples were taken from an outcrop of highly foliated chlorite-leucoxene(?)-carbonate(?) schist near 11100E 9600N, returning up to 2.16% Cu (358086) with low values for other base and precious metals. It contained up to 6% chalcopyrite as blebs and stringers; the stringers have been stretched out and disaggregated along foliation, indicating their emplacement prior to deformation. This outcrop could represent footwall stringer zone alteration and mineralization in a VMS system.

Float of iron formation, consisting mainly of martite with minor specularite and jasper bands, was sampled near 10600E 9750N; samples 358080 and 358095 returned low values for all other base and precious metals. The iron formation could represent an iron-rich exhalite deposited distally in a VMS environment.

Sample 358096 (1565 ppm Cu) was taken from a malachite-stained block of cryptocrystalline quartz. It is not clear whether this was derived from felsic volcanics, a quartz vein or silicification of another lithology.

7.0 SOIL GEOCHEMISTRY

Soil samples were taken on 50 x 200 metre centres over the Funken and Groovin claims in 1978 by Noranda (MacArthur and Bradish, 1978), with analysis only for Cu, Zn, Pb and Mo.



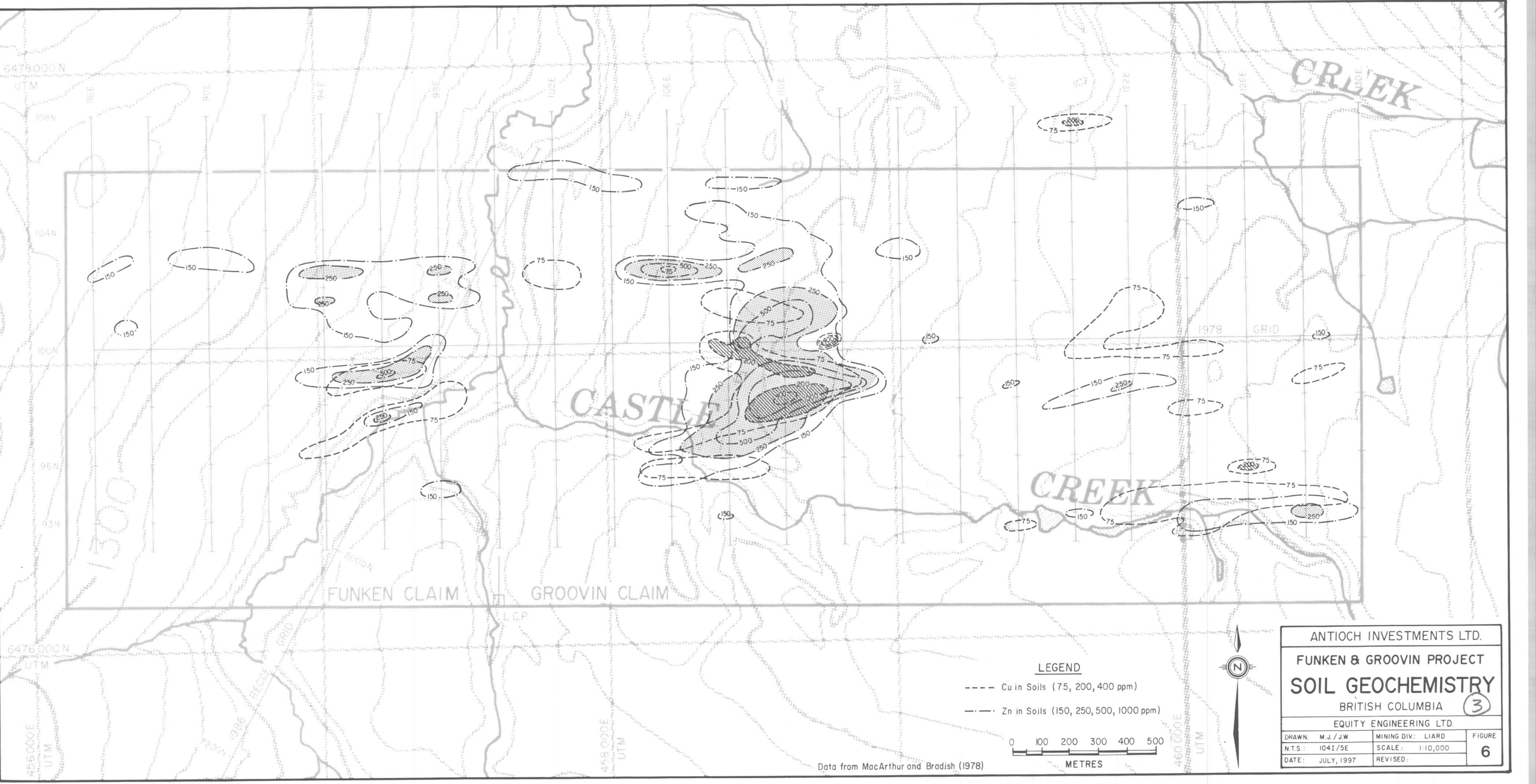
PRE-1996 ROCK GEOCHEMISTRY

Sample Number	Au (ppb)	Ag (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
83251*	20	0.8	4	4935	5	360
83252*	3	0.1	5	49	3	45
83253*	1	0.9	9	723	8	141
83256*	4	0.1	10	39	12	418
99051#	10	0.4	N/A	340	N/A	88
99052#	10	0.2	N/A	28	N/A	340
99053#	10	1.0	N/A	34	N/A	40
99054#	10	0.4	N/A	16	N/A	52
99056#	10	0.6	N/A	N/A	N/A	N/A
99057#	10	0.4	N/A	N/A	N/A	N/A
99058#	10	0.1	N/A	N/A	N/A	N/A
99059#	10	0.4	N/A	N/A	N/A	N/A

* Data from Archambault and Lehtinen (1991).
# Data from Maxwell and Bradish (1987)

1996 ROCK GEOCHEMISTRY

Sample Number	Au (ppb)	Ag (ppm)	As (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)
358080	<5	<.2	18	69	22	38
358081	<5	<.2	2	27	16	86
358082	<5	<.2	14	9	14	8
358083	<5	0.8	14	1.59%	<2	294
358084	<5	0.6	2	9490	<2	298
358085	10	0.8	16	63	10	50
358086	<5	1.2	<2	2.16%	<2	276
358087	<5	0.6	<2	1.26%	<2	324
358088	<5	<.2	12	291	8	356
358089	<5	1	<2	1.66%	<2	358
358090	<5	<.2	4	29	<2	20
358091	<5	<.2	<2	119	<2	54
358092	<5	<.2	8	23	6	74
358093	<5	4.8	46	5020	6	146
358094	<5	0.4	8	6710	<2	406
358095	<5	<.2	12	43	28	26
358096	<5	<.2	12	1565	<2	6
358097	<5	0.2	2	144	126	58
358098	55	3.8	60	74	132	242
358099	<5	<.2	16	18	6	34
358100	<5	0.2	28	17	4	122
547352	<5	0.4	172	608	2	46
547353	<5	0.4	12	134	60	46
547354	<5	<.2	6	56	8	90
547355	<5	6	6	9.33%	<2	220
547356	<5	<.2	8	197	<2	22
547357	<5	0.2	<2	3750	<2	312


6478000N
UTM
CREEK
CASTLE
CREEK
1979 GRID
FUNKEN CLAIM
GROOVIN CLAIM
LCP
6476000N
UTM
456000E
UTM
458000E
UTM
460000E
UTM
LEGEND
Cu in Soils (75, 200, 400 ppm)
Zn in Soils (150, 250, 500, 1000 ppm)
0 100 200 300 400 500
METRES
Data from MacArthur and Bradish (1978)
ANTIOCH INVESTMENTS LTD.
FUNKEN & GROOVIN PROJECT
SOIL GEOCHEMISTRY
BRITISH COLUMBIA
EQUITY ENGINEERING LTD.
DRAWN: M.J./J.W
MINING DIV.: LIARD
N.T.S.: 104I/5E
SCALE: 1:10,000
DATE: JULY, 1997
REVISED:
FIGURE 6

Their results have been compiled in Figure 6, with contour levels chosen arbitrarily for Cu (75, 200 and 400 ppm) and Zn (150, 250, 500 and 1000 ppm).

Much of the Funken and Groovin property is covered by varying thicknesses of glacial till. This produces erratic soil anomalies with "thumb-print" highs; intervening low values may be due to low bedrock metal content or to masking of the bedrock geochemical signature by glacial till.

Copper and zinc soil geochemical anomalies are largely coincident. The strongest of these covers an area of 400 x 700 metres on the north side of Castle Creek between lines106E and 112E, with peak values of 470 ppm Cu and 4000 ppm Zn. Little mapping or prospecting has been carried out in this area, but it appears to be underlain in part by felsic and chlorite schists. No mineralization has been discovered to explain the soil anomaly, although chlorite-carbonate schist with discordant, pre-deformation chalcopyrite stringers ("footwall stringer zone"?) outcrops 100 metres southeast of this anomaly and Archambault and Lehtinen (1991) reported "rusty chlorite schist" with 4935 ppm Cu (sample 83251) within the anomaly.

A smaller zinc-copper soil anomaly covers 100 x 500 metres on the west side of Little Eagle River, from lines 94E to 98E at about 9900N. It is also underlain by felsic and chlorite schists, with no reported mineralization. A weaker anomaly to the south overlies chlorite schist with sulphide-silica layers; rock samples graded up to 9.33% Cu.

8.0 GEOPHYSICS

In 1978, Noranda carried out a vertical shootback EM survey over the western end of their grid, from lines 86E to 104E (MacArthur and Bradish, 1978). The southwestern 40% of this area showed a moderate to strong conductivity; this corresponds to the area underlain by the locally graphitic phyllite, argillite and greywacke. The remainder of the surveyed area has a fairly flat electromagnetic response, with the exception of a few weak conductors along the northern claim boundary on lines 94E, 98E, 100E and 102E.

In 1986, Noranda ran SE-88 and magnetics over a reconnaissance line along the Little Eagle River (Maxwell and Bradish, 1987). Two conductors were revealed on the Funken claim, at 8320N and 8480N, accompanied by a weak magnetic response. The northern conductor was apparently caused by graphitic argillite. The one at 8320N is associated with highly foliated chlorite schists containing zones of heavily disseminated pyrite.

9.0 DISCUSSION

The Funken and Groovin property lies within the King Salmon allochthon, approximately 85 kilometres west-northwest of the Kutcho Creek VMS deposit, whose main lens contains open pit mineable reserves of 17 million tonnes grading 1.62% Cu, 2.32% Zn and 0.3 g/tonne Au. Its geological situation is similar to Kutcho Creek, with much of the property underlain by mafic and felsic schists of the Kutcho Formation. Their stratigraphic thickness cannot be easily determined, due to limited outcrop exposure and unresolved structural complications. Like Kutcho Creek, the Funken and Groovin property covers the highest volcanic cycle of the Kutcho Formation, extending up into the overlying Kutcho conglomerate and Sinwa limestone. Indications that VMS mineralization may be present on the Funken and Groovin property include:

- iron formation (distal exhalite?)
- chloritized quartz-phyric felsic schists (footwall alteration?)
- sericite-quartz-pyrite alteration of felsic schists
- pre-deformation chalcopyrite stringers in chlorite-carbonate schist (footwall stringer zone?)

• strong but erratic Cu-Zn soil geochemical anomalies associated with the felsic and mafic schists

Despite its clear potential for hosting Kutcho Creek-style pyritic massive sulphides, the Funken and Groovin property has received little systematic exploration. Noranda's soil geochemical grid, with samples taken at 50 metre intervals along lines 200 metres apart, was far too coarse to define zones of mineralization. In future, soil samples should be taken on 25 x 100 metre centres to avoid passing over possible VMS mineralization. The Noranda soil samples were analyzed only for Cu, Mo, Pb and Zn; the Kutcho Creek deposit is also marked by soil anomalies for silver, arsenic and mercury. In addition to these, gold and barium analyses are useful in other VMS camps and should be carried out on the Funken and Groovin claims. No ground geophysics has been carried out over most of the property, including the strong 400 x 700 metre Cu-Zn soil anomaly around line 110E. Very little systematic mapping or sampling has been carried out to date and much of the geological framework has not been well established. Finally, the economics of a VMS deposit of Kutcho Creek's size and grade on the Funken and Groovin property should be considerably better than for Kutcho Creek itself, since the Funken/Groovin lies only 15 kilometres from the highway (and rail-bed for the unfinished BCR northern line) at Dease Lake; road access would be comparatively simple and inexpensive to construct.

Respectfully submitted,

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
H. J. AWMACK

Henry J. Awmack, P.Eng.
EQUITY ENGINEERING LTD.

Murray I. Jones, P.Geo.

Vancouver, British Columbia
July, 1997

APPENDIX A

BIBLIOGRAPHY

BIBLIOGRAPHY

Archambault, M. and Lehtinen, J. (1991): Prospecting Report on the Acme 1 and 2 Claims; British Columbia Mineral Branch Assessment Report #21,408.

Barrett, T.J., Thompson, J.F.H. and Sherlock, R.L. (1996): Stratigraphic, Lithogeochemical and Tectonic Setting of the Kutcho Creek Massive Sulfide Deposit, Northern British Columbia; Exploration and Mining Geology, Vol. 5, No. 4, pp. 309-338.

Bridge, D.A., Marr, J.M., Hashimoto, K., Obara, M. and Suzuki, R. (1986): Geology of the Kutcho Creek volcanogenic massive sulphide deposits, northern British Columbia, in Mineral Deposits of Northern Cordillera; CIM Special Volume 37, pp. 115-128.

Childe, F. and Thompson, J.F.H. (1995): U-Pb Age Constraints & Pb Isotopic Signature of the Kutcho VMS Deposit; The Gangue No. 49 (July 1995), pp. 6-8.

Childe, F. and Thompson, J.F.H. (In press): Geological setting, U-Pb geochronology, and radiogenic isotopic characteristics of the Permo-Triassic Kutcho assemblage, North-Central British Columbia; Canadian Journal of Earth Sciences.

Gabrielse, H. (1994): Geology of Cry Lake (104I) & Dease Lake (104J/E) Map Areas, North Central British Columbia; Geological Survey of Canada Open File 2779, 1:50,000 sheets.

Gabrielse, H. (1977): Geology of Cry Lake Map Area; Geological Survey of Canada Open File 610, 1:125,000 sheet.

Holland, S.S. (1986): Placer Gold Production of British Columbia; British Columbia Ministry of Energy, Mines and Petroleum Resources, Bulletin 28.

MacArthur, R.G. and Bradish, L.C. (1978): Geological, Geochemical and Geophysical Report on the Castle 1 and Castle 2 Claims; British Columbia Mineral Branch Assessment Report #6,979.

Maxwell, G and Bradish, L. (1987): Geological & Geophysical Report on the Castle Claim; British Columbia Mineral Branch Assessment Report #15,656.

Thorstad, L.E. and Gabrielse, H. (1986): The Upper Triassic Kutcho Formation, Cassiar Mountains, North-Central British Columbia; Geological Survey of Canada Paper 86-16, 53 pp.

APPENDIX B

STATEMENT OF EXPENDITURES

STATEMENT OF EXPENDITURES
FUNKEN AND GROOVIN CLAIMS
June 6-8, 1996

PROFESSIONAL FEES AND WAGES:		
Brian Dahl, Prospector		
2.5 days @ $300/day	$ 750.00	
Tim Sullivan, Sampler		
2.5 days @ $225/day	562.50	$ 1,312.50
EXPENSES:		
Chemical Analyses	$ 417.30	
Accommodation	41.04	
Automotive Fuel	36.60	
Food	158.87	
Helicopter	365.03	
Maps and Publications	11.79	
Materials and Supplies	87.49	
Truck Rental	170.70	
Telephone Distance Charges	9.80	1,298.62
REPORT (estimated)		2,000.00
MANAGEMENT FEES:		
15% on expenses		194.79
	Total:	$ 4,805.91

APPENDIX C

ROCK SAMPLE DESCRIPTIONS

ROCK SAMPLE DESCRIPTIONS

358080, 358095 Iron formation
- matrix is black to dark steel grey martite, local specularite, minor jasper bands
- magnetism gone; only very weak response
- cut by vuggy, crystalline quartz-carbonate veins

358081 Chlorite schist
- heavy gossan; coarse crystalline pyrite seams
- moderate chlorite alteration
- bleaching associated with cross-cutting quartz veins (with pyrite cubes common)
- local silica flooding

358082, 358090 Quartz-carbonate vein
- angular float from outcrop along Little Eagle River
- traces of vuggy pyrite along fractures; trace of malachite

358083, 358084, 358086, 358087, 358089, 358093, 358094 Chlorite-leucoxene(?)-carbonate(?) schist
- taken from outcrop 4 metres from #547357
- strong foliation, locally disturbed
- dark green clasts(?)
- weathers brown
- trace to 6% chalcopyrite, as blebs and stringers (stretched out and disaggregated along foliation); pre-deformation
- also contains intact, post-deformation quartz veinlet

358085, 358092, 358100 Quartz-pyrite rock
- float at head of small creek near small gossan; similar outcrop in gossan
- pyrite boxwork in foliated cryptocrystalline quartz

358088 Felsic(?)
- proximal float from small gossan below beaver dam at Squaw Creek on Little Eagle River
- aphanitic to weakly porphyritic (or amygdaloidal)
- leucoxene common: light tan, tiny disseminations
- ghostlike fragments?
- possibly silicified
- jarosite-goethite on surface, also in small vugs with quartz crystals

358091 Sericite-chlorite-quartz schist
- clastic rock (lapilli tuff?)
- cut surface reveals fragmental nature; possible phenocrysts in matrix
- light-coloured felsic fragments
- also porphyritic clasts
- 1-3% disseminated pyrite in pyritohedrons
- traces of jasper

358096 Quartzose rock
- cryptocrystalline quartz, aphanitic
- malachite stains on fractures with abundant jarosite and goethite
- disseminated manganese oxides?

358097, 547353 Quartz-sericite-pyrite schist
- fragmental rock, possibly volcanic
- silica veins, flooding and bleaching common
- 5-8% pyrite as blebs and crystals

358098
- taken from sidehill at junction of creeks
- brecciated, strongly weathered
- possibly mixed lithology

- locally appears to be hematitic iron formation; also layered tuff or sediment?
- jarosite, goethite, bleaching of layered rock
- vuggy, crystalline matrix; carbonate-quartz?

358099 Sediment or porphyritic flow
- located 30 metres north of post 6E 0N of Groovin Claim
- altered, foliated rock
- granules of quartz common
- carbonate-rich matrix; gives gossanous weathering
- quartz veins/gashes

547352 Carbonate-sericite(?)-chlorite(?) schist
- located where Castle Creek flows into pond
- brown-weathering, locally fragmental
- Fe-carbonate veinlets
- minor fuchsite(?)
- minor malachite stain

547354 Carbonate-sericite-chlorite schist (conglomerate)
- taken just above beaver lodge at upper lake on Castle Creek
- clasts flattened, rounded in general
- heterolithic; some siliceous clasts, some limestone
- traces of cubic pyrite
- matrix may contain tiny (<<1 mm) phenocrysts

547355 Chlorite schist
- outcrop at beaver dam at Squaw Creek on Little Eagle River
- siliceous, sulphidic layer from outcrop (could be quartz vein?)
- chalcopyrite-pyrite as lenses and disseminated blebs

547356 Felsic?
- outcrop above adit
- strongly bleached and quartz-veined rock
- white to pinkish colour
- 3-5% pyrite as fine-grained vug (amygdule?) fillings
- strongly weathered, with jarosite-goethite

547357 Chlorite schist
- strongly schistose
- boxwork after pyrite; cubes disseminated throughout
- stringers of chalcopyrite cross-cut and follow foliation; zigzags indicate pre-deformation
- tiny disseminated chalcopyrite blebs
- could represent footwall stringer zone mineralization

APPENDIX D

ANALYTICAL CERTIFICATES

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221 FAX: 604-984-0218

EQUITY ENGINEERING LTD.

207 - 675 W. HASTINGS ST.
VANCOUVER, BC
V6B 1N2

A9628516

Comments:

CERTIFICATE A9628516

(EIA) - EQUITY ENGINEERING LTD.

Project: FUNKEN-GROOVIN
P.O. #: ANT96-02

Samples submitted to our lab in Vancouver, BC.
This report was printed on 28-AUG-96.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
205	24	Geochem ring to approx 150 mesh
226	24	0-3 Kg crush and split
3202	24	Rock - save entire reject
229	24	ICP - AQ Digestion charge
* NOTE	1:	

The 32 element ICP package is suitable for trace metals in soil and rock samples. Elements for which the nitric-aqua regia digestion is possibly incomplete are: Al, Ba, Be, Ca, Cr, Ga, K, La, Mg, Na, Sr, Ti, Tl, W.

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
983	24	Au ppb: Fuse 30 g sample	FA-AAS	5	10000
2118	24	Ag ppm: 32 element, soil & rock	ICP-AES	0.2	200
2119	24	Al %: 32 element, soil & rock	ICP-AES	0.01	15.00
2120	24	As ppm: 32 element, soil & rock	ICP-AES	2	10000
2121	24	Ba ppm: 32 element, soil & rock	ICP-AES	10	10000
2122	24	Be ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
2123	24	Bi ppm: 32 element, soil & rock	ICP-AES	2	10000
2124	24	Ca %: 32 element, soil & rock	ICP-AES	0.01	15.00
2125	24	Cd ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
2126	24	Co ppm: 32 element, soil & rock	ICP-AES	1	10000
2127	24	Cr ppm: 32 element, soil & rock	ICP-AES	1	10000
2128	24	Cu ppm: 32 element, soil & rock	ICP-AES	1	10000
2150	24	Fe %: 32 element, soil & rock	ICP-AES	0.01	15.00
2130	24	Ga ppm: 32 element, soil & rock	ICP-AES	10	10000
2131	24	Hg ppm: 32 element, soil & rock	ICP-AES	1	10000
2132	24	K %: 32 element, soil & rock	ICP-AES	0.01	10.00
2151	24	La ppm: 32 element, soil & rock	ICP-AES	10	10000
2134	24	Mg %: 32 element, soil & rock	ICP-AES	0.01	15.00
2135	24	Mn ppm: 32 element, soil & rock	ICP-AES	5	10000
2136	24	Mo ppm: 32 element, soil & rock	ICP-AES	1	10000
2137	24	Na %: 32 element, soil & rock	ICP-AES	0.01	5.00
2138	24	Ni ppm: 32 element, soil & rock	ICP-AES	1	10000
2139	24	P ppm: 32 element, soil & rock	ICP-AES	10	10000
2140	24	Pb ppm: 32 element, soil & rock	ICP-AES	2	10000
2141	24	Sb ppm: 32 element, soil & rock	ICP-AES	2	10000
2142	24	Sc ppm: 32 elements, soil & rock	ICP-AES	1	10000
2143	24	Sr ppm: 32 element, soil & rock	ICP-AES	1	10000
2144	24	Ti %: 32 element, soil & rock	ICP-AES	0.01	5.00
2145	24	Tl ppm: 32 element, soil & rock	ICP-AES	10	10000
2146	24	U ppm: 32 element, soil & rock	ICP-AES	10	10000
2147	24	V ppm: 32 element, soil & rock	ICP-AES	1	10000
2148	24	W ppm: 32 element, soil & rock	ICP-AES	10	10000
2149	24	Zn ppm: 32 element, soil & rock	ICP-AES	2	10000

Chemex Labs Ltd.

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EQUITY ENGINEERING LTD.

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V6B 1N2

Project : FUNKEN-GROOVIN
Comments:

Page Number : 1-A
Total Pages : 1
Certificate Date: 28-AUG-96
Invoice No. : I9628516
P.O. Number : ANT96-02
Account : EIA

* PLEASE NOTE

CERTIFICATE OF ANALYSIS A9628516

SAMPLE	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
NO. 358080	205	226	< 5	< 0.2	0.40	18	30	0.5	6	0.43	< 0.5	8	386	69	>15.00	< 10	< 1	0.01	< 10	0.04	260
NO. 358081	205	226	< 5	< 0.2	1.28	2	< 10	< 0.5	< 2	0.12	0.5	19	109	27	6.52	< 10	< 1	0.01	< 10	1.40	295
NO. 358082	205	226	< 5	< 0.2	< 0.01	14	< 10	0.5	6	>15.00	2.0	< 1	30	9	0.15	< 10	< 1	< 0.01	< 10	0.80	335
NO. 358083	205	226	< 5	0.8	5.23	14	< 10	0.5	2	1.54	< 0.5	41	644	>10000	12.15	30	< 1	< 0.01	< 10	6.15	3600
NO. 358084	205	226	< 5	0.6	5.66	2	< 10	0.5	< 2	2.53	< 0.5	33	578	9490	11.75	30	< 1	< 0.01	< 10	6.63	3520
NO. 358085	205	226	10	0.8	0.17	16	20	< 0.5	2	0.09	< 0.5	1	276	63	0.81	< 10	< 1	0.03	< 10	0.08	75
NO. 358086	205	226	< 5	1.2	5.07	< 2	< 10	0.5	Intf*	1.92	0.5	32	519	>10000	11.80	30	< 1	< 0.01	< 10	6.07	3390
NO. 358087	205	226	< 5	0.6	5.60	< 2	< 10	0.5	Intf*	0.98	< 0.5	51	706	>10000	13.45	30	< 1	< 0.01	< 10	6.18	3730
NO. 358088	205	226	< 5	< 0.2	0.37	12	< 10	< 0.5	2	0.09	1.0	5	180	291	3.27	< 10	< 1	0.01	< 10	0.17	125
NO. 358089	205	226	< 5	1.0	5.72	< 2	10	0.5	Intf*	0.05	< 0.5	63	697	>10000	13.15	30	< 1	< 0.01	< 10	6.07	4240
NO. 358090	205	226	< 5	< 0.2	0.02	4	< 10	< 0.5	< 2	>15.00	< 0.5	< 1	10	29	0.22	< 10	< 1	0.01	< 10	0.60	315
NO. 358091	205	226	< 5	< 0.2	1.46	< 2	50	< 0.5	< 2	8.70	< 0.5	14	122	119	3.17	< 10	< 1	0.08	< 10	1.43	955
NO. 358092	205	226	< 5	< 0.2	0.09	8	< 10	< 0.5	< 2	0.11	< 0.5	< 1	383	23	0.78	< 10	< 1	< 0.01	< 10	0.02	25
NO. 358093	205	226	< 5	4.8	1.93	46	30	< 0.5	14	0.05	< 0.5	16	453	5020	>15.00	30	< 1	0.02	< 10	1.51	650
NO. 358094	205	226	< 5	0.4	6.05	8	10	0.5	< 2	1.36	< 0.5	34	800	6710	12.20	30	< 1	< 0.01	< 10	7.01	3870
NO. 358095	205	226	< 5	< 0.2	0.45	12	10	< 0.5	6	0.38	< 0.5	6	115	43	14.70	< 10	< 1	< 0.01	< 10	0.14	240
NO. 358096	205	226	< 5	< 0.2	0.23	12	< 10	< 0.5	2	0.08	< 0.5	3	155	1565	1.12	< 10	< 1	< 0.01	< 10	0.03	105
NO. 358097	205	226	< 5	0.2	1.05	2	< 10	< 0.5	8	0.02	< 0.5	28	199	144	14.10	< 10	< 1	0.02	< 10	1.08	280
NO. 358098	205	226	55	3.8	0.19	60	20	< 0.5	< 2	4.42	3.0	16	42	74	4.67	< 10	< 1	0.03	< 10	0.17	250
NO. 358099	205	226	< 5	< 0.2	1.16	16	310	< 0.5	< 2	5.49	< 0.5	4	51	18	2.06	< 10	< 1	0.12	< 10	0.45	360
NO. 358100	205	226	< 5	0.2	0.06	28	< 10	< 0.5	2	0.03	< 0.5	2	280	17	6.93	< 10	< 1	< 0.01	< 10	< 0.01	30
NO. 547352	205	226	< 5	0.4	0.84	172	90	< 0.5	< 2	4.74	< 0.5	6	72	608	2.51	< 10	< 1	0.18	< 10	1.23	390
NO. 547353	205	226	< 5	0.4	0.84	12	< 10	< 0.5	6	0.03	< 0.5	36	260	134	>15.00	< 10	< 1	0.04	< 10	0.66	180
NO. 547354	205	226	< 5	< 0.2	2.04	6	70	< 0.5	< 2	7.16	< 0.5	10	68	56	4.10	< 10	< 1	0.10	< 10	1.50	850

CERTIFICATION: [signature]

* INTERFERENCE: HIGH Cu on Bi and P

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
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SAMPLE	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
NO. 358080	205	226	2	< 0.01	4	920	22	< 2	10	53	0.21	< 10	< 10	727	< 10	38
NO. 358081	205	226	< 1	0.05	1	460	16	6	8	12	0.16	< 10	< 10	50	< 10	86
NO. 358082	205	226	< 1	< 0.01	3	30	14	2	< 1	614	< 0.01	10	10	4	< 10	8
NO. 358083	205	226	< 1	< 0.01	264	240	< 2	16	23	15	< 0.01	< 10	< 10	204	< 10	294
NO. 358084	205	226	< 1	< 0.01	228	350	< 2	12	25	26	< 0.01	< 10	< 10	214	< 10	298
NO. 358085	205	226	< 1	< 0.01	6	70	10	< 2	< 1	8	< 0.01	< 10	< 10	5	< 10	50
NO. 358086	205	226	< 1	< 0.01	219	Intf*	< 2	8	21	18	< 0.01	< 10	< 10	207	< 10	276
NO. 358087	205	226	< 1	< 0.01	289	Intf*	< 2	16	24	7	< 0.01	< 10	< 10	214	< 10	324
NO. 358088	205	226	< 1	0.19	10	320	8	< 2	2	4	< 0.01	< 10	< 10	7	< 10	356
NO. 358089	205	226	< 1	< 0.01	313	Intf*	< 2	10	25	2	< 0.01	< 10	< 10	225	< 10	358
NO. 358090	205	226	1	< 0.01	1	10	< 2	< 2	< 1	740	< 0.01	< 10	< 10	4	< 10	20
NO. 358091	205	226	< 1	0.03	36	410	< 2	< 2	6	289	< 0.01	< 10	< 10	34	< 10	54
NO. 358092	205	226	< 1	< 0.01	5	10	6	< 2	< 1	2	< 0.01	< 10	< 10	3	< 10	74
NO. 358093	205	226	< 1	< 0.01	47	530	6	4	7	3	< 0.01	< 10	< 10	194	< 10	146
NO. 358094	205	226	< 1	< 0.01	309	300	< 2	12	29	10	< 0.01	< 10	< 10	213	< 10	406
NO. 358095	205	226	7	0.06	13	1030	28	< 2	6	15	0.09	< 10	< 10	385	< 10	26
NO. 358096	205	226	1	0.09	3	90	< 2	< 2	1	3	< 0.01	< 10	< 10	5	< 10	6
NO. 358097	205	226	30	0.02	24	80	126	< 2	5	5	< 0.01	< 10	< 10	56	< 10	58
NO. 358098	205	226	9	0.06	37	860	132	20	2	337	< 0.01	< 10	< 10	14	< 10	242
NO. 358099	205	226	< 1	0.02	6	480	6	< 2	3	273	0.02	< 10	< 10	30	< 10	34
NO. 358100	205	226	4	< 0.01	4	30	4	< 2	< 1	4	< 0.01	< 10	< 10	3	< 10	122
NO. 547352	205	226	< 1	0.05	6	500	2	2	4	251	0.01	< 10	< 10	18	< 10	46
NO. 547353	205	226	20	0.04	20	50	60	< 2	5	4	< 0.01	< 10	< 10	43	< 10	46
NO. 547354	205	226	< 1	0.03	13	830	8	< 2	6	578	0.01	< 10	< 10	82	< 10	90

CERTIFICATION: Hart Bichler

* INTERFERENCE: HIGH Cu on Bi and P

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221 FAX: 604-984-0218

EQUITY ENGINEERING LTD.

207 - 675 W. HASTINGS ST.
VANCOUVER, BC
V6B 1N2

Comments:

CERTIFICATE A9630546

(EIA) - EQUITY ENGINEERING LTD.

Project: FUNKEN-GROOVIN
P.O. # : ANT96-02

Samples submitted to our lab in Vancouver, BC.
This report was printed on 6-SEP-96.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
244	4	Pulp; prev. prepared at Chemex

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
301	4	Cu %: Conc. Nitric-HCL dig'n	AAS	0.01	100.0

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Project : FUNKEN-GROOVIN
Comments:

Page Number : 1
Total Pages : 1
Certificate Date: 06-SEP-96
Invoice No. : I9630546
P.O. Number : ANT96-02
Account : EIA

CERTIFICATE OF ANALYSIS A9630546

SAMPLE	PREP CODE		Cu %
NO. 358083	244	--	1.59
NO. 358086	244	--	2.16
NO. 358087	244	--	1.26
NO. 358089	244	--	1.66

CERTIFICATION: [signature]

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207 - 675 W. HASTINGS ST.
VANCOUVER, BC
V6B 1N2

Project : ANT 97-01
Comments: ATTN: M. JONES / H. AWMACK

Certificate Date: 15-JUN-97
Invoice No. : I9726652
P.O. Number :
Account : EIA

* PLEASE NOTE

CERTIFICATE OF ANALYSIS A9726652

SAMPLE	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
547355	205	226	< 5	6.0	0.47	6	< 10	< 0.5	Intf*	4.29	11.5	26	70	>10000	8.46	< 10	< 1	< 0.01	< 10	0.47	1365
547356	205	226	< 5	< 0.2	0.29	8	< 10	< 0.5	< 2	0.05	< 0.5	10	261	197	1.67	< 10	< 1	< 0.01	< 10	0.14	120
547357	205	226	< 5	0.2	5.55	< 2	< 10	< 0.5	< 2	0.27	< 0.5	38	370	3750	14.00	30	< 1	0.01	< 10	4.87	3170

CERTIFICATION: Hart Bichler

* INTERFERENCES: Cu on Bi and P

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P.O. Number :
Account : EIA

* PLEASE NOTE

CERTIFICATE OF ANALYSIS A9726652

SAMPLE	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
547355	205	226	3	< 0.01	37	Intf*	< 2	10	< 1	12	0.01	< 10	< 10	22	< 10	220
547356	205	226	< 1	0.08	8	10	< 2	< 2	4	< 1	< 0.01	< 10	< 10	8	< 10	22
547357	205	226	< 1	< 0.01	212	340	< 2	< 2	23	5	< 0.01	< 10	< 10	224	< 10	312

CERTIFICATION: [signature]

* INTERFERENCES: Cu on Bi and P

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V6B 1N2

A9727790

Comments: ATTN: M. JONES / H. AWMACK

CERTIFICATE A9727790

(EIA) - EQUITY ENGINEERING LTD.

Project: ANT 97-01
P.O. # :

Samples submitted to our lab in Vancouver, BC.
This report was printed on 17-JUN-97.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
244	1	Pulp; prev. prepared at Chemex

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
301	1	Cu %: Conc. Nitric-HCL dig'n	AAS	0.01	100.0

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Project : ANT 97-01
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Page Number :1
Total Pages :1
Certificate Date: 17-JUN-97
Invoice No. : I9727790
P.O. Number :
Account : EIA

CERTIFICATE OF ANALYSIS A9727790

SAMPLE	PREP CODE		Cu %									
547355	244	--	9.33									

CERTIFICATION: [signature]

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To: EQUITY ENGINEERING LTD.

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V6B 1N2

Project : FUNKEN-GROOVIN
Comments:

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P.O. Number : ANT96-02
Account : EIA

CERTIFICATE OF ANALYSIS A9630546

SAMPLE	PREP CODE		Cu %									
NO. 358083	244	--	1.59									
NO. 358086	244	--	2.16									
NO. 358087	244	--	1.26									
NO. 358089	244	--	1.66									

CERTIFICATION: [signature]

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A9726656

Comments: ATTN:M.JONES / H. AWMACK

CERTIFICATE A9726656

(EIA) - EQUITY ENGINEERING LTD.

Project: ANT 97-01
P.O. # :

Samples submitted to our lab in Vancouver, BC.
This report was printed on 25-JUN-97.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
205	1	Geochem ring to approx 150 mesh
226	1	0-3 Kg crush and split
3202	1	Rock - save entire reject
200	1	Whole rock fusion

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
594	1	Al2O3 %: Whole rock	ICP-AES	0.01	100.00
588	1	CaO %: Whole rock	ICP-AES	0.01	100.00
590	1	Cr2O3 %: Whole Rock	ICP-AES	0.01	100.00
586	1	Fe2O3(total) %: Whole rock	ICP-AES	0.01	100.00
821	1	K2O %: Whole rock	ICP-AES	0.01	100.00
593	1	MgO %: Whole rock	ICP-AES	0.01	100.00
596	1	MnO %: Whole rock	ICP-AES	0.01	100.00
599	1	Na2O %: Whole rock	ICP-AES	0.01	100.00
597	1	P2O5 %: Whole rock	ICP-AES	0.01	100.00
592	1	SiO2 %: Whole rock	ICP-AES	0.01	100.00
595	1	TiO2 %: Whole rock	ICP-AES	0.01	100.00
475	1	L.O.I. %: @ 1000 deg.C	FURNACE	0.01	99.99
540	1	Total %	CALCULATION	0.01	105.00
2840	1	Ba ppm: ICP-MS	ICP-MS	1	10000
2841	1	Cs ppm: ICP-MS	ICP-MS	1	10000
2842	1	Hf ppm: ICP-MS	ICP-MS	1	10000
2843	1	La ppm: ICP-MS	ICP-MS	1	10000
2844	1	Nb ppm: ICP-MS	ICP-MS	1	10000
2845	1	Rb ppm: ICP-MS	ICP-MS	1	10000
2846	1	Sr ppm: ICP-MS	ICP-MS	1	10000
2847	1	Ta ppm: ICP-MS	ICP-MS	1	10000
2848	1	Y ppm: ICP-MS	ICP-MS	1	10000
2849	1	Zr ppm: ICP-MS	ICP-MS	1	10000

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Project : ANT 97-01
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Page Number : 1-A
Total Pages : 1
Certificate Date: 25-JUN-97
Invoice No. : I9726656
P.O. Number :
Account : EIA

CERTIFICATE OF ANALYSIS A9726656

SAMPLE	PREP CODE		Al2O3 %	CaO %	Cr2O3 %	Fe2O3 %	K2O %	MgO %	MnO %	Na2O %	P2O5 %	SiO2 %	TiO2 %	LOI %	TOTAL %	Ba ppm
547358	205	226	14.15	0.63	0.06	21.20	0.09	10.76	0.46	0.06	0.06	35.63	1.18	13.68	97.96	20

CERTIFICATION: Hart Bichler

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Invoice No. : I9726656
P.O. Number :
Account : EIA

CERTIFICATE OF ANALYSIS A9726656

SAMPLE	PREP CODE		Cs ppm	Hf ppm	La ppm	Nb ppm	Rb ppm	Sr ppm	Ta ppm	Y ppm	Zr ppm
547358	205	226	1	1	1	1	1	23	< 1	16	55

CERTIFICATION: [signature]

APPENDIX E

ENGINEER'S AND GEOLOGIST'S CERTIFICATES

ENGINEER'S CERTIFICATE

I, HENRY J. AWMACK, of 1735 Larch Street, Vancouver, in the Province of British Columbia, DO HEREBY CERTIFY:

1. THAT I am a Consulting Geological Engineer with offices at Suite 207, 675 West Hastings Street, Vancouver, British Columbia.

2. THAT I am a graduate of the University of British Columbia with an honours degree in Geological Engineering.

3. THAT I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia.

4. THAT this report is based on fieldwork carried out by Equity Engineering Ltd. crews in June 1996, hand specimens from that work and on publicly-available reports.

DATED at Vancouver, British Columbia, this 31st day of July, 1997.

Henry J. Awmack, P.Eng.

GEOLOGIST'S CERTIFICATE

I, MURRAY I. JONES, of 8606 - 144A Street, Surrey, in the Province of British Columbia, DO HEREBY CERTIFY:

1. THAT I am a Consulting Geologist with offices at Suite 207, 675 West Hastings Street, Vancouver, British Columbia.

2. THAT I am a graduate of the University of British Columbia with an honours B.Sc. in Geology (1982).

3. THAT I am a graduate of the University of Ottawa, with a M.Sc. in Geology (1992)

4. THAT I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia.

5. THAT this report is based on fieldwork carried out by Equity Engineering Ltd. crews in June 1996, hand specimens from that work and on publicly-available reports.

DATED at Vancouver, British Columbia, this_____day of______________, 1997.

____

Murray I. Jones, P.Geo.