ARIS SUMMARY SHEET

District Geologist, Smithers Off Confidential: 92.08.20

ASSESSMENT REPORT 21750 MINING DIVISION: Liard

PROPERTY: Grace
LOCATION: LAT 57 11 00 LONG 131 28 00
UTM 09 6340279 350906
NTS 104G03W
CLAIM(S): Grace 2
OPERATOR(S): Pioneer Metals
AUTHOR(S): Kasper, B.
REPORT YEAR: 1991, 47 Pages
KEYWORDS: Triassic,Stuhini Group,Andesites,Tuffs,Chalcopyrite,Chalcocite Malachite

WORK DONE: Geochemical,Geological
GEOL 150.0 ha
ROCK 19 sample(s) ;ME
SILT 3 sample(s) ;ME
SOIL 35 sample(s) ;ME

RELATED REPORTS: 18054,20486

1991 GEOLOGICAL AND GEOCHEMICAL REPORT ON THE GRACE 1-2 AND RIM 1 CLAIMS

Located in the Galore Creek Area
Liard Mining Division
NTS 104G/3W
57° 11′ North Latitude
131° 28′ West Longitude

-prepared for-
PIONEER METALS CORPORATION

-prepared by-
Bruno J. Kasper, Geologist

October, 1991

1991 GEOLOGICAL AND GEOCHEMICAL REPORT ON THE GRACE 1-2 AND RIM 1 CLAIMS

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION

The Grace 1-2 and Rim 1 claims were staked in 1989 over the projected northward extension of the Central Zone of the Galore Creek copper-gold porphyry deposit, approximately 170 kilometres northwest of Stewart in northwestern British Columbia. The Grace claim area has been explored at various times since the discovery of the Galore Creek copper-gold porphyry deposit in 1955.

Limited soil sampling and prospecting was carried out over the Grace 2 claim in August 1991 to fulfil assessment work requirements. Equity Engineering Ltd. conducted this program for Pioneer Metals Corporation and has been retained to report on the results of the fieldwork.

2.0 LIST OF CLAIMS

The Grace property comprises three claims totalling 56 units in the Liard Mining Division. Records of the British Columbia Ministry of Energy, Mines and Petroleum Resources indicate that these claims, summarized in Table 2.0.1, are owned by Pioneer Metals Corporation (Figure 2).

TABLE 2.0.1
CLAIM DATA

Claim Name	Record Number	Tenure Number	No. of Units	Record Date	Expiry Date
Rim 1	6259	224191	16	Aug. 25, 1989	Aug. 25, 1992*
Grace 1	6260	224192	20	Aug. 24, 1989	Aug. 24, 1992*
Grace 2	6261	224193	20	Aug. 25, 1989	Aug. 25, 1992*
			56		

* Subject to approval of assessment work filed in August, 1991.

The claims overlap previously staked ground of Stikine Copper Ltd. to the south, the Glacier 11 and 12 claims to the northeast, and the Saddle 1, Pup 3 and 4 and PL-6 claims to the west. Although the boundary with Stikine Copper Ltd. holdings to the south is unknown, the actual ground is estimated to cover 35 units. The location of the legal corner post for the Grace 2 claim, as well as posts for the claims overlapped to the northeast and west, have been verified by Equity Engineering Ltd. personnel.

3.0 LOCATION, ACCESS AND GEOGRAPHY

The Grace claim group is located within the Coast Range Mountains approximately 170 kilometres northwest of Stewart and 90

Km 0 100 200 300 400 500 Km

MILES 0 50 100 200 300 MILES

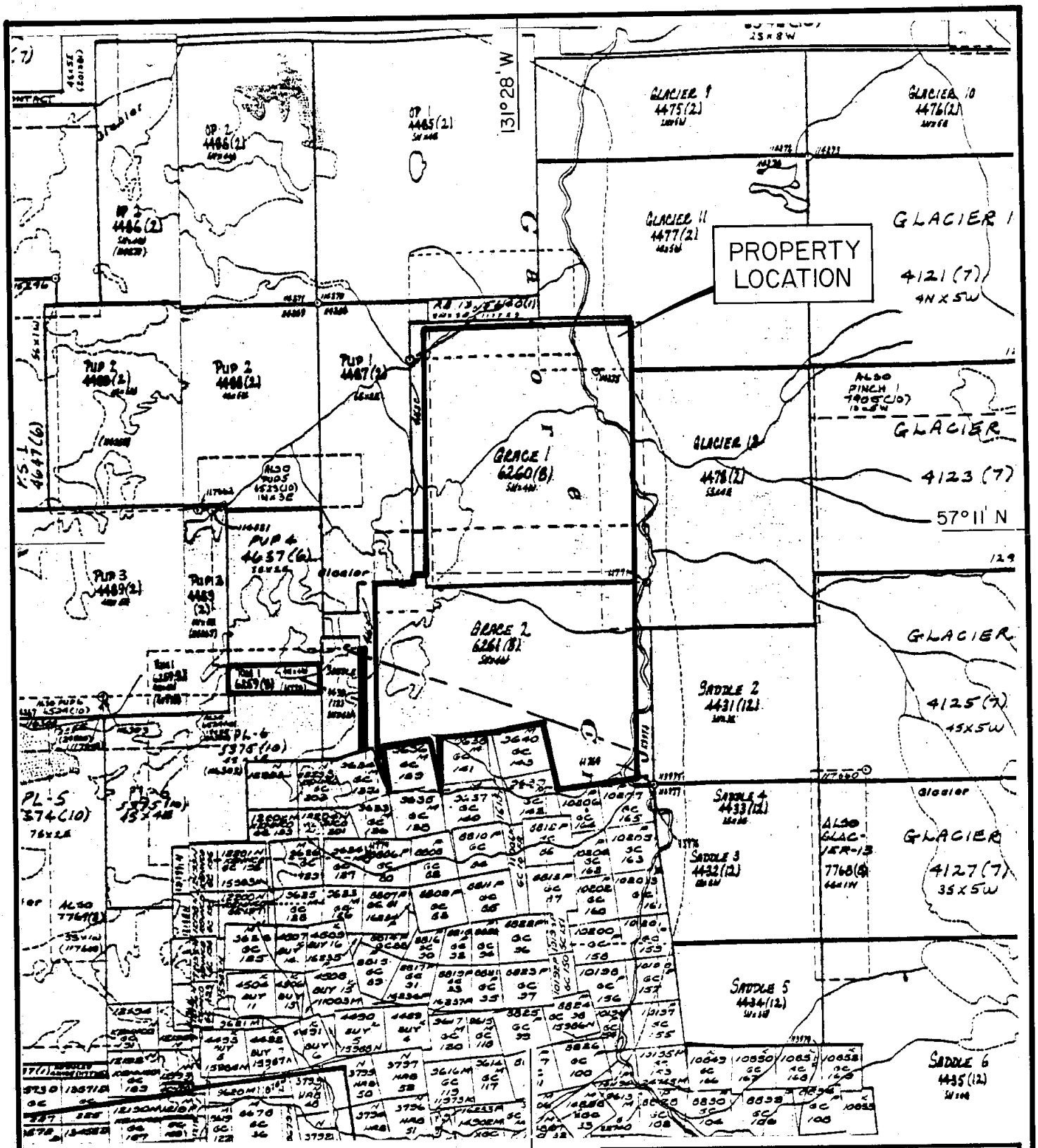
PIONEER METALS CORP.

GRACE 1&2, RIM 1 CLAIMS
LOCATION MAP

BRITISH COLUMBIA

EQUITY ENGINEERING LTD.

DRAWN: J.W.	MINING DIV. LIARD	FIGURE
N.T.S.: 104G/3W	SCALE: AS SHOWN	1
DATE: SEPT., 1991	REVISED:	



PIONEER METALS CORP.

GRACE 1 & 2, RIM 1 CLAIMS

CLAIM MAP

BRITISH COLUMBIA

EQUITY ENGINEERING LTD.

DRAWN: J.J.E.	MINING DIV.: LIARD	FIGURE
N.T.S.: 104G/3W	SCALE: 1:50000	2
DATE: SEPT., 1991	REVISED:	

kilometres south of Telegraph Creek in northwestern British Columbia (Figure 1). It lies within the Liard Mining Division, centered at 57° 11′ north latitude and 131° 28′ west longitude.

Access to the Grace property during the 1991 exploration program was provided by a helicopter set out from a fly camp on a nearby property. In previous years, helicopter access was provided from the Galore Creek airstrip which is located approximately four kilometres to the south. A bulldozer road to the Grace claims from the Galore Creek airstrip was constructed by Pioneer Metals Corporation in 1989.

On the Alaskan side of the border, Wrangell lies approximately 100 kilometres to the southwest, and provides a full range of services and supplies, including a commercial airport. The Stikine River has been navigated by 100-ton barges upriver as far as Telegraph Creek, allowing economical transportation of heavy machinery and fuel to the Scud River airstrip located 24 kilometres to the northwest of the claim group.

The Grace claims cover the western flank of the Galore Creek drainage, extending south from Galore Pup Creek. The Rim #1 claim lies immediately west of the Grace 2 claim, covering part of the cirque at the headwaters of Jack Wilson Creek. Topography is rugged, typical of mountainous and glaciated terrain, with elevations ranging from 550 metres in the Galore Creek valley to over 2000 metres on the western edge of the Grace 2 claim.

Lower slopes are covered by a mature forest of hemlock, spruce and balsam fir with a dense undergrowth of devil's club, alder and huckleberry. Above treeline, which occurs at approximately 1200 metres, the creek beds and slopes are covered by dense slide alder and willow growth. The steeper slopes are covered in short heather and other alpine vegetation.

The property lies in the wet belt of the Coast Range Mountains, with annual precipitation between 190 and 380 centimetres (Kerr, 1948). Except during July, August and September, precipitation at higher elevations falls mainly as snow, with accumulations reaching three metres or more. Both summer and winter temperatures are moderate, ranging from -5°C in the winter to 20°C in the summer months.

4.0 PROPERTY MINING HISTORY

4.1 Previous Work

The Galore Creek district was extensively explored for its copper potential throughout the 1960's, following the discovery in 1955 of the Galore Creek copper-gold porphyry deposit (Figure 3). This deposit, whose Central Zone hosts reserves of 125 million

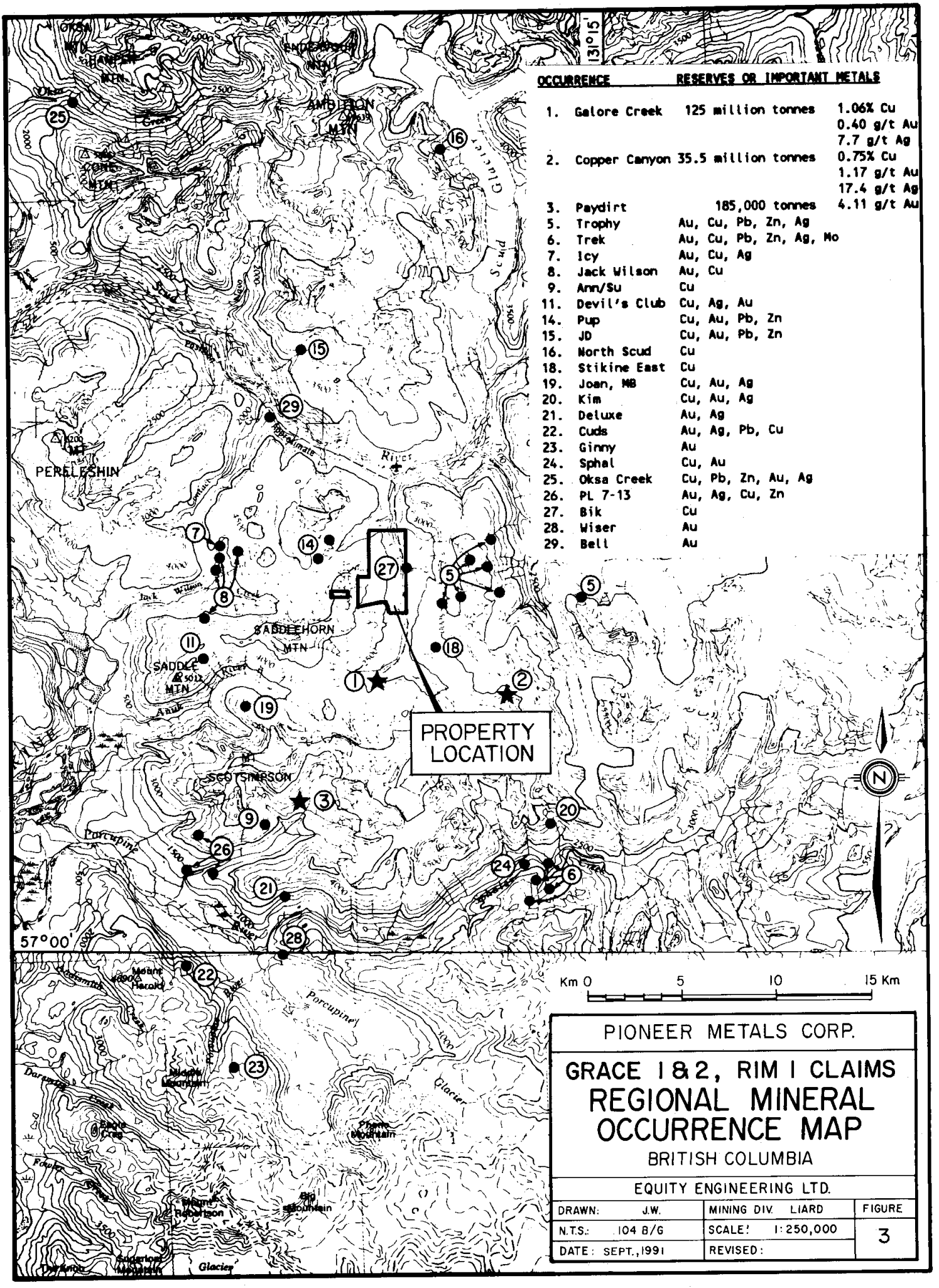
tonnes grading 1.06% copper and 400 ppb gold (Allen et al, 1976), adjoins the Grace claims to the south. Stikine Copper Ltd. is currently updating its feasibility study on the Galore Creek deposit, incorporating significant gold and copper results from drilling in recent years. Several major mining companies conducted regional mapping and silt sampling programs in the 1950's and 1960's over the entire Galore Creek area and in 1957 the Copper Canyon copper-gold porphyry deposit was discovered eight kilometres east of the Central Zone. The Copper Canyon deposit, with 35.7 million tonnes at a grade of 0.75% copper and 1.17 g/tonne (0.034 oz/ton) gold (Cons. Rhodes, 1991), was actively explored in 1990 after a hiatus of 33 years.

In 1964, the BIK Syndicate staked the Stikine North claim group immediately north and northeast of Stikine Copper's holdings, including ground currently covered by the Grace 1 and 2 claims. They carried out ground magnetometer (Falconer, 1965a) and induced polarization (Falconer, 1965b) surveys. Three induced polarization anomalies were identified, two of which lie on the Grace claims. Falconer (1965b) noted outcrop of syenite and andesite with minor chalcopyrite and pyrite within one of these, the Northwest anomaly. The other, the Southwest anomaly, covers "syenite porphyry breccia with very minor sulphides" and trends southwards onto Stikine Copper's ground.

Conwest Exploration staked the CW claim group in 1964 over a large area north and west of the Stikine North claim group, including the northern part of the Grace 1 claim. They conducted regional mapping and sampling over their claims, taking fifteen rock samples and 91 silt samples in 1964, of which two rock samples and four silt samples were taken from the area now covered by the Grace 1 claim (Grant, 1964). An induced polarization survey carried out by Conwest in 1966 showed a northward extension of the BIK Syndicate's Northwest Anomaly onto their claim group, on what is now the Grace 1 claim (Dodds, 1966). Dodds (1966) recommended that two diamond drill holes be completed on this anomaly, but there is no record of drilling by Conwest.

In 1987, Pioneer Metals Corporation staked the Grace 1 and 2 claims and carried out limited geological mapping and stream sediment sampling (Blusson, 1988). Those claims lapsed in 1989 and were immediately re-staked by Pioneer Metals as the Grace 1-2 and Rim 1 claims. Around this time, Pioneer Metals constructed a tractor road for drill access to the claims. An airborne geophysical survey was carried out in the winter of 1989/90 over the Grace claims and the adjoining Trophy Gold property, which adjoins it to the east (Blusson, 1990).

During 1987, the federal and provincial geological surveys conducted a joint regional geochemical survey throughout the Telegraph Creek and Sumdum map sheets. Two silt samples, taken from streams draining the Grace property, were anomalous in gold



OCCURRENCE		RESERVES OR IMPORTANT METALS	
1.	Galore Creek	125 million tonnes	1.06% Cu 0.40 g/t Au 7.7 g/t Ag
2.	Copper Canyon	35.5 million tonnes	0.75% Cu 1.17 g/t Au 17.4 g/t Ag
3.	Paydirt	185,000 tonnes	4.11 g/t Au
5.	Trophy	Au, Cu, Pb, Zn, Ag	
6.	Trek	Au, Cu, Pb, Zn, Ag, Mo	
7.	Icy	Au, Cu, Ag	
8.	Jack Wilson	Au, Cu	
9.	Ann/Su	Cu	
11.	Devil's Club	Cu, Ag, Au	
14.	Pup	Cu, Au, Pb, Zn	
15.	JD	Cu, Au, Pb, Zn	
16.	North Scud	Cu	
18.	Stikine East	Cu	
19.	Joan, MB	Cu, Au, Ag	
20.	Kim	Cu, Au, Ag	
21.	Deluxe	Au, Ag	
22.	Cuds	Au, Ag, Pb, Cu	
23.	Ginny	Au	
24.	Sphal	Cu, Au	
25.	Oksa Creek	Cu, Pb, Zn, Au, Ag	
26.	PL 7-13	Au, Ag, Cu, Zn	
27.	Bik	Cu	
28.	Wiser	Au	
29.	Bell	Au	

PIONEER METALS CORP.

GRACE 1&2, RIM 1 CLAIMS
REGIONAL MINERAL OCCURRENCE MAP
BRITISH COLUMBIA

EQUITY ENGINEERING LTD.

DRAWN: J.W.	MINING DIV. LIARD	FIGURE
N.T.S.: 104 B/G	SCALE: 1:250,000	3
DATE: SEPT., 1991	REVISED:	

and copper, and one was also anomalous in silver, lead, cobalt, molybdenum, antimony and tungsten (GSC, 1988).

4.2 1991 Exploration Program

During July of 1991, Pioneer Metals Corporation carried out a limited exploration program on the Grace 1-2 and Rim 1 claims in order to satisfy assessment requirements. This program was directed at discovering copper-gold porphyry mineralization similar to the Galore Creek deposit to the south.

Geological mapping, prospecting silt sampling and soil sampling, were carried out over the Grace 2 claims. During the course of this program, 3 silt samples, 35 soil samples and 19 rock samples were taken. Silt samples were taken from the backwaters of drainages, sieved to minus 80 mesh in the laboratory and analyzed geochemically for gold and 32 elements by ICP (Figure 5).

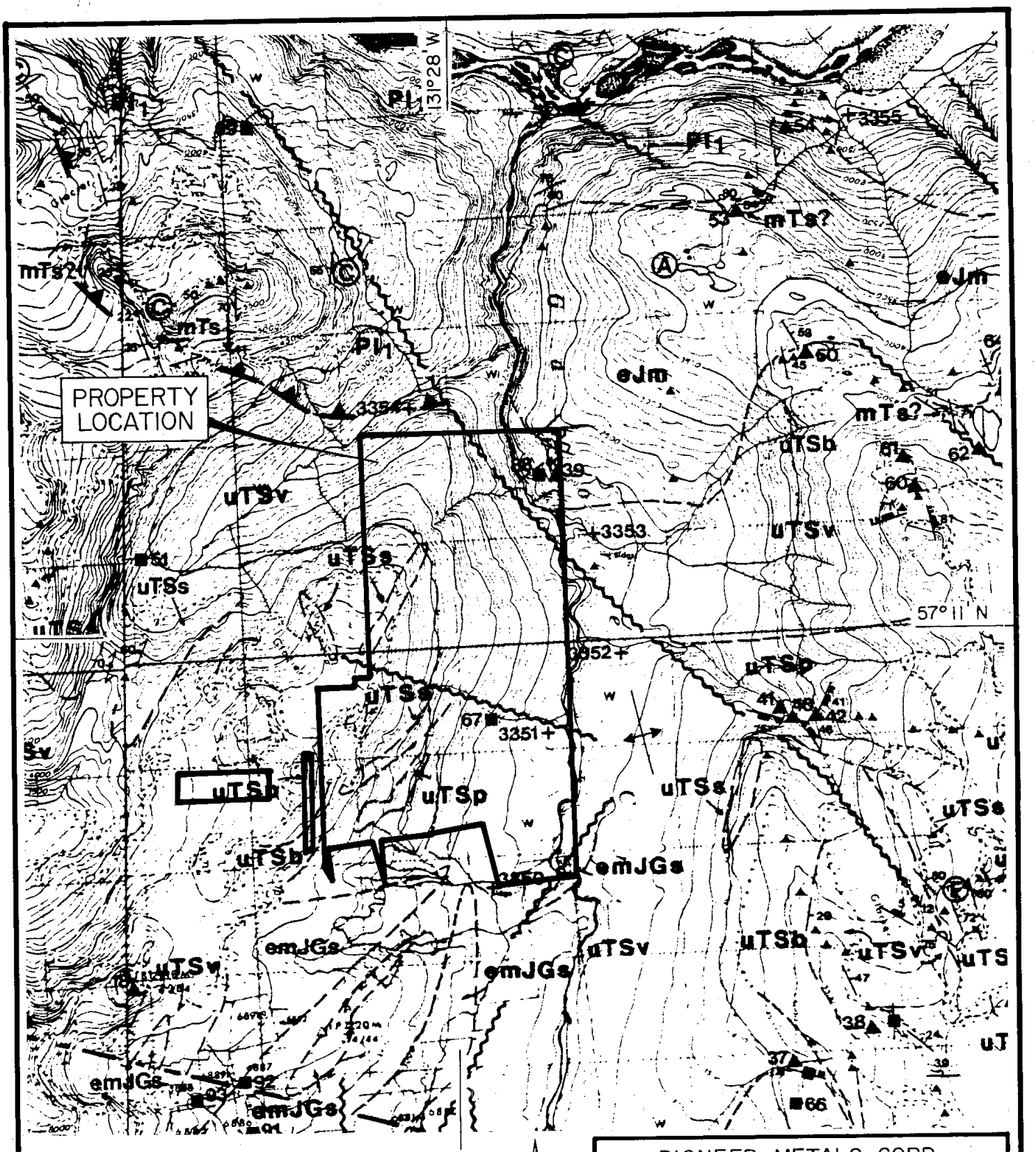
Soil samples were taken at 25-metre intervals along two contour soil lines above two of the existing bulldozer roads (Figure 6) and analyzed geochemically for gold and ten base metals. Wherever possible, soil samples were taken from the red-brown B horizon.

Geological mapping and prospecting were carried out on the Grace 2 claim using a 1:50,000 government topographic map for control. Rock samples, described in Appendix C, were taken from zones of alteration and mineralization and analyzed geochemically for gold and 32 elements by ICP. Samples exceeding 1,000 ppb gold, 100 ppm silver or 10,000 ppm for base metals, were assayed for the appropriate elements. Analytical certificates are attached in Appendix D.

5.0 REGIONAL GEOLOGY

The basis for regional geological mapping in the Stikine River area was set out by Kerr (1948), the crew of Operation Stikine (GSC, 1957) and Souther (1972). Their work has been refined in the Galore Creek area by Brown and Gunning (1989a,b), Logan and Koyanagi (1989) and Logan et al (1989) at a scale of 1:50,000.

The Galore Creek Camp lies within the Intermontane Belt, a geological and physiographic province of the Canadian Cordillera, and flanks the Coast Plutonic Complex to the west (Figure 4). At Galore Creek, the generally northwest-trending structure of the Intermontane Belt is discordantly cut across by the northeast-trending Stikine Arch which became an important, relatively positive tectonic element in Mesozoic time when it began to influence sedimentation into the Bowser Successor Basin to the southeast and into the Whitehorse Trough to the northwest (Souther et al., 1979).



Geology after Logan et al 1989b

LEGEND on following page

PIONEER METALS CORP.

GRACE 1&2, RIM 1 CLAIMS

REGIONAL GEOLOGY

BRITISH COLUMBIA

EQUITY ENGINEERING LTD.

DRAWN: J.J.E.	MINING DIV.: LIARD	FIGURE
N.T.S.: 104G/3W	SCALE: 1:50000	4
DATE: SEPT., 1991	REVISED:	

LEGEND

To accompany Figure 4

QUATERNARY

Qal	*UNCONSOLIDATED GLACIAL TILL AND POORLY SORTED ALLUVIUM*

UPPER TRIASSIC
STUHINI GROUP (WHERE UNDIVIDED DENOTED AS uTSv)

uTSs	*SILTSTONE, SANDSTONE, CONGLOMERATE, MINOR LIMESTONE CONTAINS Monotis*
uTSp	*PYROXENE-PORPHYRY FLOWS AND FRAGMENTALS*
uTSb	*INTERMEDIATE TO MAFIC FRAGMENTALS, BRECCIA, TUFF, LAHAR*

MIDDLE TRIASSIC

mTs	*CARBONACEOUS SILTY SHALE WITH ELLIPTICAL CONCRETIONS, SILICEOUS AND LIMY SILTSTONES CONTAINING Halobia*

STIKINE ASSEMBLAGE

PERMIAN

Pl1	*LIGHT GREY MASSIVE TO THICKLY-BEDDED BUFF, BIOCLASTIC CALCARENITE*
Pl2	*DARK GREY TO BUFF THIN BEDDED, BIOCLASTIC LIMESTONE, CHERT INTERBEDS, ARGILLACEOUS NEAR BASE*

INTRUSIVE ROCKS

EARLY TO MIDDLE JURASSIC
GALORE CREEK INTRUSIONS

emJGs	*SYENITE, ORTHOCLASE PORPHYRITIC MONZONITE*

EARLY JURASSIC

eJm	*MEDIUM-GRAINED, HORNBLENDE, BIOTITE GRANODIORITE TO MONZONITE*

Geological boundary (defined, approximate, assumed)

Unconformity (assumed)

Bedding (inclined, vertical, parallel to foliation)

Bedding tops observed (inclined, vertical, overturned)

Bedding, estimated attitude (g = gentle, m = moderate, s = steep)

Foliation (inclined, vertical; *M* = mylonitic)

Joint (inclined, vertical)

Dyke (inclined, vertical)

Dyke, estimated attitude (g= gentle, m = moderate, s = steep)

Vein (inclined, vertical, Q = quartz)

Anticlinal axis

Synclinal axis

Overturned synclinal axis

Axial plane of minor fold (inclined, vertical)

Fold axis of minor fold with M, S and Z symmetry; crenulation (arrow indicates plunge)

High angle fault; surface trace (defined, approximate, assumed; Solid circle indicates downthrown side, arrows indicate relative movement)

Thrust fault (defined, approximate, assumed; teeth in direction of dip)

Shear zone, mylonite

Stikinian stratigraphy ranges from possibly Devonian to Jurassic, and was subsequently intruded by granitoid plutons of Upper Triassic to Eocene age. The oldest strata exposed in the Galore Creek camp are Mississippian or older mafic to intermediate volcanic flows and pyroclastic rocks (**Units 4A** and **4B**) with associated clastic sediments (**Units 4C, 4D, 4G** and **4J**) and carbonate lenses (**Unit 4E**). These are capped by up to 700 metres of Mississippian limestone with a diverse fossil fauna (Unit 4E). It appears from fossil evidence that all of the Pennsylvanian system is missing and may be represented by an angular unconformity and lacuna of 30 million years, though field relationships are complicated by faulting (Monger, 1977; Logan and Koyanagi, 1989). Permian limestones (**Units 6A, 6B** and **6C**), also about 700 metres thick, lie upon the Mississippian limestone but are succeeded by a second lacuna amounting to about 20 million years from the Upper Permian to the upper Lower Triassic.

Middle and Upper Triassic siliciclastic and volcanic rocks (**Unit 7**) are overlain by Upper Triassic Stuhini Group siliciclastic (**Units 8A** and **8B**) and volcanic (**Units 8D, 8E, 8G, 8H** and **8I**) rocks, consisting of mafic to intermediate pyroclastic rocks and lesser flows. The Galore Creek porphyry copper deposit appears from field evidence to mark the edifice of an eroded volcanic centre with numerous sub-volcanic plutons of syenitic composition. Jurassic Bowser Basin strata onlap the Stuhini Group strata to the southeast of the Iskut River but, because of erosion and non-deposition, are virtually absent from the Galore Creek area.

The plutonic rocks follow a three-fold division (Logan and Koyanagi (1989) and Logan et al (1989)). Middle Triassic to Late Jurassic syenitic and broadly granodioritic intrusions are partly coeval and cogenetic with the Stuhini Group volcanics and include the composite Hickman Batholith (**Unit 9**) and the syenites of the Galore Creek Complex (**Unit 11**). Jura-Cretaceous Coast Plutonic Complex intrusions (**Unit 12**) occur on the west side of the Galore Creek Camp, along the Stikine River, with the youngest of these intrusions occupying more axial positions along the trend of the Coast Plutonic Complex flanked by older intrusions. The youngest intrusives in the Galore Creek Camp are Eocene quartz monzonitic plugs (**Unit 13**), felsic and mafic sills and dykes (**Unit 14**), and biotite lamprophyre (minette) dykes (**Unit 14C**).

The dominant style of deformation in the Galore Creek area consists of upright north-trending, open to tight folds and northwest-trending, southwest-verging, folding and reverse faulting in the greenschist facies of regional metamorphism. Localized contact metamorphism ranges as high as pyroxene hornfels grade; metasomatism is also noted near intrusions. Upright folding may be an early manifestation of a progressive deformation which later resulted in southwest-verging structures. Southwest-verging deformation involves the marginal phases of the Hickman Batholith and so is, at least in part, no older than Late Triassic.

Steeply dipping faults which strike north, northwest, northeast, and east have broken the area into a fault-block mosaic. North-striking faults are vertical to steeply east-dipping and parallel to the Mess Creek Fault (Souther, 1972), which was active from Early Jurassic to Recent times (Souther and Symons, 1974); northwest-striking faults are probably coeval with the north-striking faults, but locally pre-date them. East-west trending faults are vertical or steeply dipping to the north and display north-side down dip slip kinematics, whereas northeast-striking faults are the loci of sinistral, strike-slip motion (Brown and Gunning, 1989a).

A number of metallic deposit types have been recognized in the Galore Creek camp: porphyry copper $\pm$ molybdenum $\pm$ gold deposits, structurally-controlled precious metal vein/shear deposits, skarns and breccia deposits (Figure 3). Porphyry copper deposits of this area include both the alkalic Galore Creek copper-gold and calc-alkalic Schaft Creek copper-molybdenum deposits. Galore Creek, which is associated with syenitic stocks and dykes rather than a quartz-feldspar porphyry, is further contrasted from the calc-alkaline Schaft Creek in that molybdenite is rare, magnetite is common and gold and silver are important by-products. The mineralization is clearly coeval and cogenetic with the spatially associated intrusive bodies. Other porphyry copper occurrences in the Galore Creek area include the Ann/Su, Copper Canyon, Sphal and Jack Wilson Creek deposits.

Structurally-controlled gold-silver deposits have been the focus of exploration in recent years. The vein/shear occurrences are similar throughout the Galore Creek camp in that they are mesothermal in nature, containing base metal sulphides with strong silica veining and alteration. However, it appears that the intrusive bodies associated with this mineralization fall into two classes on the basis of age and composition. These two classes are reflected in differences in the style of structures, sulphide mineralogy and associated alteration products. The intrusive types are: 1) Lower Jurassic alkaline "Galore Creek" stocks; and 2) Eocene quartz monzonite to porphyritic granodiorite intrusions. Lead isotope data from the Stewart mining camp (Alldrick et al., 1987) further supports the proposition that separate Jurassic and Tertiary mineralizing events were "brief regional-scale phenomena".

Structures associated with the Lower Jurassic syenites are typically narrow quartz-chlorite veins mineralized predominately with pyrite, chalcopyrite and magnetite. Examples of these structures in the Galore Creek camp include many of the discrete zones peripheral to the Galore Creek deposit and the gold-rich veins at Jack Wilson Creek.

The Tertiary mineralization comprises discrete quartz veins and larger shear zones characterized by pervasive silicification, sericitization and pyritization whose total sulphide content is

commonly quite low. The quartz veins contain a larger spectrum of sulphide minerals including pyrite, chalcopyrite, pyrrhotite, arsenopyrite, galena and sphalerite. Unlike the Jurassic mineralization, silver grades may be very high. The Paydirt deposit appears to fall into this category.

Skarns represent a minor percentage of the precious metal-bearing occurrences in the Galore Creek camp. The mineralogy of these deposits is influenced by the composition of the intrusion driving the hydrothermal fluids. In deposits associated with alkalic intrusions, the skarn assemblage is commonly dominated by magnetite and chalcopyrite, as at the Galore Creek deposit and the Hummingbird skarn on the east side of the South Scud River.

The breccia-hosted mineralization discovered in the Galore Creek camp precious metal deposits appear to be unique in style and mineralization. Three occurrences have been located in the camp: (1) the zinc-silver-gold Ptarmigan zone in the South Scud River area, (2) the copper-molybdenum-gold-silver breccia at the Trek property on Sphaler Creek and (3) the copper-bearing and magnetite breccias of the complex Galore Creek deposit. The single common denominator of each is that the zones are located along fault structures which may represent the main conduit for mineralizing fluids.

Kuroko-type volcanogenic massive sulphide mineralization has not yet been reported from the Galore Creek area, but significant deposits occur in similar stratigraphy to the northwest and southeast. Volcanogenic massive sulphide deposits have long been known in the Tulsequah area, hosted by felsic and sedimentary units of a Paleozoic island arc complex (Nelson and Payne, 1984), which appears to correlate with the pre-Permian metamorphic rocks of the Galore Creek district. The Tulsequah Chief deposit, located 215 kilometres northwest of the Grace property, has reported reserves of 4.7 million tonnes at a grade of 1.6% copper, 1.3% lead, 7% zinc, 2.7 g/tonne gold and 101 g/tonne silver (Northern Miner, Dec. 10/90). On the Rock and Roll property, located 54 kilometres south of the Grace claims in the Iskut River area, Thios Resources reports a new VMS discovery in Stuhini sediments with drill intersections up to 881 g/tonne silver, 5.35% zinc, 2.07% lead, 2.74 g/tonne gold and 0.58% copper over 9.7 metres (Thios, 1990).

6.0 PROPERTY GEOLOGY AND MINERALIZATION

6.1 Geology

Although no property-scale geological mapping has been previously reported over the Grace property, limited mapping has been done by Blusson (1988) and Logan et al (1989) and updated by mapping from the 1991 field program (Figure 5). The Grace 2 claim is underlain by Upper Triassic Stuhini Group volcanic,

volcaniclastic and sedimentary rocks. Early to Middle Jurassic syenite porphyries and dykes of the Galore Creek Intrusions intrude the Upper Triassic stratigraphy. North to northeasterly trending faults and an andesitic dyke of probable Tertiary age, crosscut the earlier rock units.

Upper Triassic Stuhini Group crystal lapilli tuffs and agglomerates (**Unit uTSb**) are interbedded or grade into andesitic or pyroxene-phyric flows (**Unit uTSp**) along the west side of Galore Creek in the southeastern corner of the property. The volcaniclastics consist mainly of volcanic clasts within a medium-grained, magnetic crystal hash. Further up Ursus Creek, but below the bulldozer roads, the lapilli tuffs grade into a non-magnetic crystal hash tuff (Unit uTSb) and are interbedded with feldspar porphyry flows (Unit uTSp).

The upper levels of Ursus Creek are generally underlain by tuffs and breccias of Unit uTSb with minor interbeds of volcanic flows and sedimentary rocks. A 150 metre band of sedimentary rocks (**Unit uTSs**) mapped by Blusson (1988), trends northeast across the volcaniclastics from the southwestern corner of the Grace 2 claim. Blusson described these rocks as "... a generally west dipping sedimentary sequence of argillite to conglomerate with some calcareous members.". Volcanic flows (Unit uTSp) have been mapped by Logan et al (1989) beneath the band of sedimentary rocks and in the upper elevations of the Rim claim to the west. Blusson (1988) indicated the presence of an "augite basalt" beneath the band of sedimentary rocks, which would be equivalent to the "pyroxene-porphyry flows" mapped by Logan.

Syenite dykes (**Unit emJGs**) belonging to the Early to Middle Jurassic Galore Creek Intrusions are exposed along both Galore Creek and Ursus Creek in the southern part of the Grace 2 claim. At least two varieties of syenite have been recognized: a pinkish-red, equigranular, medium-grained syenite and a grey, orthoclase porphyry syenite. Two exposures of the pinkish-red syenite dykes were found north of Ursus Creek in the banded sedimentary belt. These northerly trending dykes contain small blebs of magnetite associated with pyrite. The grey, orthoclase porphyry dykes were located in both the upper and lower parts of Ursus Creek and consist of orthoclase phenocrysts up to 5 millimetres in size, in a light to medium grey, aphanitic matrix. Copper-mineralized magnetite veins are associated with the grey syenites in the upper part of Ursus Creek. The grey syenite resembles the "fine-grained porphyritic syenite" described by Allen et al (1976) for the Galore Creek property to the south, while the pinkish-red syenite is texturally equivalent to Allen's "green syenite". Logan et al (1989) mapped two tongues of syenite porphyries extending into the southern part of the Grace 2 claim. These porphyries are part of the Galore Creek Syenite Complex which has not been subdivided this far north.

1991 ROCK SAMPLE ANALYSES

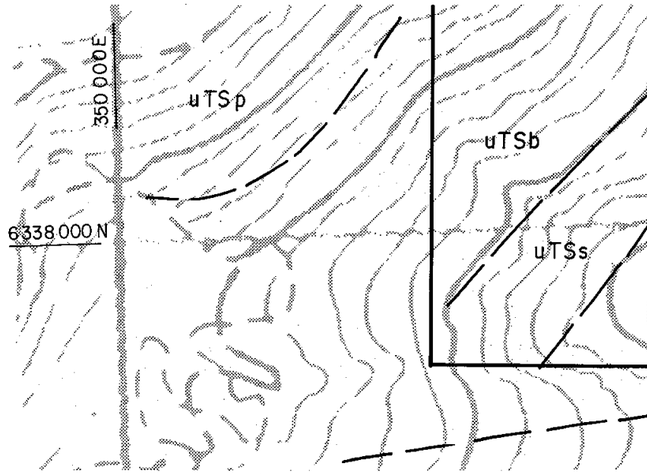
Sample	Au(ppb)	Ag(ppm)	Cu(ppm)	Pb(ppm)	Zn(ppm)	As(ppm)
508751	85	1.6	35	32	24	10
508752	<5	0.2	94	68	98	<5
508753	13.58g/t	10.2	1.41%	180	210	55
508754	1.23g/t	0.6	5220	<2	48	<5
508755	395	10.6	6510	184	180	40
508901	60	<0.2	107	6	24	<5
508902	10	<0.2	192	<2	18	10
508903	8.98g/t	6.6	1.06%	2	64	<5
508904	205	<0.2	4250	32	16	<5
508905	1.17g/t	22.2	1.35%	202	256	<5
508951	30	<0.2	744	<2	32	15
508952	5	<0.2	182	6	24	<5
508953	90	<0.2	2140	4	40	<5
508954	25	0.2	679	4	12	<5
508955	26.06g/t	5.8	158	416	24	5
508956	255	11.8	5.15%	<2	138	<5
508957	40	<0.2	402	8	12	<5
508958	9.39g/t	2.4	157	12	20	10
508959	9.33g/t	2.2	3770	<2	12	<5

1991 SILT SAMPLE ANALYSES

Sample	Au(ppb)	Ag(ppm)	Cu(ppm)	Pb(ppm)	Zn(ppm)	As(ppm)
91-MB-01	955	0.8	1045	58	70	<5
91-MB-02	50	<0.2	336	4	38	<5
91-MB-03	340	0.4	867	52	62	30

1987 GOVERNMENT SILT SAMPLE ANALYSES (GSC OPEN FILE 1646, 1988)

Sample	Au(ppb)	Ag(ppm)	Cu(ppm)	Pb(ppm)	Zn(ppm)	As(ppm)
873350	511	1.0	791	42	57	8
873351	127	0.1	138	12	42	2
90th %ile	30	0.3	103	16	133	17
95th %ile	65	0.4	132	22	181	29
99th %ile	237	1.0	272	55	478	81



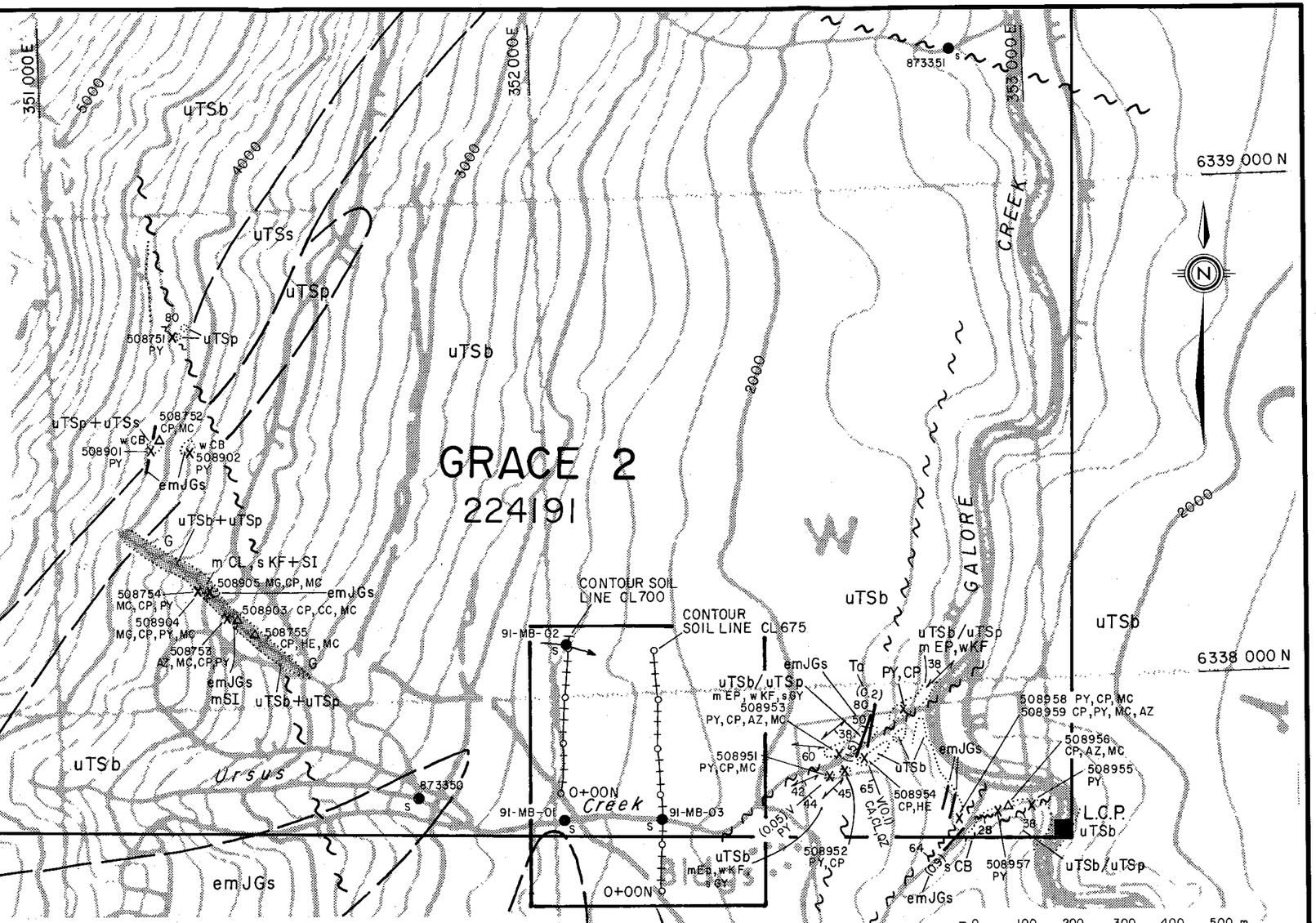


Figure 5

LEGEND

TERTIARY
Dykes and sills
Ta — Andesitic

EARLY TO MIDDLE JURASSIC
Galore Creek Intrusions
emJGs — Syenite porphyries and dykes.

UPPER TRIASSIC
Stuhini Group
uTSb — Lapilli tuffs, pyroclastic breccia and agglomerate.
uTSp — Pyroxene or feldspar - porphyry flows
uTSs — Interbedded wackes, siltstone, argillites.

MINERALS AND ALTERATION TYPES

AZ	azurite	CA	calcite	CB	Fe-carbonate
CC	chalcocite	CL	chlorite	CP	chalcopyrite
EP	epidote	HE	hematite	KF	K-feldspar
MC	malachite	MG	magnetite	PY	pyrite
QZ	quartz	SI	silica		

Alteration intensity: w -- weak; m -- moderate; s -- strong

SYMBOLS

- Rock outcrop
- Geological boundary (defined, inferred)
- Fault with dip (approximate, inferred)
- Fracturing with dip
- (1.0) Dyke with dip and true width in metres
- V (1.0) Vein with dip and true width in metres
- △, X Rock sample (float, grab or chip from outcrop)
- ● S Silt sample
- Soil sample line with 25 metre and 100 metre stations.
- G Gossan
- L.C.P Legal corner post (located)

GEOLOGY ADAPTED IN PART FROM BLUSSON (1988) AND LOGAN et al (1989)

PIONEER METALS CORPORATION

GRACE CLAIMS
GEOLOGY & GEOCHEMISTRY

BRITISH COLUMBIA

EQUITY ENGINEERING LTD.

DRAWN:	J.W.	MINING DIV.:	LIARD
N.T.S.:	104G/3W	SCALE:	1:10,000
DATE:	SEPT., 1991	REVISED:	

FIGURE 5

A twenty centimetre wide andesitic dyke (**Unit Ta**) crosscuts the crystal ash tuffs in the lower part of Ursus Creek. This greenish-grey dyke is fine-grained, weakly magnetic and unaltered when compared to the surrounding rocks. The dyke has been assigned a Tertiary age due to its relatively unaltered state and similarities to other Tertiary age dykes noted by Logan and Koyanagi (1989) for the Galore Creek area.

Three types of alterations were noted during the 1991 program: potassic, propylitic and iron-carbonate alteration. Weak to strong potassic alteration is associated with the grey syenite dykes throughout Ursus Creek making it difficult to identify the syenite-volcanic contact in places. Propylitic alteration consisting of epidote-calcite-chlorite-pyrite, varies with the intensity of fracturing. The volcanic rocks along the west side of Galore Creek are generally weakly propylitized and less fractured. In the lower part of Ursus Creek, the volcanic rocks are strongly fractured by an northeast-southwest striking "sheet" fracturing and exhibit strong propylitic alteration. Epidote is the main alteration mineral present and along with the sheet fracturing, makes identification of the original rock type difficult. Iron-carbonate alteration is associated with the pinkish-red syenites in the western part of the Grace 2 claim and a northeast trending shear zone in the southeast corner of the claim. This alteration type is recognized by its distinct brownish-orange weathering and generally consists of an ankerite altered host rock with abundant calcite and minor quartz veining. Hematite is usually the main oxide mineral present with this alteration. The degree of carbonate alteration varied from moderate along the margin of the pinkish-red syenite dykes to intense within the shear zone.

6.2 Mineralization

Several significant occurrences of gold and copper were discovered on the Grace 2 claim during the 1991 field program. These occurrences can be divided into two main categories: porphyry style mineralization and that hosted in shear zones. The following is a breakdown of the two mineralizing types and their associated mineralization:

Porphyry Style Mineralization

Porphyry style mineralization consists of disseminated chalcopyrite and/or pyrite within the syenite dykes and/or the volcanic rocks. The host rock is usually highly fractured and exhibits some degree of potassic alteration. Magnetite veinlets, with or without chalcopyrite, may be present within or along the contact of the syenite dykes. Later stage quartz or chlorite veinlets may infill highly fractured areas and if mineralized, contain small blebs of chalcopyrite.

The most significant copper-gold occurrences found on the property to date are associated with syenite dykes. The best mineralized occurrences are found with dykes of the grey, porphyritic variety, whereas samples taken from dykes of the pinkish-red, equigranular variety contained low levels of copper and gold. Mineralization related to the grey syenite dykes were found in two areas: the upper part of Ursus Creek and along Galore Creek near the Grace 2 legal corner post (Figure 5). Along Galore Creek, the intense potassic alteration and subsequent shearing makes identification of the original rock types difficult. Grab and float samples taken from the upper part of Ursus Creek returned gold and copper values up to 13.58 g/tonne (0.396 oz/ton) gold and 1.41% copper (sample 508753). Grab samples taken from the Galore Creek occurrence contained gold and copper values of 9.39 g/tonne (0.274 oz/ton) gold (sample 508958) and 3770 ppm copper (sample 508959). Table 6.2.1 lists the significant results for these two areas.

TABLE 6.2.1
SYENITE DYKES SIGNIFICANT RESULTS

SAMPLE	WIDTH metres	GOLD (ppb)	SILVER (ppm)	COPPER (ppm)	LEAD (ppm)	ZINC (ppm)
508753*	0.10	13.58g/t	10.2	1.41%	180	210
508754*	float	1.23g/t	0.6	5220	<2	48
508755*	float	395	10.6	6510	184	180
508903*	float	8.98g/t	6.6	1.06%	2	64
508904*	0.05	205	<0.2	4250	32	16
508905*	0.35	1.17g/t	22.2	1.35%	202	256
508958#	0.85	9.39g/t	2.4	157	12	20
508959#	0.90	9.33g/t	2.2	3770	<2	12

* sample taken from upper part of Ursus Creek.
\# sample taken along Galore Creek.
g/t denotes grams per tonne

A different phase of porphyry mineralization was recognized in the lower part of Ursus Creek. This phase differs from the one described above by the lack of exposed intrusives and extensive copper mineralization, the presence of strong epidote alteration and where copper mineralization is present, the lack of appreciable gold enrichment. The strong epidote alteration and extensive sheet fracturing in the area, also hinders identification of the rock type. Pyrite, the main sulphide present, is disseminated throughout the exposures and comprises up to 5% of the rock. Copper mineralization is present in areas of patchy potassic alteration and where the sheet fracturing has been crosscut by later fractures of various orientations. A 3.5 metre chip sample taken across this copper mineralization returned 2139 ppm copper, but low gold (90 ppb)(sample 508953). Chip samples from the areas

of abundant pyrite mineralization revealed low copper and gold values (samples 508951 and 508952).

Shear Zone Mineralization

The shear zone mineralization is distinguished by ankerite alteration and sulphide mineralization related to calcite and quartz veining. An iron-carbonate altered shear zone exposed for approximately seventy metres along Galore Creek, was the only occurrence of this type of mineralization found on the property (Figure 5). The shear zone, which strikes 060° and dips 38° to the southwest, has an average width of at least 50 centimetres, but may vary from 25 to 100 centimetres where exposed. Mineralization within the shear consists of either pyrite-rich calcite veining or quartz stockwork containing blebs of chalcopyrite. A select grab (sample 508955) taken from the ten centimetre wide, pyrite-rich calcite vein contained 26.06 g/tonne (0.760 oz/ton) gold and 5.8 ppm silver with low copper (158 ppm). The vein is located in the footwall of the shear zone, but is only exposed for three metres after which it appears to pinch out. Erratic areas of copper mineralized quartz stockwork are located throughout the shear zone. A select grab of chalcopyrite-rich float (sample 508956) from talus beneath one of these areas, assayed 5.15% copper with significant gold (255 ppb) and silver (11.8 ppm).

7.0 GEOCHEMISTRY

Two silt samples were taken from streams which drain the Grace and Rim property during the course of the regional geochemical sampling conducted by the federal government surveys (GSC, 1988) (Figure 5). Both samples can be considered highly anomalous in gold, exceeding the governments 95th percentile value (65 ppb) for the region. The gold and copper values in silt sample 873350, taken at the 765 metre elevation in Ursus Creek, returned 511 ppb gold and 791 ppm copper, which exceeds the governments 99th percentile for both elements. This sample also contained 1.0 ppm silver (=99th percentile), 42 ppm lead (>95th percentile), 18 ppm molybdenum (>99th percentile), 23 ppm cobalt (>90th percentile), 6.5 ppm antimony (>99th percentile) and 8 ppm tungsten (>95th percentile). Although no work was conducted up this tributary of Ursus Creek in 1991, copper-gold mineralization similar found in the tributary to the north is the most probable source for the copper, gold and silver anomalies. Silt sample 873551, taken in an unnamed drainage located 1300 metres to the north of Ursus Creek, returned 127 ppb gold and 138 ppm copper. No work has been recorded for this area and the source of the anomaly is unknown.

During the course of the 1991 exploration program, 35 soil samples were taken at 25 metre intervals along two contour soil lines located in the south part of the Grace 2 claim (Figures 5 and

6). Three silt samples were taken from drainages located along this line. Geochemical data from the silt samples are directly comparable to the government results listed in Figure 5, and anomalous results can be defined in the same way. There were not enough soil samples taken to conduct a meaningful statistical analysis but it is felt that the following levels are anomalous: gold (60 ppb), silver (1.0 ppm), copper (125 ppm), lead (31 ppm), zinc (150 ppm) and arsenic (20 ppm).

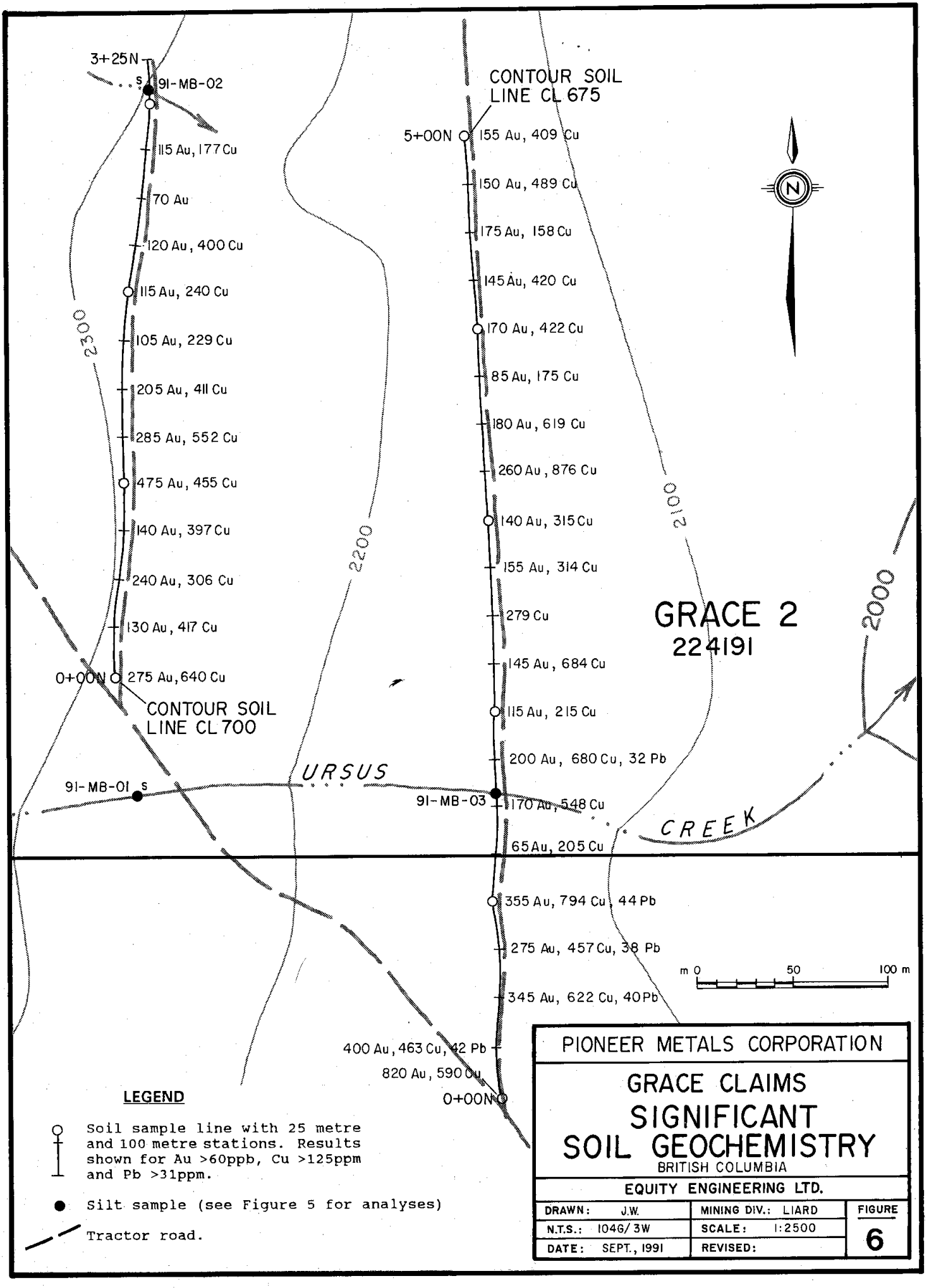
All silt samples exceeded the governments 90th percentile for gold and 99th percentile for copper and two samples exceeded or were equivalent to the governments 95th percentile for silver and lead. The silt sample results for 1991 are summarized in Table 7.0.1. The copper-gold mineralization associated with the syenite dykes in the upper part of Ursus Creek is the probable source for two samples containing extremely anomalous gold and copper (91-MB-01 and 91-MB-03). A similar source may be found for silt sample 91-MB-02 whose stream drains an area just north of where the dykes are exposed.

TABLE 7.0.1
SILT SAMPLING RESULTS

Sample	Au(ppb)	Ag(ppm)	Cu(ppm)	Pb(ppm)	Zn(ppm)	As(ppm)
91-MB-01	955***	0.8**	1045***	58***	70	<5
91-MB-02	50*	<0.2	336***	4	38	<5
91-MB-03	340***	0.4*	867***	52**	62	30**

* Sample exceeded the 90th percentile (anomalous)
** Sample exceeded the 95th percentile (highly anomalous)
*** Sample exceeded the 99th percentile (extremely anomalous)

Both contour soil lines can be considered anomalous in gold and copper with individual values up 820 ppb gold and 876 ppm copper (Figure 6). With the exception of five soil samples between 1+25N and 1+75N on contour soil line CL675 which contained anomalous levels of lead, all soils contained low levels of lead, zinc and arsenic and no detectable levels of silver. Although some of the gold and copper results could conceivably be the result of downslope dispersion from the syenite porphyries located in the upper part of Ursus Creek, the consistently high values are probably derived from a closer source. Logan et al (1989) indicates the northern extensions of two syenite porphyries near the south end of contour soil line CL700. These two porphyries are part of the intrusive complex which hosts Stikine Copper's Central Zone located to the south of the Grace 2 claim. The copper-gold values along the contour soil lines may reflect gold-copper porphyry mineralization in a northern extension of one or both of the syenite porphyries.


3+25N
91-MB-02
115 Au, 177 Cu
70 Au
120 Au, 400 Cu
115 Au, 240 Cu
105 Au, 229 Cu
205 Au, 411 Cu
285 Au, 552 Cu
475 Au, 455 Cu
140 Au, 397 Cu
240 Au, 306 Cu
130 Au, 417 Cu
0+00N
275 Au, 640 Cu
CONTOUR SOIL LINE CL 700
CONTOUR SOIL LINE CL 675
5+00N
155 Au, 409 Cu
150 Au, 489 Cu
175 Au, 158 Cu
145 Au, 420 Cu
170 Au, 422 Cu
85 Au, 175 Cu
180 Au, 619 Cu
260 Au, 876 Cu
140 Au, 315 Cu
155 Au, 314 Cu
279 Cu
145 Au, 684 Cu
115 Au, 215 Cu
200 Au, 680 Cu, 32 Pb
91-MB-03
170 Au, 548 Cu
65 Au, 205 Cu
355 Au, 794 Cu, 44 Pb
275 Au, 457 Cu, 38 Pb
345 Au, 622 Cu, 40 Pb
400 Au, 463 Cu, 42 Pb
820 Au, 590 Cu
0+00N
91-MB-01
URSUS
CREEK
2300
2200
2100
2000
GRACE 2
224191
N
m 0
50
100 m
LEGEND
Soil sample line with 25 metre and 100 metre stations. Results shown for Au >60ppb, Cu >125ppm and Pb >31ppm.
Silt sample (see Figure 5 for analyses)
Tractor road.
PIONEER METALS CORPORATION
GRACE CLAIMS
SIGNIFICANT SOIL GEOCHEMISTRY
BRITISH COLUMBIA
EQUITY ENGINEERING LTD.
DRAWN: J.W.
MINING DIV.: LIARD
FIGURE 6
N.T.S.: 104G/3W
SCALE: 1:2500
DATE: SEPT., 1991
REVISED:

8.0 DISCUSSION

Alkalic copper-gold porphyry deposits, such as Mt. Milligan, Mt. Polley, Galore Creek and Copper Canyon have been the focus of intensive exploration in recent years in British Columbia. The Galore Creek deposit located to the south of the Grace claims, hosts several significant copper-gold deposits which are currently been reevaluated. Similar geology and mineralization as the Galore Creek deposit has been found on the Grace property which shows an excellent potential to host a copper-gold deposit of alkalic affinity.

The most favourable alteration and mineralization found to date is exposed in the southern part of the Grace 2 claim. Porphyry style mineralization consisting of disseminated chalcopyrite and/or pyrite, is associated with syenite intrusives which have intruded coeval Stuhini Group volcanics and sedimentary rocks. Significant copper-gold mineralization is related to the grey, porphyritic variety of the syenite dykes. Weak to intense potassic alteration associated with this type of dyke is similar to the style of alteration found with the copper-gold zones at the Galore Creek deposit. Grab and float samples of the syenite dykes or adjoining host rocks from this area assayed up to 13.58 g/tonne gold and 1.41% copper. The copper-gold mineralization found in the upper part of Ursus Creek is reflected in the silt samples taken further downstream. Two other geochemically anomalous silt samples taken to the north of Ursus Creek may indicate a northern extension to a similar style of mineralization, but little work has been done in this area to date.

In the lower reaches of Ursus Creek, a peripheral phase of the porphyry style mineralization was found. This is characterized by abundant pyrite with strong epidote alteration and erratic copper mineralization found with patchy potassic alteration. Copper-gold values were low for this type of mineralization, which is believed to be similar to the pyrite halo that occurs on the east side of Galore Creek's Cental Zone.

Gold and copper mineralization related to an ankeritic shear zone, is located in the southeast corner of the Grace 2 claim. Significant gold mineralization is restricted to a discontinuous, ten centimetre wide, pyrite-rich calcite vein in the footwall of the 0.5 metre shear zone, whereas copper mineralization occurs in erratic quartz stockworks within the zone.

Soil sampling was conducted along two north-south trending contour soil lines parallel to existing bulldozer roads. Both contour soil lines were anomalous in gold and copper. Although both soil lines are located downslope of the copper-gold mineralization in Ursus Creek, it is expected that further mineralization may be closer at hand.

The Grace property is at an early stage of exploration. The significance of the induced polarization anomalies outlined in the earlier years to the anomalous copper-gold results of this program should be further investigated. To date, similar geology and copper-gold mineralization to that of the Galore Creek deposit to the south, has been found on the Grace 2 claim. Stream and soil geochemistry indicate that similar mineralization may extend to the north, but exploration in this area will be hindered by lack of outcrop exposure and glacial till cover in the Galore Creek valley. However, the favourable results obtained to date warrant further work on the property.

Respectfully submitted,
EQUITY ENGINEERING LTD.

Bruno J. Kasper, Geologist

Vancouver, British Columbia
October, 1991

APPENDIX A

BIBLIOGRAPHY

BIBLIOGRAPHY

Alldrick, D.J., Gabites, J.E. and Godwin, C.I. (1987): Lead Isotope Data from the Stewart Mining Camp, in Geological Fieldwork 1986; British Columbia Ministry of Energy, Mines, and Petroleum Resources, Geological Survey Branch, Paper 1987-1, pp. 93-102.

Allen, D.G., A. Panteleyev and A.T. Armstrong (1976): Galore Creek, in CIM Special Volume 15; pp. 402-414.

Blusson (1988): Assessment Report, Grace 1 and 2 Claims; British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #18,054.

Blusson (1990): Geophysical Survey Report on the Grace 1-2 and Rim 1 Claims; British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #20,486.

Brown, D.A., and Gunning, M.H. (1989a): Geology of the Scud River area, North Western British Columbia, (104G/5,6), in Geological Fieldwork 1988; British Columbia Ministry of Energy, Mines, and Petroleum Resources, Geological Survey Branch, Paper 1989-1, pp. 251-267.

Brown, D.A., and Gunning, M.H. (1989b): Geology of the Scud River area, North Western B.C. (map); British Columbia Ministry of Energy, Mines, and Petroleum Resources, Geological Survey Branch, Open File 1989-7.

Consolidated Rhodes Resources Ltd. (1991): News Release dated May 29, 1991.

Dodds, A.R. (1966): Report on an Induced Polarization Survey, CW Claim Group; British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #937.

Falconer, R.D. (1965a): Geophysical Report (Magnetometer Survey) on Mineral Claims BIK 227-269 (inclusive) and BIK 1-3 (FR) (inclusive); British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #692.

Falconer, R.D. (1965b): Geophysical Report (Induced Polarization Survey) on Mineral Claims BIK 227-269 (inclusive) and BIK 1-3 (FR) (inclusive); British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #688.

Geological Survey of Canada (1957): Stikine River area, Cassiar District, British Columbia; Geological Survey of Canada Map 9-1957.

Geological Survey of Canada (1988): National Geochemical Reconnaissance, Sumdum - Telegraph Creek, British Columbia (NTS 104F - 104G); GSC Open File 1646.

Grant, G.W. (1964): Final Geological Report - CW Group; British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Report #621.

Kerr, F.A. (1948): Taku River map-area, British Columbia; Geological Survey of Canada, Memoir 248, 84 pp.

Logan, J.M., and Koyanagi, V.M. (1989): Geology and Mineral Deposits of the Galore Creek area, Northwestern B.C., 104G/3,4, in Geological Fieldwork 1988; British Columbia Ministry of Energy, Mines, and Petroleum Resources, Geological Survey Branch, Paper 1989-1, pp. 269-284.

Logan, J.M., Koyanagi, V.M., and Rhys, D. (1989): Geology and Mineral Occurrences of the Galore Creek Area; British Columbia Ministry of Energy, Mines, and Petroleum Resources; Geological Survey Branch Open File 1989-8.

Monger, J.W.H. (1977): Upper Palaeozoic rocks of the western Canadian Cordillera and their bearing on Cordilleran evolution; Can. Jour. Earth Sci., V.14, pp. 1832-1859.

Nelson, J. and Payne, J.G. (1984): Paleozoic Volcanic Assemblages and Volcanogenic Massive Sulphide Deposits near Tulsequah, British Columbia; Canadian Journal of Earth Sciences, V. 21, pp 379-381.

Souther, J.G. (1972): Telegraph Creek Map Area, British Columbia; Geological Survey of Canada Paper 71-44.

Souther, J.G., and Symons, D.T.A. (1974): Stratigraphy and Palaeomagnetism of the Mount Edziza volcanic complex, northwestern British Columbia; Geological Survey of Canada Paper 73-32, 48 pp.

Souther, J.G., Brew, D.A., and Okulitch, A.V. (1979): Iskut River 1:1,000,000; Geological Atlas Geological Survey of Canada, Map 1418A.

Thios Resources Inc. (1990): News release dated December 4, 1990.

APPENDIX B

STATEMENT OF EXPENDITURES

GRACE 1 AND 2, AND RIM 1 CLAIMS
(July 28 - August 3, 1991)

PROFESSIONAL FEES AND WAGES:		
Henry Awmack, P. Eng.		
0.5 days @ $375/day	$ 187.50	
Mike Blusson, Sampler		
1 day @ $200/day	200.00	
Rob Falls, Project Geologist		
1.25 days @ $375/day	468.75	
Bruno Kasper, Prospecting Geologist		
1.875 days @ $250/day	468.75	
Donald McInnes, Project Manager		
0.25 days @ $300/day	75.00	
Mark O'Dea, Prospecting Geologist		
1 day @ $250/day	250.00	
		$ 1,650.00
MOBILIZATION AND SUPPORT COSTS:		
Pro rata according to mandays on each of several properties operated out of the Galore Creek/Porcupine River Camps		513.15
CHEMICAL ANALYSES:		
Rock Geochemical Analyses		
19 @ $20.20 each	$ 383.80	
Soil Geochemical Analyses		
35 @ $15.95 each	558.19	
Silt Geochemical Analyses		
3 @ $13.31 each	39.93	
Assays	28.16	
		1,010.08
EQUIPMENT RENTAL:		
Fly Camp		
4 mandays @ $20/day	$ 80.00	
Handheld Radios		
4 mandays @ $5/day	20.00	
4x4 Truck Standby		
0.5 days @ $10/day	5.00	
		105.00

EXPENSES:			
Aircraft Charters	$	147.67	
Camp Food		118.74	
Courier and Telefax		15.00	
Drafting		37.50	
Expediting		53.20	
Helicopter		461.25	
Maps and Publications		7.37	
Printing and Reproductions		56.18	
Telephone Distance Charges		3.34	
			$ 900.25
MANAGEMENT FEE @ 15% on expenses			$ 286.55
			4,464.95
REPORT (estimated)			1,200.00
			$ 5,664.95

APPENDIX C

ROCK DESCRIPTIONS

Mineral Abbreviations:

AK	Ankerite	JA	Jarosite
AS	Arsenopyrite	KF	Potassium Feldspar
AZ	Azurite	LI	Limonite
BI	Biotite	MC	Malachite
BO	Bornite	MG	Magnetite
CA	Calcite	MO	Molybdenite
CC	Chalcocite	MN	Manganese-oxides
CB	Fe-Carbonate	MR	Mariposite
CL	Chlorite	MS	Sericite
CP	Chalcopyrite	MU	Muscovite
CV	Covellite	PO	Pyrrhotite
CY	Clay	PY	Pyrite
DO	Dolomite	QZ	Quartz
EP	Epidote	SI	Silica
GA	Garnet	SM	Smithsonite
GE	Goethite	SP	Sphalerite
GL	Galena	TA	Talc
GY	Gypsum	TT	Tetrahedrite
HE	Hematite		

Alteration Intensities:	tr	trace
	w	weak
	m	moderate
	s	strong

EQUITY ENGINEERING LTD. ROCK SAMPLE DESCRIPTIONS

Property : Grace 1-2 and Rim 1 Claims NTS : 104G/3W Date : 10/08/91

Sample No.						Au	Ag	Cu	Pb	Zn	As
	Location :	6338 750 N	Type : Grab	Alteration :	sSI	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
		351 260 E	Strike Length Exp. : 3.0 m	Sulphides :	<1%PY						
508751	Elevation:	1275 m	Sample Width : 20 cm	Oxides :	LI	85	1.6	35	32	24	10
	Orientation:	140 / 80 NE	True Width : 10 cm	Host :	Andesite.						

Comments : Probable shear zone? Sample is of a vuggy and sheared silicified rock. Sampled rock contains pyrite veinlets up to 5 mm. wide. Some vugs appear to be the result of leaching of pyrite.

Sample No.						Au	Ag	Cu	Pb	Zn	As
	Location :	6338 550 N	Type : Float	Alteration :	sCA	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
		351 230 E	Strike Length Exp. : ---- m	Sulphides :	trCP						
508752	Elevation:	1240 m	Sample Width : ---- m	Oxides :	trMC	<5	0.2	94	68	98	<5
	Orientation:	-- / --	True Width : ---- m	Host :	Unknown						

Comments : 2.5 cm. wide calcite vein float taken in next drainage gulley south from rock sample 508751. The source of the float was not located.

Sample No.						Au	Ag	Cu	Pb	Zn	As
	Location :	6338 170 N	Type : Grab	Alteration :	mSI? or KF	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
		351 350 E	Strike Length Exp. : 10.0 m	Sulphides :	1-2%CP, <1%PY						
508753	Elevation:	1030 m	Sample Width : 10 cm	Oxides :	AZ, MC, LI	>10000	10.2	>10000	180	210	55
	Orientation:	? / ?	True Width : ? m	Host :	Syenite.						

Comments : Malachite stained, silicified(?) syenite containing disseminated chalcopyrite and pyite. Syenite exposure is approximately 5 metres wide and located within a steep, gossanous gulley.

Sample No.						Au	Ag	Cu	Pb	Zn	As
	Location :	6338 230 N	Type : Grab	Alteration :	mCL	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
		351 290 E	Strike Length Exp. : >50.0 m	Sulphides :	1%CP, 1%PY						
508754	Elevation:	1075 m	Sample Width : 10 cm	Oxides :	MC	1610	0.6	5220	<2	48	<5
	Orientation:	? / ?	True Width : ? m	Host :	Andesite.						

Comments : Sample of massive andesite which has been intruded by a 0.5 metre wide syenite dyke. Wallrock contains disseminated chalcopyrite and pyrite while the dyke is mineralized with magnetite veinlets.

Sample No.						Au	Ag	Cu	Pb	Zn	As
	Location :	6338 140 N	Type : Float	Alteration :	QZ veining	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
		351 405 E	Strike Length Exp. : ---- m	Sulphides :	2%CP						
508755	Elevation:	995 m	Sample Width : ---- m	Oxides :	HE, MC	395	10.6	6511	184	180	40
	Orientation:	-- / --	True Width : ---- m	Host :	Syenite.						

Comments : Syenite float containing quartz veinlets mineralized with chalcopyrite blebs. Source not found.

Sample No.						Au	Ag	Cu	Pb	Zn	As
	Location :	6338 530 N	Type : Grab	Alteration :	w to mCB	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
		351 205 E	Strike Length Exp. : 20.0 m	Sulphides :	trPY						
508901	Elevation:	1240 m	Sample Width : 25 cm	Oxides :	HE	60	<0.2	107	6	24	<5
	Orientation:	018 / ?	True Width : 10 cm	Host :	Syenite porphyry dyke.						

Comments : Red, hematite-rich dyke crosscuts volcanic and sedimentary rocks. The 5 metre wide dyke is frothy and vuggy.

Sample No.	Location	Type	Alteration	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)
508902	6338 520 N, 351 290 E; Elevation: 1190 m; Orientation: ? / ?	Grab; Strike Length Exp. : 15.0 m; Sample Width : 20 cm; True Width : ? m	w to mCB; Sulphides : 2%PY; Oxides : HE, JA; Host : Red syenite porphyry.	10	<0.2	192	<2	18	10

Comments : Dyke, which is at least 10 metres wide, contains large disseminated blebs of pyrite.

Sample No.	Location	Type	Alteration	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)
508903	6338 170 N, 351 370 E; Elevation: 1030 m; Orientation: -- / --	Float; Strike Length Exp. : ---- m; Sample Width : ---- m; True Width : ---- m	wCL, SI?; Sulphides : 1%CP, 1-2%CC; Oxides : JA, MC; Host : Volcanic?	8300	6.6	>10000	2	64	<5

Comments : Angular piece of float containing small blebs of chalcopyrite, found within drainage gulley.

Sample No.	Location	Type	Alteration	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)
508904	6338 230 N, 351 290 E; Elevation: 1080 m; Orientation: 045 / 40 W	Grab; Strike Length Exp. : 3.0 m; Sample Width : 5 cm; True Width : 5 cm	sSI?; Sulphides : 50-70%MG, 1%CP, trPY; Oxides : MC; Host : Syenite dyke and volcanic rock.	205	<0.2	4250	32	16	<5

Comments : Magnetite vein at the contact between the syenite dyke and volcanic country rock. Outcrops in the same drainage as float sample 508903 was found.

Sample No.	Location	Type	Alteration	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)
508905	6338 230 N, 351 310 E; Elevation: 1070 m; Orientation: 080 / 60 S	Grab; Strike Length Exp. : >50.0 m; Sample Width : 35 cm; True Width : ? m	m to sKF & SI?, wCB; Sulphides : 5%MG, 2%CP; Oxides : HE, MC; Host : Fine-grained syenite.	1490	22.2	>10000	202	256	<5

Comments : Syenite dyke has a well developed fracture cleavage whose orientation is indicated above. Chalcopyrite is either disseminated throughout or occurs within massive magnetite veinlets which appear to be concordant with the fracturing.

Sample No.	Location	Type	Alteration	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)
508951	6337 830 N, 352 550 E; Elevation: 540 m; Orientation: 068 / 42 SE	Chip; Strike Length Exp. : 3.00 m; Sample Width : 1.85 m; True Width : 1.75 m	sGY or KF; w to mCL & EP; Sulphides : 5%PY, <1%CP; Oxides : GE, HE, MC; Host : Feldspar porphyry or crystal ash tuff.	30	<0.2	744	<2	32	15

Comments : Disseminated sulphides within a highly fractured host rock. Patchy epidote alteration throughout, but in places of strong epidote alteration the rock has weathered to a clay. Massive pyrite veinlet striking 052 and dipping 44 SE, also present.

Sample No.	Location	Type	Alteration	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)
508952	6337 840 N, 352 580 E; Elevation: 540 m; Orientation: 045 / 45 SE	Chip; Strike Length Exp. : 1.50 m; Sample Width : 1.52 m; True Width : 1.40 m	sGY or KF, sCY, mCL & EP; Sulphides : 2%PY; Oxides : GE; Host : Feldspar porphyry or crystal ash tuff.	5	<0.2	182	6	24	<5

Comments : Sulphides disseminated throughout heavily fractured and altered outcrop. True width has been determined in relationship to the sheet fracturing which is the most prevalent fracturing present (orientation given above).

Sample No.	Location :	Type :	Alteration :	Au	Ag	Cu	Pb	Zn	As
	6337 880 N	Chip	mKF+EP & CY; m to sCL, GY	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
	352 570 E	Strike Length Exp. : >20.0 m	Sulphides : 1%CP, 1%PY						
508953	Elevation: 538 m	Sample Width : 4.0 m	Oxides : AZ, GE, HE, MC	90	<0.2	2139	4	40	<5
	Orientation: 117 / 52 S	True Width : 3.5 m	Host : Feldspar porphyry or microdiorite.						

Comments : Mineralization is disseminated throughout except for the copper oxides which are found along fractures (general orientation of these fractures is indicated above; this orientation was also used to determine the true width). Patchy k-feldspar alteration.

Sample No.	Location :	Type :	Alteration :	Au	Ag	Cu	Pb	Zn	As
	6337 860 N	Grab	sCA, CL & QZ; mKF	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
	352 625 E	Strike Length Exp. : 5.0 m	Sulphides : <1%CP						
508954	Elevation: 525 m	Sample Width : 20 cm	Oxides : HE	25	0.2	679	4	12	<5
	Orientation: 164 / 65 W	True Width : 10 cm	Host : Lapilli tuff.						

Comments : CA-CL-QZ veinlet within chlorite and k-feldspar altered host. Numerous other veinlets of millimetre scale also present. Chlorite and k-feldspar selvage around the vein. Chalcopyrite occurs as blebs within the quartz or is disseminated within the CL.

Sample No.	Location :	Type :	Alteration :	Au	Ag	Cu	Pb	Zn	As
	6337 750 N	Grab	sCA & CL, mCB, wSI	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
	352 960 E	Strike Length Exp. : 3.0 m	Sulphides : 10%PY						
508955	Elevation: 450 m	Sample Width : 30 cm	Oxides : GE, HE, JA	>10000	5.8	158	416	24	5
	Orientation: 060 / 38 SE	True Width : 10 cm	Host : Crystal ash tuff interbedded with feldspar porphyry flows.						

Comments : Pyrite-rich calcite vein located in the footwall of a 0.5 metre wide shear zone. Vein pinches and swells along with the shear zone.

Sample No.	Location :	Type :	Alteration :	Au	Ag	Cu	Pb	Zn	As
	6337 750 N	Float	sCB, wCA, wCL, QZ vein	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
	352 915 E	Strike Length Exp. : ---- m	Sulphides : 10%CP						
508956	Elevation: 445 m	Sample Width : ---- m	Oxides : AZ, HE, MC	255	11.8	>10000	<2	138	<5
	Orientation: -- / --	True Width : ---- m	Host : Crystal ash tuff interbedded with feldspar porphyry flows.						

Comments : Select grab of copper-rich quartz stockwork within carbonate altered host rocks. Float found beneath a carbonate altered shear zone which although inaccessible, is the source of the float. Chalcopyrite occurs as large blebs within the quartz veinlets.

Sample No.	Location :	Type :	Alteration :	Au	Ag	Cu	Pb	Zn	As
	6337 740 N	Chip	sCL, sCY, mSI, wEP	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
	352 900 E	Strike Length Exp. : 10.00 m	Sulphides : 5%PY						
508957	Elevation: 458 m	Sample Width : 1.90 m	Oxides : GE, HE, MN	40	<0.2	402	8	12	<5
	Orientation: 095 / 28 S	True Width : 1.60 m	Host : Crystal ash tuff interbedded with feldspar porphyry flows.						

Comments : Chip sample of the gouge zones of two faults and the pyritic wallrock in between. Upper fault, which is 10 cm. thick, appears to taper off 10 metres to the west, while the lower fault is 30 cm. thick and continuous.

Sample No.	Location :	Type :	Alteration :	Au	Ag	Cu	Pb	Zn	As
	6337 735 N	Grab	sCL, sQZ, mCA	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
	352 815 E	Strike Length Exp. : 2.00 m	Sulphides : 5%PY, trCP						
508958	Elevation: 450 m	Sample Width : 0.90 m	Oxides : GE, JA, MC	8320	2.4	157	12	20	10
	Orientation: 044 / 64 NW	True Width : 0.85 m	Host : Feldspar porphyry?						

Comments : Limonitic stained shear zone. Pyrite occurs as stringers and blebs throughout.

Sample No.	Location :	Type :	Alteration :	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)
	6337 735 N 352 815 E	Grab Strike Length Exp. : 5.0 m	sSI?, mCL, wCA, wKF Sulphides : 1%CP, trPY						
508959	Elevation: 450 m Orientation: 044? / 64? NW	Sample Width : 1.0 m True Width : 0.9 m	Oxides : AZ, MC Host : Syentic dyke?	8220	2.2	3769	<2	12	<5

Comments : Dyke outcrops within the hanging wall of the fault from which rock sample 508958 was taken. Disseminated chalcopyrite is found throughout while the copper-oxides are visible only along the fractures.

APPENDIX D

CERTIFICATES OF ANALYSIS

Chemex Labs Ltd.

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

To: EQUITY ENGINEERING LTD.

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

A9119482

Comments: ATTN: HENRY AWMACK

CERTIFICATE A9119482

EQUITY ENGINEERING LTD.

Project: GRACE
P.O. # : PSH91-01

Samples submitted to our lab in Vancouver, BC.
This report was printed on 19-AUG-91.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
205	19	Geochem ring to approx 150 mesh
294	19	Crush and split (0-10 pounds)
298	19	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
100	19	Au ppb: Fuse 10 g sample	FA-AAS	5	10000
396	7	Au oz/T: 1/2 assay ton	FA-GRAVIMETRIC	0.003	20.000
922	19	Ag ppm: 32 element, soil & rock	ICP-AES	0.2	200
921	19	Al %: 32 element, soil & rock	ICP-AES	0.01	15.00
923	19	As ppm: 32 element, soil & rock	ICP-AES	5	10000
924	19	Ba ppm: 32 element, soil & rock	ICP-AES	10	10000
925	19	Be ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
926	19	Bi ppm: 32 element, soil & rock	ICP-AES	2	10000
927	19	Ca %: 32 element, soil & rock	ICP-AES	0.01	15.00
928	19	Cd ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
929	19	Co ppm: 32 element, soil & rock	ICP-AES	1	10000
930	19	Cr ppm: 32 element, soil & rock	ICP-AES	1	10000
931	19	Cu ppm: 32 element, soil & rock	ICP-AES	1	10000
932	19	Fe %: 32 element, soil & rock	ICP-AES	0.01	15.00
933	19	Ga ppm: 32 element, soil & rock	ICP-AES	10	10000
951	19	Hg ppm: 32 element, soil & rock	ICP-AES	1	10000
934	19	K %: 32 element, soil & rock	ICP-AES	0.01	10.00
935	19	La ppm: 32 element, soil & rock	ICP-AES	10	10000
936	19	Mg %: 32 element, soil & rock	ICP-AES	0.01	15.00
937	19	Mn ppm: 32 element, soil & rock	ICP-AES	5	10000
938	19	Mo ppm: 32 element, soil & rock	ICP-AES	1	10000
939	19	Na %: 32 element, soil & rock	ICP-AES	0.01	5.00
940	19	Ni ppm: 32 element, soil & rock	ICP-AES	1	10000
941	19	P ppm: 32 element, soil & rock	ICP-AES	10	10000
942	19	Pb ppm: 32 element, soil & rock	ICP-AES	2	10000
943	19	Sb ppm: 32 element, soil & rock	ICP-AES	5	10000
958	19	Sc ppm: 32 elements, soil & rock	ICP-AES	1	10000
944	19	Sr ppm: 32 element, soil & rock	ICP-AES	1	10000
945	19	Ti %: 32 element, soil & rock	ICP-AES	0.01	5.00
946	19	Tl ppm: 32 element, soil & rock	ICP-AES	10	10000
947	19	U ppm: 32 element, soil & rock	ICP-AES	10	10000
948	19	V ppm: 32 element, soil & rock	ICP-AES	1	10000
949	19	W ppm: 32 element, soil & rock	ICP-AES	10	10000
950	19	Zn ppm: 32 element, soil & rock	ICP-AES	2	10000

Chemex Labs Ltd.

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

To: EQUITY ENGINEERING LTD.

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

Project : GRACE
Comments: ATTN: HENRY AWMACK

Certificate Date: 19-AUG-91
Invoice No. :I9119482
P.O. Number :PSH91-01

CERTIFICATE OF ANALYSIS A9119482

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Au FA oz/T	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 %
508751	205	294	85	-----	1.6	0.31	10	470	< 0.5	< 2	0.03	< 0.5	4	20	35	3.27	< 10	< 1	0.27	20	0.02
508752	205	294	< 5	-----	0.2	0.25	< 5	< 10	< 0.5	< 2	>15.00	1.5	1	82	94	0.44	30	< 1	< 0.01	10	0.25
508753	205	294	>10000	0.396	10.2	1.07	55	100	< 0.5	< 20	0.98	< 0.5	40	283	>10000	6.65	10	3	0.93	30	1.32
508754	205	294	1610	0.036	0.6	1.92	< 5	400	< 0.5	< 2	0.33	< 0.5	40	60	5220	5.04	< 10	< 1	1.84	< 10	1.95
508755	205	294	395	-----	10.6	0.09	40	320	< 0.5	< 2	0.61	0.5	9	241	6510	2.18	< 10	2	0.04	< 10	0.14
508901	205	294	60	-----	< 0.2	0.63	< 5	170	< 0.5	< 2	2.04	< 0.5	4	25	107	2.16	10	< 1	0.45	20	0.09
508902	205	294	10	-----	< 0.2	0.90	10	200	< 0.5	< 2	2.45	< 0.5	11	53	192	3.16	10	3	0.27	30	0.69
508903	205	294	8300	0.262	6.6	3.43	< 5	100	< 0.5	< 20	0.55	< 0.5	35	285	>10000	6.93	< 10	< 1	3.41	10	4.08
508904	205	294	205	-----	< 0.2	0.37	< 5	120	< 0.5	< 2	0.52	< 0.5	58	28	4250	>15.00	10	10	0.27	10	0.44
508905	205	294	1490	0.034	22.2	0.57	< 5	470	< 0.5	< 20	1.44	< 0.5	26	72	>10000	4.49	< 10	4	0.53	10	0.60
508951	205	294	30	-----	< 0.2	1.56	15	70	< 0.5	< 2	1.46	< 0.5	38	105	744	6.39	< 10	< 1	1.07	30	1.43
508952	205	294	5	-----	< 0.2	1.45	< 5	80	< 0.5	< 2	1.41	< 0.5	6	105	182	4.97	< 10	< 1	0.94	30	1.38
508953	205	294	90	-----	< 0.2	1.81	< 5	130	< 0.5	< 2	1.27	< 0.5	24	88	2140	5.70	< 10	< 1	1.27	40	1.91
508954	205	294	25	-----	0.2	0.38	< 5	10	< 0.5	< 2	>15.00	< 0.5	12	48	679	1.48	40	1	0.01	10	1.33
508955	205	294	>10000	0.760	5.8	0.23	5	50	< 0.5	< 2	3.06	< 0.5	22	86	158	7.80	10	1	0.22	10	0.59
508956	205	294	255	-----	11.8	0.23	< 5	150	< 0.5	< 20	1.06	< 0.5	17	157	>10000	5.74	10	< 1	0.17	< 10	0.06
508957	205	294	40	-----	< 0.2	1.33	< 5	30	< 0.5	< 2	0.83	< 0.5	14	152	402	4.77	< 10	< 1	0.50	10	1.26
508958	205	294	8320	0.274	2.4	0.63	10	30	< 0.5	< 2	1.65	< 0.5	29	105	157	8.75	10	< 1	0.26	< 10	0.73
508959	205	294	8220	0.272	2.2	0.58	< 5	160	< 0.5	< 2	1.09	< 0.5	7	80	3770	3.75	10	3	0.22	< 10	0.32

CERTIFICATION: B. Caughlin

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: EQUITY ENGINEERING LTD.

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

Project : GRACE
Comments: ATTN: HENRY AWMACK

Certificate Date: 19-AUG-91
Invoice No. :I9119482
P.O. Number :PSH91-01

CERTIFICATE OF ANALYSIS A9119482

SAMPLE DESCRIPTION	PREP CODE		Mn ppm	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
508751	205	294	40	32	0.03	< 1	350	32	< 5	4	44	< 0.01	< 10	< 10	30	10	24
508752	205	294	685	< 1	< 0.01	< 1	< 10	68	< 5	4	337	0.01	< 10	< 10	20	10	98
508753	205	294	680	3	0.01	108	1000	180	40	23	57	0.05	< 10	< 10	270	< 50	210
508754	205	294	350	< 1	0.03	14	330	< 2	< 5	13	44	0.22	< 10	< 10	260	< 10	48
508755	205	294	205	7	0.02	9	50	184	310	4	192	< 0.01	< 10	< 10	14	< 10	180
508901	205	294	560	1	0.05	< 1	920	6	< 5	3	59	< 0.01	< 10	< 10	75	10	24
508902	205	294	355	3	0.08	< 1	1240	< 2	< 5	6	117	0.02	< 10	< 10	108	10	18
508903	205	294	660	< 1	0.03	105	1400	2	< 5	19	33	0.36	< 10	< 10	374	< 50	64
508904	205	294	270	< 1	0.01	55	40	32	5	6	25	0.12	< 10	< 10	2090	< 50	16
508905	205	294	250	7	0.03	18	600	202	< 5	11	43	0.05	< 10	< 10	244	< 50	256
508951	205	294	280	10	0.08	24	980	< 2	< 5	6	126	0.32	< 10	< 10	157	20	32
508952	205	294	365	8	0.07	15	1070	6	< 5	6	145	0.34	< 10	< 10	149	20	24
508953	205	294	445	11	0.10	24	1120	4	< 5	8	124	0.35	< 10	< 10	188	10	40
508954	205	294	995	23	0.01	14	70	4	< 5	10	1750	< 0.01	< 10	< 10	48	20	12
508955	205	294	380	116	0.01	26	1000	416	35	12	76	< 0.01	< 10	< 10	49	30	24
508956	205	294	100	308	< 0.01	37	400	< 2	< 5	4	29	< 0.01	< 10	< 10	29	250	138
508957	205	294	220	20	0.05	28	870	8	< 5	6	110	0.28	< 10	< 10	173	20	12
508958	205	294	545	2	< 0.01	28	470	12	< 5	7	53	< 0.01	< 10	< 10	77	40	20
508959	205	294	290	6	0.01	19	810	< 2	< 5	9	59	< 0.01	< 10	< 10	82	< 10	12

CERTIFICATION: B. Caplin

Chemex Labs Ltd.

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

To: EQUITY ENGINEERING LTD.

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

A9120224

Comments: ATTN: HENRY AWMACK

CERTIFICATE A9120224

EQUITY ENGINEERING LTD.

Project: GRACE
P.O. # : PSH91-01

Samples submitted to our lab in Vancouver, BC.
This report was printed on 26-AUG-91.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
214	4	Received sample as pulp

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
301	4	Cu %: HClO4-HNO3 digestion	AAS	0.01	100.0

Chemex Labs Ltd.

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

To: EQUITY ENGINEERING LTD.

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

Project : GRACE
Comments: ATTN: HENRY AWMACK

Certificate Date: 26-AUG-91
Invoice No. :I9120224
P.O. Number :PSH91-01

CERTIFICATE OF ANALYSIS A9120224

SAMPLE DESCRIPTION	PREP CODE	Cu %
508753	214 --	1.41
508903	214 --	1.06
508905	214 --	1.35
508956	214 --	5.15

CERTIFICATION: _____

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: EQUITY ENGINEERING LTD.

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

A9119480

Comments: ATTN: HENRY AWMACK

CERTIFICATE A9119480

EQUITY ENGINEERING LTD.

Project: GRACE
P.O. # : PSH91-01

Samples submitted to our lab in Vancouver, BC.
This report was printed on 19-AUG-91.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
201	3	Dry, sieve to -80 mesh
298	3	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
100	3	Au ppb: Fuse 10 g sample	FA-AAS	5	10000
922	3	Ag ppm: 32 element, soil & rock	ICP-AES	0.2	200
921	3	Al %: 32 element, soil & rock	ICP-AES	0.01	15.00
923	3	As ppm: 32 element, soil & rock	ICP-AES	5	10000
924	3	Ba ppm: 32 element, soil & rock	ICP-AES	10	10000
925	3	Be ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
926	3	Bi ppm: 32 element, soil & rock	ICP-AES	2	10000
927	3	Ca %: 32 element, soil & rock	ICP-AES	0.01	15.00
928	3	Cd ppm: 32 element, soil & rock	ICP-AES	0.5	100.0
929	3	Co ppm: 32 element, soil & rock	ICP-AES	1	10000
930	3	Cr ppm: 32 element, soil & rock	ICP-AES	1	10000
931	3	Cu ppm: 32 element, soil & rock	ICP-AES	1	10000
932	3	Fe %: 32 element, soil & rock	ICP-AES	0.01	15.00
933	3	Ga ppm: 32 element, soil & rock	ICP-AES	10	10000
951	3	Hg ppm: 32 element, soil & rock	ICP-AES	1	10000
934	3	K %: 32 element, soil & rock	ICP-AES	0.01	10.00
935	3	La ppm: 32 element, soil & rock	ICP-AES	10	10000
936	3	Mg %: 32 element, soil & rock	ICP-AES	0.01	15.00
937	3	Mn ppm: 32 element, soil & rock	ICP-AES	5	10000
938	3	Mo ppm: 32 element, soil & rock	ICP-AES	1	10000
939	3	Na %: 32 element, soil & rock	ICP-AES	0.01	5.00
940	3	Ni ppm: 32 element, soil & rock	ICP-AES	1	10000
941	3	P ppm: 32 element, soil & rock	ICP-AES	10	10000
942	3	Pb ppm: 32 element, soil & rock	ICP-AES	2	10000
943	3	Sb ppm: 32 element, soil & rock	ICP-AES	5	10000
958	3	Sc ppm: 32 elements, soil & rock	ICP-AES	1	10000
944	3	Sr ppm: 32 element, soil & rock	ICP-AES	1	10000
945	3	Ti %: 32 element, soil & rock	ICP-AES	0.01	5.00
946	3	Tl ppm: 32 element, soil & rock	ICP-AES	10	10000
947	3	U ppm: 32 element, soil & rock	ICP-AES	10	10000
948	3	V ppm: 32 element, soil & rock	ICP-AES	1	10000
949	3	W ppm: 32 element, soil & rock	ICP-AES	10	10000
950	3	Zn ppm: 32 element, soil & rock	ICP-AES	2	10000

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: EQUITY ENGINEERING LTD.

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

Project : GRACE
Comments: ATTN: HENRY AWMACK

Certificate Date: 19-AUG-91
Invoice No. :I9119480
P.O. Number :PSH91-01

CERTIFICATE OF ANALYSIS A9119480

SAMPLE DESCRIPTION	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
91-MB-01	201	298	955	0.8	1.31	< 5	220	< 0.5	< 2	1.88	< 0.5	22	156	1045	6.29	< 10	< 1	0.36	10	1.53	745
91-MB-02	201	298	50	< 0.2	1.65	< 5	60	< 0.5	< 2	0.92	< 0.5	14	177	336	5.33	< 10	1	0.33	< 10	1.47	340
91-MB-03	201	298	340	0.4	1.32	30	190	< 0.5	< 2	1.96	< 0.5	19	134	867	5.29	< 10	< 1	0.37	10	1.48	715

CERTIFICATION: P. Langkow

Chemex Labs Ltd.

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

To: EQUITY ENGINEERING LTD.

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

Project : GRACE
Comments: ATTN: HENRY AWMACK

Page Number :1-B
Total Pages :1
Certificate Date: 19-AUG-91
Invoice No. :I9119480
P.O. Number :PSH91-01

CERTIFICATE OF ANALYSIS A9119480

SAMPLE DESCRIPTION	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
91-MB-01	201 298	16	0.01	44	1490	58	5	9	84	0.14	< 10	< 10	247	30	70
91-MB-02	201 298	4	0.02	48	780	4	< 5	5	68	0.25	< 10	< 10	164	20	38
91-MB-03	201 298	16	0.01	37	1370	52	5	9	89	0.15	< 10	< 10	204	20	62

CERTIFICATION: B. Caybl

Chemex Labs Ltd.

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

To: EQUITY ENGINEERING LTD.

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

A9119481

Comments: ATTN: HENRY AWMACK

CERTIFICATE A9119481

EQUITY ENGINEERING LTD.

Project: GRACE
P.O. # : PSH91-01

Samples submitted to our lab in Vancouver, BC.
This report was printed on 19-AUG-91.

SAMPLE PREPARATION

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION
201	35	Dry, sieve to -80 mesh
238	35	NITRIC-AQUA REGIA DIGESTION

ANALYTICAL PROCEDURES

CHEMEX CODE	NUMBER SAMPLES	DESCRIPTION	METHOD	DETECTION LIMIT	UPPER LIMIT
100	35	Au ppb: Fuse 10 g sample	FA-AAS	5	10000
13	35	As ppm: HNO3-aqua regia digest	AAS-HYDRIDE/EDL	1	10000
1005	35	Ag ppm: 9 element,soil and rock	ICP-AES	0.5	200
1929	35	Co ppm: 9 element, soil & rock	ICP-AES	1	10000
1931	35	Cu ppm: 9 element, soil & rock	ICP-AES	1	10000
1932	35	Fe %: 9 element, soil & rock	ICP-AES	0.01	15.00
1937	35	Mn ppm: 9 element, soil & rock	ICP-AES	5	10000
1938	35	Mo ppm: 9 element, soil & rock	ICP-AES	1	10000
1940	35	Ni ppm: 9 element, soil & rock	ICP-AES	1	10000
1004	35	Pb ppm: 9 element,soil and rock	ICP-AES	5	10000
1950	35	Zn ppm: 9 element, soil & rock	ICP-AES	2	10000

Chemex Labs Ltd.

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

To: EQUITY ENGINEERING LTD.

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

Project : GRACE
Comments: ATTN: HENRY AWMACK

Page Number :1
Total Pages :1
Certificate Date: 19-AUG-91
Invoice No. :I9119481
P.O. Number :PSH91-01

CERTIFICATE OF ANALYSIS A9119481

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	As ppm	Ag ppm	Co ppm	Cu ppm	Fe %	Mn ppm	Mo ppm	Ni ppm	Pb ppm	Zn ppm			
CL-675 0+00N	201	238	820	6	< 0.5	21	590	5.32	765	8	52	28	64			
CL-675 0+25N	201	238	400	14	< 0.5	31	463	6.31	1040	12	70	42	86			
CL-675 0+50N	201	238	345	12	< 0.5	30	622	6.14	1035	11	68	40	86			
CL-675 0+75N	201	238	275	14	< 0.5	29	457	6.14	950	11	62	38	74			
CL-675 1+00N	201	238	355	14	< 0.5	31	794	6.36	995	14	65	44	88			
CL-675 1+25N	201	238	65	2	< 0.5	14	205	5.80	540	6	45	20	72			
CL-675 1+50N	201	238	170	8	< 0.5	26	548	5.89	895	8	62	30	82			
CL-675 1+75N	201	238	200	16	< 0.5	30	680	6.30	1020	9	67	32	80			
CL-675 2+00N	201	238	115	4	< 0.5	14	215	6.65	505	4	61	12	62			
CL-675 2+25N	201	238	145	14	< 0.5	22	684	7.15	780	10	62	30	80			
CL-675 2+50N	201	238	55	4	< 0.5	17	279	7.13	660	5	61	20	78			
CL-675 2+75N	201	238	155	10	< 0.5	15	314	7.40	620	9	47	28	70			
CL-675 3+00N	201	238	140	8	< 0.5	25	315	6.76	965	5	60	28	88			
CL-675 3+25N	201	238	260	12	< 0.5	34	876	6.96	1105	7	61	28	84			
CL-675 3+50N	201	238	180	12	< 0.5	33	619	6.58	1110	6	54	24	84			
CL-675 3+75N	201	238	85	2	< 0.5	9	175	3.98	380	5	19	18	60			
CL-675 4+00N	201	238	170	10	< 0.5	20	422	6.55	770	6	49	26	82			
CL-675 4+25N	201	238	145	10	< 0.5	23	420	6.59	920	7	51	22	72			
CL-675 4+50N	201	238	175	4	< 0.5	18	158	5.76	685	3	45	12	58			
CL-675 4+75N	201	238	150	6	< 0.5	27	489	6.48	1005	5	71	14	76			
CL-675 5+00N	201	238	155	12	< 0.5	27	409	6.19	870	5	49	16	70			
CL-700 0+00N	201	238	275	10	< 0.5	31	640	6.64	895	6	56	20	68			
CL-700 0+25N	201	238	130	14	< 0.5	24	417	6.75	930	8	57	28	82			
CL-700 0+50N	201	238	240	10	< 0.5	24	306	5.79	730	6	49	18	74			
CL-700 0+75N	201	238	140	12	< 0.5	27	397	6.47	915	7	57	26	82			
CL-700 1+00N	201	238	475	8	< 0.5	29	455	6.35	1175	5	61	20	80			
CL-700 1+25N	201	238	285	10	< 0.5	34	552	6.46	1055	5	58	20	74			
CL-700 1+50N	201	238	205	8	< 0.5	29	411	6.13	1080	5	51	18	72			
CL-700 1+75N	201	238	105	4	< 0.5	17	229	5.88	590	4	47	16	62			
CL-700 2+00N	201	238	115	6	< 0.5	23	240	6.36	990	3	61	16	66			
CL-700 2+25N	201	238	120	8	< 0.5	30	400	6.74	1200	7	69	18	82			
CL-700 2+50N	201	238	70	4	< 0.5	9	77	6.02	330	3	31	18	38			
CL-700 2+75N	201	238	115	4	< 0.5	16	177	6.10	550	8	49	10	60			
CL-700 3+00N	201	238	20	4	< 0.5	11	104	4.85	225	6	35	16	34			
CL-700 3+25N	201	238	20	2	< 0.5	15	119	4.97	450	4	60	16	54			

CERTIFICATION: B. Caglioni

APPENDIX E

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, BRUNO KASPER, of 101-1990 West 6th Avenue, Vancouver, 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 Alberta with a Bachelor of Science degree in Geology.

3. THAT my primary employment since June, 1988 has been in the field of mineral exploration.

4. THAT this report is based on fieldwork carried out under my direction.

5. THAT I have no interest, directly or indirectly, in the property.

DATED at Vancouver, British Columbia, this 15th day of October, 1991.

Bruno Kasper, Geologist

Respectfully submitted,
EQUITY ENGINEERING LTD.