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ASSESSMENT REPORT

describing

PROSPECTING AND GEOCHEMICAL SURVEYS

on the

OLD IRONSIDES 3 CLAIM

Tenure No. 369543

Latitude 50° 13'N; Longitude 124° 08'W

NTS 92K/1

in the

VANCOUVER MINING DIVISION

BRITISH COLUMBIA

ARND BURGERT
OCTOBER 30, 1999

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INTRODUCTION

The Old Ironsides 3 mineral claim was staked during June, 1999 to protect a previously unstaked copper sulphide showing identified while evaluating the area for volcanogenic massive sulphide (VMS) mineralization potential during the summer of 1998. One claim was staked over rocks of the lower Cretaceous Gambier group.

Gambier group rocks host the Britannia deposit on Howe Sound as well as the Northair deposit near Whistler. In the Powell River region, uneconomic base metals occurrences lying within the Gambier group include the Mt. Diadem workings overlooking Jervis Inlet and the Hummingbird past producer on Goat Island in Powell Lake.

All work was conducted personally by the author, whose Statement of Qualifications appears in Appendix I.

PROPERTY, LOCATION AND ACCESS

The Old Ironsides 3 claim is located in southwest British Columbia at 50° 13'N latitude and 124° 08'W longitude on NTS mapsheet 92K/1 (Figure 1). It consists of a single two-post claim (Figure 2) registered with the Mining Recorder's Office in Vancouver. The Old Ironsides 3 claim was staked during June 1999 to protect a chalcopyrite showing discovered by prospecting during a 1998 exploration program. The Old Ironsides 3 claim is contiguous with the Old Ironsides and Old Ironsides 2 claims, but none of the claims are grouped. Claim registration data is summarized below.

Claim Name	Units	Tenure Number	Expiry Date*
Old Ironsides 3	1	369543	June 16, 2002

*If assessment credit for work described in this report is granted.

During 1999, exploration was conducted from a helicopter-supported fly camp located on the Old Ironsides 2 claim to the south. The work consisted of prospecting and soil sampling.

FIGURE 1

Old Ironsides 3 Claim

PROPERTY LOCATION

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DATE: OCT 12, 1999	FILE: GENERAL\BCMAP.DWG

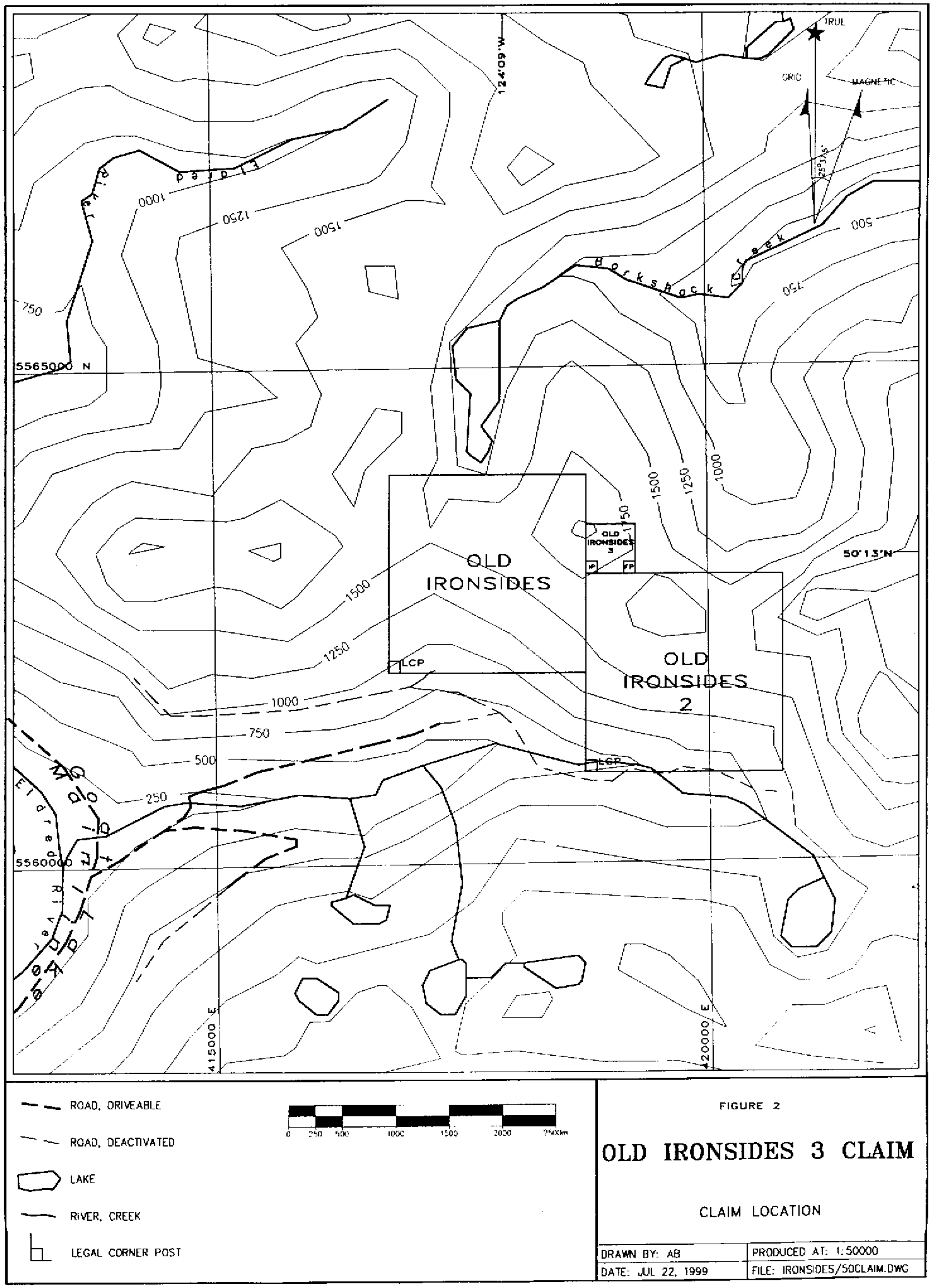

FIGURE 2

OLD IRONSIDES 3 CLAIM

CLAIM LOCATION

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DATE: JUL 22, 1999	FILE: IRONSIDES/50CLAIM.DWG

GEOMORPHOLOGY

The Old Ironsides 3 property is situated over a ridgetop in mountainous terrain of the Coast Ranges. Topography is steep, typically 20° to 30°. Elevations range from 1525m on the north-facing slope near the property's northern boundary to 1905m at a peak at the western claim boundary.

There are no significant drainages on the claim, but the northern slope is part of the Barkshack Creek watershed, which in turn flows into the Skwakwa River and eventually Jervis Inlet. The southern slope drains into a tributary of the Eldred River which flows into Goat Lake and eventually Powell Lake.

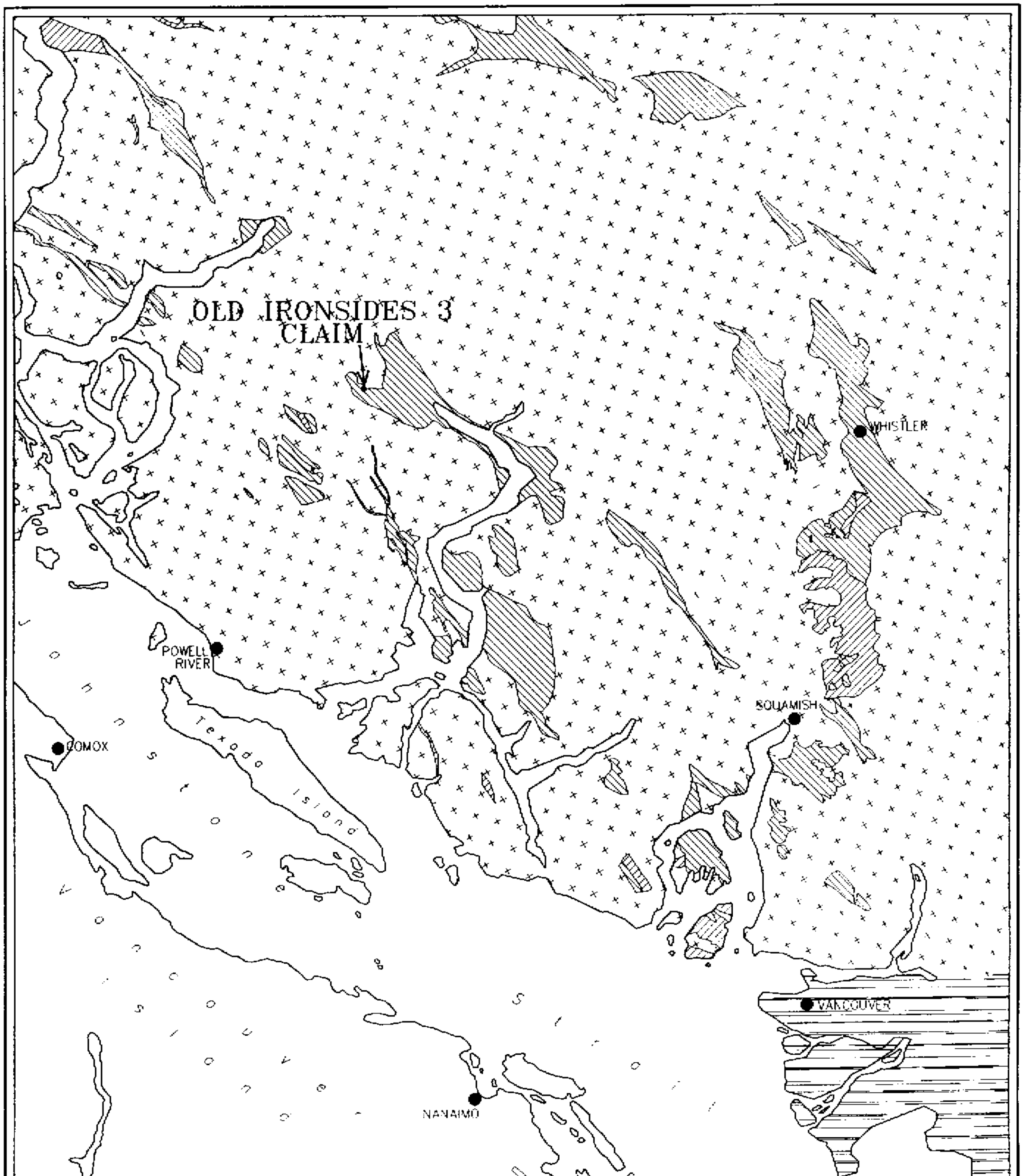
Vegetation on the north-facing slope consists of dense stands of scrubby fir, balsam and buckbrush, while the southern slope is dominated by dwarf balsam and yellow cedar. Vegetation along the ridgetop is limited to grasses, moss and scattered clumps of dwarf conifers.

REGIONAL GEOLOGY

The Old Ironsides 3 claim covers steeply dipping blocks or pendants of metasedimentary and metavolcanic rocks which lie engulfed in the main mass of the Coast Plutonic Complex (Figure 3). Pendants of Gambier Group, named for their type locality on Gambier Island in Howe Sound extend discontinuously from North Vancouver in the southeast to north of Bella Bella in the northwest.

These pendants are thought to represent fault slices along which plutonic rock was thrust upwards (Roddick, 1976). The bounding shear zones in places still exist, and in many places are flanked by diorite. The dioritic rocks may represent remnants of a primitive granitoid basement upon which sedimentary and volcanic rocks were deposited.

The metamorphic rocks have undergone deep burial and subsequent deformation, probably in response to compressive forces transmitted through the North America Plate against oceanic crust. With the eventual onset of subduction, plutonic masses, formed during the compressive stage, began their movement upwards bounded by synplutonic faults.



- ● Major City or Town
- Quaternary
- Coast Plutonic Complex: diorite, quartz diorite, granodiorite, quartz monzonite, gabbro
- Gambier: greenstone, volcanic breccia, argillite, minor conglomerate, limestone and schist
- Other layered rocks: Upper Karmutsen; Bowen Island; Garibaldi; other stratified rocks, Triassic to Tertiary

Scale: 0 5 10 20 30 40 50km

FIGURE 3

OLD IRONSIDES 3 CLAIM

REGIONAL GEOLOGY

Geology by Roddick et al, 1976; Roddick et al, 1979; Woodsworth, 1977

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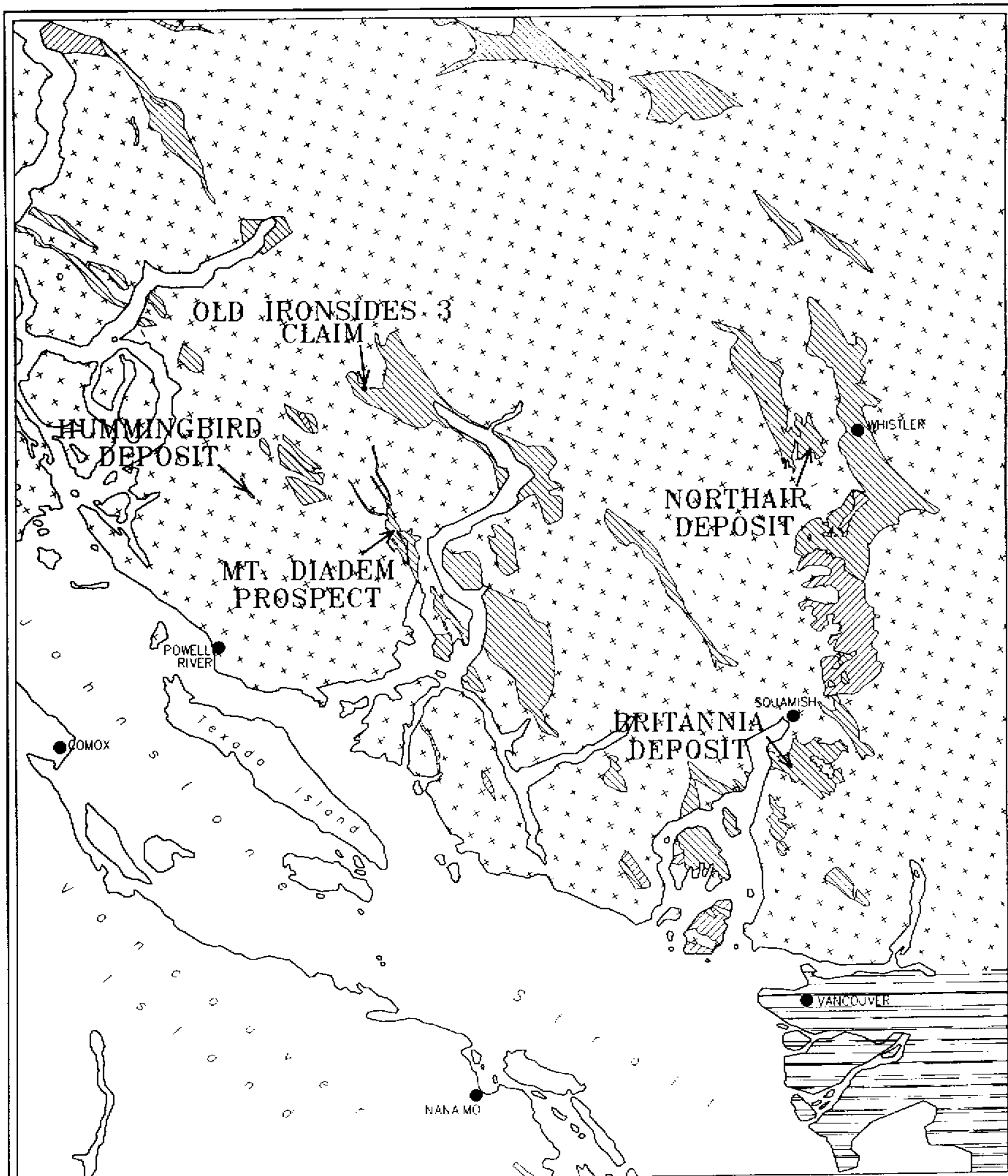
DATE: SEPT 9, 1999	FILE: GENERAL\REGGEOL.DWG

REGIONAL MINERALIZATION

A number of significant base metals deposits occur within pendants of Gambier group (Figure 4). Some of those that are known or suspected to be volcanocenic in origin are described in this section. The descriptions are taken from the British Columbia Ministry of Energy and Mines Minfile database, where references can be found.

The most valuable deposit discovered to date in rocks of the Gambier group is the **Britannia Deposit** at Britannia Beach on Howe Sound. The Britannia district is underlain by a roof pendant of mid- Mesozoic volcanic and sedimentary rocks, within the Cenozoic-Mesozoic Coast Plutonic Complex. A broad, steeply south dipping zone of complex shear deformation and metamorphism, the Britannia shear zone, crosses the pendant in a northwest direction; all orebodies are in the shear zone. A narrow zone of foliated rocks, the Indian River shear zone, is subparallel to the Britannia shear zone and transects the northeast part of the Britannia pendant. The deformed rocks are cut by dacite dykes and several major sets of faults. The Britannia roof pendant is one of many northwest trending bodies within, and in part metamorphosed by, the Coast Plutonic Complex. The pendant is comprised of fresh to weakly metamorphosed rocks with sharp contacts against plutonic rocks, and belongs to the Lower Cretaceous Gambier Group. The Coast plutonic rocks consist of older, commonly foliated bodies ranging



● Major City or Town

Quaternary

Coast Plutonic Complex
diorite, quartz diorite, granodiorite, quartz monzonite, gabbro

Gambier
greenstone, volcanic breccia, argillite, minor conglomerate, limestone and schist

Other layered rocks
Upper Karmutsen; Bowen Island; Garibaldi; other stratified rocks, Triassic to Tertiary

0 5 10 20 30 40 50km

FIGURE 4

OLD IRONSIDES 3 CLAIM

REGIONAL MINERALIZATION

DRAWN BY: AB	PRODUCED AT: 1:1000000
DATE: SEPT 9, 1999	FILE: GENERAL\REGGEOL.DWG

from diorite to granodiorite and younger quartz diorite to quartz monzonite intrusions (Squamish pluton). The plutonic rocks have produced contact metamorphic aureoles up to a hundred metres wide in the Britannia pendant.

The Britannia mine area within the Britannia shear zone is dominated by strongly foliated pyroclastic rocks of dacitic to andesitic volcanism intercalated near the top and overlain by dark marine shales and siltstones. Extensive units of fine-grained andesitic rocks were formed in the mine area during hiatuses in dacitic volcanism; one hiatus occurred during the period of formation of massive sulphides and related deposits after extrusion of a dacite tuff breccia. The lower pyroclastic sequence and the upper shale-siltstone sequence are cut by many dacitic and andesitic dykes. The lower sequence is composed of pyroclastic dacite tuff breccia (locally called the Bluff tuff breccia) that commonly grades to dacitic crystal and lithic tuffs. This unit contains prominent dark, wispy fragments and grades at the top into distinctive beds which consist of intercalated black argillite and plagioclase crystal tuffs. These may be regularly interbedded, convoluted or disaggregated by soft rock deformation. Within the pyroclastic sequence there are also minor intercalations of black or green argillite or volcanic sandstone; fragments of argillite also form a normal component of the pyroclastic flow rocks. Overlying the dacite tuff breccias are a sequence of andesitic tuffaceous sediments, andesitic tuffs and cherty andesitic sedimentary rocks. The overlying black argillite and siltstone are relatively featureless, poorly bedded, but commonly displays cleavage. Intercalations of greywacke may show graded bedding, shale sharpstones and minor slump structures. Although gross stratigraphic units can be defined over much of the area, numerous lateral lithologic variations, the scarcity of marker units in the mine area, and complex deformation hampers detailed stratigraphic and structural interpretation.

Intruding this package are two major dyke sequences and a group of small mafic dykes. The early dyke intrusions are composed of dark grey-green andesites that commonly have a slightly mottled texture that reflects a fragmental nature; they may also contain abundant quartz and chlorite amygdules. They are clearly almost contemporaneous with the pyroclastic flow rocks and may be highly deformed and mineralized. The second group are massive grey-green porphyritic dacites, which show no deformation or slight deformation on their margins. Their emplacement postdates major mineralization but they have a close spatial and structural relationship to orebodies. Late dykes are common but volumetrically insignificant and include lamprophyre, basalt and andesite.

Sulphide and genetically related deposits of anhydrite, quartz, silicified rock, cherty andesitic sedimentary rocks, bedded chert, and minor barite formed from volcanogenic hydrothermal solutions after formation of the dacite tuff breccia and during deposition of the overlying andesitic sedimentary and tuffaceous rocks. Sulphides occur as massive and stringer deposits and as disseminations and bedding plane concentrations. Massive deposits are mainly along and slightly above the upper contact of the dacite tuff breccia and commonly in or near cherty andesitic rocks. Stringer deposits are mainly in silicified dacite tuff breccia below the massive sulphide deposits. The ratio of stringer (80 per cent of ore) to massive deposits is much greater at Britannia than in most volcanogenic sulphide deposits. Original deposits and alteration halos are modified by shear deformation and segmented by faults. The massive sulphide-type orebodies mined were: Jane, Fairview Zinc (1.5 per cent of total ore mined); No. 8 (top), Beta, 040, Bluff (4.5 per cent of total ore mined); and No. 8 (bottom), No. 10, Empress, Victoria, West Victoria (15 per cent of total ore mined). Stringer-type orebodies mined were the Bluff, East Bluff, Jane, No. 4 (Bluff), No. 5, No. 10 and Fairview Veins (79 per cent of total ore mined). Other zones within and near the mine area include the Daisy, Homestake, Robinson, Furry Creek, Fairwest and 074.

The sulphide orebodies of Britannia are highly heterogeneous mixtures of sulphides, remnant altered host rocks, and discrete veins. The main mineralogy of orebodies is simple and fairly constant. Pyrite is by far the most abundant mineral, with less chalcopyrite and sphalerite and minor erratically distributed galena, tennanite, tetrahedrite and pyrrhotite. The main nonmetallic minerals include quartz and muscovite (chlorite), anhydrite and siderite. The main massive orebodies, the Bluff, East Bluff, No. 5, No. 8 and 040 all show a marked zonal structure in which they have one or more high-grade chalcopyrite cores enveloped successively by a lower-grade zone and overlapping pyrite and siliceous zones. Zinc-rich ore tends to occur in the upper central parts of massive bodies and as almost sheet-like masses, like the Fairview Zinc vein. In section, the main orebodies have a crude lens-like shape oriented within the schistosity and are commonly connected to a steeply plunging root which may or may not be of ore grade. The other orebodies such as the Fairview Veins are stringer lodes and veins composed of thin sheet-like masses of chalcopyrite and pyrite with some quartz that appear generally parallel to the schistosity but actually cut across schistosity in plan at a small angle. Trace realgar, orpiment, scheelite, fluorite and pyrolusite occur in post-dacite, northeast trending gash quartz-carbonate veins in the No. 10 orebody.

The ore contains thin layers of sphalerite, pyrite and barite parallel to the bedding planes (So). Galena forms irregular intergrowths in sphalerite and is abundant in a few thin layers in zinc and zinc-copper ore. Gold is abundant in scattered narrow veins in the Homestake showing, in high-grade quartz veinlets in the No. 8 orebody and throughout the No. 5 and East Bluff orebodies. Massive ore in the No. 10 mine contains pyrrhotite and argentite inclusions within the chalcopyrite-rich massive orebody. Many of the orebodies contain several types of sulphide concentrations; the No. 8 massive orebodies grade from zinc-copper to copper. The No. 8 and No. 8A ore zones contain more zinc than the No. 8B. In the Bluff deposit, sphalerite is abundant only above the 1800 level; locally in this region siliceous copper-zinc stringer ore grades into massive zinc-copper ore toward the structural footwall (stratigraphic top).

A broad zone of pervasively silicified rock surrounds all stringer orebodies in the dacite tuff breccia except the Fairview veins. Quartz and quartz-pyrite veins occur throughout the silicified halos and increase in abundance and sulphide content toward an orebody. Pyrite is abundant as beds and nodules in andesitic sedimentary rocks above the Fairview Zinc orebody and locally pyritic layers show slumping features characteristic of soft sediment deformation. Anhydrite is abundant in pyritic andesitic sedimentary rocks and less abundant in the dacite tuff breccia in a broad elongate tabular halo around ore centres. Locally anhydrite forms massive deposits in tuffaceous sedimentary rocks, flanking and above orebodies, and is also found as distinct crosscutting veins in tensional zones. Locally the anhydrite has been converted to gypsum, especially near permeable zones where the gypsum occurs as narrow replacement veinlets. Within 60 to 90 metres of surface the conversion of anhydrite to gypsum is complete. James (1929) reports the presence of native sulphur in the mine. While the native sulphur may have gypsum or anhydrite associated with it none is present in the large gypsum masses (Open File 1991-15, page 35). Barite is disseminated and/or well bedded in zinc ore and nearby zinc-rich sedimentary rocks. Cherty andesitic sedimentary rocks and tuffs, locally with abundant pyrite, occur in and near massive sulphide bodies and host most of the No. 8 ore lenses.

Structure at the Britannia mine is complex; the earliest deformation (Do) produced widespread, open, concentric, flexural-slip folds (Fo) with subhorizontal to gently plunging, west-northwest trending axes. A major anticline was formed in the dacitic pyroclastic rocks and a major syncline was formed in argillite to the north. Further flexural-slip deformation was localized along the Britannia anticline, which became overturned to the north. Under continued stress, deformation consisting of several episodes of inhomogeneous strain produced the Britannia and other shear zones. Rocks were crystallized to S-tectonites with phase assemblages the same as those of lower greenschist facies regional metamorphism. East of the Jane basin, the axis of the Britannia shear zone follows the axis of the Britannia anticline; from the Jane basin to the west, the shear zone cuts across the south limb of the Britannia anticline. On the surface, the shear zone narrows to a single fault west of the Jane basin, whereas at depth and to the east it widens.

The first episode of shear deformation (D1) was the most intense. Parallel orientation of recrystallized chlorite and sericite plates and flattened lithic fragments define a foliation (S1). Numerous isoclinal folds (F1) were formed with S1 as an axial plane cleavage. In the second episode of shear deformation (D2), some sericite which had formed parallel to S1 during D1 was recrystallized to define S2 into steeply dipping west plunging mesoscopic and microscopic folds (F2). A critical factor regarding the origin of the Britannia sulphide deposits is whether they are pre- or post- D1 (and D2). Recent observations support the hypothesis that sulphide and related deposits at Britannia were deformed during D1 (see Economic Geology, Payne, et. al. 1980, for extensive discussion). The existence of stratabound ore lenses within a felsic volcanic sequence, including pyroclastic breccias, suggests that the Britannia area was a structural locus for all initial and subsequent geological processes. Volcanism, hydrothermal activity, shear deformation, faulting, and metamorphism were all dynamic forces centred along the axis presently known as the Britannia shear zone.

Rocks were altered by volcanogenic hydrothermal solutions during sulphide deposition and by metasomatic hydrothermal solutions during shear deformation. Near orebodies, alteration during deformation was superimposed on ore-stage alteration such that the two are indistinguishable. Alteration is more pronounced in andesitic than in dacitic rocks. Andesitic rocks were altered to an assemblage of quartz-chlorite-sericite (epidote-albite-potassium feldspar-calcite). Some strongly altered andesitic rocks are distinguished from strongly altered dacitic rocks by the andesite's much higher TiO_2 content. Studies of rocks near several of the orebodies show that much of the variation in chemical composition in all rock types is produced by ore-stage introduction of quartz, sulphides and sulphates.

A major compressional event (ending with D2) was followed by a period of relaxation of stress during which dacitic magma was intruded into dilated zones within the shear zone and surrounding rocks. In the shear zone, dacite formed dykes subparallel to S1 mainly in or near the dacite tuff breccia. Near the axis of the Britannia anticline, dykes coalesce upward and to the west and appear to cap some of the orebodies. Thin continuous andesite dykes are subparallel to S1 and cut the dacite dykes. Outside the shear zones, sills, dykes and irregular bodies of several varieties of dacite cut the Gambier Group rocks. The evidence suggests that most of the dykes at Britannia were intruded in the late stages of D2 deformation.

A third metamorphic foliation (S3) was formed locally, possibly following the dacite intrusion. It is parallel to northeast trending gash fractures in and near the dacites and to a set of northeast trending faults. The faults cut the dacite dykes and late andesite dykes and commonly contain vuggy quartz-carbonate veins. They have siderite-kaolinite alteration halos that are most intensely developed in rocks with abundant chlorite. A fourth metamorphic foliation (S4) is a widespread strain-slip cleavage and may have formed from a release of compression perpendicular to the shear zone.

A major set of post-dacite dyke faults cuts the Britannia shear zone subparallel to its margins and to S1. The faults converge upward and to the west to form one major fault. To the east, successive faults branch off a major footwall zone and cut diagonally across the shear zone subparallel to S1. These faults are characterized by a few centimetres to metres of gouge and/or strongly sheared rock. Many are braided and coalesce. In the major fault blocks, minor faults of a similar nature are abundant. Some show more than one age of movement. All the orebodies are cut by the minor faults and many are bounded by, or are near, one or more major faults.

Because many orebodies have contacts at or near major east striking faults and because most appear to be parts of a typical volcanogenic sulphide deposit, the present orebodies may represent faulted segments of a few original major sulphide deposits. A predeformation reconstruction suggests that the orebodies are segments of two original massive sulphide deposits; this requires a near vertical displacement along one fault zone followed by sub-horizontal offset with a cumulative right-lateral displacement of a couple of thousand of metres (Economic Geology, Payne et. al., 1980).

In summary, the Britannia ore deposits were formed from hydrothermal solutions genetically related to dacitic volcanism. Massive zinc, zinc-copper and copper deposits were formed near the contact of dacite tuff breccia and overlying fine andesitic tuff and sedimentary rocks. Siliceous stringer zones were formed in the dacitic tuff breccia and grade upward into massive deposits. Massive to disseminated bodies of anhydrite, pyrite, and minor barite were formed near the orebodies from exhalite solutions. Cherty andesitic sedimentary rocks are common near the orebodies. A northeast trending compressive stress couple produced the following events: a) Broad concentric folds, under continued stress, became tighter and slightly overturned at Britannia. The early part of deformation overlapped the late stages of dacitic volcanism and hydrothermal activity, and produced a series of subparallel fractures which acted as channelways for hydrothermal solutions. b) With continuing stress, several episodes of inhomogeneous strain produced the schistose rocks which define the Britannia shear zone. Rocks were recrystallized into S-tectonites and sulphide deposits were deformed in part by fracture and in part by plastic flow, and were segmented into a series of en echelon stringers parallel to S1. Sulphides and quartz in the orebodies show typical deformation textures similar to those of the enclosing rock. c) Ore-stage hydrothermal solutions and deformation stage solutions caused chemical alteration. Andesitic rocks were effected more than dacitic rocks and show increases in Al_2O_3, K_2O, SiO_2 and H_2O and decreases in CaO, FeO and MnO. TiO_2 remains relatively constant and its content can be used to distinguish some strongly altered andesitic rocks from similarly altered dacitic rocks. d) Orebodies were deformed during several periods of faulting. Following an early period of right-lateral movement, dacite dyke swarms were intruded into the shear zone generally parallel to S1 and concentrated in the dacitic tuff breccia. Dykes were cut by northeast trending quartz-carbonate gash fractures, which near orebodies contain sulphides, mainly chalcopyrite and pyrrhotite, remobilized from the orebodies. e) A major set of late east faults displaces the rock and orebodies with a cumulative right-lateral horizontal component of motion to a maximum of 2438 metres (Economic Geology, Payne, J.G. et. al., 1980).

Measured and drill indicated reserves in the No. 10 mine at the time of closure were 1,424,147 tonnes grading 1.9 per cent copper (Property File -- Northcote, K.). Past work consisted of extensive underground and surface development. Between 1905 and 1977, the Britannia orebodies yielded approximately 52.7 million tonnes of ore grading 1.1 per cent copper, 0.65 per cent zinc, 6.8 grams per tonne silver and 0.6 grams per tonne gold. The mine site became the B.C. Museum of Mining, a National Historic Site in 1975.

The **Northair Deposit** is located in a Lower Cretaceous roof pendant of Gambier Group volcanic and sedimentary rocks within the southern Coast Plutonic Complex. This particular pendant, known as the Callaghan Creek pendant, is comprised of variably metamorphosed northwest trending volcanic and volcanically-derived sedimentary rocks, commonly characterized by a strong northwest foliation. The pendant rocks exhibit regional lower greenschist facies metamorphism, except near their contact with intrusive bodies, where they have locally undergone contact metamorphism.

The plutonic rocks in the area have a compositional range which varies from quartz monzonite to diorite. The plutonic rocks vary in age from Early Tertiary to Late Jurassic. Pendant contacts with adjacent plutonic rocks are often sharp and commonly marked by narrow shear zones which are parallel to the foliation within the pendant rocks.

Previous mapping in the Northair mine area has divided the geology of the 5000-metre thick Gambier Group into two major units. Unit 1 is a lower, volcanic-derived, sediment-rich unit characterized by well-sorted wacke with low fragment (clast) variation and minor volcanic tuffs, indicating a relatively long depositional history. Sedimentary features such as graded bedding and crossbedding are present with indicated tops to the northeast. Thin magnetite beds are locally present in wacke sediments. The stratigraphy appears to have a north to northwest strike and a steep dip to the northeast.

Unit 2 is comprised of a volcanic tuff of predominantly andesitic composition which stratigraphically overlies unit 1. Most of the southern contact between these two units is a fault which locally is occupied by a Tertiary felsic dyke. The upper 2500 metres of unit 2 is characterized by a high variability of clast size (ash tuff to block breccia) representing a rapid depositional environment. Depositional cycles are evident by the northeastward and southward fining of these fragmentals. Locally emergent conditions are indicated by features such as hematitic clasts which are well-rounded and similar in size. This is found particularly in the upper portion of the stratigraphy (northwest part of the property).

A proximal environment is indicated for the lower 1000 metres of unit 2, which is characterized by the absence of sediments, almost chaotic and locally clast-supported angular block and ash tuffs, volcanic breccias and lapilli tuffs which represent a brief, rapid depositional history. The significance of the lower unit lies in the fact that it hosts more of the ore.

Recent workers have interpreted the Gambier Group rocks on the property as a homoclinal succession (Assessment Report 18402). No minor fold structures have been observed. The bedding varies in strike from 160 to 200 degrees and dips from 45 to 89 degrees east. A pervasive cleavage is moderately well-developed and is common in the volcanic rocks; it has a strike of 160 to 180 degrees and is steeply inclined. Rock analyses show that the volcanics are calc-alkaline basalt to dacite in composition, with the majority of the samples falling into the andesite to dacite fields (Assessment Report 18402). Host rocks to the ore deposits at the Northair mine are andesitic pyroclastic breccia and lapilli tuffs. The ore deposits are comprised of 3 or 4 steeply dipping, fault-dismembered tabular zones, 1 to 7 metres wide and approximately 1200 metres long. They dip steeply southwest and are known to extend downdip at least 300 metres. The four mineralized segments are separated by north trending faults and are named from south to north as: Manifold, Warman, C and Discovery.

The mineralized segments are generally small bodies. The sulphides comprise pyrite, galena, sphalerite and minor chalcopyrite disseminations, veins and locally discontinuous, banded segregations in quartz-calcite gangue. Anastomosing veins of pyrite, galena and sphalerite are common; often they are irregular sulphide pods and lenses, separated by barren, brecciated country rock (horses). Locally, spectacular ribbon-banded, quartz-chlorite-pyrite veins (with minor lead-zinc sulphides) are present in the ore zone. The vein zone which comprises most of the ore, as a whole has a steep southwest dip which is broadly discordant to the perceived northeast dip of the volcanic stratigraphy. A general pattern of sulphide mineralogy indicates silver-rich, base metal-poor mineralization in the Manifold zone, progressing to more base metals and less silver toward the northwest (through Warman, C and Discovery zones). The width of the mineralization increases from the south to the northwest. Local banded, massive sphalerite and galena were reported at the Discovery zone. Other minerals reported at the mine are tetrahedrite, argentite, bornite, pyrargyrite and electrum with trace amounts of gold and stromeyerite (Geology in British Columbia 1977-1981, page 100).

At the northwest end of the "Northair horizon" (C and Discovery zones), where highest base metal values are indicated, the tested extent of mineralization is essentially less than 150 metres below surface. This locality was considered to have the best chance for massive sulphides discovery because of reported local occurrences of banded sulphides and shallow testing by previous exploration (Assessment Report 18402).

A consistent black, biotite/chlorite hydrothermal alteration zone is closely associated with the mineralization. This alteration forms an envelope to the sulphide vein zone, and is in some cases asymmetrical; more often it appears to be broadest in the structural hanging wall. The biotite content increases toward the sulphide vein system; it is a pervasive, fine-grained overprint of dark green chlorite. A gradation exists from a dark green, pervasive chlorite-altered tuff to a black, biotite-dominant tuff, most strongly altered nearest the mineralization. The biotite forms 6 to 7-millimetre clumps or aggregates in the altered host rock very close to, and within the mineralized vein system. Pervasive sericite alteration is also evident, but it appears to be an earlier event, and much more extensive; it is not directly related to the mineralization. Near the sulphide vein system within the alteration is a quartz-calcite stockwork which contains weak metal sulphides.

A long standing controversy has existed regarding the origin of the Northair mineralization. Two views are that the sulphides represent (1) volcanogenic massive sulphide mineralization or (2) that it is vein-type mineralization, related either to a synvolcanic hydrothermal system, or to nearby intrusions of the Coast Plutonic Complex; the latter genesis is proposed (Assessment Report 18402).

Production at the Northair mine began in 1974 and was suspended in mid-July, 1982 due mainly to low grades and low gold prices. Indicated reserves are 59,071 tonne grading 26.73 grams per tonne silver, 9.08 per tonne gold and 2 per cent combined lead-zinc (Canadian Mines 1986-87, page 285).

The **Hummingbird**-Romana Copper showing is located on the north side of Goat Island on Powell Lake.

The showing was extensively worked in the late 1920s including numerous opencuts, a gloryhole and 2 tunnels exceeding a total of 183 metres. Romana Copper Mines Ltd. acquired Hummingbird and nine other claims in 1928. The Hummingbird claim was Crown granted in 1929. A tramway was constructed in 1928. Tunnels were driven in 1929 and 1930. The property lay dormant until 1983 when explored by Corinth Resources. In 1988, Ashworth Explorations Ltd. conducted a geochemical exploration program on the Humming Bird (Lot 4815a) Reverted Crown grant and Clover claims covering the property. The property was owned by J. Fleishman.

The area of interest consists of a roof pendant which forms a 100-metre wide belt of highly altered volcanic and sedimentary rocks unconformably overlying diorite, quartz diorite and granodiorite of the Cretaceous Coast Plutonic Complex. The apparent strike of the belt, thought to be part of the Lower Cretaceous Gambier Group, is about 220 degrees.

Within this roof pendant is a contact metamorphosed zone containing garnetite, epidote and mineralization. The mineralization, manifested by rusty zones and malachite stain, consists of pods, streaks, veins and lenses of massive sulphides composed of varying proportions of pyrite and chalcopyrite. Most samples were moderately magnetic, and magnetite was identified in some specimens.

The best silver values occur in the opencut from which previous ore shipments were made. In 1983, a chip sample over unknown length assayed 17.40 per cent copper and 320.17 grams per tonne silver (Assessment Report 11884). Eight rock chip samples were taken during property exploration in 1988. Sample CL88-R2 yielded 3.08 per cent copper, 52.80 grams per tonne silver and 0.27 gram per tonne gold (Assessment Report 18531). The sample was a 100-centimetre chip sample across malachite stained, heavily altered metavolcanics striking 160 degrees and dipping vertical.

One hundred and forty tonnes of ore are quoted as being mined and shipped several years before 1928 assaying 8 to 11 per cent copper, 240 to 685 grams per tonne silver and minor gold (Minister of Mines Annual Report 1928).

Mineralization in the **Mount Diadem** area became known in 1928, when several massive sulphide showings containing pyrite, pyrrhotite, chalcopyrite and sphalerite were discovered near the headwaters of No Man's Creek. Both Britain River Mining Co. Ltd. and Mount Diadem Mines Ltd. staked claims west and north of Mount Diadem. Numerous trenches were excavated where sulphide showings occurred in altered limestone and other sedimentary rocks. Some adits were driven and work continued sporadically over the years. The original claims lapsed and were restaked in 1947 by Nickel Mining Company of Canada Ltd. The new claims were optioned to Bralorne Mines Ltd. in 1949. Considerable work has been carried out since 1949 by various operators. Geological mapping, limited diamond drilling and sampling of old adits and trenches were performed by Sphere Development Corp. in 1967. In 1970, Tiger Silver Mines Ltd. performed geophysical magnetic and geochemical soil surveys. Britain River Syndicate performed geological, geophysical and geochemical surveys in 1971. Some new anomalies were discovered. Minor rock sampling was conducted by Fury

Explorations in 1980. The claims were transferred to Fury Explorations Ltd. in the early 1980s. In 1983, Anaconda Ltd. optioned these claims and conducted a drilling program, consisting of nine holes and 899 metres. In the late 1980s, Covenant Resources staked the Diadem claims, surrounding the claim owned by Fury Exploration and the Fox claim owned by R. Schmidt.

Immediately above the head of No Man's Creek on the northern slopes of Mount Diadem an old adit is located at an elevation of 900 metres. The adit lies within the Cretaceous Coast Plutonic Complex near its western boundary with the Insular Belt. The complex consists mainly of diorites, granodiorites, gneisses and migmatites enclosing a northwest trending belt (pendant) of Lower Cretaceous Gambier volcanic and sedimentary rocks. Only in the eastern and possibly basal part of the belt are mafic flows and interbedded tuff evident. These rocks have been metamorphosed to greenschist and less commonly amphibolite grade. Structural deformation has been intense with the early development of tight, moderate to steep, north plunging folds characterized by an axial planar cleavage. This has been overprinted with later, open style folds. Two shear orientations predominate, both of which appear to locally control massive sulphide mineralization. One is subparallel to regional banding and parallel to the penetrative foliation. The other set strikes 060 to 100 degrees and is steeply dipping.

Seven rock units have been defined locally. These are: (1) tuffaceous sandstone, siltstone and argillite; andesitic flows, lapilli tuff and chloritic schist and massive diorite, (2) green-grey, chlorite-rich tuff, tuffaceous sandstone; felsic lapilli and vesicular flows and breccias and massive diorite, (3) rusty to black weathering, thinly bedded argillite, (4) well banded, grey-green interbedded argillite, siltstone, sandstone, black chert and lapilli tuffs, (5) siliceous argillite, tuffaceous siltstone, chert and lapilli tuff, (6) andesitic breccia and (7) feldspar-rich diorite, quartz diorite and granite. The adit is collared at the contact of the volcanic rocks with the intrusive rocks. The adit penetrates the silicified, recrystallized volcanics for 12 metres, at which distance a 0.61-metre shear is intersected. Pods consisting of galena, sphalerite, pyrite and small amounts of chalcopyrite are exposed in the shear.

A 0.25-metre wide sample of the shear southeast of the adit assayed 0.017 per cent copper, greater than 1 per cent lead, greater than 1 per cent zinc, greater than 200 grams per tonne silver and 0.18 gram per tonne gold (Assessment Report 11641). A grab sample from the adit assayed 4.9 grams per tonne gold, 264 grams per tonne silver, 8.89 per cent lead, 8.62 per cent zinc and 0.02 per cent copper (Assessment Report 11641).

Diamond drilling completed under option to Anaconda has tested up to 175 metres along strike, the contact between sheared argillite - chloritized volcanics. Three zones were believed intersected; the North, Central and South. The best drilling results were obtained from the Central zone. Diamond-drill hole 84-3 intersected 0.79 per cent copper, 2.74 per cent lead, 1.61 per cent zinc and 148.80 grams per tonne silver over 12.0 metres (Assessment Report 18207). The Central zone was also intersected by drillholes 84-1, 84-5, 84-6, and 84-8. The South zone was intersected in drillhole 84-9, approximately 60 metres below the surface. A 7.7-metre section yielded 0.1 per cent copper, 1.48 per cent lead, 1.53 per cent zinc and 44.91 grams per tonne silver (Assessment Report 18207). Mineralization in all intersections is hosted in intensely deformed argillite.

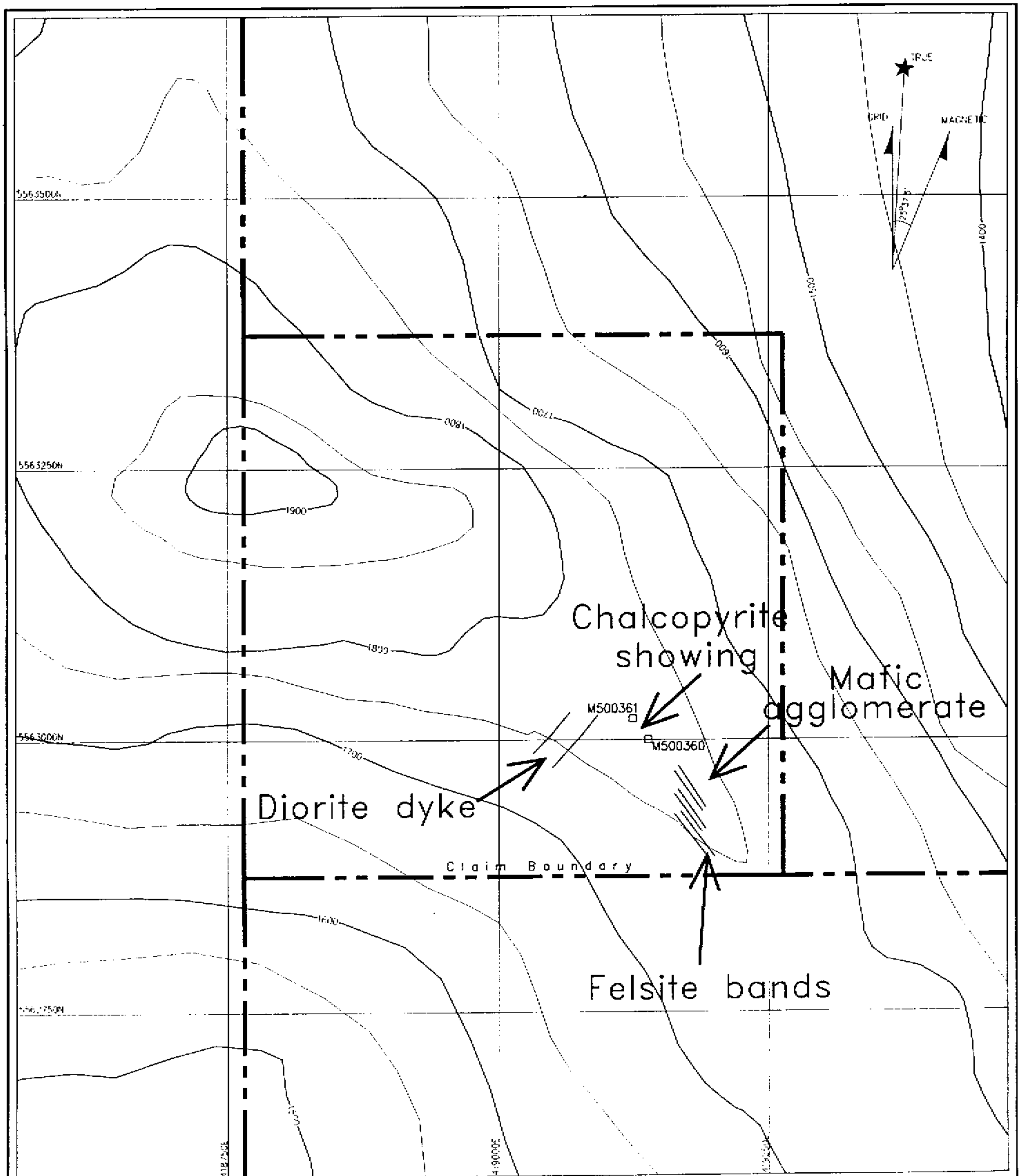
REGIONAL GEOCHEMISTRY

A regional stream sediment survey published by the British Columbia Geological Survey in 1988 indicates geochemical anomalies in streams that drain the Old Ironsides 3 claim. Streams are moderately anomalous for molybdenum and weakly anomalous for copper, zinc and lead.

PROPERTY GEOLOGY

The Old Ironsides 3 claim has not been mapped in detail. The limited amount of information gathered during a single traverse during each of 1998 and 1999 is shown in Figure 5.

Rocks observed include bands of felsite, mafic agglomerate, and diorite. The felsite is fine to medium grained, white to grey and weakly to moderately foliated. It sometimes exhibits a sucrosic texture and often contains very fine to fine grained pyrite as sparse disseminations, thin bands and occasional fracture coatings. The mafic agglomerate is dark grey to black, rarely with a very dark greenish tinge, and weathers grey. It consists of 45% very fine grained black groundmass and 65% fine grained dark grey to black angular to subangular clasts. The clasts range in size from 2mm to 70mm. The diorite does not appear to have been affected by regional metamorphism and may be of the same age as the Coast Plutonics diorite to the north of the property.



0 25 50 100 150 200 250m
Contour interval 50m

M500361
□ Rock float sample location with sample number

FIGURE 5

OLD IRONSIDES 3 CLAIM

PROPERTY GEOLOGY

DRAWN BY: AB	PRODUCED AT: 1:5000
DATE: OCT 12, 1999	FILE: OI3\OI3SNO.DWG

PROPERTY GEOCHEMISTRY

During 1999, seven soil samples were collected from a single reconnaissance contour line. Sample spacing along the line is 50m. All soil samples were submitted to Chemex Labs in North Vancouver, BC, where they were dried, screened to -150 mesh, split, digested in nitric aqua regia and analysed for 32 elements using an induced coupled plasma (ICP) technique.

A statistical analysis was performed on a population of soil samples collected during a regional exploration program conducted in the Powell River region during 1998 and 1999. A total of 522 soil samples are included in the analysis, all of which were collected over roof pendants of metamorphic Gambier group rocks. The resulting data were used to establish thresholds for geochemical anomalies. A summary of the data and histogram plots for elements of primary interest is shown in Figure 6, while the threshold values are summarized in the following table.

ANOMALOUS THRESHOLDS FOR 522 SOIL SAMPLES

Element		Anomalous threshold (ppm)			
	Background	Weak	Moderate	Strong	Peak
Cu	25	45	90	180	1775
Zn	15	30	60	120	3650
Ag	<0.2	0.3	0.6	1.0	48.8
Co	4	6	12	25	83
Ba*	75	150	300	600	1510
As	7	15	30	60	750
Pb	2	5	10	20	584

*partial digestion

PROPERTY GEOCHEMISTRY

During 1999, seven soil samples were collected from a single reconnaissance contour line. Sample spacing along the line is 50m. All soil samples were submitted to Chemex Labs in North Vancouver, BC, where they were dried, screened to -150 mesh, split, digested in nitric aqua regia and analysed for 32 elements using an induced coupled plasma (ICP) technique.

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	Background	Weak	Moderate	Strong	Peak
Cu	25	45	90	180	1775
Zn	15	30	60	120	3650
Ag	<0.2	0.3	0.6	1.0	48.8
Co	4	6	12	25	83
Ba*	75	150	300	600	1510
As	7	15	30	60	750
Pb	2	5	10	20	584

*partial digestion

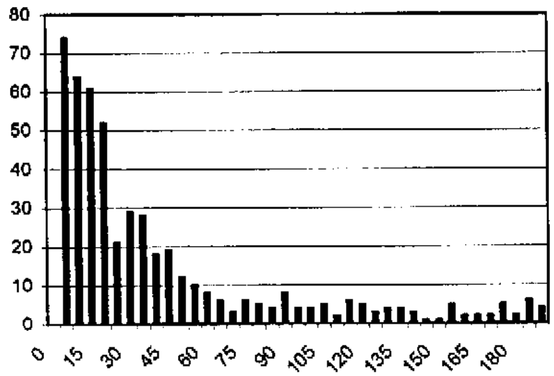
Figure 6: Regional Soil Geochemistry Histograms

Horizontal Axes: geochemical value range; Vertical Axes: number of values in range

Number of samples n=522

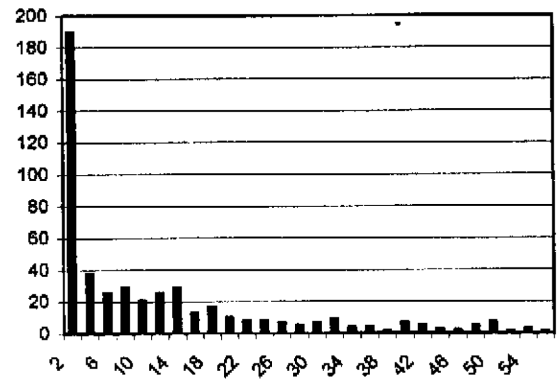
NB: outliers trimmed from histograms but included in calculations

Copper



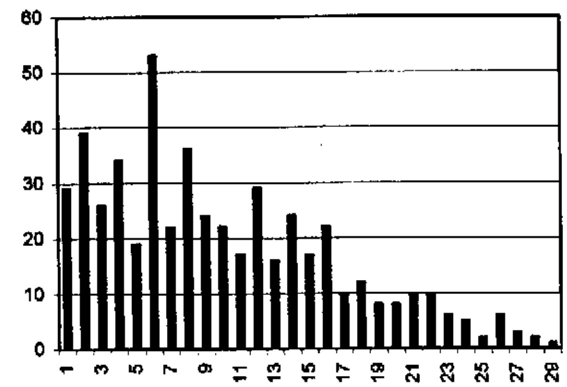
mean	52	peak	1775
median	24	95th percentile	187
sandard deviation	99	90th percentile	149

Arsenic



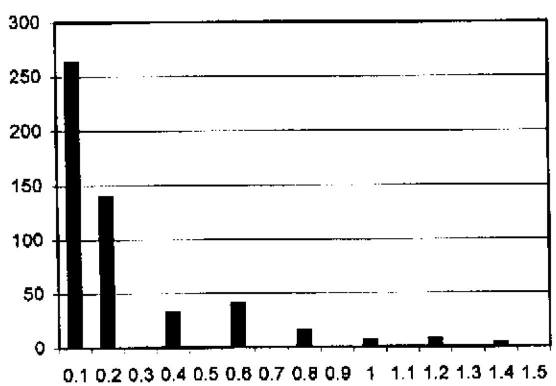
mean	19	peak	750
median	8	95th percentile	66
sandard deviation	48	90th percentile	46

Zinc



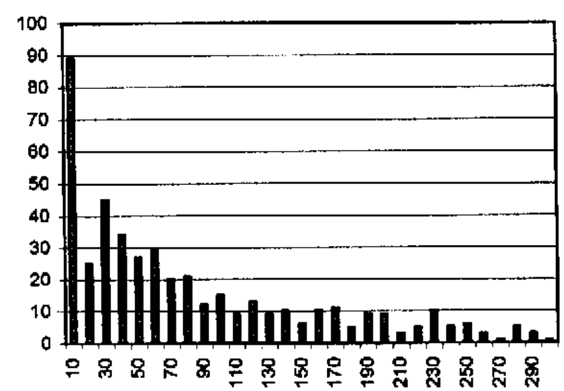
mean	57	peak	3650
median	42	95th percentile	118
sandard deviation	162	90th percentile	102

Silver



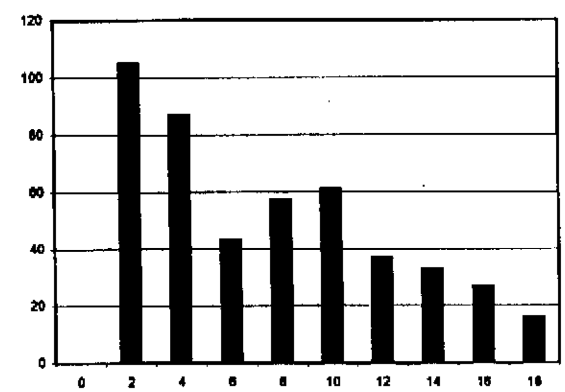
mean	0.32	peak	48.8
median	0.00	95th percentile	1.00
sandard deviation	2.16	90th percentile	0.60

Barium (partial digestion)



mean	163	peak	1510
median	70	95th percentile	650
sandard deviation	248	90th percentile	429

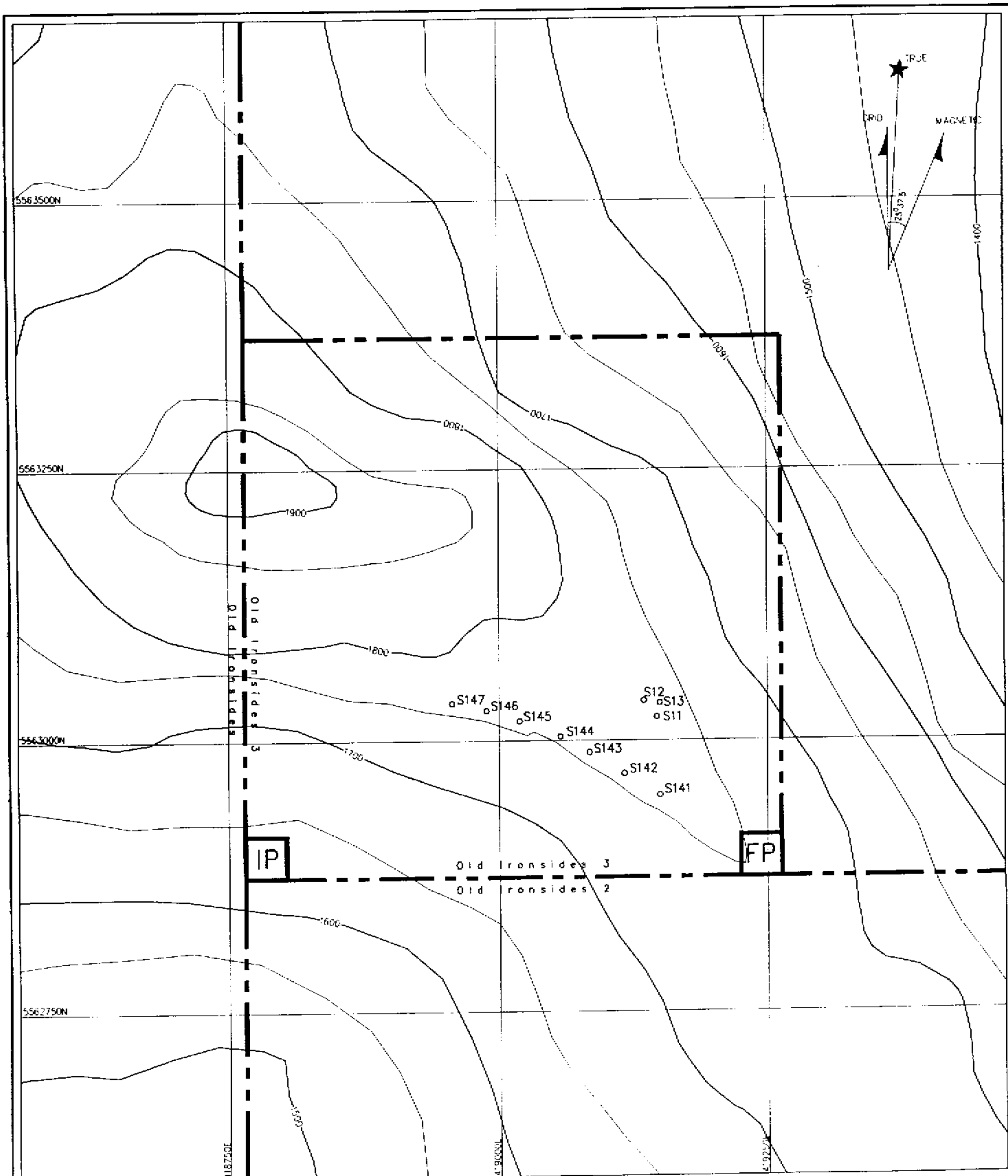
Cobalt



mean	9.2	peak	83
median	7.0	95th percentile	25
sandard deviation	9.4	90th percentile	19

Overburden is considered largely residual or colluvial, and often of thickness of less than one metre. It was observed that soil development at almost all sample sites is extremely poor, with no differentiable horizons. Material commonly sampled was a brown-grey C horizon. The poor soil development suggests that the soil geochemistry may not reflect an accurate signature of bedrock mineralization. Sample locations are plotted in Figure 7.

At various sites along the soil line, geochemical response was anomalous for copper, zinc, barium and arsenic (Figures 8-11). Barium response is likely understated due to incomplete digestion of barium sulphate by the aqua regia digestion. Barite is an accessory mineral at the Britannia deposit (Payne et al, 1980) and the Red Dog deposit in Alaska (Koehler et al, 1991), as well as numerous other VMS deposits (Hoffman, 1986).



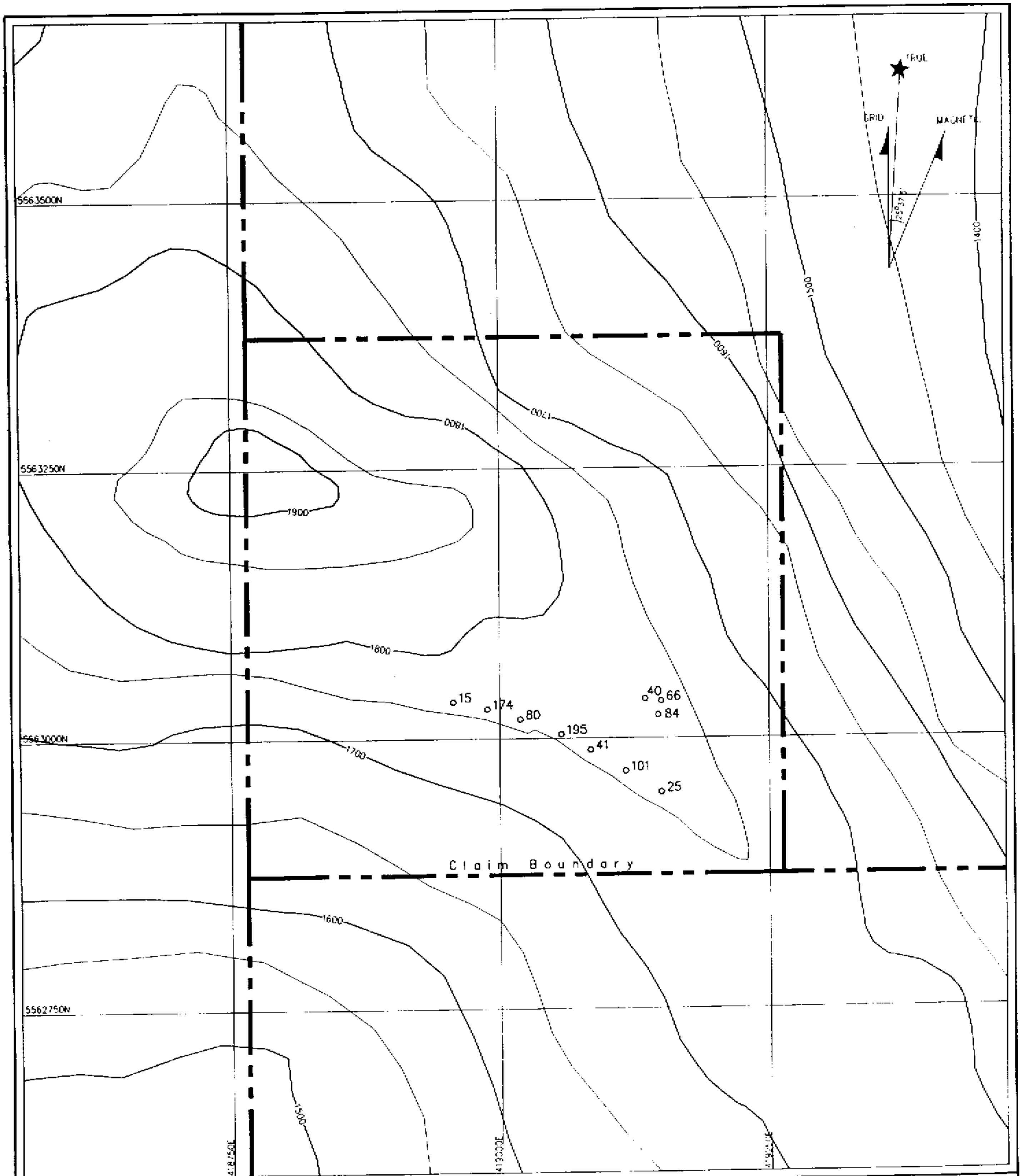
o Soil sample location with sample number

FIGURE 7

OLD IRONSIDES 3 CLAIM

SAMPLE LOCATIONS

DRAWN BY: AB	PRODUCED AT: 1:5000
DATE: OCT 12, 1999	FILE: OI3/OI3SNO.DWG



0 25 50 100 150 200 250m

Contour interval 50m

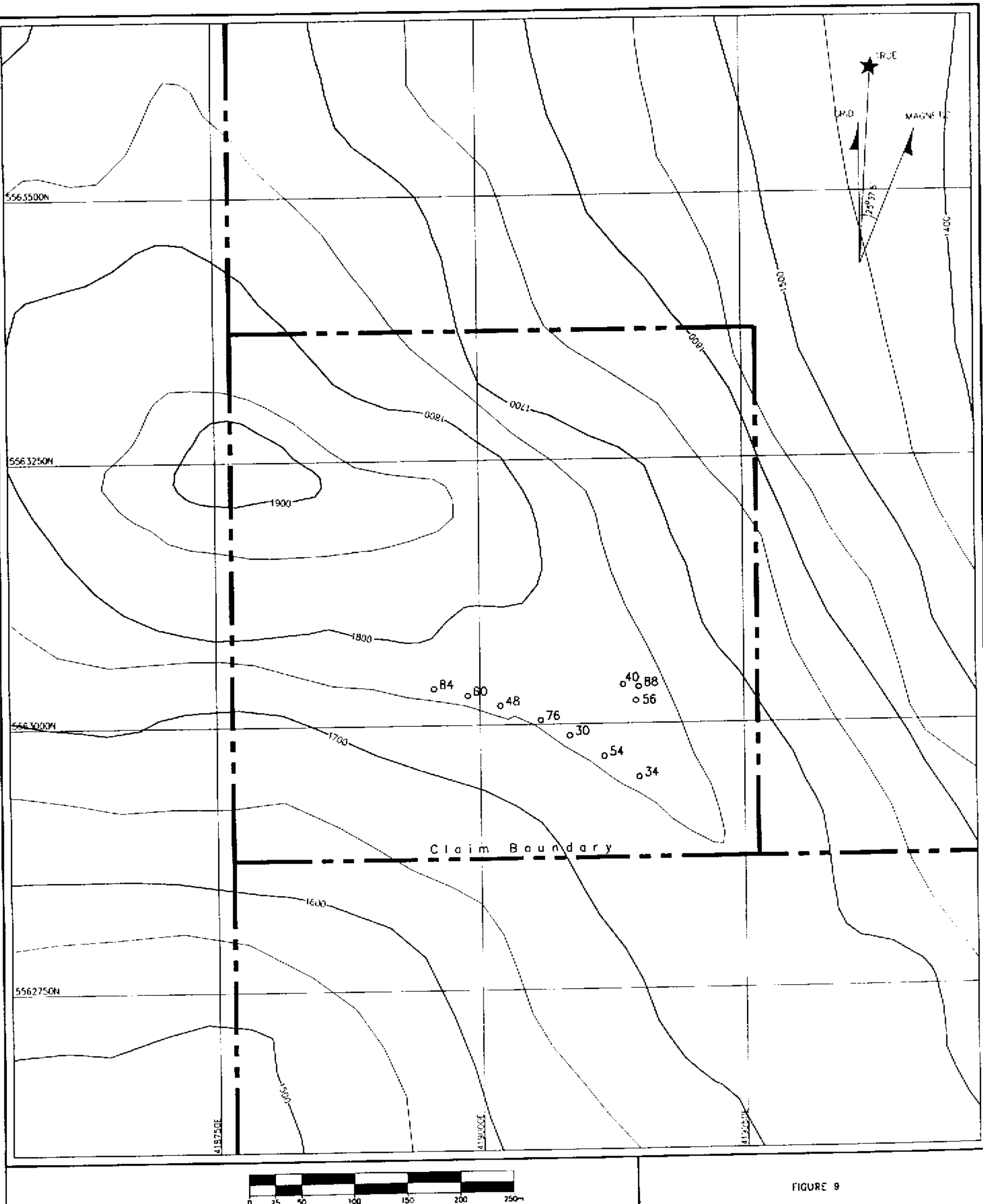
o20 Soil sample location with copper value in ppm

FIGURE 8

OLD IRONSIDES 3 CLAIM

COPPER
SOIL GEOCHEMISTRY

DRAWN BY: AB	PRODUCED AT: 1:5000
DATE: OCT 12, 1999	FILE: 013/013SNO.DWG



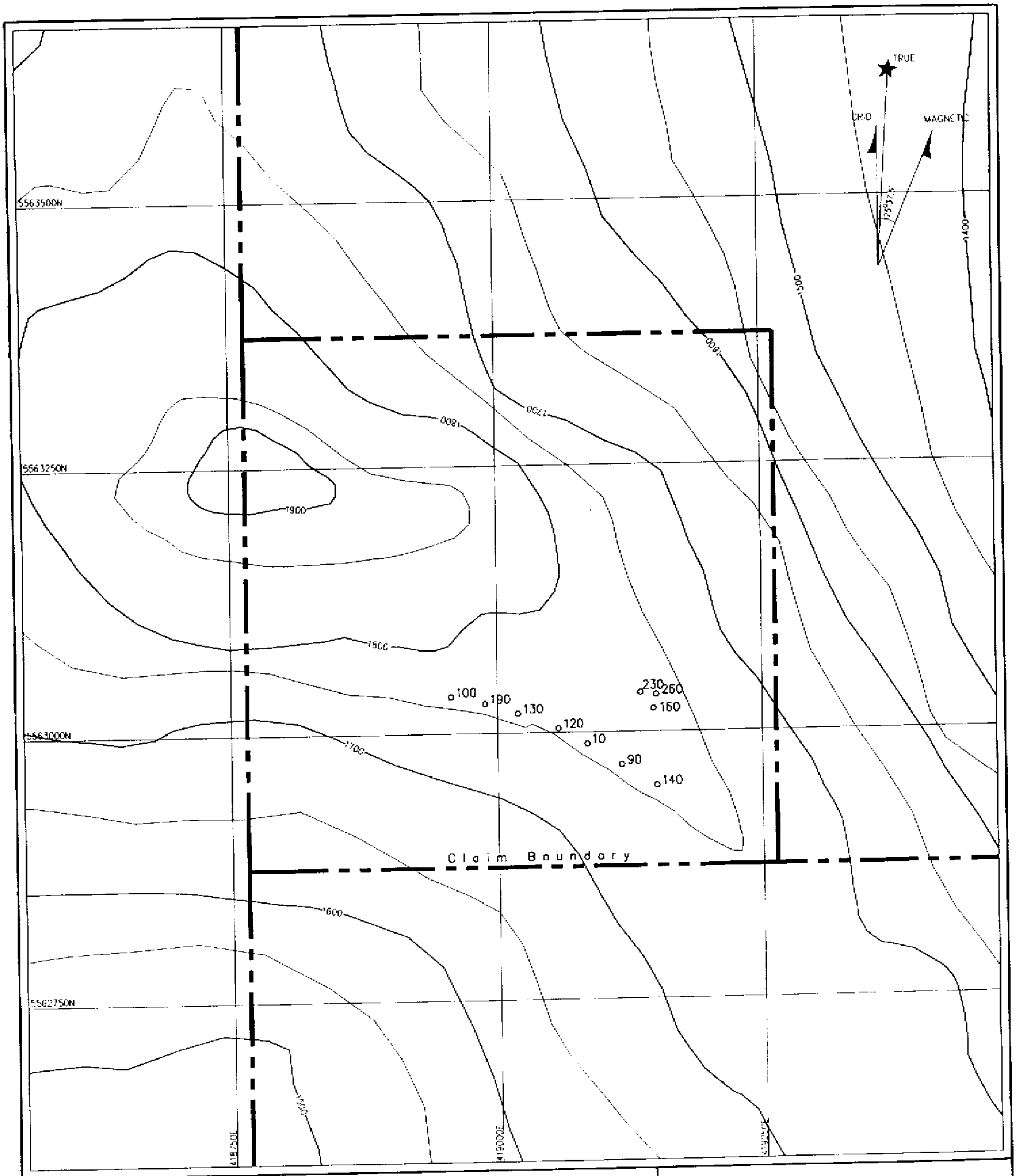
o100 Soil sample location with zinc value in ppm

FIGURE 9

OLD IRONSIDES 3 CLAIM

ZINC
SOIL GEOCHEMISTRY

DRAWN BY: AB	PRODUCED AT: 1:5000
DATE: OCT 12, 1999	FILE: 013/013SNO.DWG



0 25 50 100 150 200 250m
Contour interval 50m

○120 Soil sample location with barium value in ppm
NB: partial digestion only

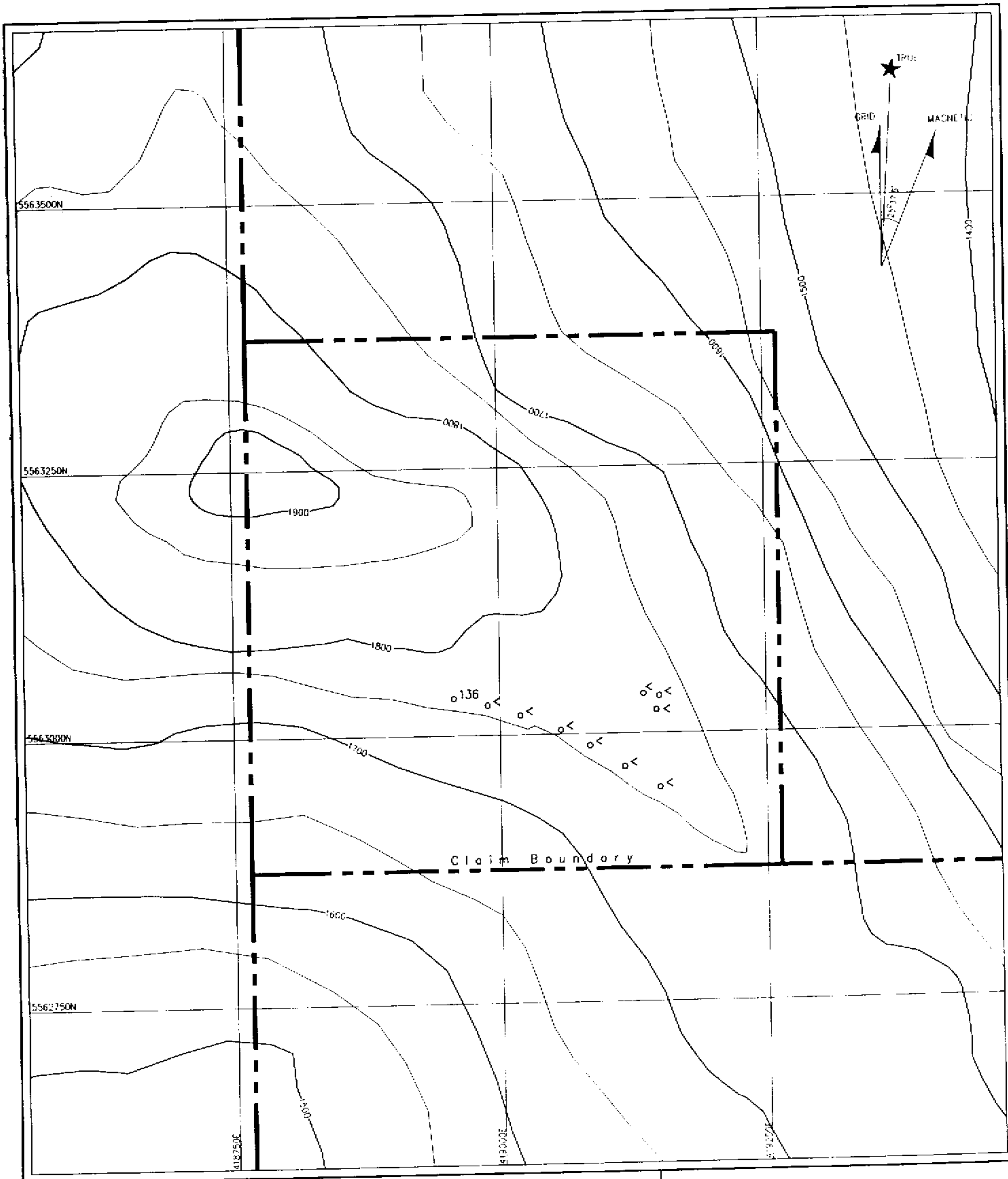
FIGURE 10

OLD IRONSIDES 3 CLAIM

BARIUM
SOIL GEOCHEMISTRY

NB: Partial digestion only

DRAWN BY: AB	PRODUCED AT: 1:5000
DATE: OCT 12, 1999	FILE: 013/013SNO.DWG



0 25 50 100 150 200 250m

Contour interval 50m

o20 Soil sample location with arsenic value in ppm

o< Soil sample location with arsenic value below detection limit

FIGURE 11

OLD IRONSIDES 3 CLAIM

ARSENIC SOIL GEOCHEMISTRY

DRAWN BY: AB	PRODUCED AT: 1:5000
DATE: OCT 12, 1999	FILE: 013\013SNO.DWG

CONCLUSIONS AND RECOMMENDATIONS

The Old Ironsides 3 mineral claim was staked in June, 1999 to protect a VMS base metals target lying within a metamorphic roof pendant of Gambier Group rocks. Due to poor access, helicopter support is recommended for future work.

Prospecting and soil sampling were carried out in 1999. Seven soil samples were collected, most of which returned anomalous values for any of copper, zinc, barium, arsenic or a combination of these elements.

It is recommended that the known sulphide showing be fully evaluated by prospecting. Geology should be mapped at a suitably small scale to define units likely to host mineralization. The anomalous values on the current soil line warrant further evaluation by grid soil sampling.

Respectfully submitted,

Arnd Burgert

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Hoffman, S. J., 1986: The volcanogenic massive sulphide target, *in* Exploration geochemistry: design and interpretation of soil surveys, Reviews in economic geology, (ed.) James M. Robertson, Society of economic geologists, pp. 139-146.

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APPENDIX I

AUTHOR'S STATEMENT OF QUALIFICATIONS

AUTHOR'S STATEMENT OF QUALIFICATIONS

I, Arnd Burgert, geologist, with business and residential address in New Westminster, British Columbia, do hereby certify that:

1. I graduated from the University of British Columbia in 1995 with a B.Sc. in Geology.

2. From 1989 to present, I have been actively engaged in mineral exploration in British Columbia, the Northwest Territories and the Yukon Territory.

3. I have personally performed the work reported herein.

A. Burgert, B.Sc.
Dated this 30th day of October, 1999

APPENDIX II

CERTIFICATES OF ASSAY

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

To: BURGERT, ARND
P.O. BOX 1208
PORT MCNEILL, BC
V0N 2R0

Project : OLD IRONSIDES
Comments: ATTN: ARND BURGERT CC: ARND BURGERT

Certificate Date: 09-SEP-199
Invoice No. : I9927561
P.O. Number :
Account :QHB

CERTIFICATE OF ANALYSIS A9927561

SAMPLE	PREP CODE		Ag ppm	Al %	As ppm	B 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
S139	201	229	0.8	2.38	< 2	< 10	40	< 0.5	< 2	0.12	< 0.5	3	24	28	3.68	< 10	< 1	0.11	< 10	0.47	145
S140	201	229	0.8	2.21	< 2	< 10	40	< 0.5	< 2	0.03	< 0.5	2	51	13	4.91	< 10	< 1	0.20	< 10	0.59	135
S141	201	229	0.2	3.49	< 2	< 10	120	< 0.5	< 2	0.05	< 0.5	3	3	25	4.33	10	< 1	0.41	< 10	1.28	300
S142	201	229	0.2	3.51	< 2	< 10	90	< 0.5	< 2	0.05	< 0.5	6	26	101	4.32	10	1	0.32	< 10	1.37	365
S143	201	229	< 0.2	1.66	< 2	< 10	10	< 0.5	< 2	0.09	< 0.5	5	9	41	2.10	< 10	< 1	0.06	< 10	0.53	195
S144	201	229	0.2	4.25	< 2	< 10	120	< 0.5	18	0.11	< 0.5	10	9	195	7.48	10	< 1	0.41	< 10	1.00	465
S145	201	229	0.2	4.00	< 2	< 10	130	< 0.5	< 2	0.14	< 0.5	8	12	80	4.53	10	< 1	0.38	< 10	0.99	255
S146	201	229	< 0.2	3.94	< 2	< 10	190	< 0.5	< 2	0.10	< 0.5	11	3	174	5.85	10	< 1	0.47	< 10	0.96	355
S147	201	229	0.2	3.88	136	< 10	100	< 0.5	< 2	0.06	< 0.5	11	15	15	4.65	10	< 1	0.28	< 10	0.67	965
S148	201	229	< 0.2	0.27	< 2	70	20	< 0.5	< 2	6.25	< 0.5	1	9	24	0.31	< 10	1	8.34	< 10	1.42	120
S149	201	229	< 0.2	0.09	< 2	10	40	< 0.5	< 2	1.89	< 0.5	< 1	2	3	0.16	< 10	< 1	0.08	< 10	0.27	145

CERTIFICATION: [signature]

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

To: BURGERT, ARND
P.O. BOX 1208
PORT MCNEILL, BC
V0N 2R0

Project : OLD IRONSIDES
Comments: ATTN: ARND BURGERT CC: ARND BURGERT

Certificate Date: 09-SEP-1999
Invoice No. : I9927561
P.O. Number :
Account :QHB

CERTIFICATE OF ANALYSIS A9927561

SAMPLE	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	S %	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
S139	201	229	5	0.01	5	1020	2	0.07	< 2	4	5	0.07	< 10	< 10	67	< 10	22
S140	201	229	< 1	0.01	16	680	4	0.07	< 2	3	7	0.10	< 10	< 10	50	< 10	40
S141	201	229	3	0.03	1	530	< 2	0.09	< 2	6	6	0.19	< 10	< 10	93	< 10	34
S142	201	229	3	0.01	10	400	2	0.07	< 2	5	6	0.16	< 10	< 10	98	< 10	54
S143	201	229	< 1	0.01	5	570	2	0.07	< 2	1	5	0.09	< 10	< 10	45	< 10	30
S144	201	229	10	0.03	3	740	< 2	0.08	< 2	4	10	0.25	< 10	< 10	113	< 10	76
S145	201	229	13	0.04	1	730	< 2	0.09	< 2	2	13	0.17	< 10	< 10	108	< 10	48
S146	201	229	7	0.03	1	850	< 2	0.16	< 2	5	11	0.17	< 10	< 10	95	< 10	60
S147	201	229	< 1	0.01	5	440	6	0.05	< 2	7	4	0.19	< 10	< 10	74	< 10	84
S148	201	229	4	0.80	13	7460	< 2	3.34	< 2	< 1	145	< 0.01	< 10	10	7	< 10	76
S149	201	229	1	0.01	1	610	< 2	0.43	< 2	< 1	75	< 0.01	< 10	< 10	3	< 10	18

CERTIFICATION:

APPENDIX III

STATEMENT OF EXPENDITURES

Old Ironsides 3 Mineral Claim
1999 Statement of Expenditures

Prospecting			
Prospector			
0.5 days	@	225 /day	113
Camp costs			
0.5 days	@	45 /day	23
Soil Sampling			
Soil Sampler			
0.5 days	@	180 /day	90
Camp costs			
0.5 days	@	45 /day	23
Laboratory			
7 soil samples	@	9 /sample	63
Freight			
shipping, Powell River - Vancouver			15
Supplies			
flagging tape, soil bags, tags, etc.			10
General			
4 wheel drive truck			
1 days	@	70 /day	70
fuel and oil			5
drafting			320
report preparation; photocopying			219
Total			$ 950