ASSESSMENT REPORT

GEOLOGY AND GEOCHEMISTRY

ON THE

JACKO PROPERTY

KAMLOOPS MINING DIVISION

NTS 92I/9W

Owner: Teck Corp.

Author: G.Evans

Date: July 1995

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A.- INTRODUCTION

During April and May of 1995 an exploration program was conducted on the Jacko property SW of Kamloops B.C. The program was directed at defining a buried alkaline style Iron Mask Cu-Au porphyry system. To this end a combination of field mapping in an attempt to use alteration vectors and geochemical sampling using "enzyme leach" techniques were used to try to define targets.

This report will describe the work done and present interpretation of results.

B.- LOCATION AND ACCESS

The property is located 10 km's SW of Kamloops,B.C.(see Fig.2). The property is accessed along the Lac le Jeune Rd. which cuts through the western portion of the property from km.7 to km.10. Numerous ranch roads access all portions of the property which covers rolling grasslands and limited treed hills.

C.- CLAIMS

The property consists of the Jacko Group which is comprised of the following claims which are registered to Teck Corp. (see fig.1).

CLAIM NAME	RECORD #	# of UNITS	EXPIRY DATE *
• JACKO 1	325674	20	May 07, 1997
• JACKO 2	325744	14	May 09, 1997
• JACKO 3	325745	10	May 10, 1997
• JACKO 4Fr	325746	1	May 10, 1997

* Pending acceptance of this report

D.- PREVIOUS WORK

Several groups have conducted preliminary work over what is now the Jacko property. These include Bata Resources Ltd.(1965) who completed an I.P. and magnetometer survey over the western portion of the property and Rolling Hills Copper Mines Ltd.(1971) who conducted large scale soils and preliminary I.P. surveys over much of the property. Other groups including Afton Mines, Cominco and Abermin have geologically mapped the northern portions of the property adjacent the main Iron Mask batholith.

E.- 1995 PROGRAM

The 1995 program consisted of geological mapping @ 1:5,000 scale over the entire property and 3 widely spaced soil lines (total of 5.0 km's) along which samples were collected every 50m's (103 samples total). The goal of these two approaches was to

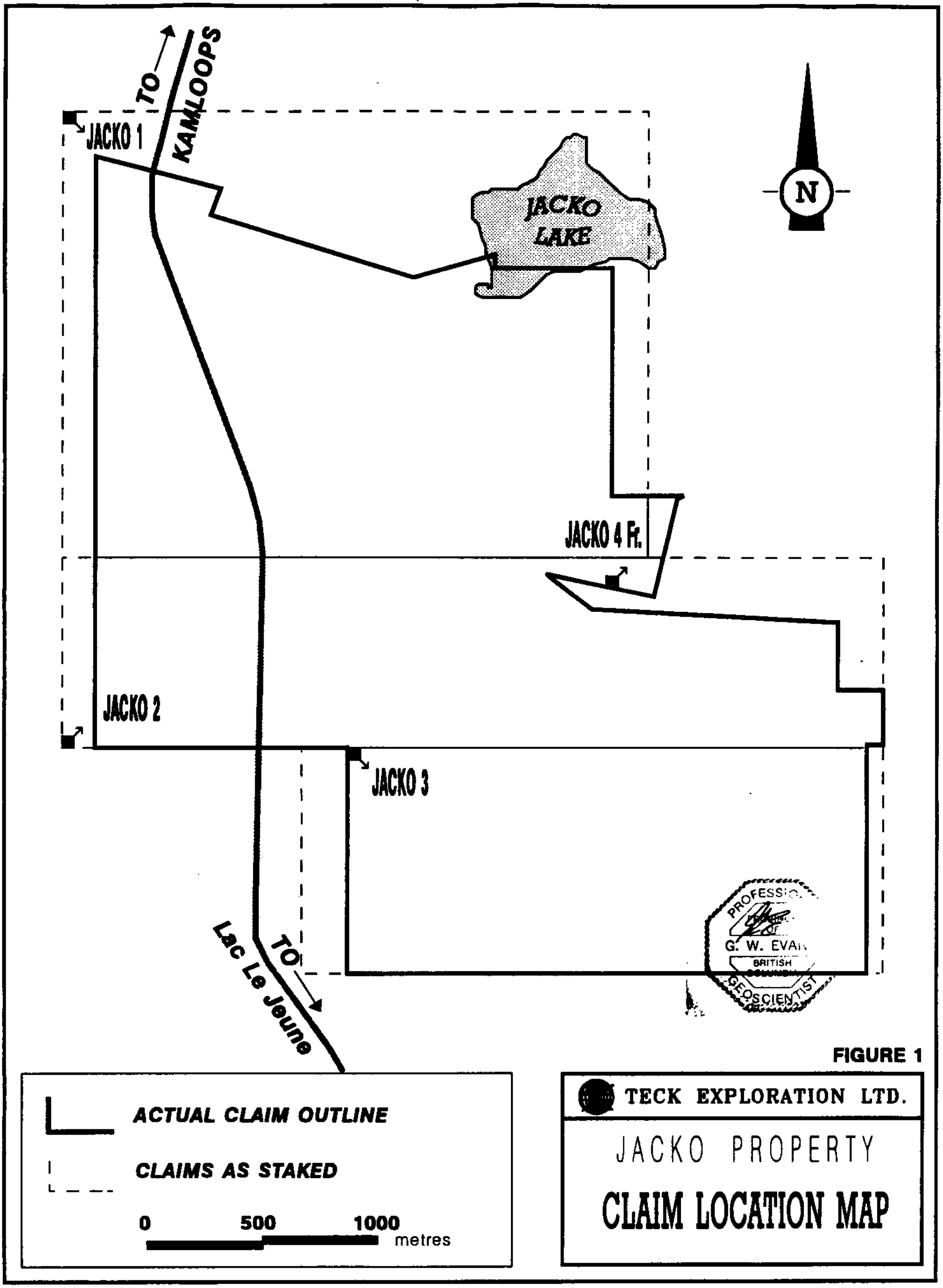

FIGURE 1

TECK EXPLORATION LTD.

JACKO PROPERTY

CLAIM LOCATION MAP

combine geological mapping and alteration vectors to direct towards buried Iron Mask Cu-Au porphyry targets which could be detected with the use of enzyme leach sampling. This Technique developed by Bob Clark (see appendix.3) has been tested by the G.S.C. over the Iron Mask Batholith for the last couple of years.

F- GEOLOGY

The regional geology consists of the Triassic-Jurassic Iron Mask Batholith surrounded by co-eval Nicola Volcanics and sediments. The Iron Mask Batholith is a complex series of alkaline intrusives which hosts several Cu-Au porphyry systems. The Jacko property covers Nicola volcanics near the southern volcanic-intrusive contact south of the Ajax deposits(see fig.3). Outcrop exposure is limited to ridges with extensive glacial cover occuring in the valleys along the NW-SE structural grain.

LITHOLOGY

JURASSIC & TRIASSIC

Unit 1

Along the southern and southwestern edge of Jacko 3 there are strongly foliated mafic volcanics affected by amphibolite grade metamorphism. These rocks are believed to form a horst along the southern portion of Jacko 3.

Unit 2

This is the most common rocktype on the property and has been grouped to avoid small scale variations at the outcrop scale. These rocks consist of variable amounts of augite bearing mafic pyroclastics with cystal tuff beds and matrix infill. The lapilli are polylithic and are subrounded varying from 0.5- 5.0 cm in diameter. To date all flows are subaqueous with no subaerial flows seen on the property.

Unit 3

Limited exposures occur in the central portion of the property and the recessive nature of the lithologies has probably resulted in the subdued topography. This unit consists of argillaceous sediments and fine grained mafic tuffs. These units have a trace amount of disseminated primary pyrite and bedding measurements reflect signifigant folding.

Unit 4

Unit 4 is the only intrusive unit on the property and covers the NE portion of Jacko 3 along the edges of Jacko Lake. This unit consists of coarse grained gabbro with lesser amounts of medium grained diorites.

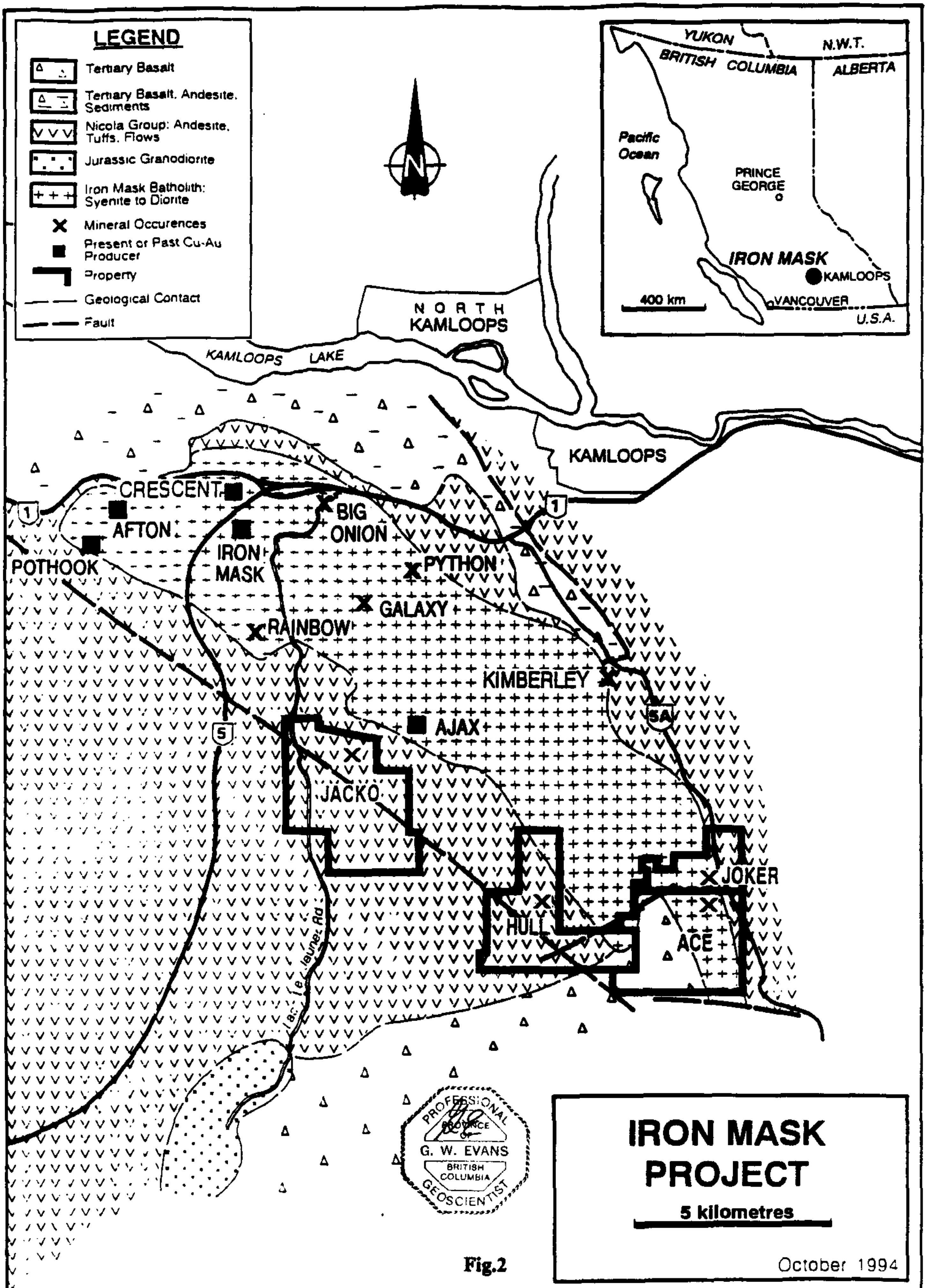
LEGEND
Tertiary Basalt
Tertiary Basalt, Andesite, Sediments
Nicola Group: Andesite, Tuffs, Flows
Jurassic Granodiorite
Iron Mask Batholith: Syenite to Diorite
Mineral Occurences
Present or Past Cu-Au Producer
Property
Geological Contact
Fault
YUKON
N.W.T.
BRITISH COLUMBIA
ALBERTA
Pacific Ocean
PRINCE GEORGE
IRON MASK
KAMLOOPS
400 km
VANCOUVER
U.S.A.
N
NORTH KAMLOOPS
KAMLOOPS LAKE
KAMLOOPS
CRESCENT
AFTON
POTHOOK
IRON MASK
BIG ONION
PYTHON
GALAXY
RAINBOW
KIMBERLEY
AJAX
JACKO
HULL
JOKER
ACE
1
5
5A
PROFESSIONAL
PROVINCE OF
G. W. EVANS
BRITISH COLUMBIA
GEOSCIENTIST
IRON MASK PROJECT
5 kilometres
October 1994

Fig.2

TERTIARY & MIOCENE

Unit 5

Felsic Tertiary dykes are common over much of the property. They vary in width from 1-40m's and contain sericite and potassic alteration. Distinctive phenocrysts up to 1cm in diameter consist of quartz and plagioclase with lesser phlogophite. These dykes follow NW and NE trending fault structures and reflect tertiary reactivation of many of these structures.

Unit 6

This unit does not occur on the property but does outcrop just south of the property forming ridges of vesicular olivine plateau basalts (Miocene?).

STRUCTURE

The dominant structural grain on the property is large through going NW trending faults. These are believed to form a graben feature along the SW flank of the Iron Mask batholith and recent mapping suggests a horst feature exists along the southern side of the property. Internal stratigraphy within the Nicola volcanics and sediments is not recognizable with rapid facies changes and limited exposure. Bedding is variable suggesting signifigant folding within NW trending fault blocks. Tertiary QFP dykes reflect Eocene activity along NW and NE trending fault sets.

ALTERATION & MINERALIZATION

The only Cu mineralization seen on the property consists of narrow chalcopyrite-pyrite calcite veinlets in the northern portion of the property within Nicola Volcanics or the Hybrid unit near this contact. Elsewhere on the property the only signifigant alteration is weak-moderate pervasive propylytic alteration and limited alteration associated with QFP dykes and fault zones. The propylytic alteration consists of pervasive epidote +/- calcite, chlorite and hematite veinlets over widths of 5- 50 meters. These zones appear spatially related to major NW trending fault zones but at best contain trace amounts of disseminated pyrite. Tertiary QFP dykes also appear spatially related to major NW trending faults as well as smaller NE trending fault zones. Alteration related to the dykes is more variable ranging from sericite, potassic to distal calcite, chlorite and hematite alteration. Only trace amounts of fine grained disseminated pyrite was ever observed with this alteration. No mineralization or alteration reflecting a buried porphyry system was seen on the property. All mineralization appears structurally controlled Tertiary and older? of limited potential.

G- ENZYME LEACH

Enzyme leach is a technique developed by Bob Clark (see appendix.3) to detect buried mineral deposits through various overburden cover. The Iron Mask region was selected by the GSC (Bruce Ballantyne) as a good test area due to its extensive and varying styles of glacial overburden. Conventional soil geochemistry has limited use due to thicknesses of glacial till sheets, drumlin fields and down ice contamination from exposed occurrences. The enzyme leach process is based on the use of amorphous manganese dioxide in the soils as a collector of a wide range of trace elements emanating directly from leaching of buried mineral deposits. Interpretation of the large data sets and correlation's of multi-element anomalies allow a prediction of buried mineral deposits.

Collection of samples is conventional soil sampling of B-horizon soils which on Jacko were collected on three (NW trending) widely spaced lines (see fig.3). These samples are treated (see Appendix.3) and then analyzed with ICP-MS for high quality low detection limits analyses.

Interpretation of these surveys is still in its infancy but several features have been demonstrated and major significant elements have been recognized by work of the GSC and Bob Clark. Typically anomalies consist of a central low feature surrounded by symetrical-assymetrical "Rabbit Ear" features believed to form the cathode-anode set in a buried electrochemical cell. This can often be complicated by anomalously high elements directly above a buried deposit reflecting direct elemental diffusion. In the Iron Mask area elements that appear most significant to date include Cl, I, Re, Mo, Cu, As, Sb, W, Te, Ni, V, Au, and Ag both from electrochemical cells and diffusion.

The following graphs outline the elements with the strongest contrast on the Jacko Grid. The following elements were plotted for each of the lines. Cl "Rabbit ears" appears very distinctive for Iron Mask porphyries and is the most significant element on the Cl & Majors graph plots. The base metal plots indicate the strongest contrasting elements on the Jacko grid on these plots are Cu, Ni +/- Au which correlate quite well and form similar "Rabbit ear" patterns to Cl. The Precious Metal graph series shows a general correlation with the Base metal series with elements showing the greatest contrast including Sb, W +/- Cd with very low variations in Ag and Au. The Trace Element series highlights a Mo, Sb correlation which generally corresponds to the aforementioned "Rabbit Ear" anomalies.

The following co-ordinates have signifigant Cl, Cu, Ni, Sb, W, Br, Mo anomalies +/- Co, Au and Ag. These anomalies have anomalously high shoulders with distinctive low cores reflecting geochemical cell activity.

1. L1 1+50E - 5+50E

2. L4 1+50E - 5+50E

3. L6 11+00E - 14+00E

JACK Chart 2

Cl & MAJORS L1

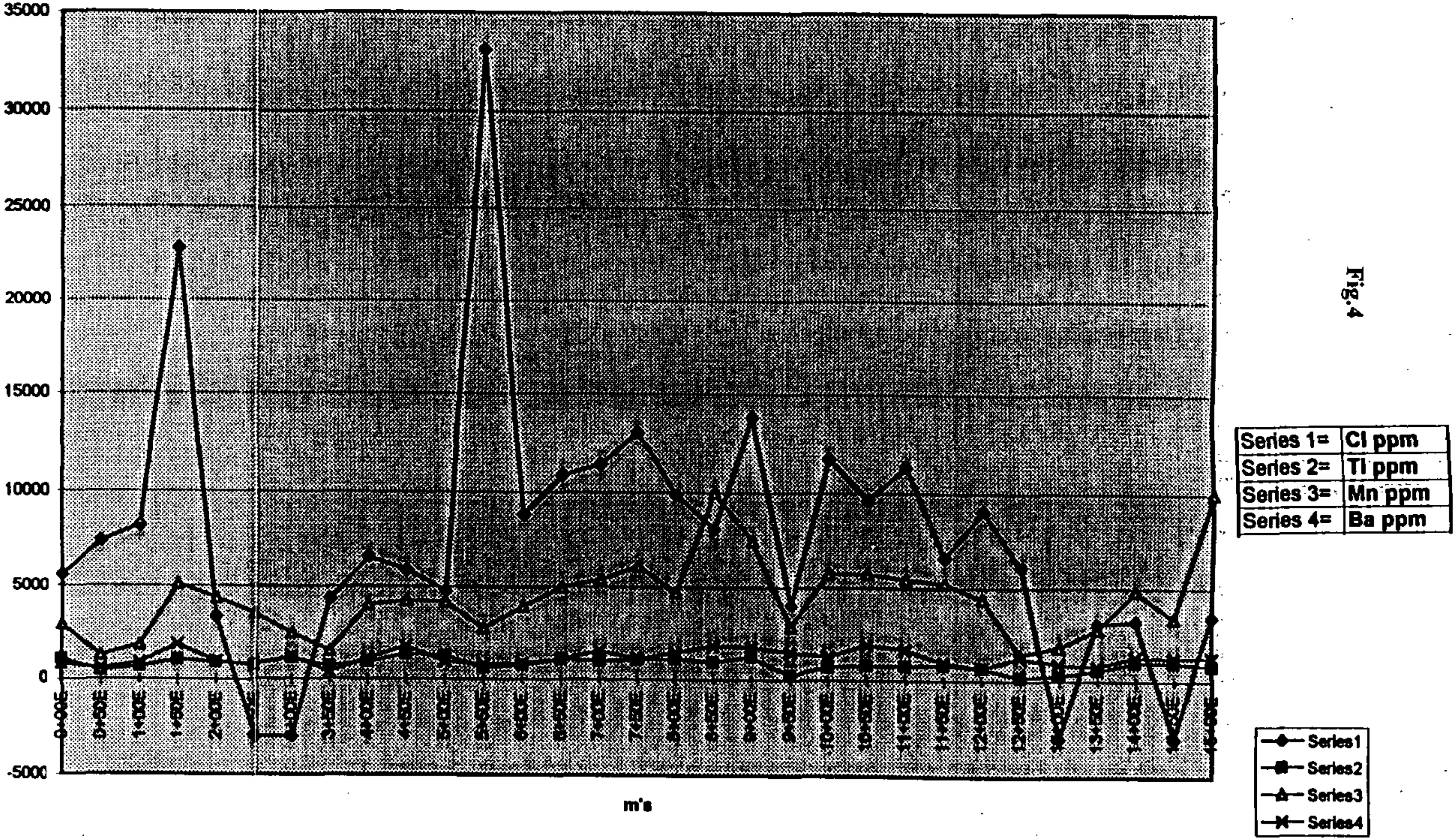

Fig.4

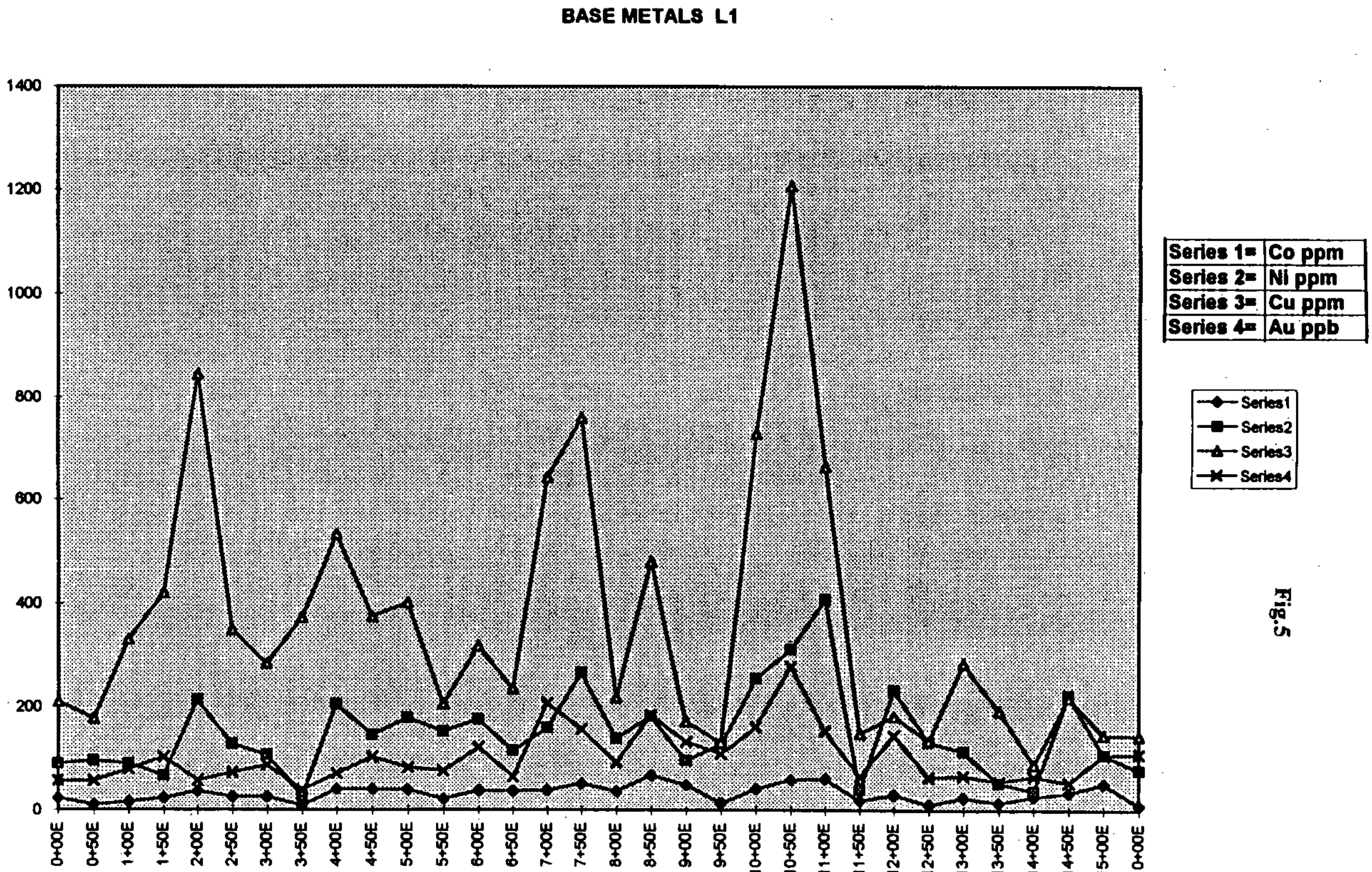
BASE METALS L1
1400
1200
1000
800
600
400
200
0
0+00E
0+50E
1+00E
1+50E
2+00E
2+50E
3+00E
3+50E
4+00E
4+50E
5+00E
5+50E
6+00E
6+50E
7+00E
7+50E
8+00E
8+50E
9+00E
9+50E
10+00E
10+50E
11+00E
11+50E
12+00E
12+50E
13+00E
13+50E
14+00E
14+50E
15+00E
0+00E
Series 1= Co ppm
Series 2= Ni ppm
Series 3= Cu ppm
Series 4= Au ppb
Series1
Series2
Series3
Series4

Fig.5

PRECIOUS METALS L1

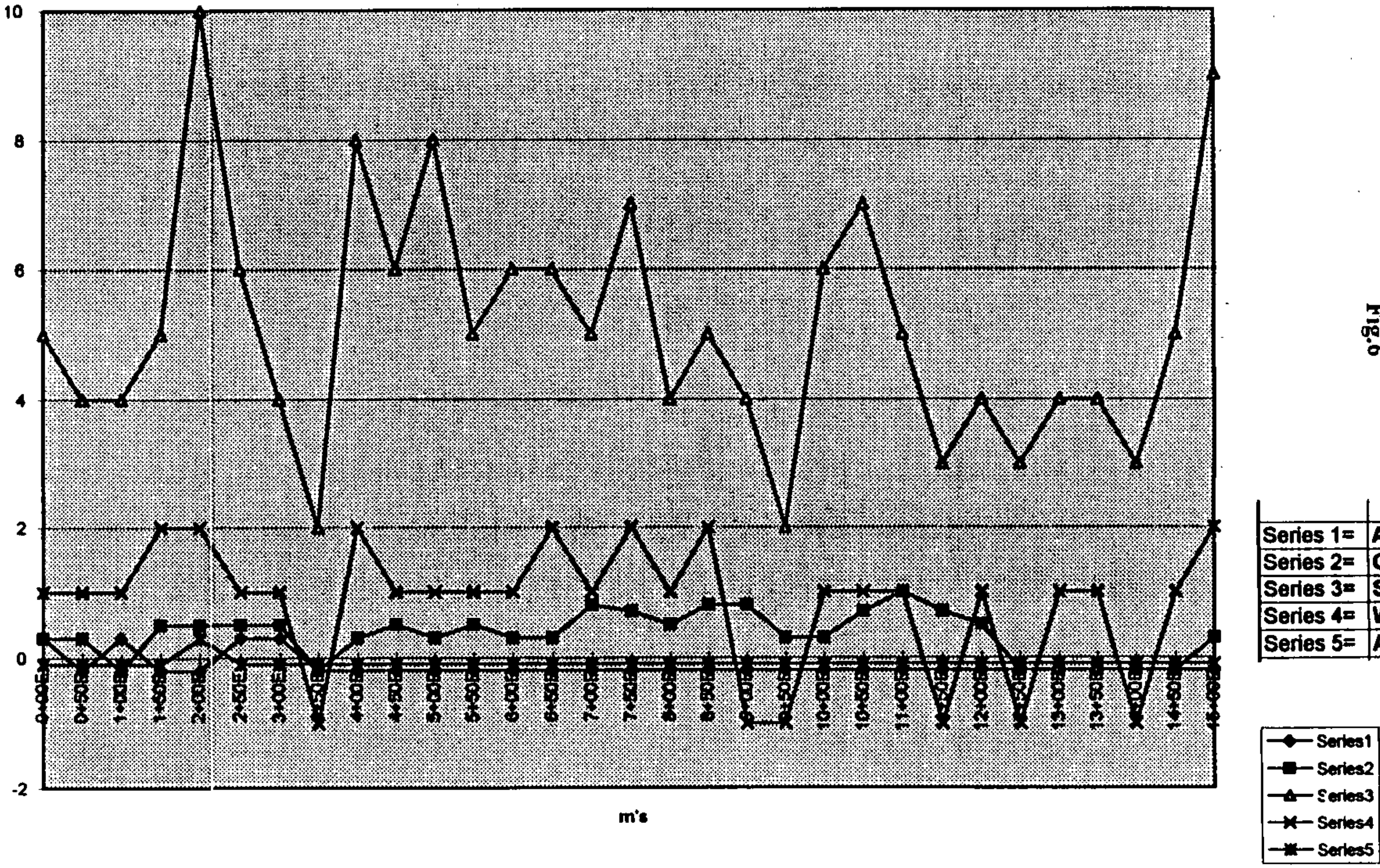

Fig.6

Series 1=	Ag ppm
Series 2=	Cd ppm
Series 3=	Sb ppm
Series 4=	W ppm
Series 5=	Au ppb

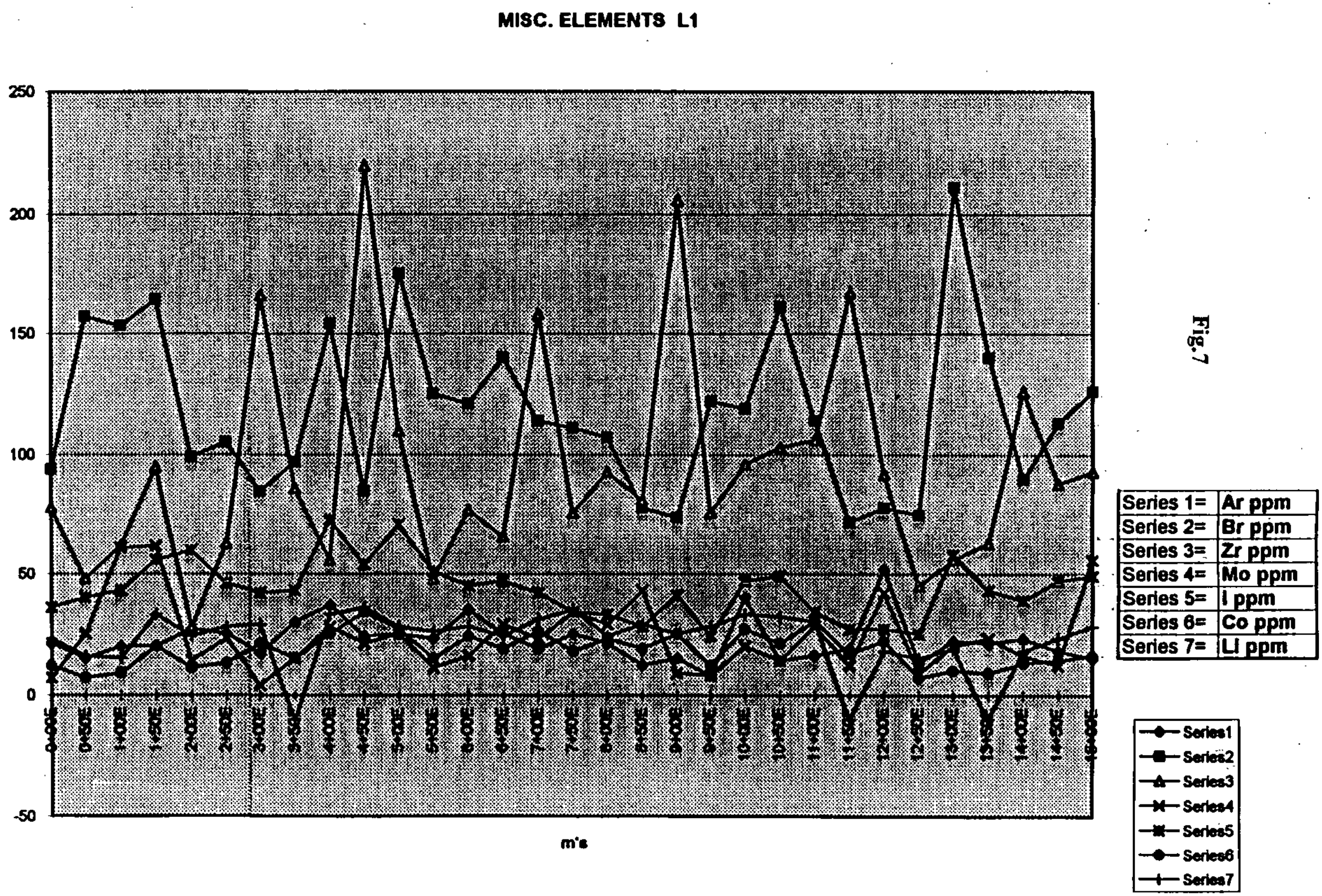
MISC. ELEMENTS L1
250
200
150
100
50
0
-50
0+00E
0+50E
1+00E
1+50E
2+00E
2+50E
3+00E
3+50E
4+00E
4+50E
5+00E
5+50E
6+00E
6+50E
7+00E
7+50E
8+00E
8+50E
9+00E
9+50E
10+00E
10+50E
11+00E
11+50E
12+00E
12+50E
13+00E
13+50E
14+00E
14+50E
15+00E
m's
Series 1= Ar ppm
Series 2= Br ppm
Series 3= Zr ppm
Series 4= Mo ppm
Series 5= I ppm
Series 6= Co ppm
Series 7= Li ppm
Series1
Series2
Series3
Series4
Series5
Series6
Series7

Fig.7

JACK Chart 3

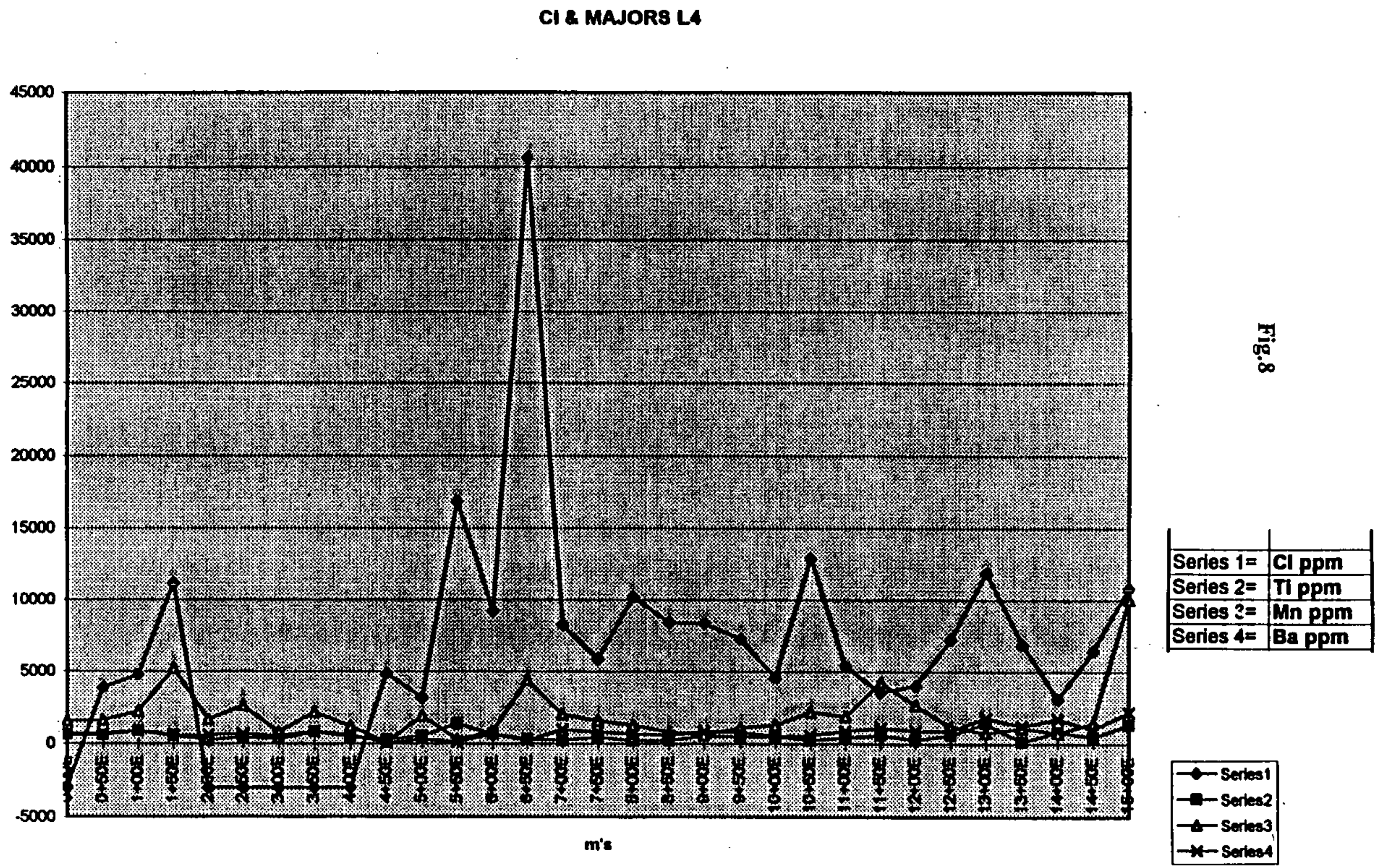

Fig.8

JACK Chart 2

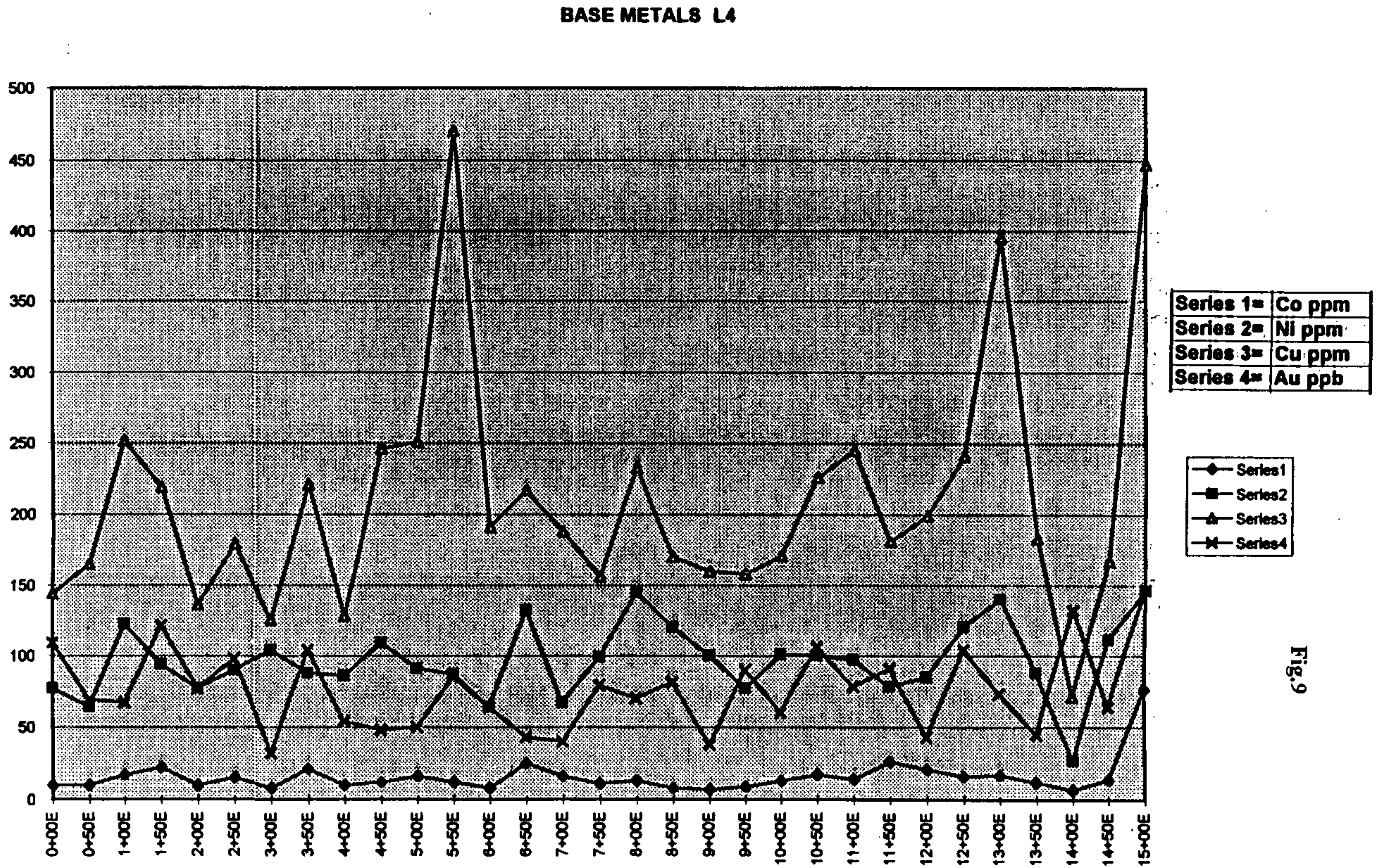

Fig.9

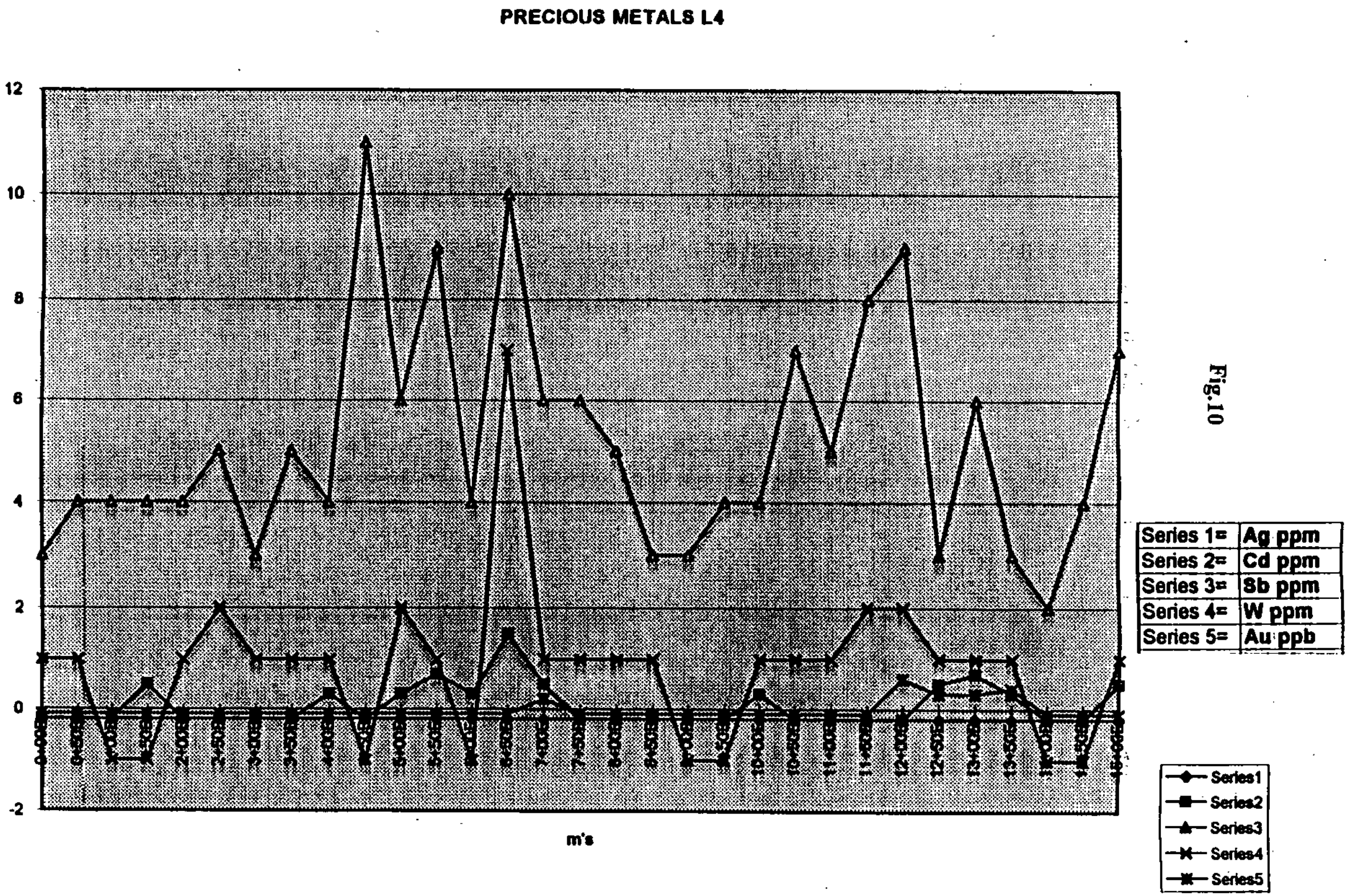
PRECIOUS METALS L4
12
10
8
6
4
2
0
-2
m's
Series 1= Ag ppm
Series 2= Cd ppm
Series 3= Sb ppm
Series 4= W ppm
Series 5= Au ppb
Series1
Series2
Series3
Series4
Series5

Fig.10

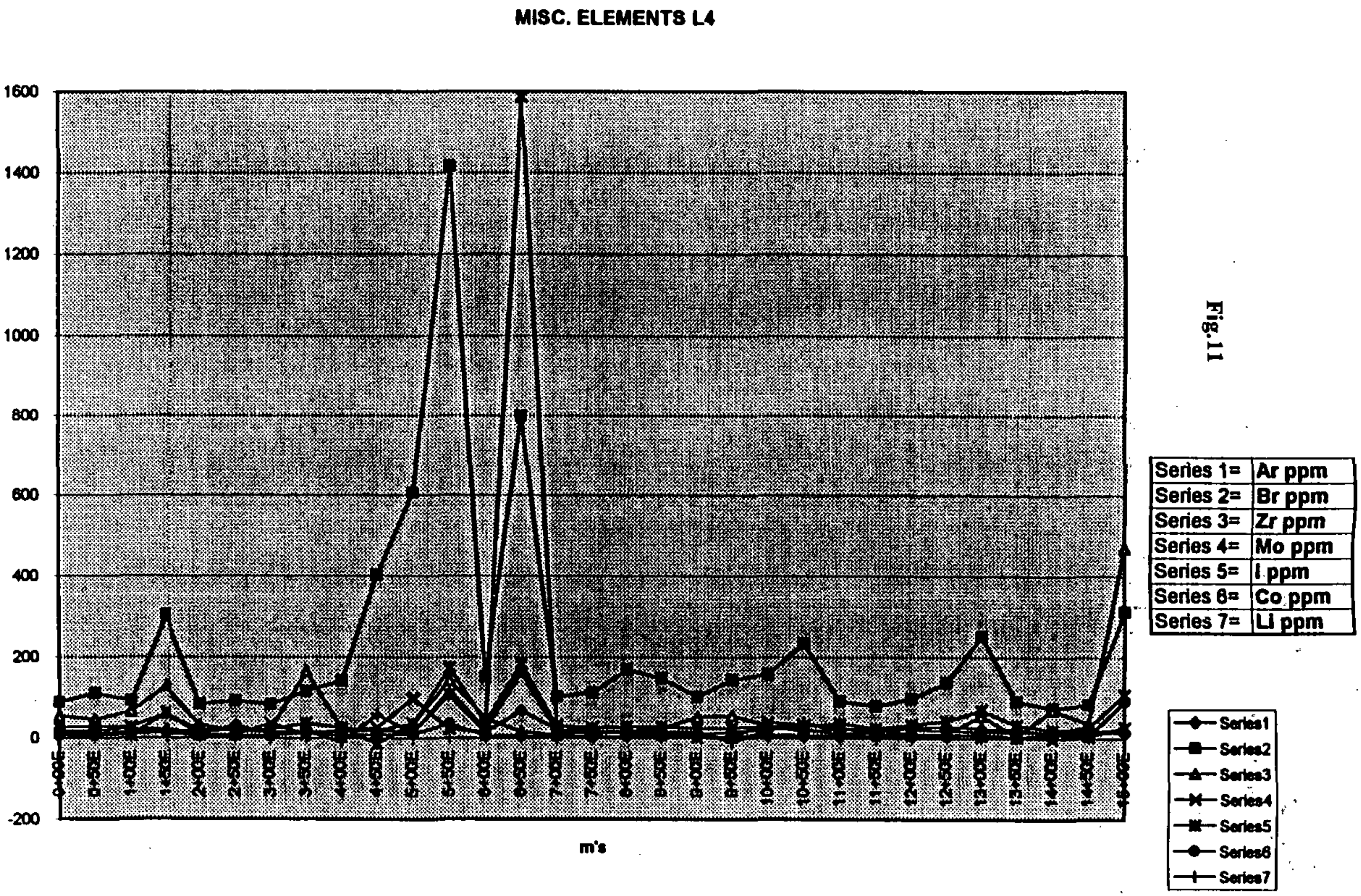
MISC. ELEMENTS L4
1600
1400
1200
1000
800
600
400
200
0
-200
m's
Series 1= Ar ppm
Series 2= Br ppm
Series 3= Zr ppm
Series 4= Mo ppm
Series 5= I ppm
Series 6= Co ppm
Series 7= Li ppm
Series1
Series2
Series3
Series4
Series5
Series6
Series7

Fig.11

JACK Chart 4

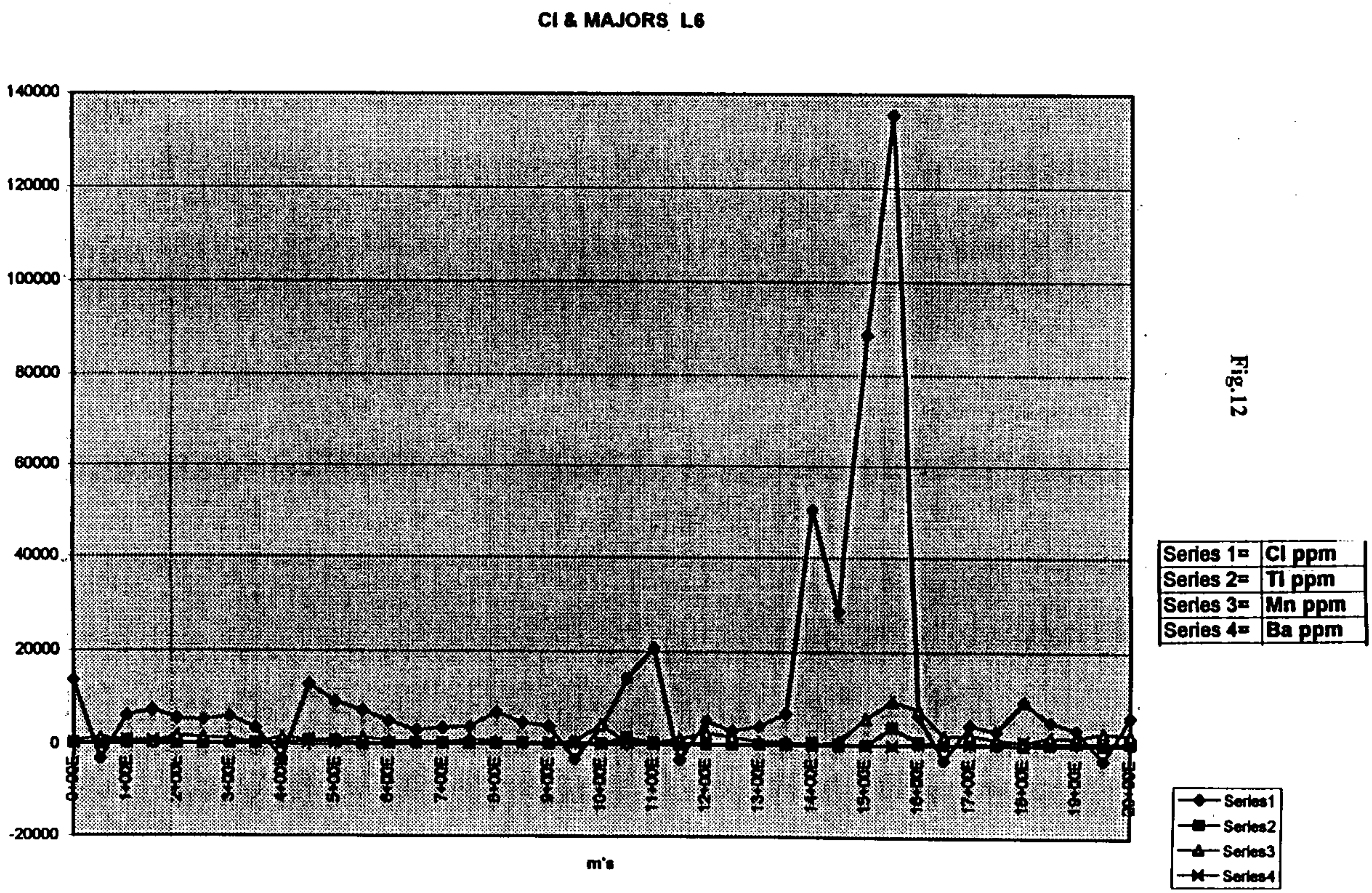

Fig.12

JACK Chart 3

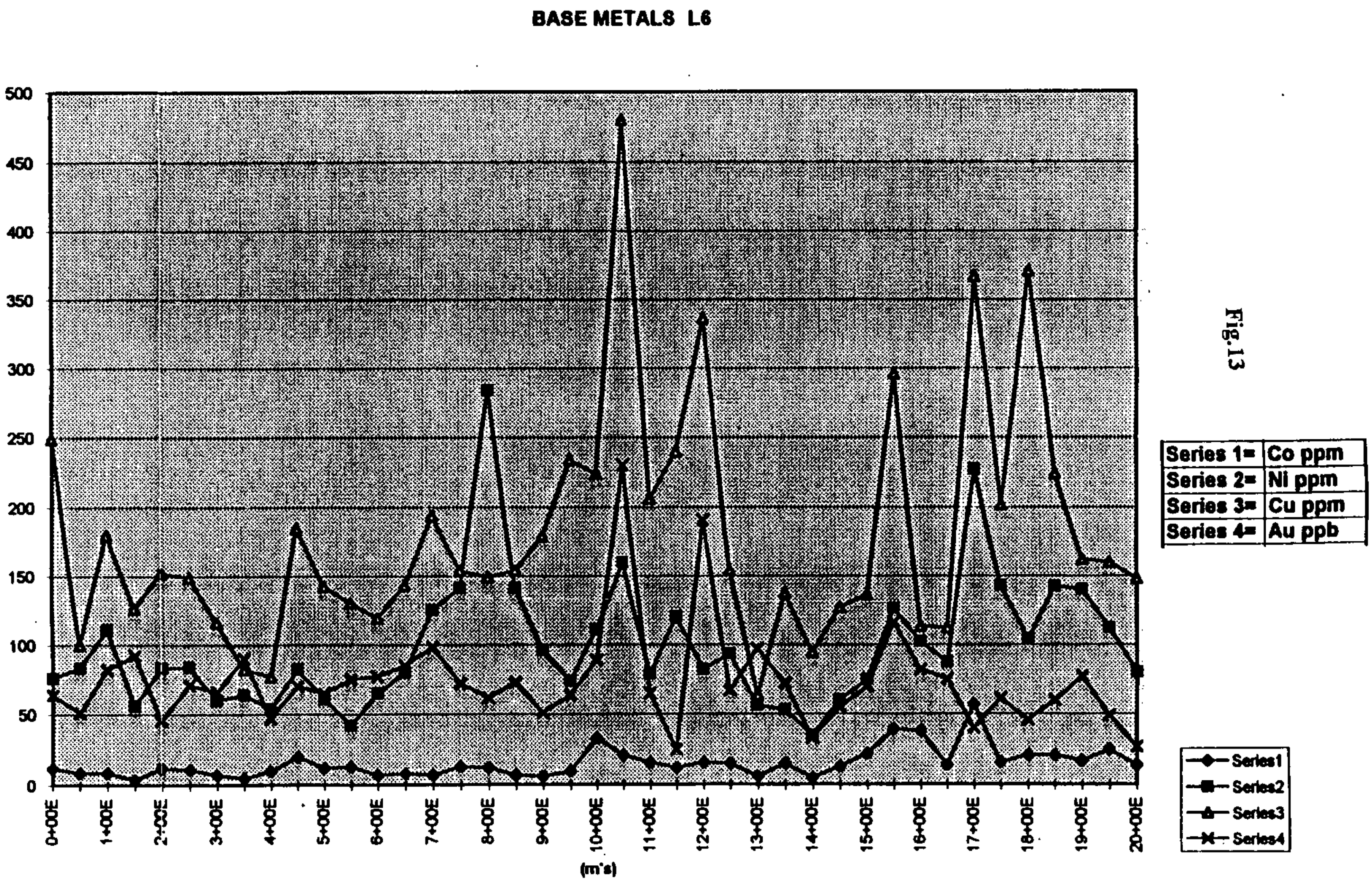

Fig.13

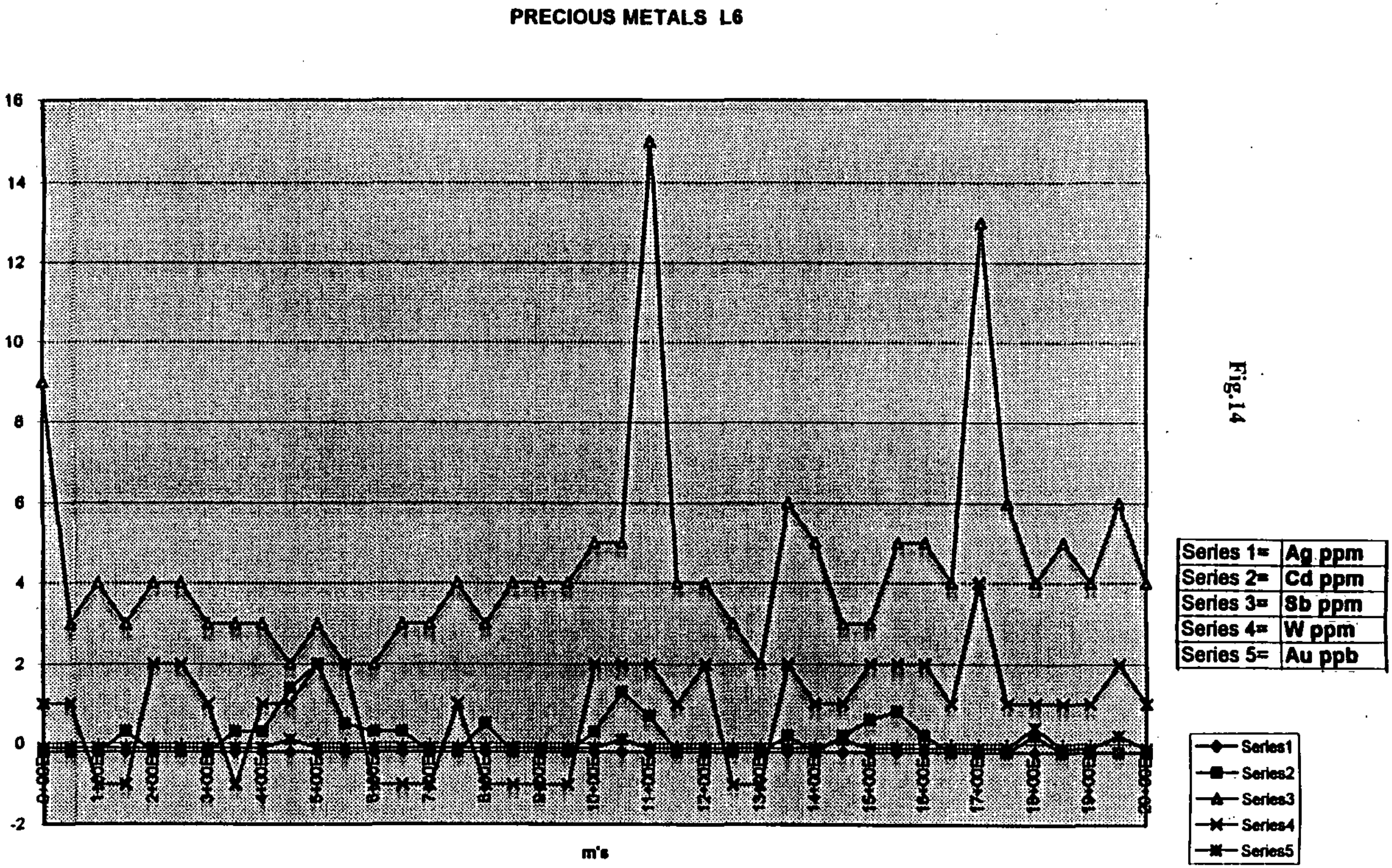
PRECIOUS METALS L6
16
14
12
10
8
6
4
2
0
-2
m's
Series 1= Ag ppm
Series 2= Cd ppm
Series 3= Sb ppm
Series 4= W ppm
Series 5= Au ppb
Series1
Series2
Series3
Series4
Series5

Fig.14

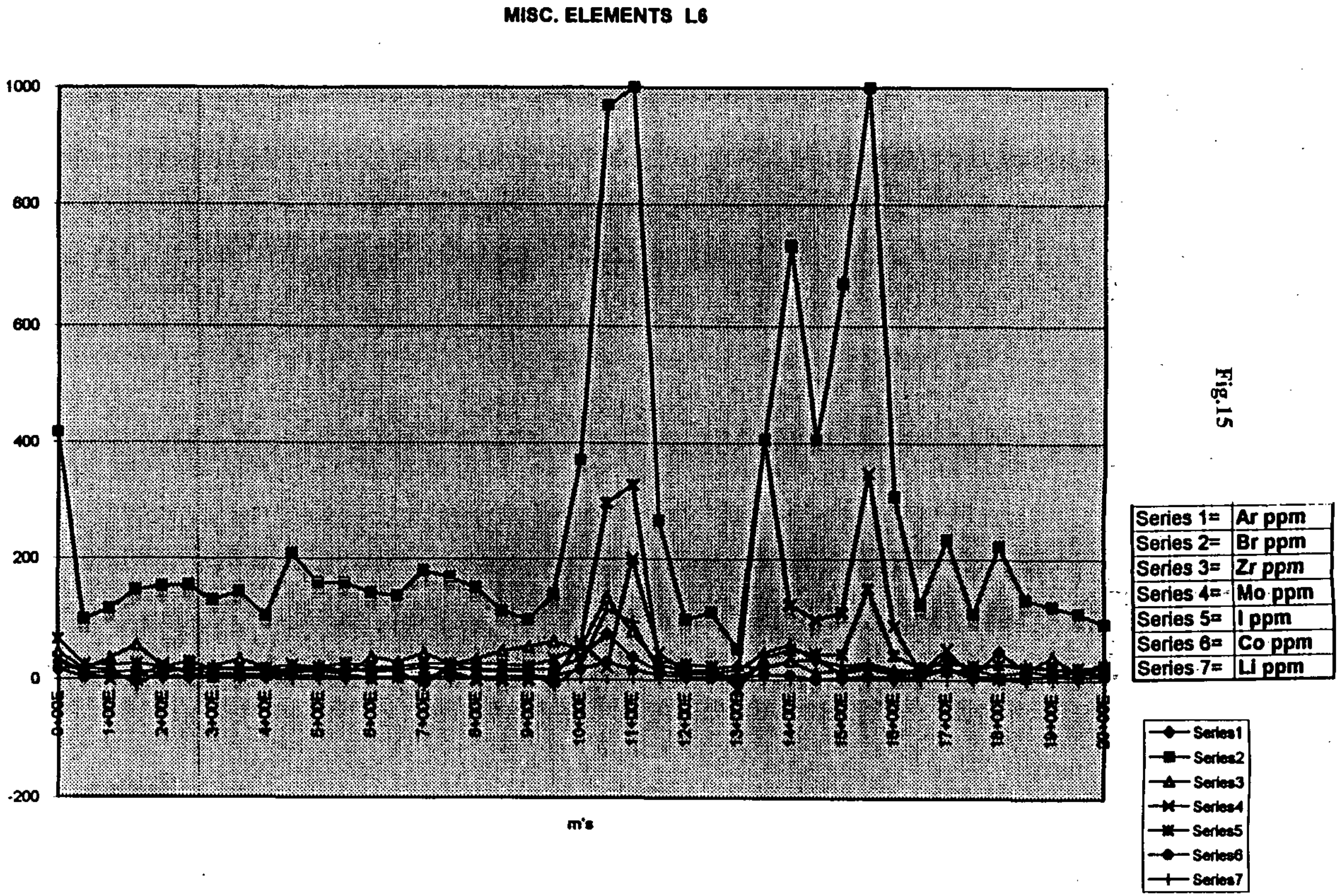
MISC. ELEMENTS L6
m's
Series 1= Ar ppm
Series 2= Br ppm
Series 3= Zr ppm
Series 4= Mo ppm
Series 5= I ppm
Series 6= Co ppm
Series 7= Li ppm
Series1
Series2
Series3
Series4
Series5
Series6
Series7

Fig.15

These anomalies when compared to the geology maps reflect areas over major NW trending fault zones and maybe related to Tertiary QFP dykes or structurally controlled propylytic zones. Numerous highly anomalous spot anomalies are present along the lines but these are believed to reflect fracture controlled diffusion anomalies of little economic interest.

H.- CONCLUSIONS

The Jacko property covers a large structurally controlled area dominated by Nicola volcanics. This region is controlled by large scale NW trending faults with Tertiary QFP dykes and structurally controlled propylytically altered zones. These systems are likely responsible for the geochemical enzyme leach anomalies (Cl, Cu, Ni, Sb, W, Br, Mo +/- Co, Au, Ag). These anomalies vary with lower intensity and a somewhat different element signature from surveys over known porphyry deposits. This combined with geological mapping and the absence of large scale alteration haloes indicates a low chance of a buried porphyry system being present. Unless a shift in priorities towards structurally controlled mineralization occurs ,no further work is recommended.

L- REFERENCES

Kwong, Y.T.J. (1987): Evoloution of the Iron Mask Batholith and its Associated Copper Mineralization ; B.C. Ministry of Energy Mines and Petroleum Resources, Bulletin 77.

Nicholls, E.B. (1965): Geophysical Report on Property of Bata Resources Ltd.

Northcote, K.E. (1974): Geology of the Northwest Half of Iron Mask Batholith, B.C. Dept. of Mines and Petroleum Res., Geological Fieldwork 1974, pp 22-26.

Seraphim, R.H. (1971): Report on Iron Mask Batholith area for Rolling Hills Copper Mines Ltd.

APPENDIX 1

COST STATEMENT

COST STATEMENT

1. Geological Mapping - G. Evans (April 17-21,24,25 1995) 7 days (@ $300.00/day)	$2100.00
2. Grid Preparation & Sample Collection -P.Watt (April 10-14,17) 6 days (@ $240.00/day)	$1440.00
3. Sample Preparation @ Eco-Tech Labs 103 samples (@ $1.96/sample)	$ 201.88
4. Analysis @ Activation Labs Ltd. 103 samples (@ $24.64/sample)	$2537.92
5.Supplies (bags, pickets, flagging etc.)	$ 210.00
6. Vehicle 12 days @ $40.00/day	$ 480.00
7. Report compilation and writing -G.Evans 5 days (@ $300/day)	$1500.00
8. Drafting -S. Archibald 4 days (@ $200/day)	$ 800.00
TOTAL =	**$9269.80**

APPENDIX 2

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Graeme Evans, do certify that:

1) I am a geologist and have practiced my profession for the last thirteen years.

2) I graduated from the University of British Columbia, Vancouver, British Columbia with a Bachelor of Science degree in Geology (1983).

3) I am a member in good standing with the APEGBC as a professional geoscientist.

4) I was actively involved and supervised the Jacko program and authored the report herein.

5) All data contained in this report and conclusions drawn from it are true and accurate to the best of my knowledge.

6) I hold no personal interest, direct or indirect in the Jacko property which is the subject of this report.

PROFESSIONAL
PROVINCE
G. W. EVANS
BRITISH COLUMBIA
GEOSCIENTIST

Graeme Evans
Senior Project Geologist
July, 1995

APPENDIX 3

ANALYTICAL PROCEDURE

ACTLABS

ACTIVATION LABORATORIES LTD

Ancaster, July 21, 1995

Teck Corporation
fax: (604)372-1285

ATTN: MR. EVANS

METHOD FOR ENZYME LEACH

Samples are dried below 40°C to avoid volatilization of halides. The samples are sieved at -60 mesh. A 1 gram aliquot is weighed into a test tube and leached at room temperature using the proprietary glucose oxidaze enzyme leach solution. After mixing on a vortex shaker the sample is allowed to sit for 1 hour before it is centrifuged. An aliquot is removed for analysis with a volumetric pipette and an internal standard is added. After an appropriate time the samples are run on a Perkin-Elmer ELAN 5000 ICP/MS or a Perkin Elmer ELAN 6000 ICP/MS.

Approximately 7% of the samples are replicated and an internal standard is used as a check for every 40 samples. Calibration is achieved with synthetic standards.

If you require any further information, please do not hesitate to call me.

Sincerely yours

Eric L. Hoffman, Ph.D
President

FAXED

1336 SANDHILL DRIVE, ANCASTER, ONTARIO, CANADA L9G 4V5 • TEL: 905-648-9611 • FAX: 905-648-9613

SAMPLE COLLECTION FOR ENZYME LEACH ANALYSES: MINERAL AND PETROLEUM EXPLORATION

THEORY

The Enzyme Leach rapidly dissolves amorphous manganese dioxide, while crystalline phases of MnO_2 are only mildly attacked. Amorphous MnO_2 is a very effective trap for a wide variety of cations, anions, and polar molecules, while crystalline MnO_2 phases trap a few cations of certain sizes and charges. Therefore, selectively leaching soils or sediments for amorphous manganese dioxide has distinct advantages in mineral exploration.

Amorphous MnO_2 is found in the oxide coatings on mineral grains in soils and sediments. It is metastable in the natural environment, and it typically accounts for less that 5% of the total manganese dioxides in *B*-horizon soils. It is rapidly leached from soil horizons that contain decaying organic matter. Also, once removed from the active zone of chemical weathering in soils, amorphous manganese dioxide will probably slowly become crystalline over an extended period of time, loosing much of its effectiveness as a mineral exploration media. This may happen as basin fill buries old soils over tens of thousands of years. Once sediments in streams or lakes are buried and removed from the active layer of sedimentation, decaying organic matter will reduce and dissolve manganese oxides. Therefore, depth of sample collection is critical to successful use to the Enzyme Leach.

Although the Enzyme Leach can be used as a partial-analysis method for virtually any surficial geological material, the sample media most commonly analyzed with this method is *B*-horizon soils. Research to date indicates that amorphous MnO_2 in soils is most abundant in the *B* horizon. This horizon is the most chemically active part of the soil, with regard to the formation of oxide coatings on mineral grains. Studies in both arid and humid climates indicate that the sampler should be careful to collect soil samples from the *B* horizon.

PRACTICE

The following information is based on observations from studies in glacially-buried terrain in northern Minnesota, desert pediments in Nevada, in the Colorado Front Range, and over oil fields in western Wyoming and southeastern Texas. Soil horizons vary in appearance and depth, even within relatively small areas. It should be emphasized that the samplers should be collecting material from a consistent soil horizon, rather than a consistent depth. The samplers should be encouraged to expose the soil profile whenever they encounter soil zoning that varies from previous observations. Before beginning, it is a good idea to observe soils profiles in ditches and trenches in and near the area to be sampled.

The best potential sample sites are those that appear to be undisturbed and that have mature vegetation growing on and around the site. Samples collected from trenches and pit cuts are also good, as long as a fresh surface is scraped on the face of the soil profile to be sure that you are collecting freshly exposed material. Ditch banks, on the side away from infrequently used roads, under most circumstances can also be good sample sites, after scraping the bank to expose fresh material. The sampler should observe the conditions at such sites and make a judgement about the potential for contamination or of excessive disturbance. Road fill (new or old) is not usable sample material. You do not know if the fill was derived form the ditches on either side or if it was trucked in from some distance. Also, roads are often contaminated with a variety of pollutants that can linger for centuries. Ploughed fields can provide usable samples, if an undisturbed site is not available. It is better to move a sample site a *relatively short distance rather than to use a bad site just because it is at the* specified spot.

The Enzyme Leach will not dissolve metallic gold. Oxidized gold in soils appears to be an indicator of high oxidation potential, and it is dissolved by the Enzyme Leach. Wearing gold jewelry while sampling will not effect the results of Enzyme Leach surveys. However, there is always the possibility that your company will have conventional low-level gold analyses performed at a later time on the samples you collect. Therefore, it is recommended that you eliminate the possibility of contamination.

Desert-Pediment Soils

There is an adage to the effect that desert soils are not zoned (azonal). In most cases this is not true. The appearance of the horizons is different from soils in humid climates, but they are still zoned. The current surface on many desert pediments is more than one million years old, which more than sufficient time for soil horizons to develop.

Relatively little organic matter is found in *A*-horizon soils in desert climates. The *A* horizon is typically a light-gray to light-grayish-tan, loose, fine sand to silt. Descending through the soil profile, the *B* horizon begins where the soil is more cemented and slightly darker in color, often becoming slightly more brown than the overlying loose material. The brown color often becomes darker farther down into the *B* horizon, but in other cases, the color difference between the *A* and *B* horizons is almost imperceptible. Where the color changes are minimal, a key criteria is that the cementing of the grains in the *B* horizon often produces a blocky fracture that is absent in the *A* horizon.

In areas that have a history of previous mining activity, the upper centimeter of the *A* horizon can be highly contaminated with many trace elements. Rarer elements, such as gold, can be enriched by as much as 10- to 100-times background. The *A* horizon should scraped from the area around the spot to be samples for a radius large enough to prevent this contaminated material from trickling into the sample material. Tests involving sampling in and below the caliche layer have not been completed. All the Enzyme Leach studies performed to date have used *B*-horizon soils collected above the caliche layer.

Humid Climate Soils

Sample sites with the best developed soil horizons are usually found in groves of trees. In northern climates, aspen groves are the best. The *A* horizon consists of an upper humus layer, a dark layer of mixed organic and mineral matter, and there may have a bleached mineral layer at the bottom. The bleached layer results from the reducing action of the overlying organic-rich layers, which dissolves oxide coatings on mineral grains. The top of the *B* horizon is the point below which there is no organic matter and where oxide coatings are found on mineral grains. Iron oxide coatings typically give *B*-horizon soils colors that are some shade of brown or red (dark brown, medium brown, light brown, brick red, tan, orange, etc.). Where the *A* horizon is quite thick, such as around bogs, there is often a faintly gray layer beneath the bleached layer of the *A* horizon. The faint gray color is due to manganese oxides, and this material is usable *B* horizon, if a darker colored *B*-horizon layer is not available. In a humid forested area all the material comprising the *A* horizon of the soil (decaying leaf litter, humus, and organic-rich mineral layers) should be scraped away to reveal the *B* horizon. The sample is collected from 10 to 30 centimeters into the top of the B horizon. *A*-horizon contamination of *B*-horizon samples should be avoided as much as possible.

Mountain Soils and Glacially Scoured Terrain

Due to the rapid rate of mechanical weathering in mountainous areas, there are localities where the soil is truly azonal. During Pleistocene glaciation, the regolith was completely removed in many areas and a mature soil profile has not had sufficient time to redevelop. In such cases the sampler should dig deep enough to obtain soil material that is as free of organic matter as possible.

Sediments

Stream-sediment samples should be collected from the top 10 centimeters of the active sediment. Lake-sediment samples should be collected from the top 3 to 5 centimeters of the sediment section.

SAMPLE HANDLING

Your samples should consist of about 250 to 500 grams of material (1/2 to 1 pound). If at all possible, the sample should be air dried. If circumstances require the use of a drying oven, the temperature should not exceed 35°C, and the drying time should not be longer than is necessary to dry the sample. Let the laboratory perform the sample preparation. They know which sieve sizes to use, and what steps must be followed to maintain the geochemical integrity of the sample material.

Pulverized samples and samples that have been "cooked" are not suitable for analysis with the Enzyme Leach.

ENZYME LEACHING OF SOILS DEVELOPED ON TRANSPORTED OVERBURDEN ENHANCES ANOMALIES NEAR BURIED MINERAL DEPOSITS

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Amorphous manganese dioxide, which is commonly a very small part of the total manganese oxides in soils, is one of the most efficient natural traps for trace elements that are mobilized in the surface and near-surface environment. The large surface area and the random distribution of charges on the irregular surface of this material make it an ideal adsorber for numerous cations, anions, and polar molecules with widely varying chemical characteristics. By contrast, crystalline manganese-oxide phases effectively trap only a few trace metals. Trace elements adsorbed by amorphous MnO_2 in soils are often indicative of the chemistry of oxidizing mineral occurrences in the bedrock rather than the composition of transported overburden from which the soils formed. Thus, in many mineral exploration situations, there are distinct advantages to selectively leaching samples for amorphous manganese dioxide rather than all the manganese oxides in soils.

An enzyme leach preferentially leaches amorphous manganese-oxide coatings on mineral grains. Glucose oxidase reacts with dextrose in the leach solution to produce trace amounts of hydrogen peroxide and gluconic acid. Dilute hydrogen peroxide readily reduces and dissolves amorphous manganese dioxide, releasing trace elements trapped in that compound, whereas crystalline manganese-oxide phases are only weakly attacked. Gluconic acid complexes the metals that are released and keeps them in solution. The enzyme reaction stops once the products of the glucose oxidase-dextrose reaction are no longer being consumed. The hydrogen peroxide concentration probably never exceeds 40 μg/L, and sufficient gluconic acid is produced to complex the metals solubilized by the process. In effect, the leaching process turns itself off after all the amorphous manganese dioxide in each sample has been reacted. This self-limiting characteristic of the enzyme leach minimizes dissolution of trace elements from mineral substrates and consequently greatly enhances the contrast of trace-element anomalies. The low concentration of hydrogen peroxide will not appreciably attack oxidizable materials in the sample or produce undesirable precipitation of metal peroxides. However, the hydrogen peroxide concentration is sufficient to suppress the dissolution of ferric hydroxide. The low concentration of the weak organic acid generated will not appreciably increase the hydrolysis of silicate minerals in the samples. The same results cannot be achieved by artificially mixing diluted hydrogen peroxide and a weak organic acid with samples.

In laboratory tests, the enzyme leach rapidly dissolves large quantities of amorphous MnO_2. Tests have also been performed that showed that highly concentrated hydrogen peroxide reacted relatively slowly with crystalline manganese-oxide phases. In a set of 1,670 B-horizon soil samples collected in northern Minnesota, on average, the enzyme leach dissolved less than five percent of the total manganese present as manganese oxides. Therefore, laboratory and field studies confirm that the enzyme leach tends to selectively dissolve the most reactive portion of the manganese oxides present in the sample, which are amorphous and semiamorphous manganese dioxide. Studies in both arid and humid climates indicate that the greatest proportions of active amorphous manganese dioxide coatings on mineral grains in soil are found in the B horizon.

The enzyme leach is not prone to generating false anomalies. Detailed statistical studies of enzyme-leach data from these 1,670 B-horizon samples revealed distinctly anomalous populations for numerous elements. Among the background populations, positive correlations were found between Mn and elements such as Co, Ni, Ba, and Zn. However, when restricting the statistical analyses to samples that were anomalous in these metals, there were no correlations between the leachable concentrations of these trace elements and enzyme-leachable Mn. Thus, the anomalies detected in this sample set were not the result of high concentrations of manganese in the soils.

The enzyme leach has been successfully used for mineral assessment studies in an area of northern Minnesota characterized by complex glacial tills, which are capped by glacial-lake sediments. Throughout much of the area, surface drainage is very poorly developed, and the water table is quite near the surface. Ground-water flow apparently is the primary mechanism by which trace elements are dispersed from mineralized bedrock and basal till. Varved lake sediments are not a long-term barrier to the dispersal of trace elements in ground water. Enzyme leach analyses of B-horizon soils from that area typically produced higher anomaly contrasts than were found in aspen and willow stems collected at the same sites. Chemical analyses of A-horizon soils often did not reflect these vegetation and B-horizon anomalies. Evidently, trace elements in plant litter are rapidly leached from the A-horizon and carried down to the B horizon, where they are trapped mostly in oxide coatings on mineral grains. Thus, in a humid northern-latitude climate, B-horizon soils apparently act as long-term integrators of vegetation anomalies.

A high degree of apparent basement structural and stratigraphic control of enzyme-leach B-horizon anomalies was observed in northern Minnesota. Anomalies often were found along, or less than two kilometers down ice from, the trace of buried bedrock features. B-horizon Ag, As, Bi, Te, and W anomalies occur along several quartz-chlorite-carbonate-altered shear zones that have been interpreted as having potential for lode-gold deposits. Zinc, Cu, and metals that substitute for Zn and Cu in sulfide minerals are often found to be present in anomalous concentrations along buried exhalative horizons. Alignments of B-horizon Co, Tl, Ag, Ni, As, and Sb anomalies often define geochemical trends that appear to be related to Proterozoic veins. Some of these trends provide evidence of a possible vein-Ag district south of International Falls. Enzyme-leach bromine and iodine anomalies are often associated with base-metal anomalies in B-horizon soils directly over mineralized structures or strata.

The enzyme leach has also been used to analyze B-horizon soils in pilot studies near four pediment-covered gold deposits within the Basin and Range Province, including the Sleeper and Rabbit Creek mines. Anomaly contrasts in these four pilot studies often exceeded 50 times the background, and at Rabbit Creek, a very-high-contrast soil anomaly, with contrast greater than

100 times the background, was found above mineralized bedrock covered by 600 feet of basin fill. At these four deposits, strong correlations were found between the concentrations of halogens and trace metals (As, Mo, Re, Sb, and V) that form volatile halides or oxyhalides under acid-oxidizing conditions. Based on an electrochemical model for the oxidation of buried mineralized bodies, such conditions might be expected around the edges of weathering sulfide-mineralized bedrock bodies. As predicted, the highest contrast anomalies are typically found in soils over the periphery of mineralized bedrock. These observations suggest that the very high contrast enzyme-leach soil anomalies found on these desert pediments result from diffusion of relatively volatile phases away from acid-oxidizing conditions. The key halogen—trace metal associations vary from one deposit to another, depending on the chemistry of the mineralized bedrock.

Using the enzyme leach to selectively leach amorphous manganese dioxide in soils provides a useful tool for geochemical exploration in areas where the bedrock is masked by transported overburden. Although the B horizon is the ideal sample media in both humid and arid climates, the mechanisms of anomaly formation are apparently different in the two climates. The most dramatic anomaly contrasts are typically found in arid climates. However, enzyme-leachable halogen anomalies are found to correlate with metal anomalies in the B-horizon soils near mineralized bedrock under both arid and humid conditions. This suggests that electrochemical reactions may play a similar role in the formation of anomalies above bedrock sources in either environment.

APPENDIX 4

CERTIFICATES OF ANALYSES

Enzyme Leach Job #: 1360 Company: Teck Exploration Ltd. Geologist: G. Evans Customer's Job #: 1732
Trace Element Values Are in Parts Per Billion. Negative Values Equal Not Detected at That Lower Limit.
Values = 999999 are greater than working range of instrument.

Sample ID:		Li	Be	Cl	Sc	Ti	V	Mn	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Rb	Sr	Y
L1+00N	0+00E	23	-10	5,599	-10	1,085	568	2,915	23	89	211	57	5	-1	21	-30	94	15	1,120	16
L1+00N	0+50E	16	-10	7,418	-10	428	273	1,261	10	95	177	56	3	-1	15	-30	157	8	758	11
L1+00N	1+00E	15	-10	8,238	-10	644	284	1,825	16	89	330	78	4	-1	20	-30	153	10	1,030	14
L1+00N	1+50E	33	-10	22,759	-10	1,015	629	5,094	23	66	419	102	5	-1	20	-30	164	21	1,890	28
L1+00N	2+00E	24	-10	3,365	-10	899	609	4,335	36	213	844	57	3	-1	27	-30	99	18	1,066	12
L1+00N	2+50E	28	-10	-3,000	-10	773	505	3,547	25	127	349	71	5	-1	25	-30	105	12	897	13
L1+00N	3+00E	29	-10	-3,000	-10	1,096	381	2,457	25	106	284	86	6	-1	17	-30	85	15	890	33
L1+00N	3+50E	-10	-10	4,334	-10	669	377	1,494	9	27	372	39	3	-1	30	-30	97	4	961	20
L1+00N	4+00E	33	-10	6,574	-10	898	941	3,981	40	205	532	70	5	-1	37	-30	154	13	808	24
L1+00N	4+50E	36	-10	5,889	-10	1,304	653	4,238	40	145	374	102	6	-1	24	-30	85	16	1,078	38
L1+00N	5+00E	28	-10	4,790	-10	1,232	652	4,157	39	178	401	82	5	3	25	-30	175	16	1,073	31
L1+00N	5+50E	26	-10	33,086	-10	603	522	2,727	21	152	206	75	2	-1	23	-30	125	8	867	14
L1+00N	6+00E	28	-10	8,843	-10	730	659	3,921	37	175	317	121	3	-1	35	-30	121	8	826	23
L1+00N	6+50E	24	-10	10,841	-10	1,035	574	4,966	36	114	235	64	6	-1	25	-30	140	11	999	14
L1+00N	7+00E	31	-10	11,396	-10	972	375	5,374	38	159	642	207	4	-1	19	-30	114	10	1,261	32
L1+00N	7+50E	35	-10	13,005	-10	1,011	468	6,111	51	266	759	157	5	-1	25	-30	111	17	1,009	15
L1+00N	8+00E	24	-10	9,852	-10	1,084	430	4,686	36	138	218	92	5	-1	21	-30	107	17	964	19
L1+00N	8+50E	29	-10	8,130	-10	921	365	999999	67	182	480	184	6	-1	12	-30	78	32	990	13
L1+00N	9+00E	25	-10	13,789	-10	1,220	441	7,481	48	96	172	133	6	-1	15	-30	74	17	1,169	18
L1+00N	9+50E	28	-10	4,057	-10	236	253	2,849	14	127	131	109	3	-1	8	-30	122	14	892	19
L1+00N	10+00E	33	-10	11,700	-10	701	488	5,733	41	255	728	161	3	-1	40	-30	119	10	916	29
L1+00N	10+50E	32	-10	9,655	-10	783	315	5,750	58	311	1,206	278	4	1	14	-30	161	35	845	20
L1+00N	11+00E	30	-10	11,326	-10	767	592	5,454	60	407	663	154	4	-1	16	-30	114	25	1,043	32
L1+00N	11+50E	-10	-10	6,623	-10	807	207	5,248	19	39	148	65	3	-1	19	-30	72	13	1,096	13
L1+00N	12+00E	18	-10	9,118	-10	660	392	4,392	30	232	182	145	2	-1	52	-30	78	25	1,527	14
L1+00N	12+50E	15	-10	6,114	-10	174	213	1,402	11	132	134	63	2	-1	13	-30	75	17	1,054	13
L1+00N	13+00E	19	-10	-3,000	-10	262	513	1,772	24	113	284	66	2	-1	22	-30	211	8	642	15
L1+00N	13+50E	-10	-10	3,042	-10	554	465	2,736	15	52	193	55	4	-1	21	-30	140	11	950	6
L1+00N	14+00E	18	-10	3,200	-10	981	253	4,848	26	37	88	65	5	-1	23	-30	90	25	887	10
L1+00N	14+50E	23	-10	-3,000	-10	979	568	3,361	33	223	218	53	5	-1	18	-30	113	13	851	15
L1+00N	15+00E	28	-10	3,428	-10	782	476	999999	51	107	146	107	5	-1	15	-30	126	22	1,061	12
L4+00N	0+00E	19	-10	-3,000	-10	575	223	1,572	10	77	144	109	2	-1	11	-30	88	21	992	7
L4+00N	0+50E	18	-10	3,859	-10	552	214	1,611	10	64	165	69	3	-1	10	-30	110	17	867	6
L4+00N	1+00E	23	-10	4,771	-10	850	401	2,198	17	122	252	67	4	-1	15	-30	92	14	868	11
L4+00N	1+50E	20	-10	11,121	-10	566	269	5,191	22	94	219	121	2	-1	14	-30	304	28	4,153	18
L4+00N	2+00E	15	-10	-3,000	-10	225	248	1,675	10	77	136	77	2	-1	9	-30	83	6	711	3
L4+00N	2+50E	19	-10	-3,000	-10	432	303	2,603	15	90	179	98	2	-1	31	-30	91	9	873	5
L4+00N	3+00E	13	-10	-3,000	-10	299	163	781	8	104	125	32	1	-1	10	-30	82	9	770	4
L4+00N	3+50E	17	-10	-3,000	-10	807	249	2,170	21	88	221	104	4	-1	14	-30	115	14	822	19
L4+00N	4+00E	-10	-10	-3,000	-10	467	305	1,206	10	86	128	54	2	-1	15	-30	141	7	1,354	8
L4+00N	4+50E	58	-10	4,862	-10	259	362	82	12	109	246	48	1	-1	18	36	403	19	223	6
L4+00N	5+00E	13	-10	3,171	-10	507	250	1,918	16	91	251	50	3	-1	14	-30	606	20	2,281	7

Enzyme Leach Job #: 1360 Company: Teck Exploration Ltd. Geologist: G. Evans Customer's Job #: 1732

Trace Element Values Are in Parts Per Billion. Negative Values Equal Not Detected at That Lower Limit.

Values = 999999 are greater than working range of instrument.

Sample ID:		Li	Be	Cl	Sc	Ti	V	Mn	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Rb	Sr	Y
L6+00N	11+00E	95	-10	20,766	-10	664	318	557	16	79	206	65	6	-1	37	-30	1,652	92	7,486	10
L6+00N	11+50E	12	-10	-3,000	-10	293	245	1,526	12	120	240	25	2	-1	15	-30	266	16	1,423	8
L6+00N	12+00E	14	-10	5,417	-10	202	243	2,853	16	82	336	191	2	-1	10	-30	100	14	943	4
L6+00N	12+50E	13	-10	3,309	-10	341	179	1,971	15	93	154	67	2	-1	10	-30	112	15	836	3
L6+00N	13+00E	16	-10	4,305	-10	361	139	1,003	6	56	64	97	2	-1	6	-30	51	13	730	3
L6+00N	13+50E	45	-10	6,988	-10	444	214	958	15	53	137	72	-1	-1	23	-30	406	16	3,546	9
L6+00N	14+00E	58	-10	50,461	-10	776	329	267	5	35	94	33	2	-1	31	-30	732	52	7,140	6
L6+00N	14+50E	34	-10	28,698	-10	141	353	1,068	13	60	127	55	-1	-1	35	-30	405	27	46,880	3
L6+00N	15+00E	24	-10	88,745	-10	292	239	5,991	22	75	136	70	1	-1	12	-30	670	29	15,997	5
L6+00N	15+50E	28	-10	135,476	-10	4,056	358	9,689	39	126	296	116	2	-1	20	151	2,076	18	21,788	11
L6+00N	16+00E	17	-10	6,606	-10	1,007	242	7,886	38	102	113	82	2	-1	10	-30	307	17	6,800	5
L6+00N	16+50E	11	-10	-3,000	-10	381	313	2,209	14	87	112	75	2	-1	12	-30	125	10	865	6
L6+00N	17+00E	40	-10	4,607	-10	627	719	2,421	57	227	367	40	4	-1	21	-30	233	14	1,824	11
L6+00N	17+50E	19	-10	3,334	-10	455	315	1,524	16	143	202	61	3	-1	10	-30	110	14	748	5
L6+00N	18+00E	26	-10	9,569	-10	176	530	1,015	21	104	371	46	2	-1	47	-30	222	24	2,251	4
L6+00N	18+50E	26	-10	5,346	-10	457	470	2,023	21	142	224	60	2	-1	17	-30	134	11	680	5
L6+00N	19+00E	20	-10	3,648	-10	698	281	1,908	17	140	162	77	2	-1	10	-30	122	12	824	8
L6+00N	19+50E	14	-10	-3,000	-10	192	345	3,016	25	112	160	49	2	-1	15	-30	111	10	794	5
L6+00N	20+00E	13	-10	6,346	-10	529	231	2,491	14	80	148	27	3	-1	8	-30	94	7	946	7

Enzyme Leach Job #: 1360
Trace Element Values Are in Parts Per Billi
Values = 999999 are greater than workin

Sample ID:		Zr	Nb	Mo	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy
L1+00N	0+00E	78	-1	7	-1	-1	-1	0.3	0.3	-0.2	-1	5	1	36	1	812	8	12	3	13	2	1	3	-1	3
L1+00N	0+50E	48	-1	25	-1	-1	-1	-0.2	0.3	-0.2	-1	4	1	40	-1	565	5	7	2	10	2	-1	2	-1	2
L1+00N	1+00E	62	-1	61	-1	-1	-1	0.3	-0.2	-0.2	1	4	2	43	-1	860	8	9	3	12	3	-1	3	-1	2
L1+00N	1+50E	95	-1	62	-1	-1	-1	-0.2	0.5	-0.2	1	5	-1	56	1	1,849	12	20	5	18	4	2	5	-1	4
L1+00N	2+00E	28	-1	14	-1	-1	-1	-0.2	0.5	-0.2	-1	10	-1	60	-1	935	7	11	3	10	2	-1	3	-1	2
L1+00N	2+50E	63	-1	23	-1	-1	-1	0.3	0.5	-0.2	1	6	-1	46	-1	717	7	13	3	11	2	-1	3	-1	2
L1+00N	3+00E	166	-1	4	-1	-1	1	0.3	0.5	-0.2	1	4	-1	42	-1	1,192	14	21	6	25	6	2	6	-1	5
L1+00N	3+50E	86	-1	15	-1	-1	-1	-0.2	-0.2	-0.2	-1	2	1	43	-1	349	9	15	4	14	3	1	4	-1	3
L1+00N	4+00E	56	-1	28	-1	-1	-1	-0.2	0.3	-0.2	1	8	2	73	-1	1,067	12	25	5	19	4	1	5	-1	4
L1+00N	4+50E	220	2	21	-1	-1	1	-0.2	0.5	-0.2	1	6	1	54	-1	1,743	17	34	8	31	6	2	7	-1	7
L1+00N	5+00E	110	1	25	-1	-1	-1	-0.2	0.3	-0.2	1	8	2	71	1	913	15	27	6	26	5	2	6	-1	5
L1+00N	5+50E	48	-1	11	-1	-1	-1	-0.2	0.5	-0.2	-1	5	-1	51	-1	786	7	15	3	11	2	-1	3	-1	2
L1+00N	6+00E	77	-1	16	-1	-1	-1	-0.2	0.3	-0.2	-1	6	1	45	-1	847	10	24	5	18	4	1	5	-1	4
L1+00N	6+50E	66	-1	29	-1	-1	-1	-0.2	0.3	-0.2	1	6	1	47	-1	1,050	8	19	4	14	2	-1	3	-1	3
L1+00N	7+00E	158	-1	23	-1	-1	-1	-0.2	0.8	-0.2	1	5	-1	42	-1	1,491	15	26	7	28	6	2	7	-1	5
L1+00N	7+50E	76	-1	34	-1	-1	-1	-0.2	0.7	-0.2	1	7	1	34	-1	1,079	8	18	3	13	3	1	3	-1	3
L1+00N	8+00E	93	-1	29	-1	-1	-1	-0.2	0.5	-0.2	-1	4	-1	33	1	1,426	10	23	4	16	3	1	4	-1	3
L1+00N	8+50E	81	-1	43	-1	-1	-1	-0.2	0.8	-0.2	2	5	1	28	1	1,799	7	19	3	11	2	-1	2	-1	2
L1+00N	9+00E	206	1	9	-1	-1	-1	-0.2	0.8	-0.2	1	4	-1	41	1	1,728	9	25	4	15	3	2	4	-1	3
L1+00N	9+50E	76	-1	8	-1	-1	-1	-0.2	0.3	-0.2	-1	2	-1	24	1	1,456	6	12	2	10	2	1	3	-1	3
L1+00N	10+00E	96	-1	20	-1	-1	-1	-0.2	0.3	-0.2	1	6	1	47	-1	1,248	13	27	6	24	5	2	6	-1	5
L1+00N	10+50E	103	-1	14	-1	-1	-1	-0.2	0.7	-0.2	1	7	-1	49	-1	1,859	9	21	4	16	3	1	4	-1	3
L1+00N	11+00E	106	-1	28	-1	-1	-1	-0.2	1.0	-0.2	1	5	1	34	-1	1,641	14	30	6	24	5	2	7	-1	6
L1+00N	11+50E	167	-1	12	-1	-1	-1	-0.2	0.7	-0.2	1	3	-1	27	-1	949	6	17	3	10	2	-1	3	-1	2
L1+00N	12+00E	92	-1	42	-1	-1	-1	-0.2	0.5	-0.2	-1	4	1	27	-1	655	8	22	3	10	2	-1	3	-1	2
L1+00N	12+50E	45	-1	9	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	-1	25	-1	1,213	4	7	2	7	1	-1	2	-1	2
L1+00N	13+00E	56	-1	20	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	58	1	857	4	10	2	8	2	-1	3	-1	3
L1+00N	13+50E	63	-1	23	-1	-1	-1	-0.2	-0.2	-0.2	1	4	1	43	1	748	3	9	1	4	-1	-1	1	-1	-1
L1+00N	14+00E	126	-1	16	-1	-1	-1	-0.2	-0.2	-0.2	1	3	1	39	-1	1,255	6	13	2	9	2	-1	2	-1	2
L1+00N	14+50E	88	-1	12	-1	-1	-1	-0.2	-0.2	-0.2	-1	5	1	47	1	1,195	9	14	4	14	3	1	3	-1	3
L1+00N	15+00E	93	-1	56	-1	-1	-1	-0.2	0.3	-0.2	1	9	1	49	1	1,247	6	16	3	9	2	1	2	-1	2
L4+00N	0+00E	54	-1	12	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	-1	26	-1	697	4	6	2	6	1	-1	1	-1	1
L4+00N	0+50E	46	-1	13	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	28	-1	696	4	6	2	6	1	-1	2	-1	1
L4+00N	1+00E	65	-1	6	-1	-1	-1	-0.2	-0.2	-0.2	1	4	1	27	-1	849	7	10	2	10	2	-1	3	-1	2
L4+00N	1+50E	128	-1	63	-1	-1	-1	-0.2	0.5	-0.2	-1	4	1	59	-1	535	9	13	4	15	3	1	4	-1	3
L4+00N	2+00E	32	-1	8	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	20	-1	575	2	3	-1	3	-1	-1	-1	-1	-1
L4+00N	2+50E	17	-1	7	-1	-1	-1	-0.2	-0.2	-0.2	-1	5	-1	21	-1	651	2	6	1	4	-1	-1	1	-1	-1
L4+00N	3+00E	20	-1	36	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	-1	20	-1	537	2	4	-1	4	-1	-1	-1	-1	-1
L4+00N	3+50E	164	-1	8	-1	-1	-1	-0.2	-0.2	-0.2	-1	5	-1	36	-1	827	9	12	4	16	3	1	4	-1	3
L4+00N	4+00E	25	-1	20	-1	-1	-1	-0.2	0.3	-0.2	-1	4	-1	25	-1	575	3	5	1	6	1	-1	2	-1	1
L4+00N	4+50E	18	-1	25	-1	-1	-1	-0.2	-0.2	-0.2	-1	11	-1	-15	-1	26	3	8	2	5	1	-1	1	-1	1
L4+00N	5+00E	36	-1	98	-1	-1	-1	-0.2	0.3	-0.2	-1	6	-1	36	-1	291	4	9	2	7	1	-1	2	-1	1

Enzyme Leach Job #: 1360
Trace Element Values Are in Parts Per Billi
Values = 999999 are greater than workin

Sample ID:		Zr	Nb	Mo	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy
L4+00N	5+50E	142	1	21	-1	-1	-1	-0.2	0.7	-0.2	1	9	-1	173	4	91	15	35	6	23	4	2	6	-1	5
L4+00N	6+00E	48	-1	14	-1	-1	-1	-0.2	0.3	-0.2	-1	4	-1	37	-1	664	4	5	2	7	1	-1	1	-1	-1
L4+00N	6+50E	16	-1	1,587	-1	-1	-1	-0.2	1.5	-0.2	-1	10	1	182	-1	190	4	4	2	8	2	-1	2	-1	2
L4+00N	7+00E	7	-1	32	-1	-1	-1	-0.2	0.5	-0.2	-1	6	1	29	-1	948	2	3	-1	3	-1	-1	-1	-1	-1
L4+00N	7+50E	17	-1	14	-1	-1	-1	-0.2	-0.2	-0.2	-1	6	-1	25	-1	797	2	3	-1	3	-1	-1	-1	-1	-1
L4+00N	8+00E	18	-1	12	-1	-1	-1	-0.2	-0.2	-0.2	-1	5	1	27	-1	641	3	4	1	4	-1	-1	1	-1	-1
L4+00N	8+50E	24	-1	9	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	1	27	-1	570	3	3	-1	4	-1	-1	1	-1	-1
L4+00N	9+00E	52	-1	2	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	1	24	-1	855	4	4	2	6	1	-1	1	-1	1
L4+00N	9+50E	55	-1	2	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	1	25	-1	751	5	3	2	8	1	-1	2	-1	1
L4+00N	10+00E	31	-1	38	-1	-1	-1	-0.2	0.3	-0.2	-1	4	-1	29	-1	517	5	7	2	7	1	-1	2	-1	1
L4+00N	10+50E	15	-1	32	-1	-1	-1	-0.2	-0.2	-0.2	-1	7	1	29	-1	561	3	4	1	5	-1	-1	1	-1	-1
L4+00N	11+00E	21	-1	26	-1	-1	-1	-0.2	-0.2	-0.2	-1	5	1	36	-1	861	3	4	1	4	1	-1	1	-1	-1
L4+00N	11+50E	21	-1	11	-1	-1	-1	-0.2	-0.2	-0.2	-1	8	1	24	-1	1,068	3	6	-1	4	-1	-1	-1	-1	-1
L4+00N	12+00E	10	-1	9	-1	-1	-1	-0.2	-0.2	-0.2	-1	9	1	33	-1	886	3	6	2	4	-1	-1	1	-1	1
L4+00N	12+50E	11	-1	11	-1	-1	-1	-0.2	0.5	-0.2	-1	3	-1	42	-1	845	3	5	1	5	1	-1	1	-1	1
L4+00N	13+00E	55	-1	4	-1	-1	-1	-0.2	0.7	-0.2	-1	6	-1	69	1	1,761	6	9	2	8	2	1	2	-1	2
L4+00N	13+50E	4	-1	3	-1	-1	-1	-0.2	0.3	-0.2	-1	3	1	32	-1	1,191	2	2	-1	2	-1	-1	-1	-1	-1
L4+00N	14+00E	70	-1	-1	-1	-1	-1	-0.2	-0.2	-0.2	-1	2	-1	20	-1	1,699	4	9	2	6	2	-1	1	-1	1
L4+00N	14+50E	36	-1	4	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	26	-1	1,006	4	6	1	5	1	-1	1	-1	1
L4+00N	15+00E	469	1	27	-1	-1	3	-0.2	0.5	-0.2	-1	7	1	107	-1	2,187	32	91	16	67	15	5	20	3	17
L6+00N	0+00E	45	-1	35	-1	-1	-1	-0.2	-0.2	-0.2	-1	9	-1	67	-1	609	8	16	3	12	3	1	3	-1	3
L6+00N	0+50E	16	-1	10	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	1	24	-1	715	2	3	-1	3	-1	-1	-1	-1	-1
L6+00N	1+00E	35	-1	-1	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	23	-1	1,063	4	4	2	6	2	-1	1	-1	1
L6+00N	1+50E	57	-1	2	-1	-1	-1	-0.2	0.3	-0.2	-1	3	-1	26	-1	836	6	4	2	9	2	-1	2	-1	2
L6+00N	2+00E	20	-1	24	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	1	20	-1	482	3	4	1	5	1	-1	1	-1	1
L6+00N	2+50E	12	-1	7	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	1	28	-1	501	2	3	-1	4	-1	-1	-1	-1	-1
L6+00N	3+00E	20	-1	3	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	-1	17	-1	502	2	1	-1	4	-1	-1	-1	-1	-1
L6+00N	3+50E	33	-1	4	-1	-1	-1	-0.2	0.3	-0.2	-1	3	-1	19	-1	537	3	3	1	4	1	-1	1	-1	-1
L6+00N	4+00E	19	-1	6	-1	-1	-1	-0.2	0.3	-0.2	-1	3	1	18	-1	529	2	3	-1	3	-1	-1	-1	-1	-1
L6+00N	4+50E	13	-1	11	-1	-1	-1	-0.2	1.4	-0.2	-1	2	1	24	-1	782	3	6	1	5	-1	-1	1	-1	1
L6+00N	5+00E	17	-1	14	-1	-1	-1	-0.2	2.0	-0.2	-1	3	-1	20	-1	550	4	5	2	10	3	1	3	-1	2
L6+00N	5+50E	8	-1	8	-1	-1	-1	-0.2	0.5	-0.2	-1	2	-1	27	-1	542	2	3	-1	3	-1	-1	-1	-1	-1
L6+00N	6+00E	37	-1	1	-1	-1	-1	-0.2	0.3	-0.2	-1	2	-1	21	-1	477	3	3	1	5	1	-1	1	-1	-1
L6+00N	6+50E	29	-1	3	-1	-1	-1	-0.2	0.3	-0.2	-1	3	-1	20	-1	540	4	4	1	5	-1	-1	1	-1	1
L6+00N	7+00E	44	-1	3	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	1	27	-1	607	6	4	3	11	3	1	3	-1	3
L6+00N	7+50E	26	-1	13	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	1	26	-1	362	3	4	1	4	-1	-1	1	-1	-1
L6+00N	8+00E	34	-1	-1	-1	-1	-1	-0.2	0.5	-0.2	-1	3	-1	27	-1	470	4	4	2	7	2	-1	2	-1	2
L6+00N	8+50E	48	-1	-1	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	25	-1	614	5	5	2	9	2	-1	2	-1	2
L6+00N	9+00E	54	-1	-1	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	23	-1	616	6	5	2	10	2	-1	2	-1	2
L6+00N	9+50E	63	-1	5	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	33	-1	562	7	6	2	10	2	1	3	-1	2
L6+00N	10+00E	50	-1	62	-1	-1	-1	-0.2	0.3	-0.2	-1	5	-1	57	-1	406	9	17	4	15	3	1	4	-1	3
L6+00N	10+50E	137	-1	21	-1	-1	-1	-0.2	1.3	-0.2	1	5	1	295	3	749	15	29	5	18	3	1	4	-1	4

Enzyme Leach Job #: 1360
Trace Element Values Are in Parts Per Billi
Values = 999999 are greater than workin

Sample ID:		Zr	Nb	Mo	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy
L6+00N	11+00E	79	-1	200	-1	-1	-1	-0.2	0.7	-0.2	-1	15	1	326	1	278	8	16	2	8	2	-1	2	-1	2
L6+00N	11+50E	26	-1	45	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	32	-1	695	5	8	2	7	2	-1	2	-1	1
L6+00N	12+00E	15	-1	14	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	26	-1	452	3	5	-1	4	-1	-1	1	-1	-1
L6+00N	12+50E	18	-1	14	-1	-1	-1	-0.2	-0.2	-0.2	-1	3	1	23	-1	451	2	4	-1	3	-1	-1	-1	-1	-1
L6+00N	13+00E	24	-1	2	-1	-1	-1	-0.2	-0.2	-0.2	-1	2	-1	-15	-1	418	2	3	-1	3	-1	-1	-1	-1	-1
L6+00N	13+50E	19	-1	405	-1	-1	-1	-0.2	0.2	-0.2	-1	6	-1	37	-1	325	5	9	2	7	1	-1	2	-1	2
L6+00N	14+00E	32	-1	125	-1	-1	-1	-0.2	-0.2	-0.2	-1	5	-1	50	-1	138	5	7	1	4	-1	-1	1	-1	1
L6+00N	14+50E	12	-1	100	-1	-1	-1	-0.2	0.2	-0.2	-1	3	-1	44	-1	617	-1	1	-1	1	-1	-1	-1	-1	-1
L6+00N	15+00E	17	-1	112	-1	-1	-1	-0.2	0.6	-0.2	-1	3	-1	43	-1	185	2	3	-1	3	-1	-1	-1	-1	-1
L6+00N	15+50E	26	-1	347	-1	-1	-1	-0.2	0.8	-0.2	-1	5	1	152	-1	188	4	6	1	6	1	-1	2	-1	2
L6+00N	16+00E	16	-1	90	-1	-1	-1	-0.2	0.2	-0.2	-1	5	1	41	-1	535	3	4	1	4	1	-1	1	-1	1
L6+00N	16+50E	18	-1	14	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	21	-1	463	4	6	1	6	1	-1	2	-1	1
L6+00N	17+00E	16	-1	52	-1	-1	-1	-0.2	-0.2	-0.2	-1	13	3	28	-1	441	5	19	2	10	2	-1	3	-1	2
L6+00N	17+50E	19	-1	7	-1	-1	-1	-0.2	-0.2	-0.2	-1	6	1	24	-1	622	3	4	1	5	-1	-1	1	-1	-1
L6+00N	18+00E	7	-1	3	-1	-1	-1	-0.2	0.2	-0.2	1	4	-1	27	-1	1,186	3	5	-1	4	-1	-1	-1	-1	-1
L6+00N	18+50E	16	-1	6	-1	-1	-1	-0.2	-0.2	-0.2	-1	5	-1	22	-1	652	3	4	1	4	-1	-1	1	-1	-1
L6+00N	19+00E	39	-1	7	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	1	20	-1	902	5	7	2	8	1	-1	2	-1	1
L6+00N	19+50E	12	-1	7	-1	-1	-1	-0.2	-0.2	-0.2	-1	6	-1	21	-1	641	3	5	1	4	-1	-1	-1	-1	-1
L6+00N	20+00E	31	-1	24	-1	-1	-1	-0.2	-0.2	-0.2	-1	4	-1	23	-1	890	4	7	2	6	1	-1	2	-1	1

Enzyme Leach Job #: 1360
Trace Element Values Are in Parts Per Billi
Values = 999999 are greater than workin

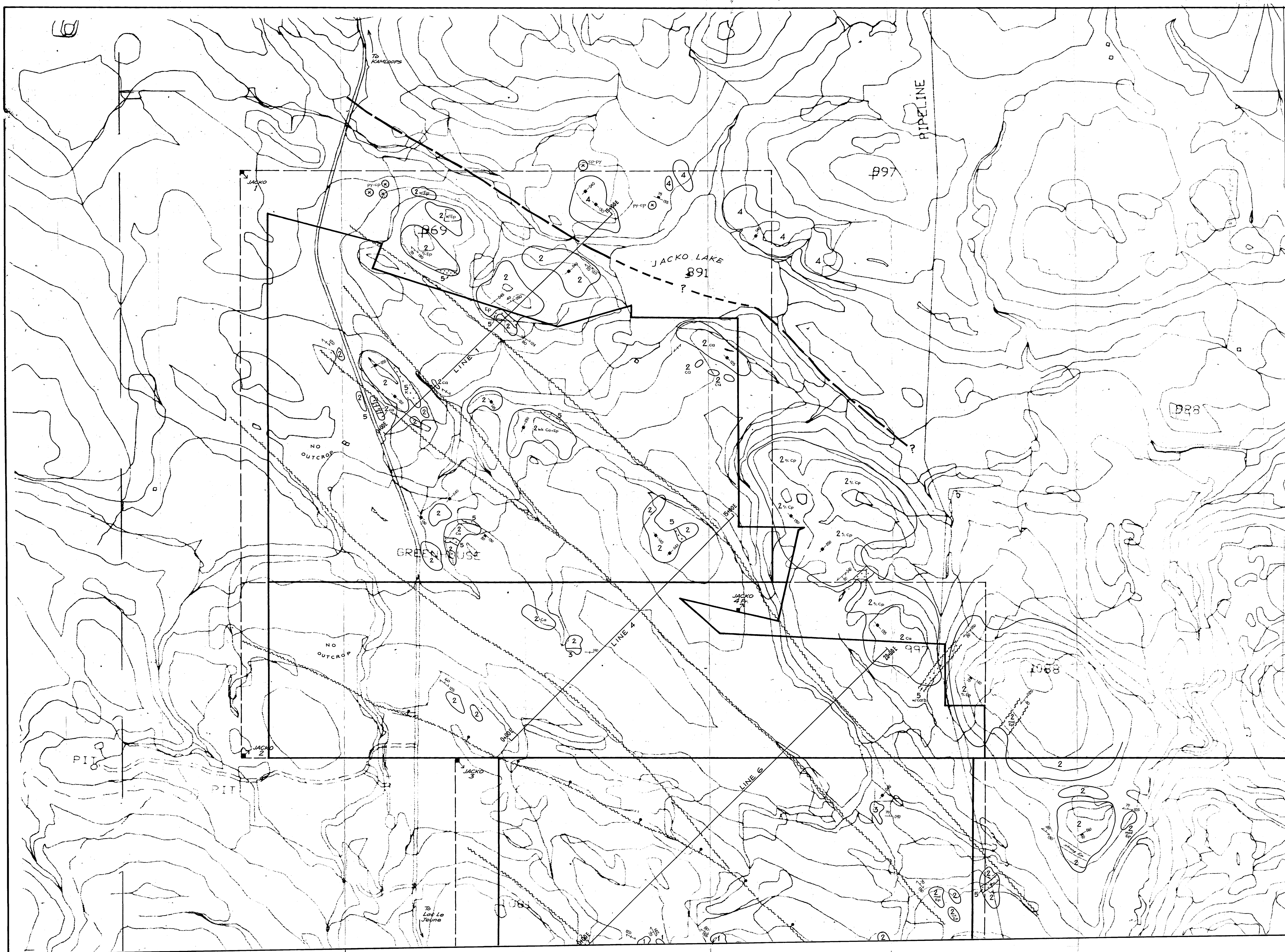
Sample ID:		Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Th	U
L1+00N	0+00E	-1	1	-1	2	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	3	-1	1	1
L1+00N	0+50E	-1	-1	-1	1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L1+00N	1+00E	-1	1	-1	1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	3	-1	1	1
L1+00N	1+50E	-1	2	-1	3	-1	1	-1	2	0.1	-1	-1	-1	-0.1	-1.0	-1	7	-1	2	1
L1+00N	2+00E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	0.3	-1.0	-1	6	-1	1	-1
L1+00N	2+50E	-1	1	-1	1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	4	-1	1	-1
L1+00N	3+00E	1	2	-1	4	-1	2	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	3	-1	3	2
L1+00N	3+50E	-1	2	-1	2	-1	1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	5	-1	1	1
L1+00N	4+00E	-1	2	-1	2	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	9	-1	2	1
L1+00N	4+50E	1	3	-1	4	-1	2	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	6	-1	2	2
L1+00N	5+00E	1	3	-1	3	-1	1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	5	-1	2	1
L1+00N	5+50E	-1	1	-1	1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	2	-1
L1+00N	6+00E	-1	2	-1	3	-1	1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	4	-1	2	-1
L1+00N	6+50E	-1	1	-1	1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	4	-1	2	1
L1+00N	7+00E	1	3	-1	3	-1	2	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	6	-1	2	1
L1+00N	7+50E	-1	1	-1	1	-1	1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	6	-1	2	1
L1+00N	8+00E	-1	1	-1	2	-1	1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	3	-1	2	1
L1+00N	8+50E	-1	1	-1	1	-1	1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	5	-1	2	1
L1+00N	9+00E	-1	2	-1	2	-1	3	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	3	-1	4	1
L1+00N	9+50E	-1	1	-1	2	-1	1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	2	-1
L1+00N	10+00E	-1	2	-1	3	-1	1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	4	-1	2	1
L1+00N	10+50E	-1	2	-1	2	-1	1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	7	-1	2	1
L1+00N	11+00E	1	3	-1	4	-1	1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	8	-1	2	1
L1+00N	11+50E	-1	-1	-1	1	-1	3	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	3	1
L1+00N	12+00E	-1	1	-1	1	-1	1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	3	-1	2	-1
L1+00N	12+50E	-1	1	-1	1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	-1
L1+00N	13+00E	-1	1	-1	2	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	-1
L1+00N	13+50E	-1	-1	-1	-1	-1	-1	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	1	1
L1+00N	14+00E	-1	-1	-1	1	-1	2	-1	-1	0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	2	1
L1+00N	14+50E	-1	1	-1	1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	1	1
L1+00N	15+00E	-1	1	-1	1	-1	1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	6	-1	2	1
L4+00N	0+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	1
L4+00N	0+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	1
L4+00N	1+00E	-1	-1	-1	1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	1	-1
L4+00N	1+50E	-1	1	-1	2	-1	2	-1	-1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	2	1
L4+00N	2+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L4+00N	2+50E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L4+00N	3+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L4+00N	3+50E	-1	1	-1	2	-1	2	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	2	1
L4+00N	4+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L4+00N	4+50E	-1	-1	-1	-1	-1	-1	-1	-1	0.8	-1	-1	-1	-0.1	-1.0	-1	1	-1	-1	1
L4+00N	5+00E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	1	-1

Enzyme Leach Job #: 1360
Trace Element Values Are in Parts Per Billi
Values = 999999 are greater than workin

Sample ID:		Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Th	U
L4+00N	5+50E	1	2	-1	3	-1	2	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	3	-1	6	4
L4+00N	6+00E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	1
L4+00N	6+50E	-1	-1	-1	1	-1	-1	-1	7	0.3	-1	-1	-1	-0.1	-1.0	-1	-1	-1	4	3
L4+00N	7+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	0.2	-1.0	-1	-1	-1	1	-1
L4+00N	7+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L4+00N	8+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	8+50E	-1	-1	-1	-1	-1	-1	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	9+00E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	9+50E	-1	-1	-1	-1	-1	-1	-1	-1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	10+00E	-1	-1	-1	-1	-1	-1	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	10+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	11+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	11+50E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L4+00N	12+00E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	0.6	-1.0	-1	-1	-1	1	-1
L4+00N	12+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	0.3	-1.0	-1	1	-1	1	-1
L4+00N	13+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	0.3	-1.0	-1	2	-1	3	1
L4+00N	13+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	0.4	-1.0	-1	-1	-1	1	-1
L4+00N	14+00E	-1	-1	-1	-1	-1	1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	1
L4+00N	14+50E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	-1
L4+00N	15+00E	3	8	1	10	2	7	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	8	4
L6+00N	0+00E	-1	1	-1	1	-1	-1	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	4	1
L6+00N	0+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	1+00E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	1+50E	-1	-1	-1	1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	2+00E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	2+50E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	3+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	3+50E	-1	-1	-1	-1	-1	-1	-1	-1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	4+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	4+50E	-1	-1	-1	-1	-1	-1	-1	1	0.1	-1	-1	-1	0.1	-1.0	-1	-1	-1	1	-1
L6+00N	5+00E	-1	1	-1	1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	5+50E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	6+00E	-1	-1	-1	-1	-1	-1	-1	-1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	6+50E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	7+00E	-1	1	-1	1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	7+50E	-1	-1	-1	-1	-1	-1	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	8+00E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	8+50E	-1	-1	-1	-1	-1	-1	-1	-1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	9+00E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	9+50E	-1	1	-1	1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	10+00E	-1	1	-1	2	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	1
L6+00N	10+50E	-1	2	-1	2	-1	2	-1	2	0.2	-1	-1	-1	0.1	-1.0	-1	6	-1	7	20

Enzyme Leach Job #: 1360
Trace Element Values Are in Parts Per Billi
Values = 999999 are greater than workin

Sample ID:		Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Th	U
L6+00N	11+00E	-1	-1	-1	-1	-1	1	-1	2	0.7	-1	-1	-1	-0.1	-1.0	-1	4	-1	3	26
L6+00N	11+50E	-1	-1	-1	-1	-1	-1	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	-1	1
L6+00N	12+00E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	-0.1	-1.0	-1	89	-1	1	-1
L6+00N	12+50E	-1	-1	-1	-1	-1	-1	-1	-1	0.1	-1	-1	-1	-0.1	-1.0	-1	8	-1	1	-1
L6+00N	13+00E	-1	-1	-1	-1	-1	-1	-1	-1	-0.1	-1	-1	-1	-0.1	-1.0	-1	4	-1	1	-1
L6+00N	13+50E	-1	-1	-1	-1	-1	-1	-1	2	0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	2	3
L6+00N	14+00E	-1	-1	-1	-1	-1	-1	-1	1	0.3	-1	-1	-1	-0.1	-1.0	-1	1	-1	3	5
L6+00N	14+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	0.1	-1.0	-1	-1	-1	2	3
L6+00N	15+00E	-1	-1	-1	-1	-1	-1	-1	2	0.6	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	15+50E	-1	-1	-1	-1	-1	-1	-1	2	0.4	-1	-1	-1	-0.1	-1.0	-1	-1	-1	3	1
L6+00N	16+00E	-1	-1	-1	-1	-1	-1	-1	2	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	16+50E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	-1
L6+00N	17+00E	-1	-1	-1	1	-1	-1	-1	4	-0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	1	-1
L6+00N	17+50E	-1	-1	-1	-1	-1	-1	-1	1	0.4	-1	-1	-1	-0.1	-1.0	-1	-1	-1	-1	-1
L6+00N	18+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	0.4	-1.0	-1	3	-1	1	-1
L6+00N	18+50E	-1	-1	-1	-1	-1	-1	-1	1	0.1	-1	-1	-1	-0.1	-1.0	-1	-1	-1	1	-1
L6+00N	19+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	2	-1	1	-1
L6+00N	19+50E	-1	-1	-1	-1	-1	-1	-1	2	-0.1	-1	-1	-1	0.2	-1.0	-1	2	-1	-1	-1
L6+00N	20+00E	-1	-1	-1	-1	-1	-1	-1	1	-0.1	-1	-1	-1	-0.1	-1.0	-1	1	-1	1	-1



GEOLOGICAL BRANCH
ASSESSMENT REPORT

23,994

LEGEND

Miocene + Eocene

| 6 | OLIVINE BASALT DYKES |
| 5 | QUARTZ-FELDSPAR PORPHYRY FELSIC DYKES |

Upper Triassic to Lower Jurassic

Iron Mask Intrusives

| 4 | HYBRID GABBRO |

Nicola Group

3	SEDIMENTS and MAFIC TUFFS-Greenschist Mica
2	LAPILLI TUFFS and TUFFS-Greenschist Mica
1	AMPHIBOLITE GRADE METAMORPHICS

Ca - Calcite/Hematite Alteration
Ep - Epidote Alteration
K - Potasium Alteration
(x) Cp - Chalcopyrite showing in Pit

KEY

FAULTS
OUTCROP
CONTACT
BEDDING
FRACTURE
FOLIATION

PROFESSIONAL GEOSCIENTIST
PROVINCE OF BRITISH COLUMBIA
G. W. EVANS

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

JACKO PROPERTY

PROPERTY GEOLOGY

0 100 200 metres
1:5000

DATE DRAWN: August 1, 1995	SCALE: 1:5,000	FIGURE No. 3
COMPILED BY: G. Evans	JOB No: 1732	
DRAWN BY: S.A.	NTS No: 92I/9	