GEOLOGICAL REPORT ON THE ERZ PROPERTY

MT. BISSON AREA, NORTH CENTRAL B. C.

Latitude: 55° 31' 19" North   Longitude: 123° 56' 21" West

NTS Map-sheet 93O/12W

Ominica Mining Division

for

ARGONAUTS GROUP LTD

by: D.G. LEIGHTON, P.GEO.

LEIGHTON EXPLORATION AND DEVELOPMENT LTD.
3806 - 254 STREET
ALDERGROVE, B.C. V4W 2R3
CANADA

TEL: (604) 856-2199
FAX: (604) 856-1917
E-MAIL: dleighto@direct.ca

January 25, 1997

CONTENTS

FIGURES

APPENDICES

SUMMARY

- The ERZ property is a rare earth prospect located in the Swannell Ranges of the Omineca Mountains in north central B.C. Argonauts Group Ltd. has acquired this property by option from Lawrence Hewitt, a local prospector.

- The claims comprise a contiguous block 160 km north of Fort St. James and 55 km northwest of Mackenzie. The property is at 1,700 metres on the western spur of Mt. Bisson, with convenient access by way of an old logging road which runs along the north side of Munro Creek from a nearby logging camp of the same name.

- Rare earths hosted by the Mt. Bisson alkaline complex occur in a unit of the Ominica crystalline belt referred to as the Wolverine metamorphic suite. Lithologies comprising this metamorphic suite are Proterzoic in age.

- The ERZ claims cover the Laura showings which were discovered by A.A.D. Halleran in 1986 and 1987. Chevron Minerals Ltd. optioned Halleran's claims and conducted a limited exploration program including reconnaissance mapping in 1988.

- The mapped area covers a series of intrusions which cut metamorphic rocks, units which include amphibolite, biotite schist and strongly foliated quartzofeldspathic gneiss. Locally the gneisses are characterized by a metosomatic alkalic signature, here mapped as the Laura alkalic unit.

- Economic significance of the Mt. Bisson complex lies in concentration of rare earth elements, notably, cerium, lanthanum, neodymium, samarium and praseodymium in the minerals allanite, cerorthite, and monazite. Yttrium is present as well as niobium at concentrations as high as 1.9 and 0.8 per cent respectively.

- The ERZ property has appeal stemming from a combination of favorable mineralogy, from high grades, and ready access though, more work is needed to evaluate the economic potential.

- The recommended program is prospecting, mapping, and systematic trench sampling. Since access is reasonable, such a program would be cost effective except during winter months.

- A sixty thousand dollar ($60,000) budget is suggested for the first phase in a two stage program that includes comprehensive trench sampling and diamond drilling, if warranted.

INTRODUCTION

The Munro Creek region of north central B. C. contains rare earth prospects in Mount Bisson alkaline complex host rocks. The most promising exploration target comprises the Laura showings, presently covered by eight ERZ mineral claims. Argonauts Group Ltd. hold the property under option.

This report describes the Mount Bisson area and the ERZ claims in particular together with recommendations for continued exploration work. It was prepared, following a field examination of the showings in October, 1996 at the request of Christopher McArthur, president of Argonauts Group Ltd.

A brief general report on rare earths has been attached as Appendix "A" to help view this special class of commodities in perspective. Information contained was abstracted from a private company report prepared by the writer and Dr. Jennifer Pell.

PROPERTY

Location Access and Physiography

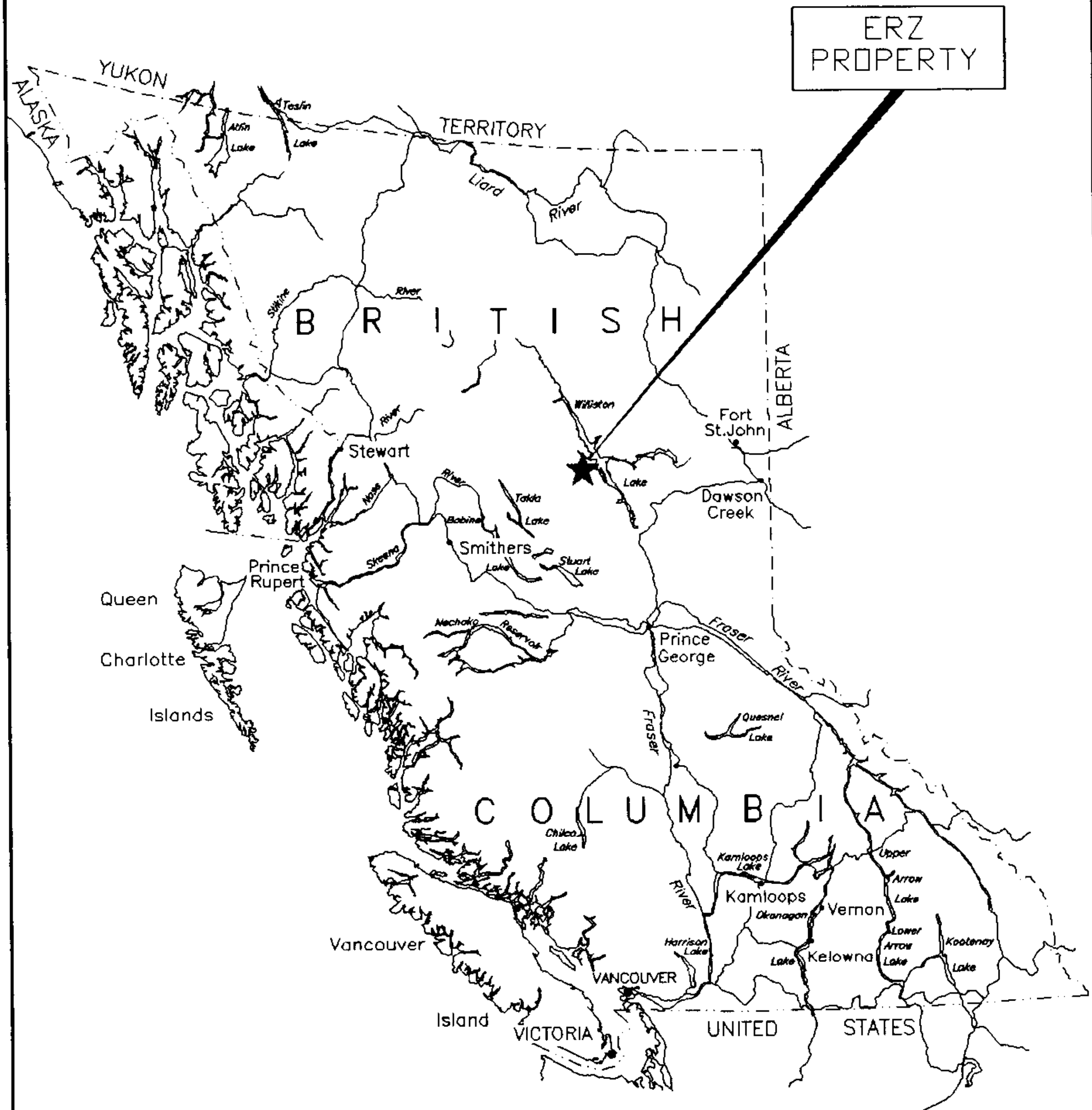
The Mt. Bisson - URZ Property is in the Swannell Ranges of the Omineca Mountains in north central B.C. (see Fig. 1). Claims comprise a contiguous block approximately 160 km north of Fort St. James and 55 km northwest of Mackenzie. Coordinates are 55° 31' 19" North, 123° 56' 21" West and the applicable 1:50,000 scale topographic map is 93O/12W.

Access is provided by the Finley – Nation forestry road from Mackenzie on Williston Lake. It is also possible to drive to the claims from Fort St. James using the Germanson Landing -- Manson Creek road (Munro Camp cutoff).

The ERZ property is at 5,500 feet, on the western spur of Mt. Bisson, with direct access via an old logging road which runs along the north side of Munro Creek from a nearby logging camp of the same name. Terrain is moderate supporting stands of pine with little or insignificant underbrush. Under normal conditions, room and board are available at the Munro logging camp.

History

The Carb and AH claims were recorded by A.A.D. Halleran in 1983. Then in June 1984 several Mon claims were staked to cover a graphite bearing limestone. In the fall of 1986



ARGONAUTS GROUP LTD.

ERZ PROPERTY

OMINECA M.D., B. C.

LOCATION MAP

LEIGHTON EXPLORATION AND DEVELOPMENT LTD.

SCALE:	DATE:	NTS.:	FIGURE NO.
AS SHOWN	OCTOBER/96	93N/8,9 93O/5,12	1

Ursa #1 was staked by Halleran to cover a rare earth showing. In 1987 more land was acquired by a prospecting partnership headed by Halleron and a small prospecting program completed which outlined several promising rare earth showings. These claims were optioned by Chevron Minerals Ltd. who completed surveys over the area. The last recorded work on the Laura Property (the ERZ claim) was in 1989.

Claims

The Mt. Bisson – ERZ Property (see Fig. 2) consists of eight 2-post mineral claims in the Ominica Mining Division as follows:

CLAIM	TENURE NO.	RECORDED	EXPIRY[1]
ERZ-1	343050	January 19, 1996	January 19, 1999
ERZ-2	343051	January 19, 1996	January 19, 1999
ERZ-3	343052	January 19, 1996	January 19, 1999
ERZ-4	343053	January 19, 1996	January 19, 1999
ERZ-5	343054	January 19, 1996	January 19, 1999
ERZ-6	343055	January 19, 1996	January 19, 1999
ERZ-7	343056	January 19, 1996	January 19, 1999
ERZ-8	343057	January 19, 1996	January 19, 1999

GEOLOGY

Regional Geology

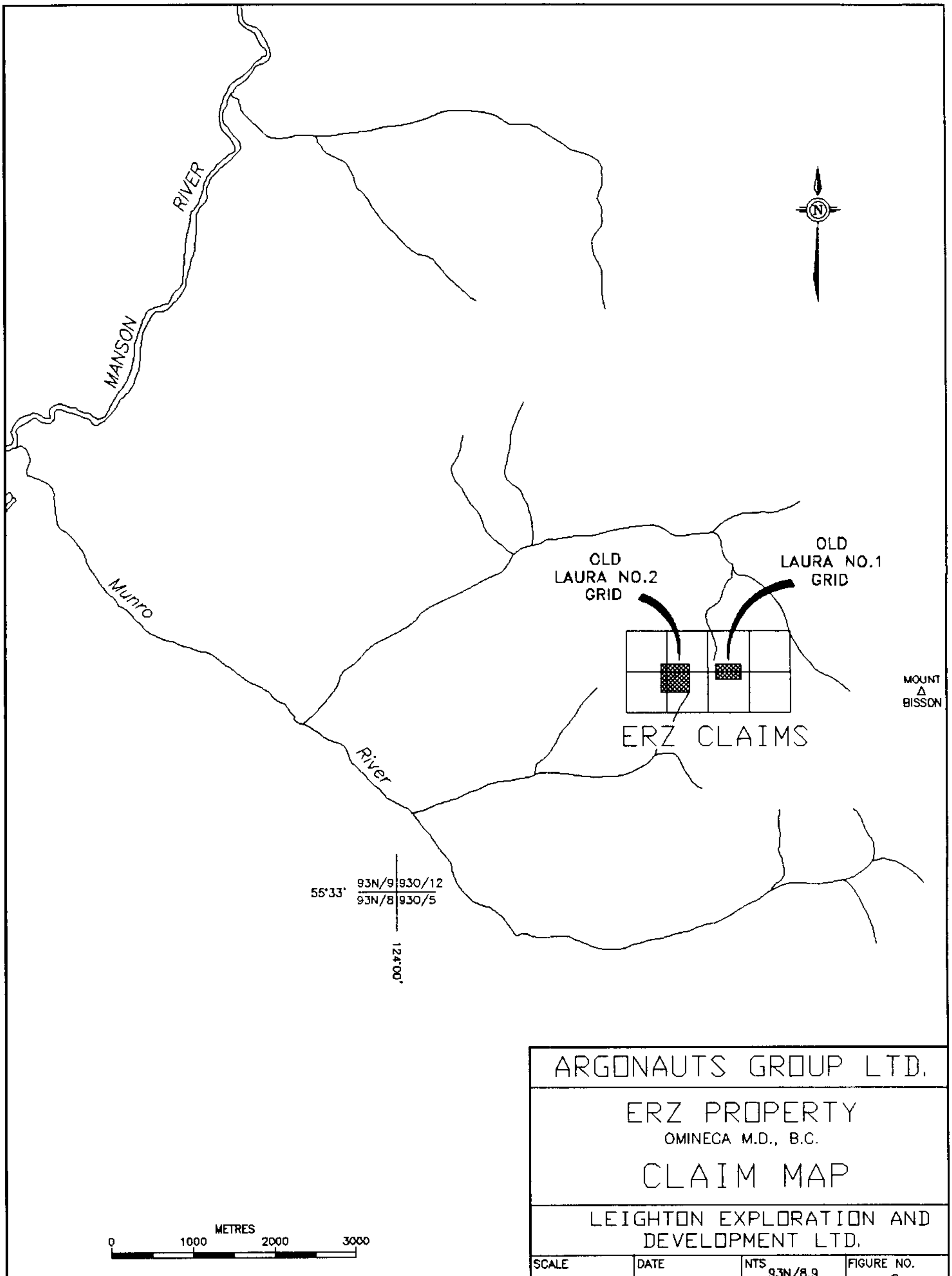
The Mt. Bisson alkaline complex occurs in a unit of the Ominica crystalline belt referred to as the Wolverine metamorphic suite. Lithologies comprising the metamorphic suite are considered to be Proterzoic in age in spite of K-Ar age determined discrepancies.

The complex includes a group of diverse rocks with common mineralogical characteristics including:

- Model primary quartz is rarely present in the alkalic rocks.
- Model sodic-bearing ferromagnesium minerals are abundant in all rock types.
- Model sphene and/or rutile are common to all alkaline rocks.
- Rare earth elements are abundant in several lithologies and are a major component of the allanite pegmatites.

The complex contain small syenite and monzonite intrusions as well as alkalic dikes, pegmatite dikes, and metamorphic rocks of the Wolverine suite characterized by a strong

[1] Upon acceptance of this report



ARGONAUTS GROUP LTD.			
ERZ PROPERTY OMINECA M.D., B.C. CLAIM MAP			
LEIGHTON EXPLORATION AND DEVELOPMENT LTD.			
SCALE AS SHOWN	DATE OCT.,1996	NTS 93N/8,9 930/5,12	FIGURE NO. 2

alkalic overprint. At Mt. Bisson, these alkalic rocks are exposed at five localities over a strike length of 10 km. They coincide with a regional aeromagnetic anomaly and contain anomalous concentrations of rare earth minerals.

Unfoliated, fine grained quartz monzonite to quartz syenite intrusions occur throughout the region. Mapping is incomplete but there are at least four large stocks (one by three kilometres in area) and numerous smaller satellite bodies.

Property Geology (Laura Showing)

The ERZ claims cover the Laura showings (Laura No. 1 Grid) shown in detail on Fig. 3 following this page. The mapped area covers a series of intrusions which cut metamorphic rocks of the Wolverine suite. Wolverine units include coarse grained amphibolite, biotite schist and strongly foliated quartzofeldspathic gneiss. Locally, the gneisses are characterized by a metosomatic alkalic signature, here mapped as the Laura alkalic unit.

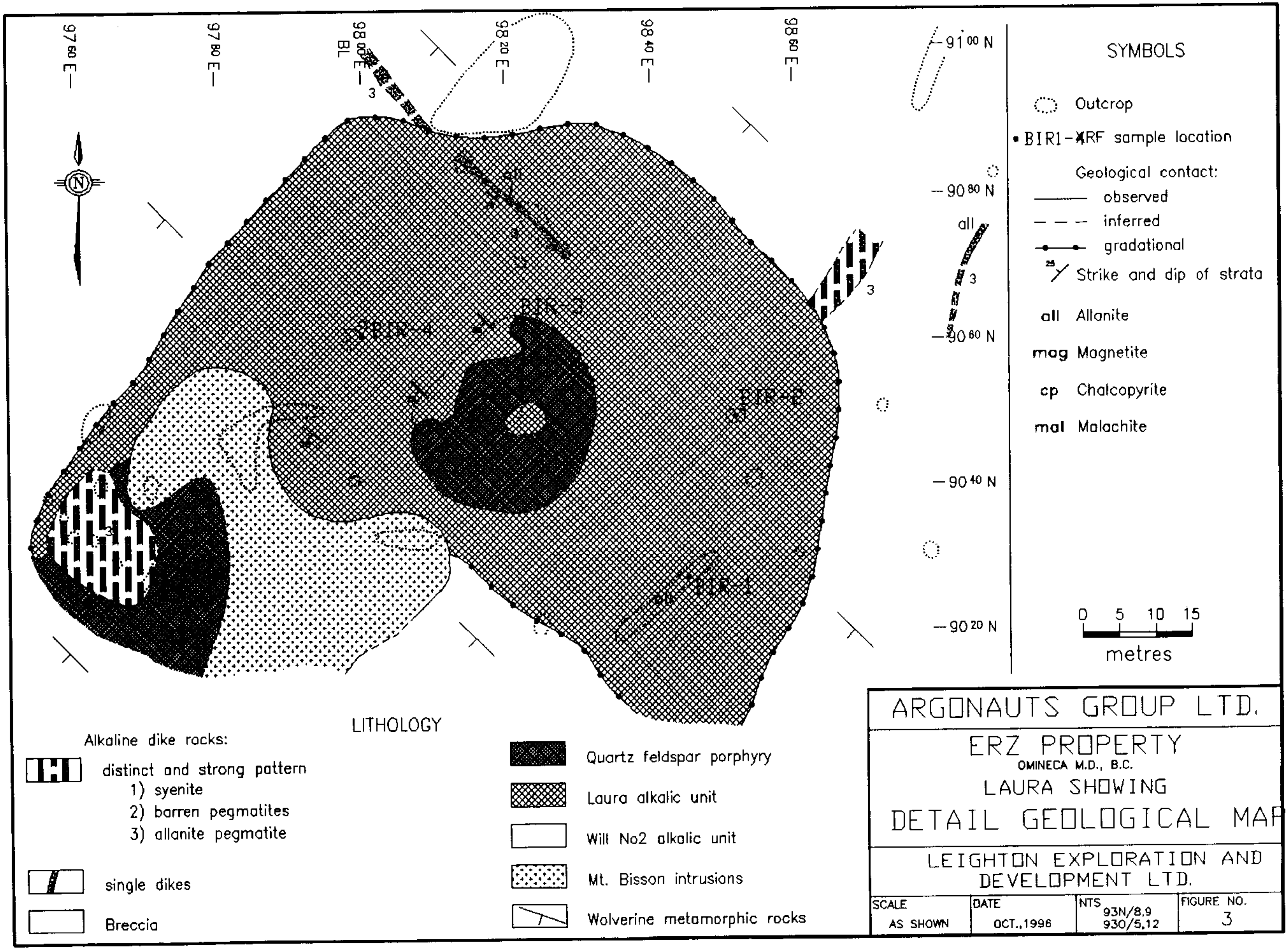
The Laura alkalic unit is a distinctive lithology comprising Wolverine metamorphic rocks, which have an alkaline character expressed by the presence of aegirine-augite and/or sphene, allanite and alkali feldspar. The map-unit is massive, fine to medium grained and retains a strong fabric related to the original metamorphic fabric of the Wolverine suite. Specifically, alkalic overprinted rocks are commonly banded on a millimeter to centimeter scale. Dark bands comprise aegirine-augite, hornblende, sphene, and allanite, whereas more felsic bands are dominated by alkalic feldspar. This unit has a circular map pattern with a minimum diameter of 60 metres.

The contact between alkalic overprinting and the host Wolverine gneisses is gradational and some metamorphic lithologies are more intensely metamorphosed than others. Furthermore, replacement processes commonly preserves older regional structure which suggests that the alkalic character is derived through preferential replacement of amphibolite gneisses of the Wolverine suite. The metasomatism may be related to a large, yet undefined, perhaps deep seated intrusion.

Economic Factors

The primary economic significance of the Mt. Bisson complex is the concentration of rare earth elements (REEs) such as praseodymium, lanthanum, neodymium, samarium and cerium in the minerals allanite, cerorthite, and monazite; minerals are often coarse, 5 to 10 millimetres. Heavy rare earths are found in concentrations of hundreds of parts per million. Niobium is also present.

Two major rare earth deposit types have been found within the complex: pegmatites, one to four metres wide and over 30 metres long, enriched in rare earth elements (combined 0.3 to 14.0 per cent) and the Laura alkalic units with concentrations of 0.07 to 0.64 per


97 60 E
97 80 E
98 00 E
BL
98 20 E
98 40 E
98 60 E
91 00 N
90 80 N
90 60 N
90 40 N
90 20 N
N
BIR-4
BIR-3
BIR-2
BIR-1
all
3
SYMBOLS
Outcrop
• BIR1-XRF sample location
Geological contact:
observed
inferred
gradational
Strike and dip of strata
all Allanite
mag Magnetite
cp Chalcopyrite
mal Malachite
0 5 10 15
metres
LITHOLOGY
Alkaline dike rocks:
distinct and strong pattern
1) syenite
2) barren pegmatites
3) allanite pegmatite
single dikes
Breccia
Quartz feldspar porphyry
Laura alkalic unit
Will No2 alkalic unit
Mt. Bisson intrusions
Wolverine metamorphic rocks
ARGONAUTS GROUP LTD.
ERZ PROPERTY
OMINECA M.D., B.C.
LAURA SHOWING
DETAIL GEOLOGICAL MAP
LEIGHTON EXPLORATION AND DEVELOPMENT LTD.
SCALE
AS SHOWN
DATE
OCT., 1996
NTS
93N/8,9
930/5,12
FIGURE NO.
3

cent light rare earths over widths of one to two metres and tens of metres in area. In addition, rare earths have been found in syenite dikes (0.80 to 4.26 per cent) and a mylonized gneiss pegmatite (2.1 per cent). Some of the pegmatites contain up to 14.5% total rare earths (Jennifer Pell, personal communication).

The alkali syenite environments are characterized by the highest overall rare earth content and independent light rare earth element minerals are formed more frequently here than in other igneous rocks. This is very important for recovery of REEs as some of them are contained in the apatite, zircon, pyroxenes and other rock forming minerals.

Other alkaline complexes in the region include: Loonie and Aley as well as the Prince and George carbonatites. Mt. Bisson is unique in that there are no known carbonatites; it comprises mainly silica saturated lithologies and consequently the host to the rare earth element mineralization are dominately silicate (allanite, cerorthite).

Grab samples collected by the writer (see Fig. 3) and tested at Acme Analytical Labs Ltd., in Vancouver by ICP-MS whole rock analysis produced the figures listed below. These new results indicated higher than previously reported yttrium levels[2], up to 1.9% in fact.

SAMPLE	La (ppm)	Ce (ppm)	Nd (ppm)	Pr (ppm)	Sm (ppm)	Gd (ppm)	%Y
BIR-1	1154.2	2993.4	806.9 3	332.5	684.1	1396.4	1.3
BIR-2	1568.7	2523.7	862.4	312.6	870.7	1741.5	1.9
BIR-3	1312.9	2564.6	779.0	287.6	716.4	1496.2	1.5
BIR-4	1221.0	3024.2	750.8	311.6	674.2	1395.1	1.3

CONCLUSIONS

The alkalic rocks underlying Mt. Bisson in general and the Laura showings in particular include primary crosscutting dikes, pegmatites, and secondary metasomatic replacements of Wolverine amphibolite gneisses. Where the original Wolverine gneisses have been metosomatized, alkalic overprinting is recognized and made a mapable unit by an increase of aegirine-augite, sphene, allanite, apatite and feldspar. The pegmatites are unique in that coarse allanite is a major constituent associated with high, quite possibly economic, concentrations of light rare earth elements. Follow-up exploration work to assess this possibility is warranted.

RECOMMENDED PROGRAM

The recommended program is a combination of prospecting, mapping, and systematic sampling. The objective is to determine extent of surface exposures, grades and estimate

[2] Demand for yttrium is high owing to the strong demand from ceramics, magnet and phosphor sectors with a sharp increase in demand predicted to satisfy an emerging superconductor market.

possible tonnages. Ease of access provided by logging roads will make such a program cost effective except during the winter months.

A sixty thousand dollar ($60,000) Stage I budget is suggested. This is the first phase of a staged program that would have be followed by extensive sampling and drilling, if warranted. Details are provided in the section: Program Budget Estimate, which follows.

PROGRAM BUDGET ESTIMATE

STAGE I (assume 30 days: prospecting, mapping, and sampling)

Senior Geologist, 35 days @ $380/day	$13,300.00	
2 Assistants, 30 days @ $550/day	16,500.00	
Mob/demob, 3 men & 2 vehicles	1,500.00	
Accom., food: 90 man-days @ $55/day	4,950.00	
Vehicles and fuel	4,400.00	
Assays: assume 70 @ $25.00	1,750.00	
Misc., (shipping, field supplies, etc.)	2,600.00	
Report	5,000.00	
Sub-total	50,000.00	
Engineering Overhead Fee	5,000.00	
Contingency 10%	5,000.00	
Total Stage I		**$ 60,000.00**

STAGE II (assume 45 days: diamond drilling and trench sampling)

Drill contract, 5,000 ft. BQ @ $20.00/ft.	$100,000.00	
Senior Geologist, 40 days @ $380/day	15,200.00	
Assistant, 35 days @ $275/day	9,625.00	
Accom., food: 75 man-days @ $55/day	4,125.00	
Assays: assume 500 @ $25.00	8,250.00	
Vehicles, fuel, supplies, etc.	4,500.00	
Report	7,000.00	
Sub-total	149,600.00	
Engineering Overhead Fee	15,000.00	
Contingency 10%	15,000.00	
Total Stage II		**179,600.00**
Total Stage I and Stage II		**$239,600.00**

REFERENCES

Armstrong, J.E. (1949): Fort St. James Map Area, Cassiar and Coast District, British Columbia; *Geological Survey of Canada*, Memoir 252, 210 pages.

Halleran, A.A.D. (1980): Petrology, Mineralogy and Origin of the Niobium-bearing Lonnie Carbonatite Complex of the Manson Creek Area, British Columbia; unpublished B.Sc. Thesis, *The University of British Columbia*, 41 pages.

Halleran, A.A.D. (1988) Geology, Geochemistry and Geophysics, Ursa Property; *B. C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Rept. 17872.

Halleran, A.A.D. (1989) Geology and Geochemistry, Laura Property; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Assessment Rept. 19404.

Halleran, A.A.D. and Russell, J.K. (1990): Geology and Descriptive Petrology of the Mount Bisson Alkaline Complex, Munroe Creek, British Columbia (93N/9E, 930/12W, 5W); in Geological Fieldwork 1989, *B. C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1990-1, pages 297-304.

Leighton and Pell (1996): Report on Potential for Rare Earths in Canada with Emphasis on British Columbia and Yukon Territory; Private Company Report.

Muller, J.E. (1961): Geology of Pine Pass, British Columbia; *Geological Survey of Canada*, Map 11.

Pell, J. (1994): Carbonatites, Nepheline Syenites, Kimberlites and Related Rocks in British Columbia, *B.C. Geological Survey Branch Bulletin 88*, page 136.

Pell, J. (1987a): Alkaline Ultrabasic Rocks in British Columbia: Carbonatites, Nepheline Syenites, Kimberlites, Ultramafic Lamprophyres and Related Rocks; *B. C. Ministry of Energy, Mines and Petroleum Resources*, Open File 1987-17.

Pell, J. and Hora, Z.D. (1990): High-tech Metals in British Columbia; *B. C. Geological Survey Branch* Information Circular 1990-19.

Tipper, H.W., et al. (1974): Parsnip River, B. C.; *Geological Survey of Canada*, Map 142A, Sheet 93.

CERTIFICATE OF QUALIFICATIONS

I, Douglas G. Leighton, do hereby certify that:

1. I am a consulting geologist with offices at 3806 - 254th Street, Aldergrove, B.C., V4W 2R3.

2. I am a graduate of the University of British Columbia, B.Sc. (1968).

3. I am a registered Professional Geoscientist of the Association of Professional Engineers and Geoscientists of the Province of British Columbia.

4. I have practiced my profession continuously since 1968.

5. I have personally examined the Mt. Bisson Property and re-sampled some of the showings described in this report for Argonauts Group Ltd.

6. I hereby consent to the publication of this report for purposes of a Prospectus or Statement of Material Facts.

Dated at Aldergrove, British Columbia, this 25th day of January, 1997

DG Leighton

Douglas G. Leighton, P.Geo.

APPENDIX A

THE RARE EARTHS - A GENERAL PERSPECTIVE

RARE EARTH MINERALS[1]

Over 70 minerals are known to contain rare earth elements in concentrations exceeding 10% rare earth oxide (REO). In fact, commercial extraction is dominated by just three minerals: bastnaesite, monazite and xenotime. Xenotime is an important source of the heavy rare earths and yttrium but is less important than monazite and occurs in fewer deposits. Predominate source minerals are:

MINERAL	FORMULA	TYPE	REO (Max. %)
Bastnaesite	$CeFCO_3$	Fluorocarbonate	75
Monazite	$(Ce,Y)PO_4$	Phosphate	65
Apatite	$(Ca\ Ce)_5(P,Si)O_4)_3(O,F)$	Phosphate	12
Pyrochlore	$(Na,Ca,Ce)_2Nb_2O_6F$	Oxide	6
Fergusonite	$(Y,Er,U,Th)_2Nb,Ta,Ti)O_4$	Oxide	46
Samarskite	$(Y,Ce,U,Ca)(Nb,Ta,Ti)_2O_6$	Oxide	22
Euxenite	$(Y,Ca,Ce,U)(Nb,Ta,Ti)_2O_6$	Oxide	30
Allanite	$(Ce,Ca,Y)_2(Al,Fe)_3(SiO_4)_3OH$	Silicate	28
Cerite	$Ca,Ce_6Si_3O_{13}$	Silicate	70
Fluocerite	CeF_3	Fluoride	70
Brannerite	$(U,Ca,Fe,Y,Th)_3(Ti,Si)_5O_{16}$	Oxide	12
Gadolinite	$(Y,Ce)_2FeBe_2Si_2O_{10}$	Silicate	48
Xenotime	YPO_4	Phosphate	62
Zircon	$(Zr,Th,Y,Ce)SiO_4$	Silicate	---

MONAZITE

Monazite is a yellow to reddish brown monoclinic phosphate mineral which contains up to 70% REEs. It is exploited as a by-product of processing mineral sands for ilmenite, rutile, cassiterite and zircon. The main sources are alluvial or beach sands. Monazite concentrates contain between 55% and 65% REEs.

BASTNAESITE

Bastnaesite is a cerium group flurocarbonate. It is a pale yellow to brown mineral with a moderate hardness (4-4.5). Bastnaesite contains up to 75% REOs and only modest amounts of yttrium (± 5%). Exploitable deposits occur in carbonatites, as veins and disseminations in carbonate-silicate rocks, in quartz

[1] From: **Roskell**, The Economics of **Rare Earths 1988**, Seventh Edition, Roskill Information Services Ltd, Chapman Road, London SW9 OJA, England. Copyright December 1988.

veins cutting schists and quartzite, and in epithermal fluorite-bearing veins and breccia fillings. The largest deposit is at Bayan Obo in China (5-6% REOs) and the highest grade commercial deposit is at Mountain Pass, California (7-10% REOs).

XENOTIME

Xenotime is a yttrium phosphate. It occurs in igneous and metamorphic rocks and in pegmatites. Xenotime is a yellow to brownish-green mineral which frequently contains uranium and thorium. Most comes from Malaysia, Indonesia, Thailand and Australia where it is recovered as a by-product of alluvial tin mining. Xenotime contains up to 62% REOs and it is a major source of heavy (HREEs), especially yttrium, samarium and gadolinium.

USES

REEs are mainly used in petroleum-cracking catalysts, iron and steel alloys, the glass industry (polishing compounds, additives), magnets and phosphors. As well there are industrial applications: drilling, welding, cutting and scribing. The REEs have important potential in superconductor applications, ceramics and lasers.

China, Australia and the US are pioneering new uses for rare earths in the agricultural industry. If successful, this will likely have a significant impact on future demand.

EXPLORATION TARGETS

Rare earths exploration is normally tied to programs searching for commodities such as niobium, uranium, and phosphate. However, exploration for (and of) certain geological environments for any element will presumably result in discovery of suites of commonly associated minerals, including the rare earth elements.

The common host rock associations include:

- Carbonatite-syenite complexes (Nb, Y, REE, Zr),
- Volatile-rich granite systems (Be, Ta, Y, REE, Nb),
- Peralkaline granite-syenite systems (Be, Nb, Ta, Y, REE, Zr, Ga),
- Sedimentary phosphorites (Y),
- Black sand placers.

All are represented in Canada. In the Western Cordillera (generally British Columbia and Yukon Territory), only four of the five host environments are present. Peralkaline granite/syenite complexes are not known to occur.

CARBONATITE-SYENITE COMPLEXES

Carbonatites and carbonatite-syenite complxes are significant sources of lanthanides, yttrium, niobium, zirconium, as well as copper, phosphate, iron and vermiculite. As a class, they are well represented in BC.

Carbonatites are igneous rocks containing more than 50% primary calcite or dolomite. Common accessory minerals include olivine, pyroxene, amphibole, apatite (phosphate), magnetite, ilmenite, zircon, columbite and pyrochlore. Fluorite and the rare earths are frequently present and the rocks typically contain elevated concentrations of strontium.

Identification of carbonites is sometimes difficult but mostly they can be recognized by a distinctive orange or dark brown weathering coloration, by their elevated radioactivity and certain diagnostic minerals (apatite, magnetite, zircon, olivine, etc.). Commonly associated rocks include quartz free syenite, nepheline or sodalite syenite and a metasomatic rock called fenite.

Carbonatites with the best economic potential for rare earths in the Western Cordillera are those of mid-Paleozoic age hosted by Paleozoic sediments in the Rocky Mountains and eastern Cassiar Mountains.

VOLATILE-RICH GRANITES

Volatile-rich granite systems host many important mineral deposits. Besides the rare earth elements, base metals, molybdenum, tungsten, tin and even gold can be present. Two Canadian Cordilleran examples are the Surprise Lake Batholith near Atlin and the Parallel Creek Pluton located between Cassiar and Teslin Lake, both of which contain anomalous concentrations of beryllium.

Volatile-enriched "granites" comprise two well defined types: 1.) Alaskites (or alkali feldspar granites) and, 2.) Two-mica granites (or quartz monzonites).

Alaskites have a low colour index, containing few mafic minerals. Common accessory minerals include: titanite, magnetite, apatite, zircon, allanite, fluorite, melanite garnet and monazite. Miarolitic cavities are frequently present. Mineralization includes: Mo, W, Y, REEs, F, U, Th, Nb, and Ta which occur in veins, skarns, greissens, porphyries and pegmatites.

Two-mica granites also tend to have a low colour index and, besides the defining rock forming minerals, accommodate the accessory minerals tourmaline, fluorite, ilmenite, monazite and topaz. Tourmaline encrusted cavities are often present and, in common with alaskites, quartz syenite is a standard *plutonic associate. Mineralization includes: Sn, Cu, W, Be, Zn, and Mo in* skarns, greissens and vein deposits. The volatile-rich granites form a cluster in north-central British Columbia and in the Yukon Territory.

PERALKALINE INTRUSIVE COMPLEXES

A metallogenic model for high-level peralkaline rock-hosted rare-metal mineralization based on the Strange Lake, Letitia Lake and other deposits has been developed by Miller (1989). Miller's model indicates that rare-metal mineralization (Zr, Y, REE, Nb, Ta, Be) occurs in anorogenic high-level peralkalike felsic intrusions and their near-vent extrusive equivalents in four situations as follows:

as pegmatites-aplite dykes and late-stage roof zone phases in high-level peralkaline granite plutons that do not vent on surface,
as pegmatites and pegmatite-aplite dykes in the roof zone of vented peralkaline granites and as disseminated mineralization in the near-vent extrusive equivalents,
as subvolcanic veins associated with peralkaline quartz syenites and disseminated mineralization in the peralkaline trachytes within the near-vent environment,
as disseminated mineralization within high-level undersaturated peralkaline complexes.

Settings I and 3 are the more economically significant. Examples of 1 include Strange Lake and Thor Lake, and Jabal Sa'id in Saudi Arabia. Examples of 3 include: Letitia Lake and Brockman in Australia.

PRINCIPAL WORLD DEPOSITS

The United States, China, Russia and Australia are major producers of rare earths. US production comes almost entirely from Mountain Pass in California. In Australia, rare earths are recovered from placers; in China, deposits occur in magnetite ores at Bayan Obo. Russia produces nearly all of its rare earths from carbonatites and alkaline rock complexes.

NORTH AMERICA

Mountain Pass

The Mountain Pass carbonatite deposit, owned by Unocal Corp., is located 80 km south-southwest of Las Vegas in southwestern California. Between 1965 and 1985 it accounted for 50% of world's production and Mountain Pass is unique in being the only deposit mined solely for its rare earth content.

The primary carbonatite, known as the Sulphide Queen, is a steeply dipping dyke about 130 m wide and 750 m long which intrudes Precambrian gneisses.

Where mined, the dyke contains 40% calcite, 25% barite or celestite, 11% bastnaesite, 10% strontianite and 8% silica, and grades 7 to 8% total REOs (predominately of the cerium subgroup). Reserves have been placed at 28 million tonnes averaging 8.9% REOs based on a cutoff grade of 5 wt%.

Mining is by open pit and a concentrate containing 55 to 60 wt% REOs is produced by flotation. Some concentrate is treated by acid leach to remove impurities to produce a 68 to 72% REO product (mischmetal). The remainder is roasted then chemically treated to produce REO products.

Pajarito Mountain

In 1989, Molycorp, Inc., announced the discovery of a potentially important 3 million tonne orebody at Pajarito Mountain in New Mexico. Located within the Mescalero Apache Reservation, Pajarito forms part of an agpaitic syenite complex exposed over an area approximately 1.6 by 0.8 km in extent. Syenite containing up to 20% eudialite and 5% fluorite with perthite, quartz, riebechite, and aegerine occurs in a well defined 1.3 km^2 zone.

The deposit contains 1.3% zirconia and 0.18% yttria. Production costs of the zirconia, yttria, and heavy lanthanides should be low because eudialite is soluble in dilute acid and heap-leach processing similar to that utilized for some low-grade gold deposits may be applicable.

The Pajarito Mountain deposit in mentioned specifically because it has similarities with two Canadian prospects: Kipawa in Quebec and the Red Wine complex in Labrador. Both are eudialite syenite-granite occurrences.

AFRICA

Between 1950 and 1975, high-grade bastnaesite-monazite-rhabdophane veins and stockwork veinlets were mined for rare earths at Karonge in Burunbi. Kangankunda Hill deposit in Malawi contains 11 million tonnes in an ankerite carbonatite orebody containing 7% monazite, 14% strontianite and minor barite surrounded by potassic fenites. Secondary REE deposits in residuum over weathered carbonates occur in several of locations including: Mrima Hill in Kenya; Wigu Hill in Tanzania and at Ondurakorume in Namibia.

EUROPE-RUSSIA

The Tomtor Massif in northern Siberia is comprised of a 12 km^2 stock of carbonatite surrounded by a jacupirangite-urtite dyke ring which in turn is encircled by a 2 to 6 km wide zone of alkaline syenite. Much of the stock is covered by alkaline volcanics and the entire massif is overlain by later sediments.

Three types of mineralization have been identified: 1.) primary pyrochlor-apatite-magnetite-bearing dolomite-calcite and ankerite carbonatite; 2.) a weathered and hydrothermally altered cap, up to 300 metres thick, of mixed carbonatite, phonolite and possible country rocks enriched in pyrochlor, columbite, apatite, monazite, rutile, anatase, other phosphates and oxides (lower ore horizon); 3.) a 3 to 25 m thick buried placer deposit containing monazite, florencite, anatase and pyrochlor, developed in local karst depressions (upper ore horizon).

The average concentration of REEs are 0.5 - 0.7 wt% in mineralized carbonatite, 4-6 wt% in the lower ore horizon and 11 - 30 wt% in the upper ore horizon. Niobium concentrations range from a few tenths of a percent in the carbonatite to a few percent in the lower horizon to 12% in the upper ore horizon. In addition to the REEs and niobium mineralization, high-grade phosphate lenses up to 50 m thick and containing 12.5 wt% P_2O_5 are developed in the lower ore zone.

ASIA - CHINA

China has over 20 separate deposits but the dominant resource is located at Baotou, Inner Mongolia, which contains heavy and light rare earths. Concentrate is obtained as a by-product from iron ore mining.

Beginning in 1987, yttrium has been produced from REE-rich clay in Jiangxi Province. Here, mill feed contains 92% total REO. As percentages of rare earths, ore contains over 30% yttrium oxide along with 10% total heavy lanthanides.

Bayan Obo

The polymetallic Bayan Obo REE-Fe ore body is located in Inner Mongolia, north-central China. Total reserve, in more than 20 open pits, is at least 1.5 billion tonnes grading 35 wt% Fe and 48 million tonnes of 6 wt% REOs. The largest pits, the Main and East Mine, contain 60% of the total reserves.

The Bayan Obo ore bodies are stratabound, consisting of discontinuous lenses in the middle of Proterozoic dolostones of the Bayan Obo Group, over an 8 km strike length. Ores are variable combinations of hematite, bastnaesite, monazite, xenotime, fluorite, aegirine, magnetite, apatite, phlogopite, alkali amphiboles and biotite.

AUSTRALIA

Australia controls approximately 6.5% of the world's rare earth resources. About one half of this reserve is contained in monazite and xenotime in mineral sands in Murray Basin. Wimmera Industrial Mineral (or WIM) is the major player, controlling almost all of the major basin deposits. One alone, WIM 150, contains

100,000 tonnes of Y_2O_3 which, combined with other deposits, contributes to a reserve of 700,000 tonnes Y_2O_3 -- 35% of the estimated total world Y_2O_3 resource.

Mount Weld

The Mount Weld carbonatite in the Yilgarn Block, Western Australia, was discovered in 1966. It comprises a perpendicular cylindrical body 3 km in diameter with an annulus of altered rock 500 m in width. Residual apatite containing 250 million tonnes of 18 wt% P_2O_5 forms in a lateritic regolith up to 90 m deep over the carbonatite. Locally this zone contains 15 million tonnes of 11.2 wt% REOs (including yttrium).

Brockman

The Brockman rare-metal deposit is in the East Kimberly region of Western Australia. It formed with the eruption of trachytic magma enriched in volatiles and a wide variety of incompatable elements including: Zr, Hf, Nb, Ta, Be, Ga, Y, and the REEs. Even beryllium is a potential product. Zircon is by far the most important ore mineral. In respect to commodities, Brockman has been compared with the Thor Lake T-Zone.

H

APPENDIX B

COST STATEMENT

TO: ERZ PROPERTY EXAMINATION OCT 5th to 10th /96 AND SUBSEQUENT REPORT PREPARATION

Professional Fees:

Total: 14 days @ $300.00/day — $3,600.00

Disbursements:

Oct. 1/96	Topographic Maps	$62.14	
Oct. 1/96	Claim Maps	11.47	
Oct. 5/96	Truck Gas	61.73	
Oct. 5/96	Truck Gas	73.12	
Oct. 5/96	Meal	16.59	
Oct. 7/96	Truck Gas	47.50	
Oct. 7/96	Groceries	27.80	
Oct. 7/96	Motel	52.90	
Oct. 8/96	Groceries	26.19	
Oct. 8/96	Meal	10.63	
Oct. 9/96	Truck Gas	39.47	
Oct. 10/96	Truck Gas	55.13	
Oct. 10/96	Truck Gas	60.00	
Oct. 10/96	Motel	51.75	
Oct. 10/96	Meal	15.15	
Oct. 10/96	Meal	17.59	
Oct. 28/96	Assays	174.41	
Oct. 29/96	Claim Recording	60.00	
Oct. 30/96	Drafting Services	412.21	
Truck Rental (5 days @ $40.00/day)		200.00	
TOTAL DISBURSEMENTS			$1,475.78
Engineering Overhead Fee (10%)			507.58
Sub-total			$5,583.36
GST			390.84
Grand Total			$5,974.20

APPENDIX C

ACME LABS. ANALYTICAL RESULTS

ACME A[illegible] TICAL LABORATORIES LTD. 852 E. HASTINGS ST. [illegible] COUVER BC V6A 1R6 PHONE(604)253-3158 FAX([illegible] 253-1716

WHOLE ROCK [illegible]CP-MS ANALYSIS

Leighton Exploration & Dev. PROJECT BISSON File # 96-5240 Page 1

3806 - 254th St., Aldergrove BC V4W 2R3 Submitted by: D.G. Leighton

SAMPLE#	Y ppm	La ppm	Ce ppm	Pr ppm	Nd ppm	Sm ppm	Eu ppm	Gd ppm	Tb ppm	Dy ppm	Ho ppm	Er ppm	Tm ppm	Yb ppm	Lu ppm
BIR1	12965.3	1154.2	2993.4	332.5	806.9	684.1	38.0	1369.4	354.0	1470.7	710.6	1408.7	285.7	1745.6	246.7
BIR2	19321.1	1568.7	2523.7	312.6	862.4	870.7	56.6	1741.5	945.0	2199.3	2629.2	2050.0	537.8	2703.8	368.7
BIR3	15014.5	1312.9	2561.6	287.6	779.0	716.4	43.4	1497.2	440.9	1769.0	2072.6	1690.4	441.1	2280.5	318.6
BIR4	13957.5	1221.0	3024.3	311.6	750.8	674.2	40.2	1395.1	386.6	1565.3	1813.0	1526.8	375.8	2001.0	281.3
RE BIR4	14029.5	1146.1	3028.2	305.2	734.4	648.2	38.5	1328.2	363.7	1458.5	736.9	1433.7	293.4	1841.2	253.8
STANDARD SY-3	706.0	1267.8	2177.6	223.0	676.1	108.1	15.7	101.8	20.5	111.8	27.5	64.9	9.4	59.8	9.2

.200 GRAM SAMPLE FUSED WITH 1.2 GM LIBO2 AND IS DISSOLVED AND DILUTED TO 100 ML WITH 5% HNO3. RARE EARTH ELEMENTS PRE-CONCENTRATED AND SEPARATED FROM MAJOR ELEMENTS, ANALYSED BY ICP -
- SAMPLE TYPE: P1 ROCK P2 SILT Samples beginning 'RE' are Reruns and 'RRE' are Reject Reruns.

DATE RECEIVED: OCT 11 1996 **DATE REPORT MAILED:** Oct 25/96 **SIGNED BY** .... .D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS