

M709

840003

Memorandum

93N/9E

November 29, 1988

To: Earl D. Dodson
Re: Ree - Mt. Bison Project (M709)

Rare earth element occurrences within the Mt. Bison Alkaline Complex were discovered by prospecting late in 1987 and staked subsequently. The claims, located in central British Columbia, were optioned by Chevron in May 1988 (Figure 1). The property consists of 227 claim units in two blocks that are underlain by the Mt. Bison Alkaline Complex that forms part of the Proterozoic Wolverine Metamorphic Complex within the Omineca Crystalline Belt. The alkaline complex consists of nepheline syenites, and layered amphibole, pyroxene, and feldspar-bearing rocks over a broad area.

This alkalic intrusive complex is one of numerous similar complexes found within the Omineca Crystalline Belt (Figure 2). Unlike Cominco's Aley Carbonatite niobium deposit, the mineralization found on the Ree properties is mainly of rare earth elements rather than niobium.

The 1988 exploration program consisted of detailed geological mapping, systematic geochemical sampling over the four known area of rare earth element occurrences, reconnaissance panned concentrate sampling, as well as prospecting utilizing a scintillometer to detect the thorium present in the monazite.

To date rare earth element mineralization has been found on the Ree property in two type of rare earth element enriched pegmatites (allanite- and monazite-bearing pegmatites) and within broad zones of alkalic altered syenite (aegirine-augite alkali-feldspar syenite).

The rare earth pegmatites have high grade zones of 1-7% REE (Table 1), while the REE content of the zone of alkalic altered syenite ranges up to 0.64%. Reconnaissance panned concentrate collected from the primary drainages in the area returned values of up to 1980 ppm cerium (Figure 3).

In areas of bedrock or minimal soil coverage the radiometric survey clearly delineated the rare earth element enriched pegmatites, as well as the zones of alkalic altered syenite. Soil sampling also proved to be a useful tool for identifying anomalous REE zones where no outcrop exists.

The results of the 1988 exploration program for each of the four areas are summarized below in Table 1.

TABLE 1
1988 REE PROJECT - SUMMARY OF RESULTS

	Rock Type	Length (m)	Width (m)	% REE (maximum)
LAURA	AMP (1)	30	1.5	7.54
	AMP (2)	18	1.3	0.45
	AMP 3	10	5	-
	AMP 4	15	1	5.56
	AMP 5	10	2	5.47
	QMP	10	1	0.32
	AAS	110	60	0.65
	AAS	200	200	0.55
WILL #2	AAM	70	20	0.15
	AASD	5	1	0.85
WILL #1	AASD	2	0.5	4.27
URSA	CG	10	2	2.14

AMP = Allanite Monzonite Pegmatite
 QMP = Quartz Monazite Pegmatite
 AAS = Alkalic Altered Syenite
 AAM = Alkalic Altered Monzodiorite
 AASD = Aegirine Augite Syenite Dyke
 CG = Cataclastic Gneiss

Table 2 has been compiled to put the grades (REE %) of the various rare earth-enriched zones outlined in Table 1 in terms that are easier to comprehend; gold grade equivalent and US \$ per ton of ore. Rare earth prices are commonly quoted for REO (Table 3), but as the analysis were obtained for the elements and not the oxides, I was able to obtain an approximate price for some of the REE from Ed Barnun of Molycorp Inc. in Los Angeles. These REE prices were used to calculated the dollar values which are quoted in US \$ and the gold grade equivalents which are based on a gold price of US \$420/oz.

Values for gold grade equivalents and prices per ton of ore have

been calculated in three ways. The first values were obtained using all REE with metal prices quoted and are found in column (1). These prices and grade equivalents are conservative as metal prices were not quoted for all elements, some of which are very valuable (ie. Europium which sells at \$745/lb of oxide). Additionally, gold grade equivalents and prices per ton of ore have been calculated using Lanthanum and Cerium, as well as with just Lanthanum. These values are found in columns (2) and (3) of Table 2, respectively.

The rare earth element showings on the Laura grid show excellent potential for an economic deposit. Five allanite-rich pegmatites and one monazite-rich pegmatite were found in or near two broad zones of alkalic altered syenite. The high grade allanite monzonite pegmatites have grades that range from 0.45 to 7.54% REE (Table 1). This represents a US \$/ton price of \$289.96 to \$4,434.56 and a gold grade equivalent of 0.690 to 10.558 oz/ton (Table 2).

The alkalic altered syenite occurs as multiple (2 to 3) replaced layers within the relatively flat lying biotite schist and amphibolite of the Wolverine Metamorphic Complex. Individual beds range up to 1.2 metres thick over hundreds of square metres. These broad zones of relatively lower grade alkalic altered syenites have values that range up to 0.65% REE (Table 1), representing a US \$/ton price of \$405.68 and a gold grade equivalent of 0.966 oz/ton (Table 2).

On the Will #2 grid a zone of alkalic altered monzodiorite occurs within monzonite and quartz pegmatite and is cut by rare earth bearing dykes (aegirine-augite syenite dyke). The rare earth enriched monzodiorite and the dyke have values that range up to 0.15 and 0.85 % REE, respectively (Table 1). These represent a US \$/ton of \$100.30 and \$545.96, as well as a gold grade equivalent of 0.239 and 1.300 oz/ton (Table 2).

An REE-enriched aegirine-augite syenite dyke was found on the Will #1 grid that grade up to 4.27% REE and reflects a price of US \$2421.96/ton or a gold grade equivalent of 5.767 oz/ton.

A monazite-bearing cataclastic gneiss (mylonitized pegmatite) on the Ursa grid grade up to 2.14% REE which reflects a price of US \$ 1176.82/ton or a gold grade equivalent of 2.802 oz/ton.

For comparison, the average grade of Molycorp's Mountain Pass rare earth deposit is 7.67 % REO (rare earth oxides). It is important to note that the REO content will be about 2 or 3 times the REE (rare earth element) content.

The significance of the Ree - Mt.Bison project REE mineralization, especially on the Laura grid is better understood when put in terms of the price per ton or the gold grade equivalent. Further to this

analysis, additional exploration is warranted on the Ree - Mt. Bison claims and should be directed towards determining the spatial extent of the alkalic altered zones and rare earth pegmatites and dykes, as well as collecting bulk samples of each type of mineralization for metallurgical testing.

S. McAllister

GOLD GRADE EQUIVALENT AND US \$ VALUE OF REE - MT. BISON PROJECT RARE EARTH ELEMENTS

ROCK TYPE	* METAL PRICE /LB											(1) US \$ /TON OF ORE	(1) AU GRADE** OZ/TON	(2) US \$ OF ORE	(2) AU GRADE** OZ/TON	(3) US \$ OF ORE	(3) AU GRADE** OZ/TON
	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Yb	%REE						

LAURA																	
AMP 1	25050	36220	1675	7361	4674	63	193	30	77	18	7.54%	4434.56	10.558	3676.20	8.753	1503.00	3.579
AMP 2	1518	2175	114	583	59	8	31	4	12	5	0.45%	289.96	0.690	221.58	0.528	91.08	0.217
AMP 4	22350	25300	1252	5800	506	44	284	25	50	21	5.56%	3505.80	8.347	2859.00	6.807	1341.00	3.193
QMP	1125	1531	80	418	36	7	19	2	7	5	0.32%	204.84	0.488	159.36	0.379	67.50	0.161
AAS	2621	2917	134	680	52	9	30	3	7	3	0.65%	405.68	0.966	332.28	0.791	157.26	0.374
AAS	1826	2577	143	819	84	12	35	3	8	3	0.55%	348.82	0.831	264.18	0.629	109.56	0.261

WILL #2																	
AAM	436	739	46	260	29	5	12	2	4	2	0.15%	100.30	0.239	70.50	0.168	26.16	0.062
AASD	2318	4215	261	1458	147	23	59	7	16	5	0.85%	545.96	1.300	391.98	0.933	139.08	0.331

WILL #1																	
AASD	13142	15707	1574	8207	3929	78	1	17	37	16	4.27%	2421.96	5.767	1730.94	4.121	788.52	1.877

URSA																	
CG	5929	6529	708	4369	3643	10	97	24	58	1	2.14%	1176.82	2.802	747.48	1.780	355.74	0.847

* Pers. comm. Ed Barnun, MolyCorp. Inc., Nov. 28, 1988 in US \$ (- no quote given)

** Gold grade equivalents quoted at US \$420 per ounce

(1) Values obtained using all REE with metal prices quoted

(2) Values obtained using only Lanthanum and Cerium

(3) Values obtained using only Lanthanum

AMP = Allanite Monzonite Pegmatite

QMP = Quartz Monazite Pegmatite

AAS = Alkalic Altered Syenite

AAM = Alkalic Altered Monzodiorite

AASD = Aegirine Augite Syenite Dyke

CG = Cataclastic Gneiss

THE LANTHANIDE SERIES

Price schedule

LANTHANUM OXIDES

October 1, 1988

Code No.	Oxide	Purity (%)	Lb in Std Container	Price per Pound	
				1 Lb to Standard	Standard Container
5000	EUROPIUM	99.99	25	\$ 825.00	\$ 745.00
5200	LANTHANUM	99.995	300	10.25	9.50
5205	LANTHANUM	99.99	300	9.50	8.75
5310	CERIUM	96.0	200	5.25	4.50
5350	CERIUM	99.0	200	8.75	8.00
5400	NEODYMIUM	96.0	300	7.25	6.75
5410	NEODYMIUM	99.0	50	45.00	40.00
5500	PRASEODYMIUM	96.0	300	17.50	16.80
5600	YTTRIUM	99.99	50	55.00	52.50
5700	GADOLINIUM	99.9	55	60.00	55.00
5775	GADOLINIUM	99.99	55	65.00	60.00
5780	GADOLINIUM	99.99	55	70.00	65.00
5810	SAMARIUM	96.0	55	90.00	85.00
8100	TERBIUM	99.9	55	400.00	375.00
8250	DYSPROSIUM	85.0	50	45.00	40.00
8400	ERBIUM	98.0	50	70.00	65.00

FOB: Louviers, Colorado
Mtn. Pass, California
York, Pennsylvania

Terms: Net 30 Days

Minimum Order: \$50

Prices subject to change without notice.

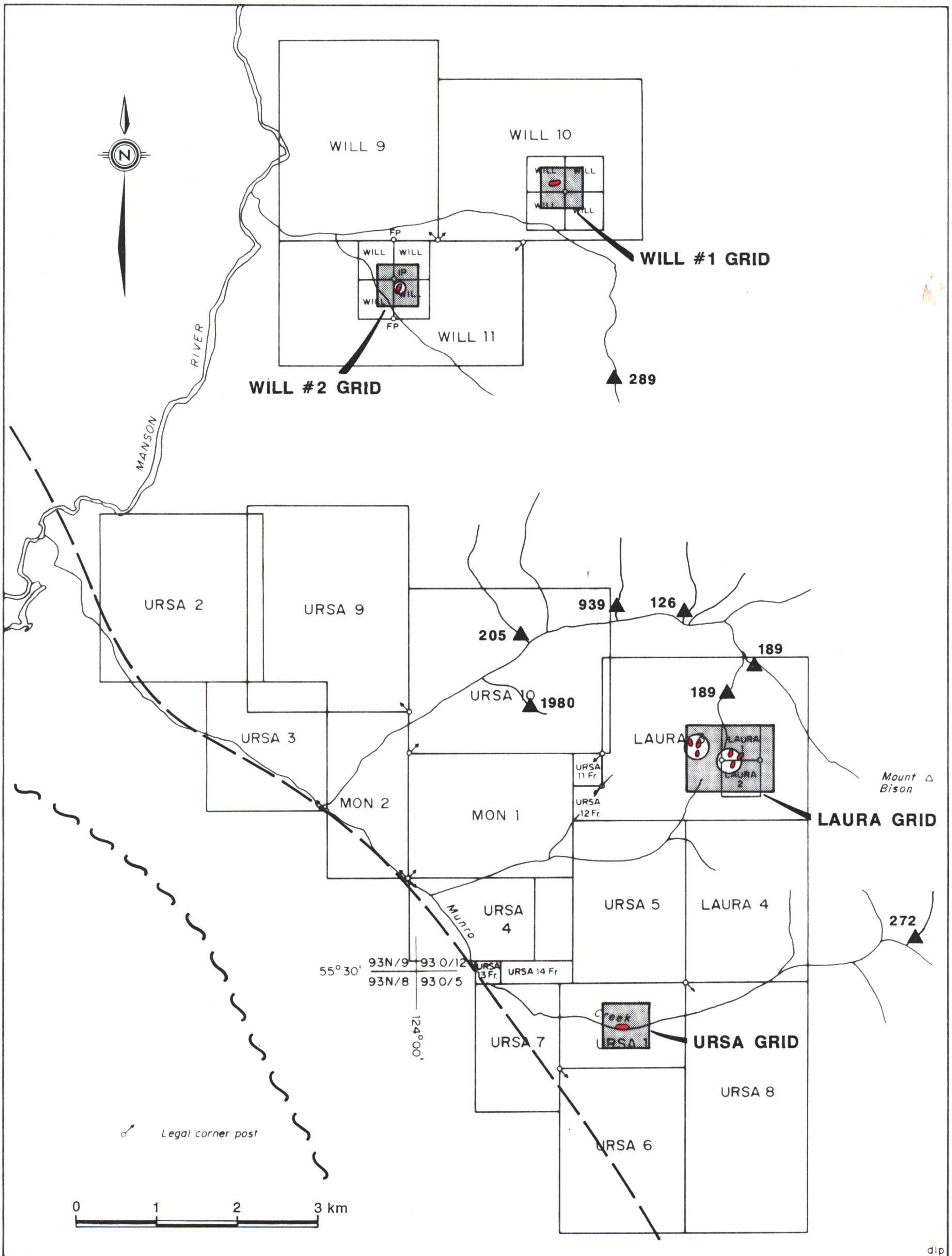


THE LANTHANIDE MINERAL

The lanthanide mineral business makes up 12% of the ore we mine at Mountain Pass, California (supplying over half of the free world's need). It contains all nine of the principal lanthanide elements in proportions much as in the exploding pie chart shown at the left. More than forty million tons of ore are in the deposit. A sample for decades to come.

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LEGEND

TRIASSIC

SLIDE MT GROUP
 3 Argillite, phyllite

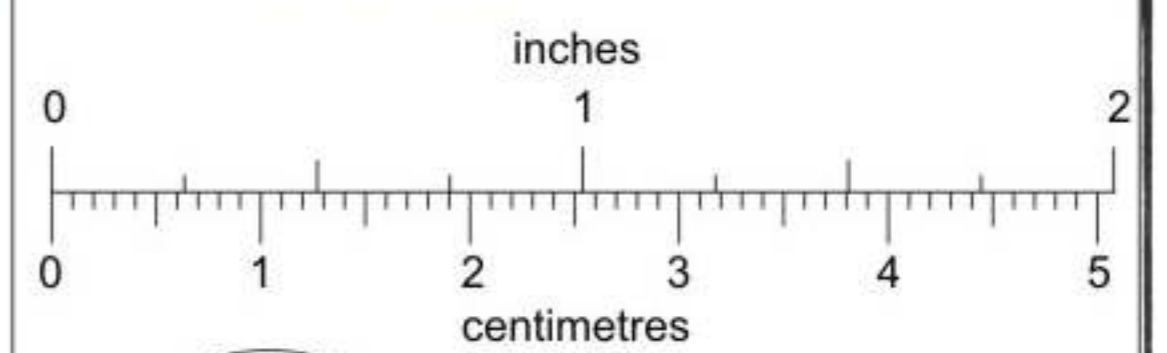
UPPER DEVONIAN

INGENIKA GROUP
 2 Quartzite, arkose, minor schist

LATE PROTEROZOIC + LOWER CAMBRIAN

1 Schist, Amphibolite, pegmatite

- Alkalic Alteration
- Rare Earth-Enriched Pegmatites and Dykes (not to scale)
- ▲¹⁸⁹ Panned Concentrate ppm Cerium
- Area of Radiometric and Geochemical Surveys



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

Chevron Minerals Ltd

**REE - MT BISON
 GEOLOGY AND SHOWINGS**

FIGURE No 3		PROJECT No M-709
DATE Nov. 1988	REVISION	SCALE 1:50,000
NTS No		
COMPILED BY		