

# MAR 19960020: FT SMITH & FT FITZGERALD

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19960020

**GEOLOGICAL REPORT  
ON**

**DOGRIVER**

**INDUSTRIAL MINERAL PERMIT NUMBER**

**9392060004**

**FORT SMITH NTS 74M14**

**PROVINCE OF ALBERTA**

**for**

**GRQ MINING INC.**

**Adrian G. Mann Ph.D., P.Geol.**

**RUTHRIE Enterprises Ltd.,  
10443 Brackenridge Road, S.W.,  
Calgary, Alberta - T2W 1A1**

**17 October 1996**

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## 1 INTRODUCTION

On the basis of an existing airborne magnetic study, and the previous assessment report's preliminary ground magnetic study, the airphotos of the permit were reexamined to pick suitable sites for intensive ground magnetics and VLF-EM to locate suitable drill targets. 11 lines were flagged for a total of 1940m, all but 100m of which was surveyed at 5m and 10m intervals by proton magnetometer, and all but 300m of which was surveyed by VLF-EM. Geochemical soil samples of the humus-'B'zone interface were collected from at 10m intervals the grid on five lines. Two diamond-drill sites, and a helicopter landing site were cleared, and 400m of trail cut through open forest from float plane docking site to this helicopter pad, and to the drill sites. Geological and prospecting scouting traverses were made to the south, to search for "down-ice" esker and moraine debris which might give a clue to the composition of the targeted zone. An attempt was made to obtain fresh rock samples from beneath the lake, using scuba gear.

Field operations were be headquartered in a camp established on site, and all staff, equipment and consumables were ferried in from Fort Smith by float plane.

The work was done by two geologists, two experienced scuba divers, and three others, acting as support and labour.

## 2 WORK DONE

This work is a follow-up to the preliminary study completed in spring 1994, when a magnetometer reconnaissance was made on the the Dog River Linear, a remarkably straight and continuous feature observed on the government aeromagnetic maps. It appears prudent to examine the feature east of the Slave River, because to the west the magnetic response appears subdued, suggesting deeper overburden.

An advance party of 2 geologists and two support workers flew in by float plane to J Lake on 30 September 1996. The intention was to define a target for two diamond drill holes which were to commence later that week.

After cutting a trail from the float plane docking site on the east end of J Lake, and establishing camp about 100m east of the shoreline; a 500m baseline was tagged by hipchain and compass at 50m interval from the east shore of J Lake along a direction 105

degrees true, then walked a further 1000m, to confirm that the zone selected is ideal. This ground work confirmed the airphoto review which had been made prior to the trip, and reinforced the impression gained from review of video footage of earlier overflights; that this is the only relatively dry area on the Dog River Linear with easy access, east of the Slave River.

Local prospecting of glacial debris was used, looking for lithology types which might explain the conductor-magnetic anomaly coincidence. Simultaneously, 200m lines off the baseline, along 195 degrees, were tagged and flagged at 10m intervals, for geophysical and geochemical work.

An unexpected problem in deploying the driller precluded diamond drilling, so the project diverted somewhat. One geologist left site on 5 October, when two scuba divers and a further worker arrived. Work was then directed towards locating rock samples underwater - which was unsuccessful - and to setting up camp for later in the year, and preparing two drill sites, cutting a track, and clearing a helicopter landing area; for when a drill becomes available, probably in November 1996.

On completion of these tasks, the project was suspended on October 8, 1996, and the team demobilized, pending availability of a drill rig and crew.

### 3 GEOPHYSICAL WORK DONE

Two exploratory lines were run at 180 degrees, being line numbers DRL075E and DRL250E, commencing at 75m and 250m east of line DRL000E on the baseline. These confirmed that this gulley indeed has a strong magnetic signature, and that the magnetic response coincides with an EM conductor. In an effort to prove that this is anomalous, a magnetometer traverse CC000N was run east-west, over a similar gulley which runs north-south. The gulley shows no magnetic response. Poor signal forced the VLF-EM traverse to be aborted.

Two comparison traverses (CC000E and CC050E) were run at 190 degrees across a subparallel gulley, roughly 1000m to the south of the baseline. This was selected because it is almost identical to the target gulley, being oriented east-west, deeply gouged out, over several kilometers, and relatively narrow. Geomorphologically, the features are indistinguishable. The magnetic profile over the gulley is flat. The VLF-EM profile, using station NSS (Maryland) shows a clear conductor, narrow and weak. Field repairs were then required for the magnetometer,

which was out of commission for a day.

With this background information, lines were set off from the baseline at 50m intervals, and traversed using the magnetometer and Ronka EM16 VLF.

The magnetic survey used a Mark II proton magnetometer. Recordings from the magnetometer were made at 2m and 3m height above ground surface in duplicate or triplicate at 10m intervals along the flagged lines. Where rapid rates of change with distance were detected, the interval was cut to 5m, and traverse direction was reversed temporarily to repeat a portion of the line. When fluctuations of readings occurred in one location, the readings were repeated until a +3 gamma reproducibility was achieved. As a matter of course, repeat readings were taken at 1 minute intervals at roughly 500m intervals, to check for diurnal fluctuations. Where practical, traverses were "jimmy" closed, by merely returning to one or more points near start of the traverse at a later time of day. No second magnetometer, as base station, was used.

The Electromagnetic survey used a Ronka EM-16, with which readings were taken at 10m intervals along the flagged lines. Where rapid rates of change occurred, the interval was cut to 5m. In the initial stages of the survey, Cutler, Maine (NAA) was chosen as source, but difficulties in obtaining a signal engendered a switch, to Anapolis, Maryland (NSS), which was surprisingly clear for much of the time. This latter proved to be the more consistent station, allowing repetition not only on In-Phase readings, but also in Quadrature.

On occasion, readings proved impossible, either through atmospherics, or because there was too broad a range for a minimum to be accurately pinpointed. Where this occurred, the traverse was abandoned for the day, and repeated on the morrow, or in the evening of the same day.

Although purists may frown at the methodology, the intent of the survey was not to provide absolute data, but rather to hone in on existing data of high quality, and thereby to choose the best drilling target.

A map of the grid, and details of all geophysical profiles are in the appendices.

Results of the geophysical work are summarized on the table below:

Line #	DIMENSIONS OF ANOMALY						
	MAGNETIC			ELECTROMAGNETIC			
	wdth	peak	amp	dpth	wdth	Xover	dpth
	m	m	γ	m	m	m	m
000E	16	-25	500	31.3	40	-40	36.6
050E	8	-25	570	27.5	15	-22	27.6
100E	14	-20	560	25.0	20	-18	26.6
150E	12	-30	700	28.7	20	-20	23.3
200E	6	-25	680	21.5	30	-18	30.0
280E	10	-35	680	20.0	45	-28	33.3

The geophysics indicates a strong linear magnetic anomaly in the centre of the permit, striking 105 degrees, centred roughly 25m south of the baseline. This coincides with a moderately strong conductor. Depth of overburden is of the order of 25-30m, based upon the half amplitude of the Magnetic anomaly, or on the 1.3 wavelength of the EM.

#### 4 GEOCHEMICAL SURVEY

Using a rabbiting spade, soil cores were cut at 10m intervals along lines DRL050E, DRL100E, DRL150E, DRL200E, DRL280E. The humus and clay fraction at the humus-clay ('B' zone) interface were collected. The samples are currently drying, preparatory to sieving. Both organic and clay fractions will be analyzed separately for a narrow spectrum of elements: copper, nickel, chromium, zinc, lead, arsenic, cadmium.

#### 5 PROSPECTING WORK

The area has had severe sheet ice erosion, which has gouged out the softer material from the Dog River Linear, and subsequently dumped debris into the gully so formed. No surface outcrop of the rocks underlying the gully have been observed in the 5km of foot traversing done on the feature east of the Slave River, nor in the 3km of road and foot traversing down west of the river. Nor has surface outcrop been seen anywhere along the 15 odd kilometres which have been flown on the feature, both in fixed wing (this year, present exercise) and helicopter (last year).

Granitic outcrop is almost universal in this area, and extends to narrow the gap to only 65m across the gully at its narrowest.

Two approaches were taken to circumvent this serious shortcoming:

A boat, equipped with an echo-sounder was used on J Lake, traversing back and forth to obtain an idea of the subsurface profile of the lake. It is evident that the ground slopes in from the east, along the gully, to the centre of the lake, where it drops off vertically on a north-south gully. This was the target for an underwater attempt to obtain fresh rock samples. Only glacial clay and rockflour, in excess of 1.5m in thickness, was observed in all points probed during the two days exercise on J Lake.

A prospecting team combed the area to the immediate north, northeast, south, southeast and southwest of the camp, examining glacial debris on the lee side of the extensive drumlins which cover the area.

Some success was achieved in the moraine dump about 500m almost due south of the camp. Here were found several large angular fragments of a dark green-black, medium to coarsely crystalline, idiomorphic olivine-pyroxenite, which seems wholly feldspar free. Discrete intercrystalline, subhedral to anhedral, brassy-brown sulphide granules, up to 2mm across, were noted in some of the material examined. Whether this rock derives from the Dog River Linear is not known. Certainly, it is from down-ice of the feature; as the morphology of the drumlins indicates movement from the north-northeast. No similar lithologies were noted in glacial debris to the north or northeast of camp.

## 6 CONCLUSIONS and RECOMMENDATIONS

The country rock is pink, potassic, mineralogically uninteresting and economically barren gneissic granite. The magnetic signature of which is flat and unremarkable. Foliation within the gneisses follows complex contortions, all in a generally north-northeast direction. This same trend is reflected further east in a north-northeast aeromagnetic fabric, associated with migmatized metasediments contained in the gneisses. The Dog River Linear, which strikes just south of east, cuts across this general trend.

The geophysical work on the Dog River Linear shows it is a narrow tabular feature, probably less than 10m thick, linear in plan, probably near-vertical to vertical, extending almost unbroken over about 40km strike length. The lithology is soft - not at



all resistant to sheet ice erosion. The feature is strongly magnetic, and is a moderate conductor, or a moderately strong conductor is associated either with the feature, or with one or other contact with the country rocks. A fault or shear would fit the character of the conductor.

The amplitude and character of the magnetic anomaly over the Dog River Linear suggests a near vertical narrow planar mafic or ultramafic body or dyke. The EM conductor with which the magnetic anomaly is associated suggests that emplacement of the mafic or ultramafic body was fault controlled.

A nickel kick associated with the gulley in the previous geochemical pilot work is most unusual in a granitic terrane such as this. Because the sample population was very small, one has to admit of the possibility that the kick is an aberration, of no significance whatever. On the other hand, it suggests that the source of the gulley may be mafic or ultramafic. As such, the nickel could be derived from a trace element in a silicate source, in which case the nickel itself would not be an economic entity. Such a source could be either kimberlite or serpentinite. Alternatively, the nickel could derive from sulphides, either disseminated within a narrow, intrusive ultramafic (peridotite or serpentinite) or mafic body (diorite or granodiorite), or scattered within a sulphide rich shear zone. In either case, the nickel could represent an economic entity, or be a pathfinder for another economic entity, such as platinum group elements.

A sulphide rich shear zone would be expected to be a rather stronger conductor than that here indicated. The association of nickel with such a feature would be unusual in granite terrane such as surrounds us. Although nickeliferous pyrrhotite is magnetic, a large body of the mineral would be required for a magnetic response similar to that here noted. Such a body would be a very strong conductor. For these reasons, a sulphide-rich shear is rejected in favour of a mafic or ultramafic dyke.

Any of these models would fit the requirement to be soft, allowing easy gouge by ice. In general, kimberlitic dykes are remarkably straight and continuous over many kilometres.

The only logical step now is to drill the feature, to establish what caused it.

---

**7 STATEMENT OF QUALIFICATIONS**

I, Adrian Gardiner MANN, undersigned, certify that:

- 1 I am a graduate of the Universities of London, England and Witwatersrand, South Africa;
- 2 I hold the degrees of:  
Ph.D.  
M.B.A.  
B.Sc. (General Honours) in chemistry and geology,  
B.Sc. (Special Geology) (Honours);
- 3 I am a member in good standing of:  
Society of Economic Geologists,  
Geological Society of South Africa,  
Institution of Mining and Metallurgy,  
Canadian Institute of Mining, Metallurgy and Petroleum;
- 4 I am registered:  
in Alberta as a Professional Geologist,  
in Britain as a Chartered Engineer;
- 5 I have practised continuously as a geologist since first I graduated in 1965. My experience was gained in central and southern Africa, south, central and north America;
- 6 This report is a fair and honest reflection of the geology of the permit;
- 7 The data on which opinions expressed in this report are made derive from field mapping by myself and colleague Justin Snelling P.Geol., and traversing all lines cited, with VLF and magnetometer.
- 8 I am a shareholder of GRQ MINING INC.

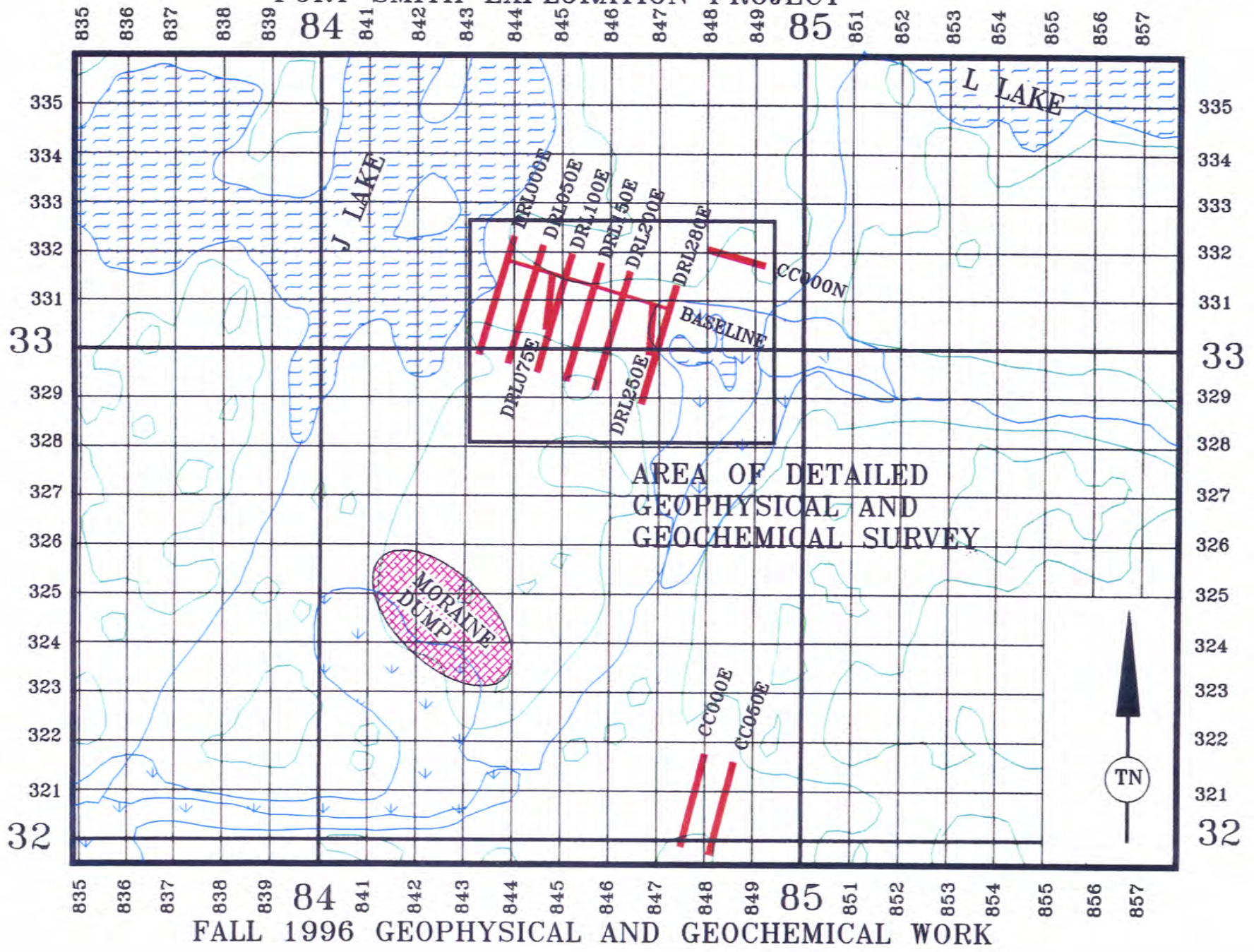
Adrian G. Mann Ph.D., P.Geol.,  
[REDACTED]

Calgary, Alberta T2W 1A1.  
17 October 1996

- Figure 1 - Fall 1996 Geophysical and Geochemical Work
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- Figure 12 - VLF-EM and Mag Traverse 280E Line

GRQ MINING INC  
FORT SMITH EXPLORATION PROJECT

Figure 1



FALL 1996 GEOPHYSICAL AND GEOCHEMICAL WORK



Figure 2

GRQ MINING INC.  
 DOG RIVER CLAIM BLOCK  
 VLF-EM AND MAG TRAVERSE CC000E LINE

- MAG AT 2m
- MAG AT 3m
- - - MAG - GRADIENT
- IN PHASE
- \*•••• QUADRATURE
- TOPOGRAPHY

DIRECTION 285  
 NSS - MARYLAND

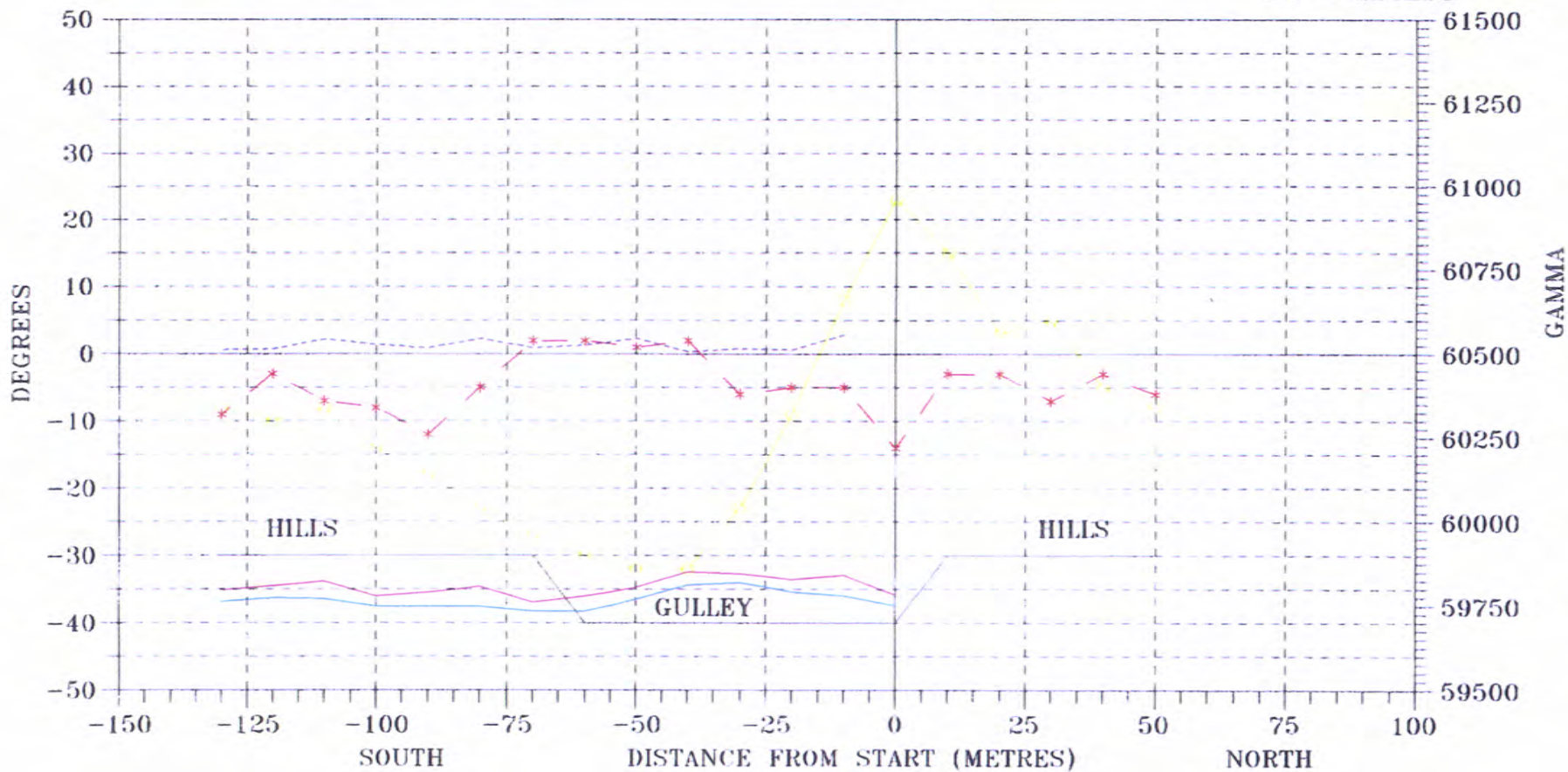


Figure 3

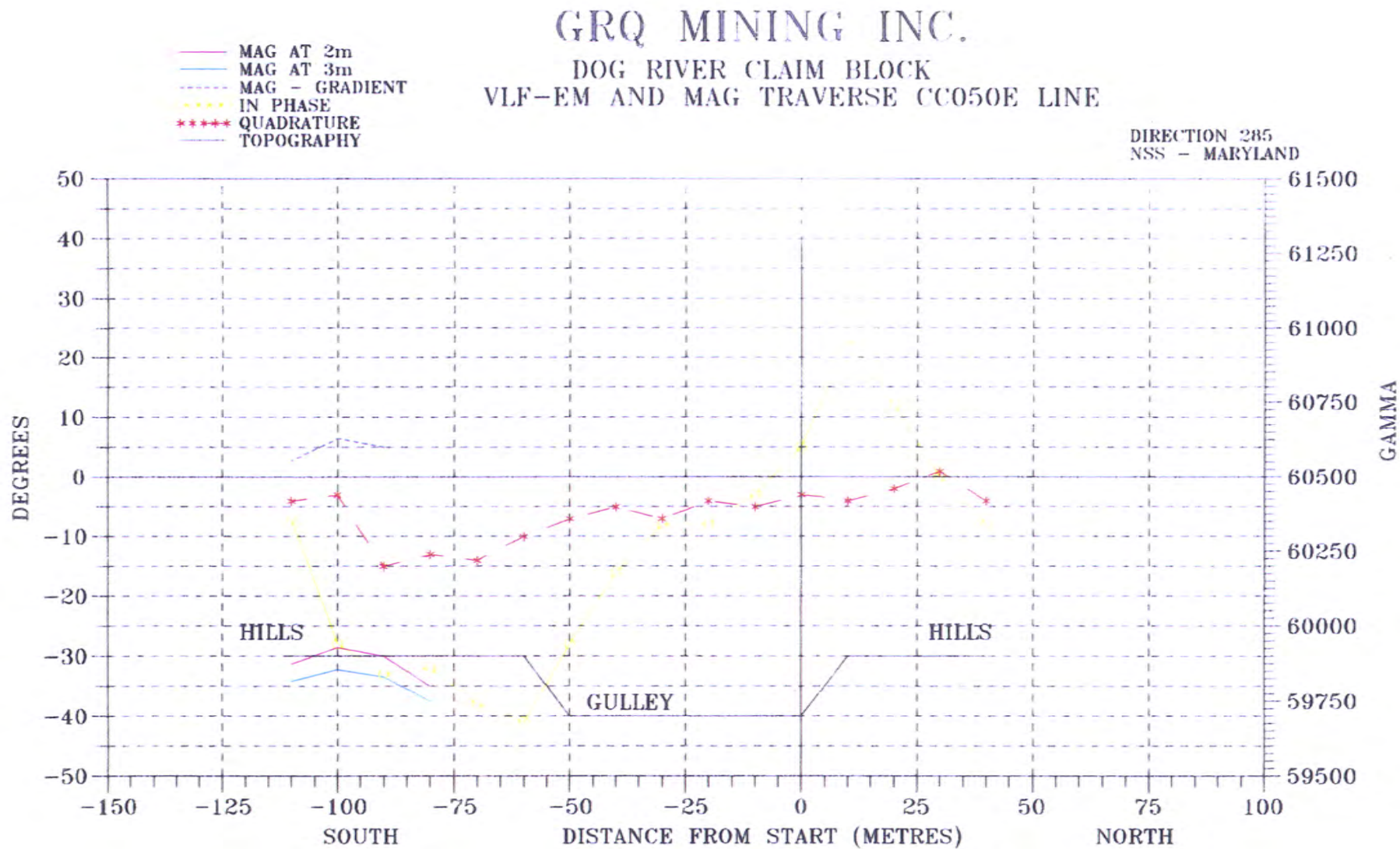


Figure 4

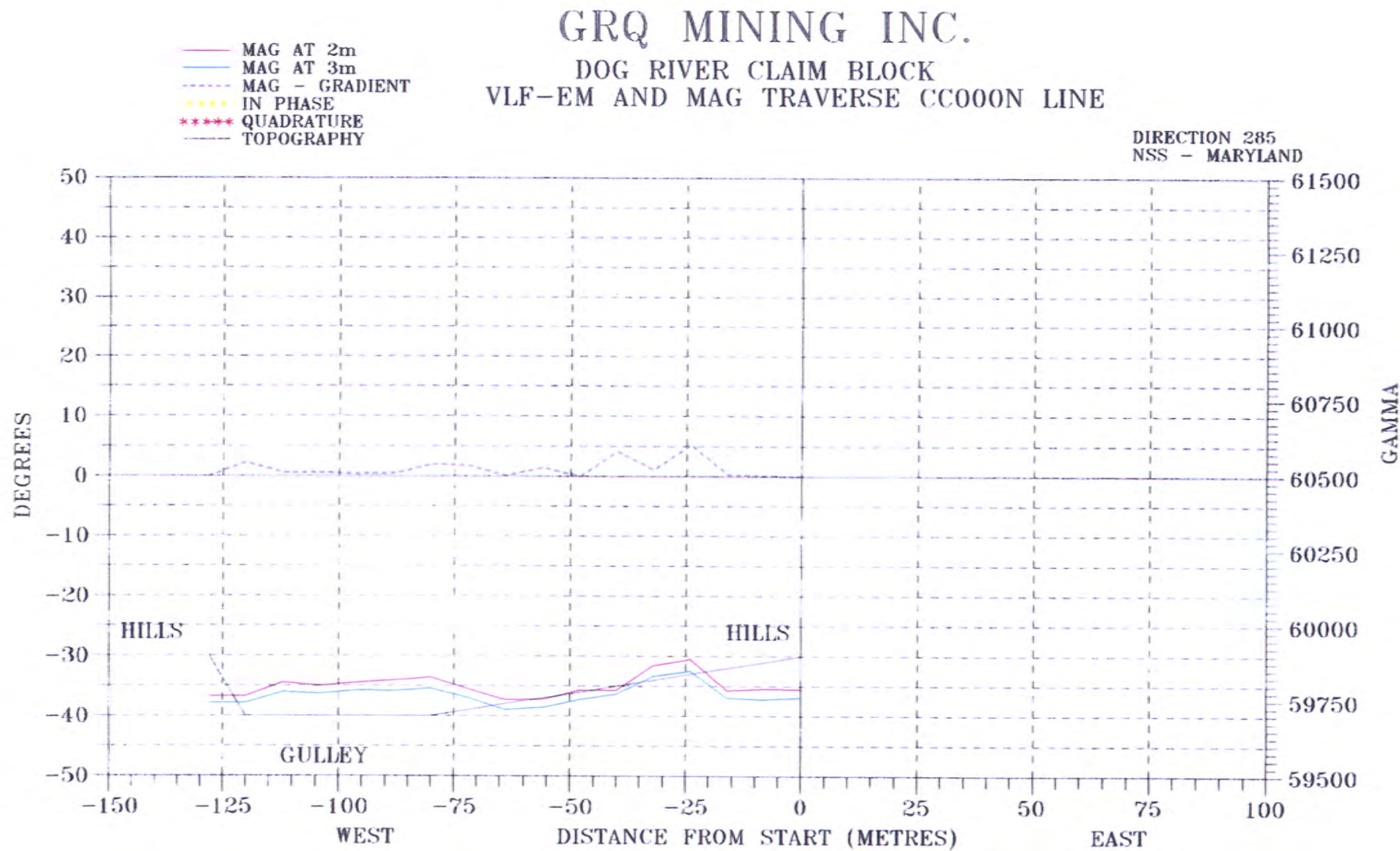




Figure 5

GRQ MINING INC.  
 DOG RIVER CLAIM BLOCK  
 VLF-EM AND MAG TRAVERSE 000E LINE

DIRECTION 285  
 NSS - MARYLAND

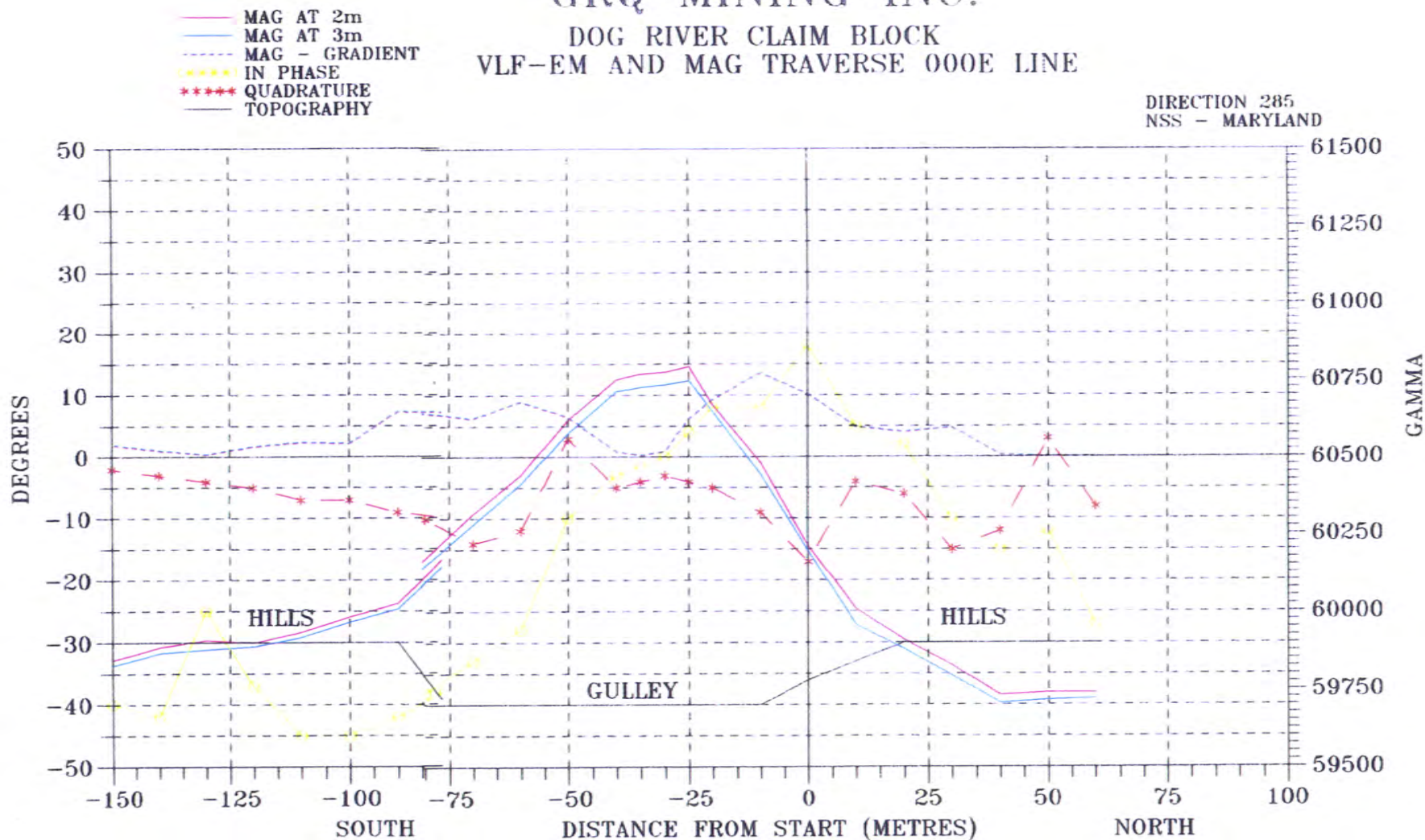




Figure 6

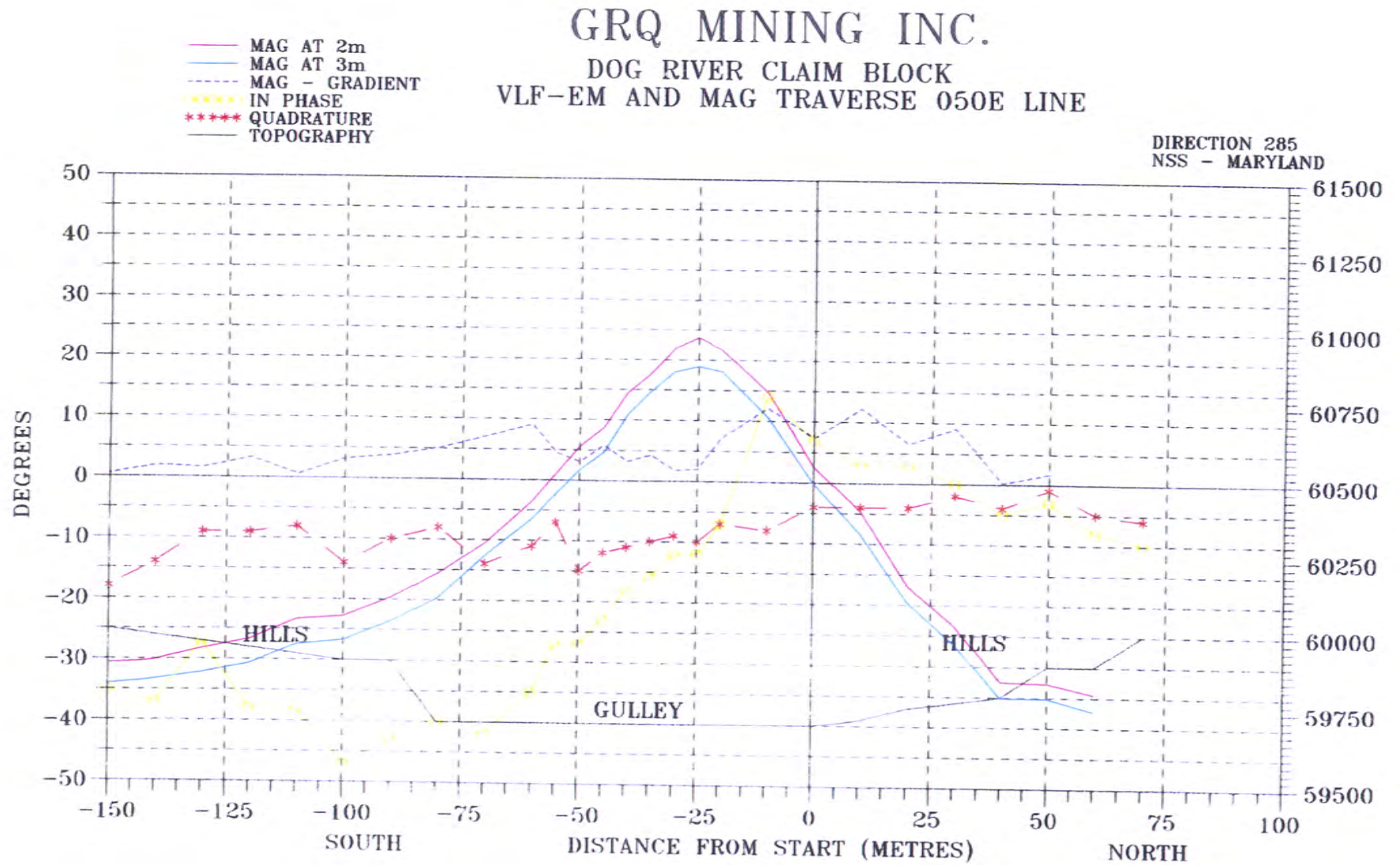


Figure 7

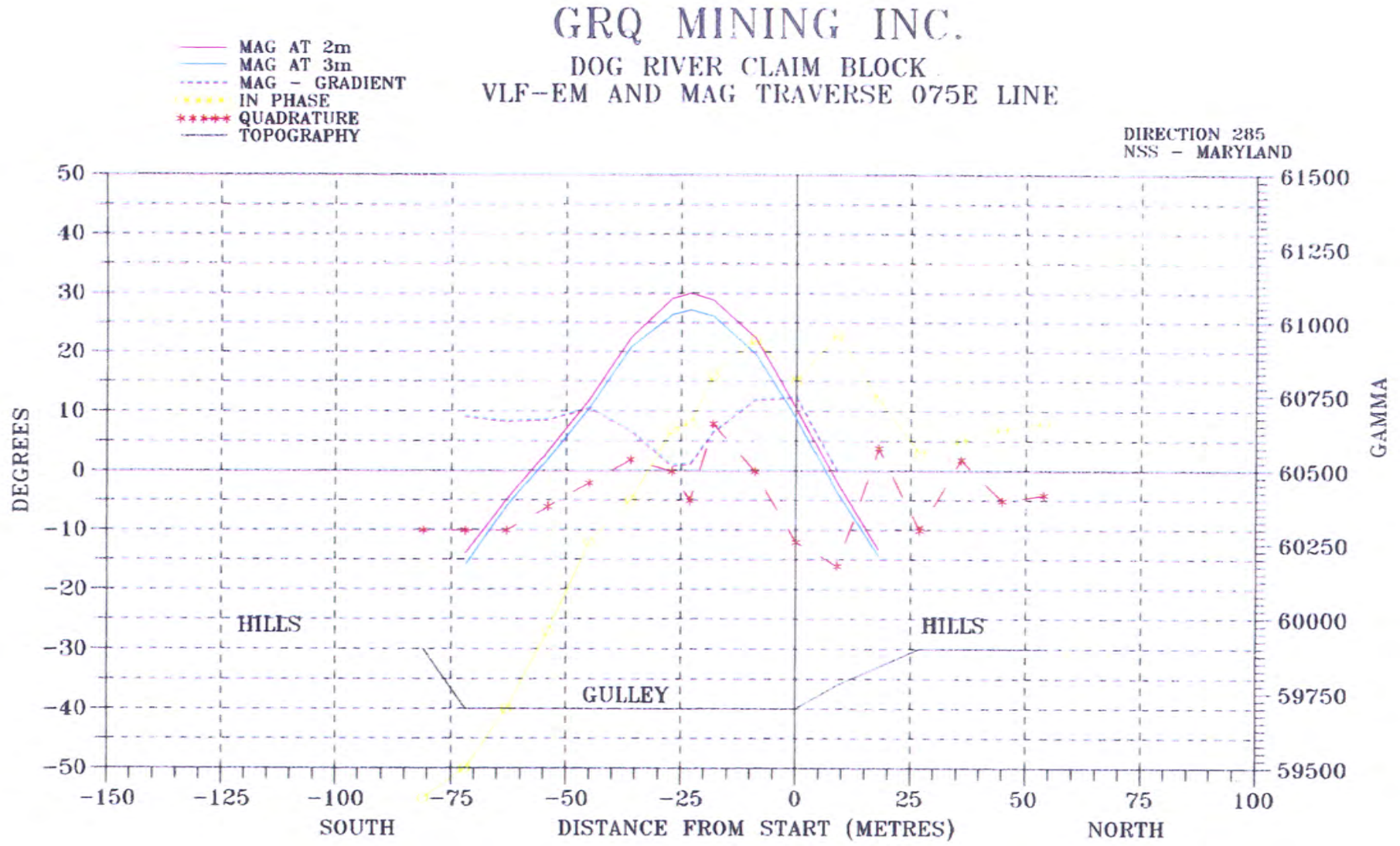


Figure 8

# GRQ MINING INC.

## DOG RIVER CLAIM BLOCK VLF-EM AND MAG TRAVERSE 100E LINE

- MAG AT 2m
- MAG AT 3m
- - - MAG - GRADIENT
- ♦♦♦♦ IN PHASE
- \*\*\*\*\* QUADRATURE
- TOPOGRAPHY

DIRECTION 285  
NSS - MARYLAND

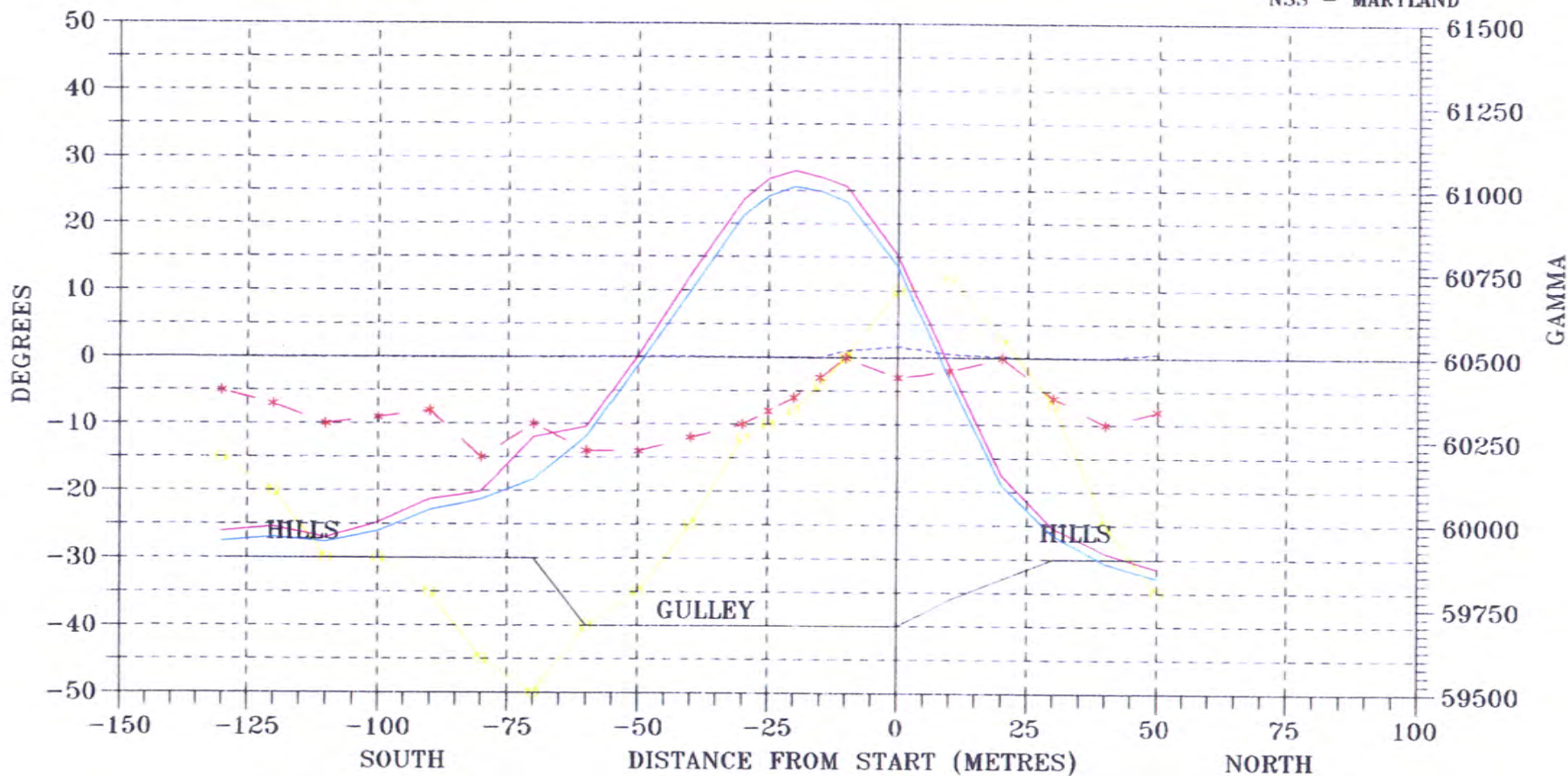




Figure 9

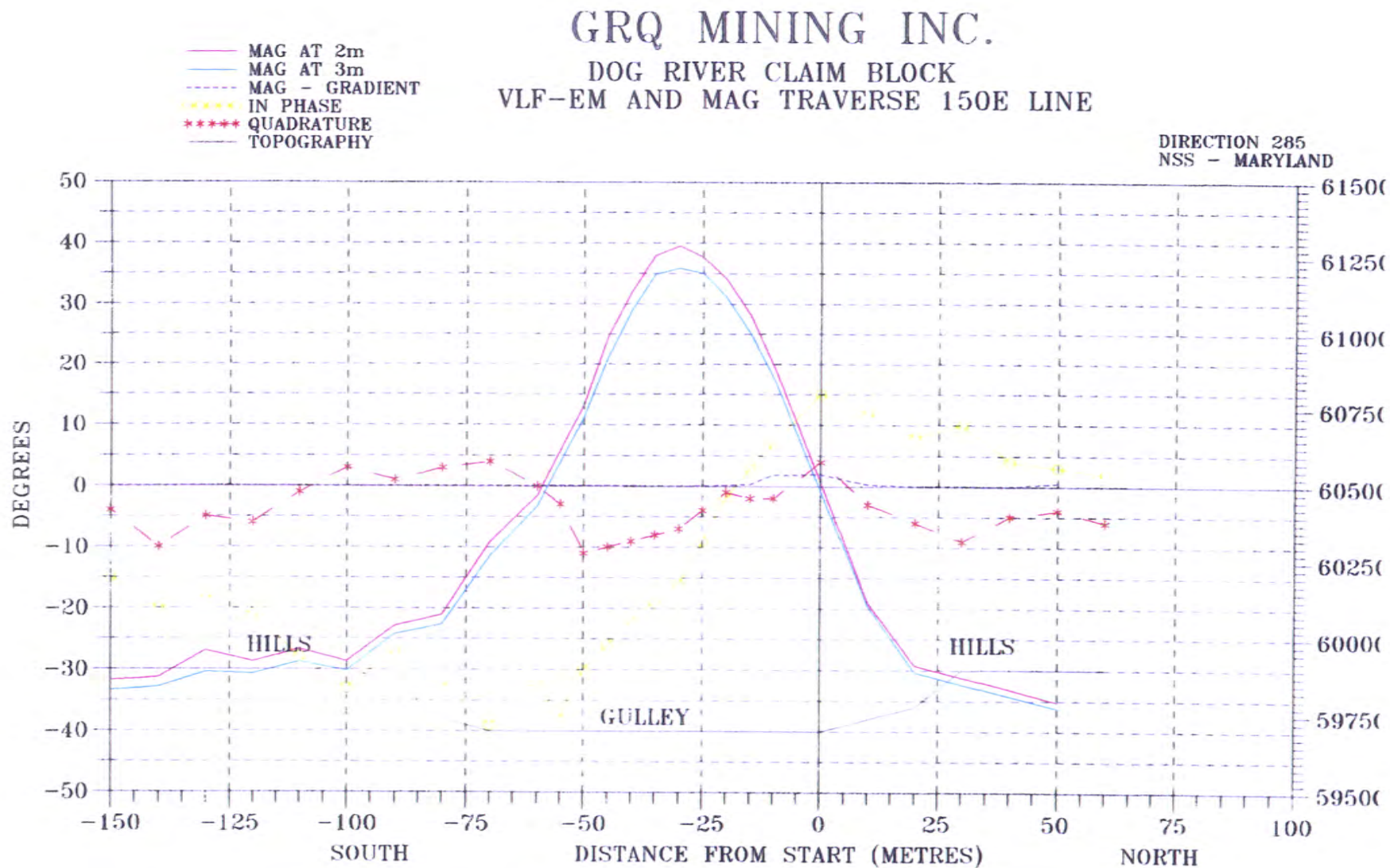


Figure 10

GRQ MINING INC.  
DOG RIVER CLAIM BLOCK  
VLF-EM AND MAG TRAVERSE 200E LINE

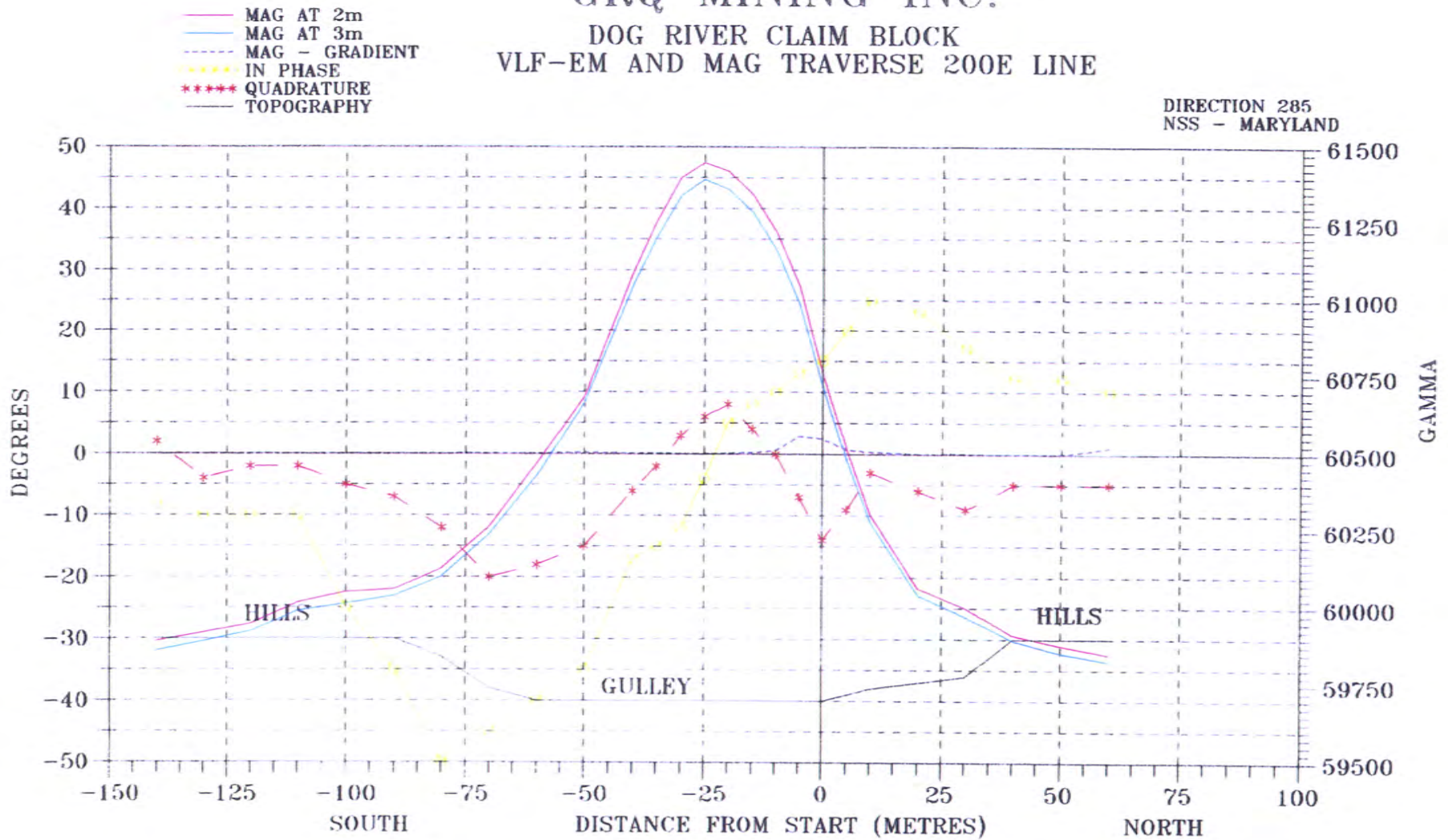


Figure 11

# GRQ MINING INC.

## DOG RIVER CLAIM BLOCK

### VLF-EM AND MAG TRAVERSE 250E LINE

- MAG AT 2m
- MAG AT 3m
- MAG - GRADIENT
- IN PHASE
- QUADRATURE
- TOPOGRAPHY

DIRECTION 285  
NSS - MARYLAND

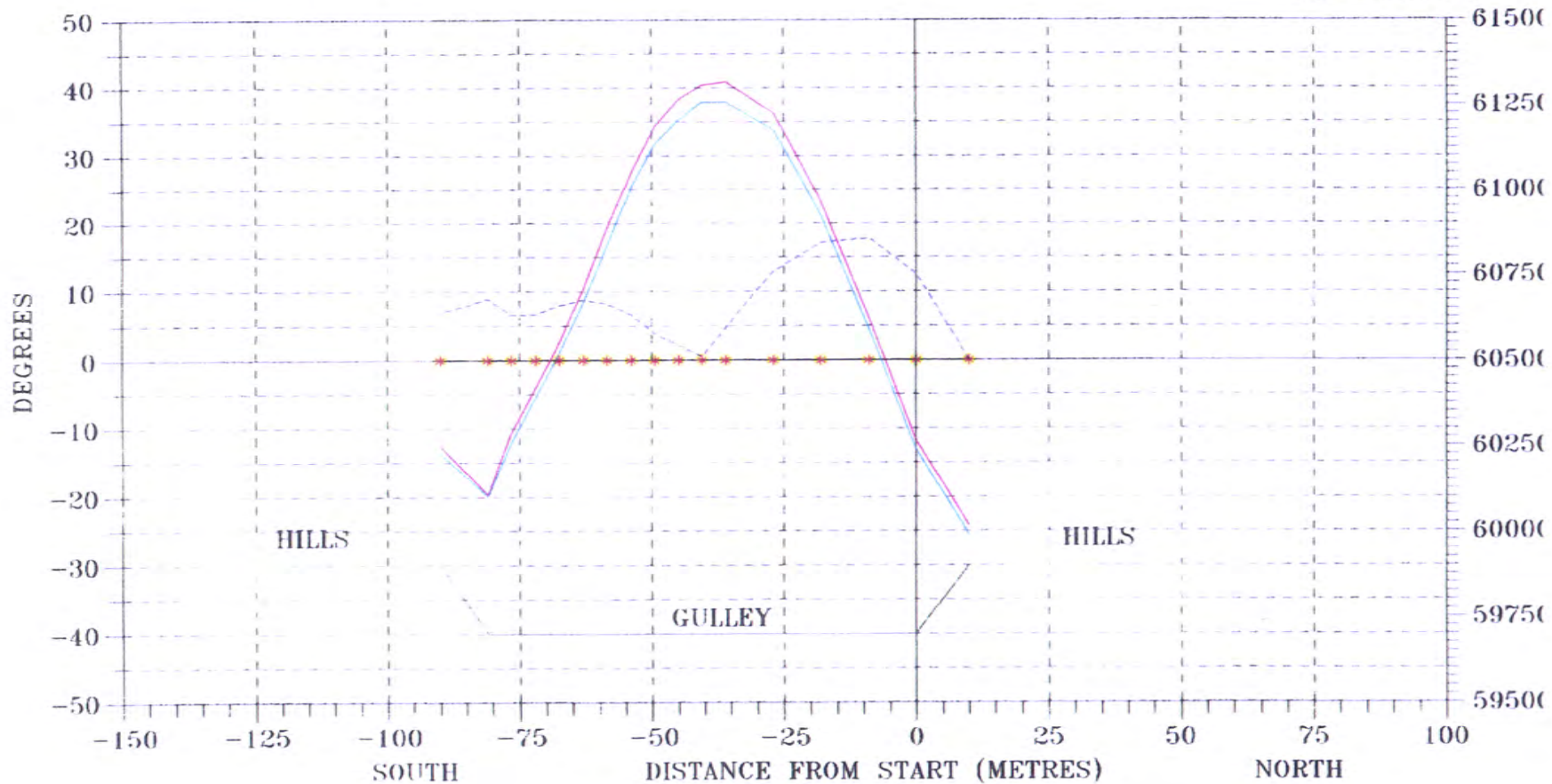


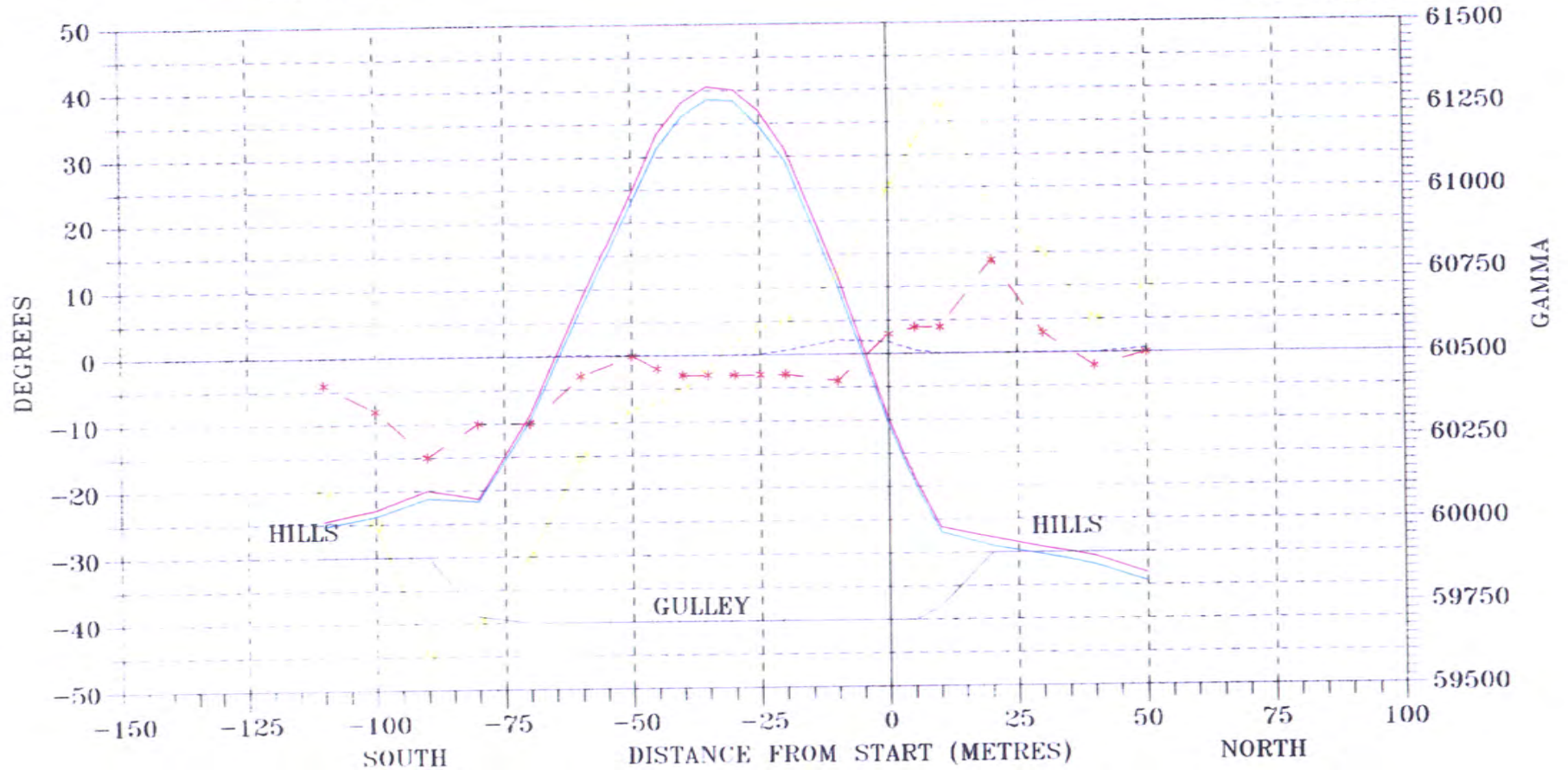


Figure 12

GRQ MINING INC.  
 DOG RIVER CLAIM BLOCK  
 VLF-EM AND MAG TRAVERSE 280E LINE

- MAG AT 2m
- MAG AT 3m
- - - MAG - GRADIENT
- IN PHASE
- \*\*\*\*\* QUADRATURE
- TOPOGRAPHY

DIRECTION 285  
 NSS - MARYLAND



Fort Smith - Dog River Linear

Expedition Expenses

Oct-96

		Days	Position	Rate \$/ Day	Cost
Personnel Involved	[REDACTED]	12	project manager / scuba	\$400.00	4800
		12	site manager	\$400.00	4800
		6	geologist	\$400.00	2400
		8	geologist	\$400.00	3200
		5	worker	\$200.00	1000
		5	worker	\$200.00	1000
		5	worker / scuba	\$250.00	1250
		5	worker / scuba	\$250.00	1250
Preparation	[REDACTED]	20	project manager / scuba	\$400.00	8000
		10	site manager	\$400.00	4000
		1	geologist	\$400.00	400
		1	geologist	\$400.00	400
		2	worker	\$200.00	400
		1	worker	\$200.00	200
		2	worker / scuba	\$250.00	500
		2	worker / scuba	\$250.00	500
		3	worker	\$200.00	600
		3	worker	\$200.00	600
Equipment	1/2 Ton truck	4000 km @ \$0.40 / km			1600
	12 ft trailer				200
	tents	3 @ 10 days @ \$20.00 / day			600
	stoves				200
	sleeping bags + cots	8 @ 10 days @ \$10 / day			800
	generator				200
	satellite phone	rental + air time			800
	magnetometer	10 days @ \$40 / day			400
	vlf	5 days @ \$40 / day			200
	float plane				3950
	quad + trailer	10 days @ \$110 / day			1100
	scuba equipment including compressor				2000
zodiak boat + motor rental				1500	
other	food				1400
	gas				50
	hotel				326
Office	[REDACTED]	5	project manager	\$400.00	2000
		5	geologist	\$400.00	2000
		5	secretary	\$200.00	1000
office equipment	computers				1500
	plotters				
	photocopy				
	telephone				200
Total					57926

1776

6700

2476



**PERSONNEL WORKLIST**

Ed Friesen	Project manager / scuba
John Martinuk	Site manager
Adrian Mann	Geologist
Justin Snelling	Geologist
Rudy Friesen	Worker
Gary Cerantola	Worker
Joe Harris	Worker/scuba
Andy Davison	Worker / scuba
Karen Ahola	Worker
Marianne Martinuk	Worker
Stella Taborski	Worker

19960020

# GRQ MINING INC.

8 LAKE PLACID RISE S.E., CALGARY, ALBERTA, CANADA T2J 5B5  
TELEPHONE: 403-278-2577 FAX: 403-278-2638

October 23, 1996

**Alberta Energy  
Mineral Resources Division  
Petroleum Plaza - North Tower  
9945 - 108 Street  
Edmonton, Alberta T5K 2G6**

24 Oct 96 10 18

**Att: Mr. Brian Hudson  
Manager - Mineral Assessments**

Dear Sir;

**Re: Assessment Report - Ft. Smith and Ft. Fitzgerald Area  
Metallic Mineral Permit's Numbers:**

**9392060003  
9392060004  
9392070001  
9392070004**

The assessment report (2 copies) for these metallic mineral permits is attached. In addition to previously reported expenditures, an additional sum of \$57,600.00 has been spent on these properties to October 8, 1996.

Further to your discussions with Justin Snelling yesterday, we wish to make the following changes to the areas covered by the four mineral permits detailed above, subject to the additional acreage claimed not being covered by other pre-existing mineral permits. Please compare the requested new mineral permit LSD lists with those in your files to verify the necessary additions and deletions requested.

**PERMIT #939206003**

TWP 125	Range 09 W4M:	14	NW, L11	5 LSD's
		15	NE L13,L14	6 LSD's
		20	NE L13,L14	6 LSD's
		21	S, NW, L10	13 LSD's
		22	L2-L5	4 LSD's
TWP 125	Range 10 W4M:	04	NW	4 LSD's
		05	NE	4 LSD's
		06	L13,L14	2 LSD's
		07	SW	4 LSD's
		08	S, NW, L9, L10	14 LSD's
		09	L4, L5	2 LSD's
TWP 125	Range 11 W4M:	01	L16	1 LSD's
		12	L1, L8	2 LSD's

Total Area: 67 LSD's = 1072 Hectares  
Original Area: 1056 Hectares  
Increased Area: 16 Hectares

**PERMIT # 9392060004**

TWP 126	Range 10	W4M	07	L15,L16	2 LSD's
			18	L1-L6	6 LSD's
TWP 126	Range 11	W4M	13	L6-L14	9 LSD's
			14	L9, L13-L16	5 LSD's
			20	L16	1 LSD's
			21	L9, L10, L11, L13-L16	7 LSD's
			22	SE, NW, L3, L5, L6, L10	12 LSD's
			23	L1-L6	6 LSD's
			28	L10-L14	5 LSD's
			29	SE, L5, L6, L11, L12	8 LSD's
			30	NE	4 LSD's

Total 65 LSD's = 1040 Hectares  
Original Permit: 672 Hectares  
Permit increased by: 368 Hectares

**PERMIT # 9392070001**

TWP 125	Range 09	W4M	29	L4,L5	2 LSD's
			30	L1,L7-L11, L13-L15	9 LSD's
			31	L3-L5	3 LSD's
TWP 125	Range 10	W4M	34	L9,L10, L13-L16	6 LSD's
			35	North Half	8 LSD's
			36	L1, L2, L5-L13	11 LSD's
TWP 126	Range 10	W6M	03	L1-L4	
			04	L1-L7	
			05	L5-L12	
			06	L7-L13	

Total 65 LSD's = 1040 Hectares  
Original 1120 Hectares  
Reduced By: 80 Hectares

**Permit # 9392070004**

TWP 124	Range 07	W4M	34	L15, L16	
			35	L13, L14	
TWP 125	Range 07	W4M	02	L3, L3	
			03	L1, L2, L3, L4	
			04	South Half	
			05	L5-L12	
			06	L7-L14	
TWP 125	Range 08	W4M	01	North Half	
			02	L13-L16	
			07	North Half	
			08	L6-L14	
			09	L5-L12	
			10	L1-L07	
			11	L2-L4	
TWP 125	Range 09	W4M	12	L15, L16	
			13	L1-L7	
			14	L1,L7,L8,L10	

Total Area: 94 LSD's = 1504 Ha  
Original: 1872 Ha  
Reduced: 368 Hectares less than original permit.

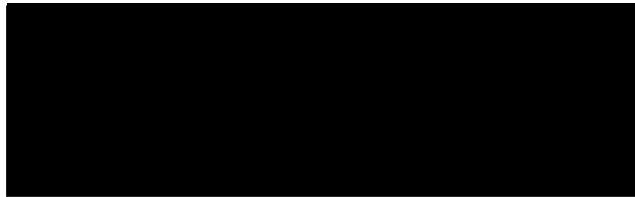
It is our opinion that the four mineral permits cover a very uniform ribbon like geological intrusive feature from its eastern limit south of Tulip Lake to its western termination to the south of Ft. Smith. For this reason we believe that any detailed geophysical and geochemical work done over any specific parts of this feature will apply equally well to the understanding of the nature of this intrusive body along its entire length. We would like to apply all mineral exploration expenses incurred on a proportional per hectare basis to each of these four separate mineral permits.

Should you have any questions please call me at 278-2577.

Thank you for your assistance.

Yours truly,

**GRQ Mining Inc.**



Ed Friesen, P.Eng.  
President

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9392070001

COMMENCEMENT OF TERM:

1992 JULY 30

DATE OF AMENDMENT:

1995 AUGUST 15

AGGREGATE AREA:

1 120 HECTARES

DESCRIPTION OF LOCATION:

4-09-125: 30N, SE; 31SW

4-10-125: 34N; 35N; 36SE, NW, L5, L6, L9, L10

4-10-126: 4S; 5SE, L5, L6, L9-L12; 6N

LEASED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL



FOR: MINISTER OF ENERGY

AMENDED APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9392070004

COMMENCEMENT OF TERM:

1992 JULY 30

DATE OF AMENDMENT:

1995 AUGUST 15

AGGREGATE AREA:

1 872 HECTARES

DESCRIPTION OF LOCATION:

4-07-124: 34L13, L14

4-07-125: 3L3, L4; 4S; 5SE, L5, L6, L9-L12; 6N, L5-L8

4-08-125: 1N, L7, L8; 2NE, L13, L14; 3L16; 7N; 8N, L5-L8; 9L5-L12;  
10S, L11, L12; 11L1-L5; 17SW, L2, L7

4-09-125: 12L14-L16; 13S, L11, L12; 14L1, L2, L9, L10

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL



FOR: MINISTER OF ENERGY

