

THE GRANBY MINING CO. LTD.

CORE DRILL LOG

147 1/2 - 160 1/2
1.15% Zn
6.37% Cu
DD-4

091090

PROPERTY Empire Metals Option

CLAIM Jean 2

LATITUDE <u>6400 S</u>	BEARING <u>East (S86 E)</u>	Hole No. <u>5</u>
DEPARTURE <u>1 + 50 W</u>	SLOPE <u>-45°</u>	PAGE <u>1/2</u>
ELEVATION <u>2,930 ±</u>	LENGTH <u>169'</u>	DATE STOPPED <u>June 28, 1977</u>

GEOLOGY		SAMPLES					RECOVERY		
FROM	TO	DESCRIPTION	FROM TO	TAG NO.	% Zn	% Cu	% Ag	FROM TO	SHORT
0	9	Casing						10-12	1
9	146	Massive grey to white limestone - as in 2, 3, 4. White & orange-weathering sections. Middle-brown patches & streaks of shale at random intervals						12-14	1/2
								14-15	1/2
								37-39	1/2
								39-42	2
146	160 1/2	Mineralized zone - shale, barite, sphalerite, galena						42 1/2 - 48	3
		146-147 1/2 - aphanitic, middle-brown shale with quartz clasts. Coarse to fine grains of sphalerite, galena, disseminated. Fine disseminated pyrite. Little barite (at bottom)	146-147 1/2	33453	11	56	07	48-52	1/2
								52-55 1/2	1/2
			147 1/2 - 151	33454	57	38	Tr	55 1/2 - 59	1/2
		147 1/2 - 151 - fairly pure barite, with low-grade sphalerite, not much galena. Sl. in coarse grains, to 1 cm plus						102-104	1/2
		151-156 - good coarse-grained sphalerite (not much galena) in barite gangue. Few shaley patches, with fine-grained pyrite & galena.	151-156	33455	10	12.25	.06	107-108	1
								108-111	1/2
								142-146	1
								156-160	1/2
		156-157 1/2 - coarse grained sphalerite and galena in barite gangue	156-157 1/2	33456	8.10	9.10	.06	160-163	2
		157 1/2 - 160 1/2 - barite, becoming increasingly contaminated with talcose phyllitic wall rock	157 1/2 - 160 1/2	33457	33	2.00	.06		

LOGGED BY J. Wilkerson

HOLE NO. 5

THE GRANBY MINING CO. LTD.

CORE DRILL LOG

187 1/2 - 194: 1.64 % Pb
2.64 % Zn
DD-4

PROPERTY Empire Metals Option

CLAIM Jean 2

LATITUDE <u>11+00 S</u>	BEARING <u>East (S86°E)</u>	Hole No. <u>6</u>
DEPARTURE <u>1+00 W</u>	SLOPE <u>-45°</u>	PAGE <u>1/2</u>
ELEVATION <u>2,910 ±</u>	LENGTH <u>2 11'</u>	DATE STOPPED <u>June 30, 1977</u>

GEOLOGY		SAMPLES				RECOVERY				
FROM	TO	DESCRIPTION	FROM TO	TAG NO.	Pb %Zn	%Cu	%S	%Ag	FROM TO	SHORT
0-	9	Casing							18-21	1/2
9-	187 1/2	Massive grey to white limestone - as in previous holes white and orange weathering sections. Patches and thin layers of brown shale (mudstone?) at random intervals. Traces of galena in shale as lower contact approached							87 1/2-89	1/2
									96-97 1/2	1/2
									97 1/2-99	1/2
									107-109	1
									110-111	1/2
187 1/2	194	Mineralized Zone: Highly silicified, fair mineralization. Barite nearly nil, siliceous py							141-142	1/2
		187-189: aphanitic, middle-brown shale with quartz clasts. Fine disseminated sl, little gn. shale altered-talcase, phyllitic.	187 1/2	33458	1.75	4.62	.16		142-144	1/2
		189-192 1/2: Highly siliceous, altered rock with fragments & streaks of black & grey shale. Fair-grade, medium-grained sphalerite and galena. Quartz stringers to 1cm, with pale yellow sh associated (as well as typical reddish-brown variety, throughout this section) Galena tends to occur as irregular stringers, and small blebs (?) on laminations.	189-192 1/2	33459	2.10	2.76	.15			
		192 1/2-194: progressively less altered, with pronounced laminations, 40° off core axis, at 194'	192 1/2-194	33460	.79	.77	.06			

LOGGED BY J. Wilkins

HOLE NO. 6

THE GRANBY MINING CO. LTD.

DD-4

CORE DRILL LOG

PROPERTY Empire Metals Option

CLAIM Jean 2

LATITUDE	BEARING	Hole No. <u>6</u>
DEPARTURE	SLOPE	PAGE <u>2/2</u>
ELEVATION	LENGTH	DATE STOPPED

GEOLOGY		SAMPLES				RECOVERY		
FROM	TO	DESCRIPTION	FROM TO	TAG NO.	% Cu	% Ag	FROM TO	SHORT
		192 $\frac{1}{2}$ -194: Mostly grey shale, with medium-grained to fine disseminated sl, little galena (on laminations) also pyrite.						
194	211	Shale: middle grey, aphanitic, with laminations from very thin to 1cm thick. Laminations locally wavy or disrupted; overall about 75° off core axis. Little galena, pyrite along laminations.	194-197	33461	.73	.03		
		End of Hole					216-211	1/2

LOGGED BY R. J. Wilkinson

HOLE NO. 6

THE GRANBY MINING CO. LTD.

CORE DRILL LOG



PROPERTY Empire Metals Option

CLAIM Jean 3

LATITUDE	<u>3 + 80 N</u>	BEARING	<u>East (S86°E)</u>	Hole No.	<u>1</u>
DEPARTURE	<u>1 + 50 W</u>	SLOPE	<u>- 45°</u>	PAGE	<u>1/1</u>
ELEVATION	<u>2,975 ±</u>	LENGTH	<u>205 1/2</u>	DATE STOPPED	<u>June 17, 1974</u>

GEOLOGY		SAMPLES			RECOVERY		
FROM	TO	DESCRIPTION	FROM TO	TAG No.	As _{total}	FROM TO	SHORT
0	6	Casing					
6	115 1/2	Grey to white, massive limestone; white and orange-weathering sections; few dk. grey to grey (brown-green) shaly inclusions, maximum width 1/2'; small py crystals 74-76: leached, porous, core loss; fracturing about 30° off core axis.				74-76	1
115 1/2	116 1/2	Shale band, with up to 3mm grains sphalerite, fine py crystals, small grains galena; shale a pale green-brown colour;	115 1/2-116 1/2	33479	.05 / 2.34	Tr	
116 1/2	121 1/2	Mineralized zone with fair amount of barite, irregular sphalerite, usually in small grains; little galena					
121 1/2	129 1/2	Nearly continuous barite gangue; coarse sphalerite grains; galena relatively poor.	121 1/2-129 1/2	33480	1.08 / 7.00	.04	
129 1/2	136 1/4	Best section of coarse grained sphalerite, less (but improved) galena, in barite gangue,	129 1/2-136 1/4	33481	7.35 / 8.11	.52	
136 1/4	139	and admixture of green-brown shale limestone	136 1/4-139	33482	.25 / .02	.06	
139	145	Massive barite with only minor sphalerite, galena. As (12% 13%) but reduced amount of sphalerite, barite, small amount galena. S/gn mineralization extends into shale 1/2' past contact at 143 1/2'.	139-145	33483	.70 / 5.16	.18	
143 1/2	205 1/2	light-dark Grey shale - aphanitic, with fine banding 65°-90° off core axis. Locally, bands are heavily pyritized. Traces of py, gn on fractures partings to 147'. Partings locally at variance with colour banding - bedding.					

LOGGED BY of Wilkinson

End of Hole

HOLE NO. 1

CORE DRILL LOG

PROPERTY *Empire Metals Option*

CLAIM *Jean 3*

LATITUDE <i>1+00N</i>	BEARING <i>East (S86E)</i>	Hole No. <i>2</i>
DEPARTURE <i>2+03W</i>	SLOPE <i>-45°</i>	PAGE <i>1/2</i>
ELEVATION <i>2,930 ±</i>	LENGTH <i>171'</i>	DATE STOPPED <i>June 20, 1977</i>

GEOLOGY		SAMPLES				RECOVERY		
FROM	TO	DESCRIPTION	FROM TO	TAG No.	Grade	Recovery	FROM TO	SHORT
0-7		Casing						
7-111		Massive grey to white limestone - white and orange-weathering sections (may be inclusions of shale, weathered & discolored by ox'd. pyrite). Brownish green-grey shaly inclusions. 69 1/2 - 78 1/2 - Altered zone - porous, with hard lamellae irregular, but overall ~45° of core axis (vertical); sig. high foramt. of cavities; no sulphides seen.					36-39	2'
111-154		Mineralized zone: greenish grey-brown shale, limestone, barite with sphalerite grains; galena occurs locally as massive blebs related to fractures.					41 1/2 - 41 1/2	1/2'
		111-117: fairly good fine to coarse-grained sphalerite, little galena, in shale, limestone, barite	111-117	33484	.17 / 9.31	.30		
		117-125: relatively weak sulphides, impure barite	117-125	33485	.65 / 4.92	.16		
		125-131: mostly barite gangue (little shale); little gn; good sl in shaly sections	125-131	33486	.58 / 5.22	.08		
		131-137: massive lead-zinc in shaly sections; massive barite	131-137	33487	5.70 / 4.14	.18		
		137-147: massive barite, lower grade sl, gn in massive blebs	137-147	33488	2.28 / 3.00	.20		

LOGGED BY *M. Wilkinson*

HOLE NO. *2*

THE GRANBY MINING CO. LTD.
CORE DRILL LOG

PROPERTY *Empire Metals Option*

CLAIM *Jean 3*

LATITUDE	BEARING	Hole No. <i>2</i>
DEPARTURE	SLOPE	PAGE <i>2/2</i>
ELEVATION	LENGTH	DATE STOPPED

GEOLOGY		SAMPLES				RECOVERY	
FROM	TO	DESCRIPTION	FROM TO	TAG NO.	Pb/Zn % AVG.	FROM TO	SHORT
		<i>147-152 1/2 : same as 137-147</i>	<i>147-152 1/2</i>	<i>33489</i>	<i>3.38 / 4.02</i>		
		<i>152 1/2 - 155 1/2 : Pb, Zn reduced as approach contact</i>	<i>152 1/2 - 155 1/2</i>	<i>33490</i>	<i>3.68 / 3.84</i>		
<i>154-171</i>		<i>(at 154') but continues 1/2' into footwall shale; very little barite. Grey shale : as in 74-1 - aphanitic, light & dark laminations slightly irregular, but average perpendicular to core axis. Few fine grains slt & visible to 161'.</i>					
		<i>End of Hole</i>					

LOGGED BY *H. J. Wilkinson*

HOLE NO. *2*

THE GRANBY MINING CO. LTD.

CORE DRILL LOG

PROPERTY *Empire Metals Option*CLAIM *Jean 3*

LATITUDE	<i>1+00 N</i>	BEARING	<i>—</i>	Hole No.	<i>3</i>
DEPARTURE	<i>2+07 W</i>	SLOPE	<i>-90°</i>	PAGE	<i>1/2</i>
ELEVATION	<i>2,930 ±</i>	LENGTH	<i>302'</i>	DATE STOPPED	<i>June 23, 1974</i>

GEOLOGY		SAMPLES			RECOVERY	
FROM TO	DESCRIPTION	FROM TO	TAG NO.	GRAV.	FROM TO	SHORT
<i>0-6</i>	<i>Casing</i>					
<i>6-193</i>	<i>Massive grey to white limestone - as in 74-2</i>					
	<i>59-59½ - shaly inclusion with distinctive texture,</i>				<i>58-62</i>	<i>1/2</i>
	<i>fine grains of a white mineral(?)</i>				<i>62-65</i>	<i>1 1/2</i>
	<i>128' - angular brn. orange fragments (1") contain pyrite → hematite</i>				<i>70-73</i>	<i>1/2</i>
	<i>136-137' mud seam (soft shale)</i>					
	<i>138-140½ " " " - fine compositional, wavy</i>					
	<i>banding about 45° off core axis, fine py</i>					
	<i>following bands.</i>				<i>168-174</i>	<i>1</i>
	<i>~140' co - limestone strongly mottled, due to bands</i>				<i>174-176</i>	<i>1/2</i>
	<i>& disrupted inclusions of orange-brn. (altered shale?)</i>				<i>179½-182</i>	<i>1</i>
	<i>Core loss at muddy shale bands (58'-182')</i>				<i>185-189</i>	<i>2</i>
	<i>193-198' - only pebbles in core; contact between</i>				<i>189-191</i>	<i>1/2</i>
	<i>limestone and mineralized zone is in this interval</i>				<i>191-193</i>	<i>2</i>
<i>193(19.8) - 233½</i>	<i>Mineralized zone: barite, strongly weathered</i>				<i>193-198</i>	<i>4 1/2</i>
	<i>brown shale (2" recovered at 198'), rusty and</i>				<i>198-204</i>	<i>4</i>
	<i>partly leached; (to 204', only possible sulphides</i>				<i>204-208</i>	<i>1 1/2</i>
	<i>is minute dark bands and on short fractures (epheritic?)</i>				<i>208-214</i>	<i>1 1/2</i>
	<i>Much core loss.</i>				<i>214-216</i>	<i>1</i>
	<i>202½-205: dirty limestone and impure barite, possibly</i>	<i>202½-205</i>	<i>33491</i>	<i>.04 / .20</i>		
	<i>aphanitic, minute amt. sulphides (see note above)</i>					
	<i>205-215: light grey-brown altered shale,</i>	<i>205-215</i>	<i>33492</i>	<i>.13 / .20</i>		

LOGGED BY *W. Williams*HOLE NO. *3*

THE GRANBY MINING CO. LTD.

DD-4

CORE DRILL LOG

PROPERTY Empire Metals Option

CLAIM Jean 3

LATITUDE	BEARING	Hole No. <u>3</u>
DEPARTURE	SLOPE	PAGE <u>2/2</u>
ELEVATION	LENGTH	DATE STOPPED

GEOLOGY		SAMPLES				RECOVERY		
FROM	TO	DESCRIPTION	FROM TO	TAG NO.	Gross Wt.	Net Wt.	FROM TO	SHORT
		strongly fractured, with minor barite; quartz apparently on fractures, as seams; rarely more than 1cm thick; fine to coarse grains of sphalerite, galena, pyrite.						
		211- on : prominent, increasing silicification						
		216 on : rock increasingly fragmental, grading to (222')-angular clasts of qtz & brown shale in highly siliceous matrix, very little barite.	215-224	33493	.25 / .49	.16	224-226	1 1/2
		224-233 - as (211-224) - highly siliceous qtz-shale (breccia?) with light 'peppering' of very fine to medium grains sphalerite, lesser galena. No barite seen.	224-233	33494	.10 / .70		249-254	2
		232 1/2 - 233 1/2 - x'ne limestone, traces sulphides in shale bx.					240-265	2 1/2
233 1/2 (?)	302	Massive gray limestone, with random inclusions of gray-brown shale, up to 1' in length. Shaley sections slightly pyritized, talcose, phyllitic.					265-273	2 1/2
		End of Hole.					273-279	1/2

LOGGED BY M. Wilkinson

HOLE NO. 3

THE GRANBY MINING CO. LTD.

CORE DRILL LOG

95-L-

DD-5

PROPERTY EMPIRE METALS (OTTER LAKE) CLAIM MEL 12

LATITUDE	52,238.8	BEARING	090	Hole No.	16
DEPARTURE	49,572.4	SLOPE	60°	PAGE	1/1
ELEVATION	3529.2	LENGTH	165'	DATE STOPPED	April 5, 1975

GEOLOGY		SAMPLES				RECOVER		
FROM	TO	DESCRIPTION	FROM TO	TAG NO.	% CU	AVG.	FROM TO	SHO
0	12	Casing					12-14	1
12	139	Limestone - massive light gray with shale shreds and partings. No mineralization. 1' shale @ 94'					35-42	1
							49-52	1
							52-54	1
							57-60	1
139	165	Shale - rusty, considerable core loss, thin laminated type.					66-73	2
							101-4	1
							137-44	1
							144-5	2
		End of Hole					148-51	1
							151-5	2
							155-9	3
							157-65	5

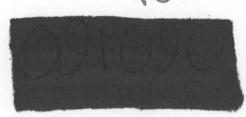
LOGGED BY D. H. Jones

HOLE NO. 16

95-D-6

MEL + JEAN claims
1974/75

091090



THE GRANBY MINING CO. LTD.

CORE DRILL LOG

DD-5

PROPERTY Empire Metals (Otter Lake)

CLAIM MEL 12

LATITUDE <u>51,703.3</u>	BEARING <u>Grid East</u>	Hole No. <u>18</u>
DEPARTURE <u>49,122.4</u>	SLOPE <u>-45°</u>	PAGE <u>1/3</u>
ELEVATION <u>2,938.6</u>	LENGTH <u>336'</u>	DATE STOPPED <u>April 8, 1975</u>

GEOLOGY		SAMPLES				RECOVERY		
FROM	TO	DESCRIPTION	FROM TO	TAG No.	% CU	AVG.	FROM TO	SHORT
0	21	Casing, overburden					21-23	1/2
21	36	Grey and orange-grey limestone, aphanitic, with some 1/4" patches of white x'd calcite. Strongly fractured & weathered, with yellowish limonitic(?) staining on fractures						
36	46	Dark grey shale, with light-dark banding 45°-70° off core axis. Irregular, contorted layering. Light coloured clastics ^{1/8"-1/16"} (2-4mm) stretched along banding. Very fissile. Some chloritization.						
46	69	Mottled grey to dark grey limestone. Fine black crenulations occur infrequently. Intensely fractured, healed with light grey calcite.						
69	105	Grey limestone: aphanitic middle to light grey matrix; varies from high proportion of light grey angular to rounded limestone clasts to massive limestone. (1mm) plentiful fine to thick (1cm) black crenulations of (chloritized shale? graphitic carbonaceous shale?)						
105	113	Limestone breccia: highly distorted black crenulations and angular, graphitic shale clasts, white limestone clasts in light grey aphanitic limestone matrix.						
113	175	Grey limestone: aphanitic, near-massive except for fine black (graphitic?) crenulations and						

LOGGED BY M. Wilkinson

HOLE NO. 18

CORE DRILL LOG

DD-5

PROPERTY *Empire Metals (Otter Lake)*

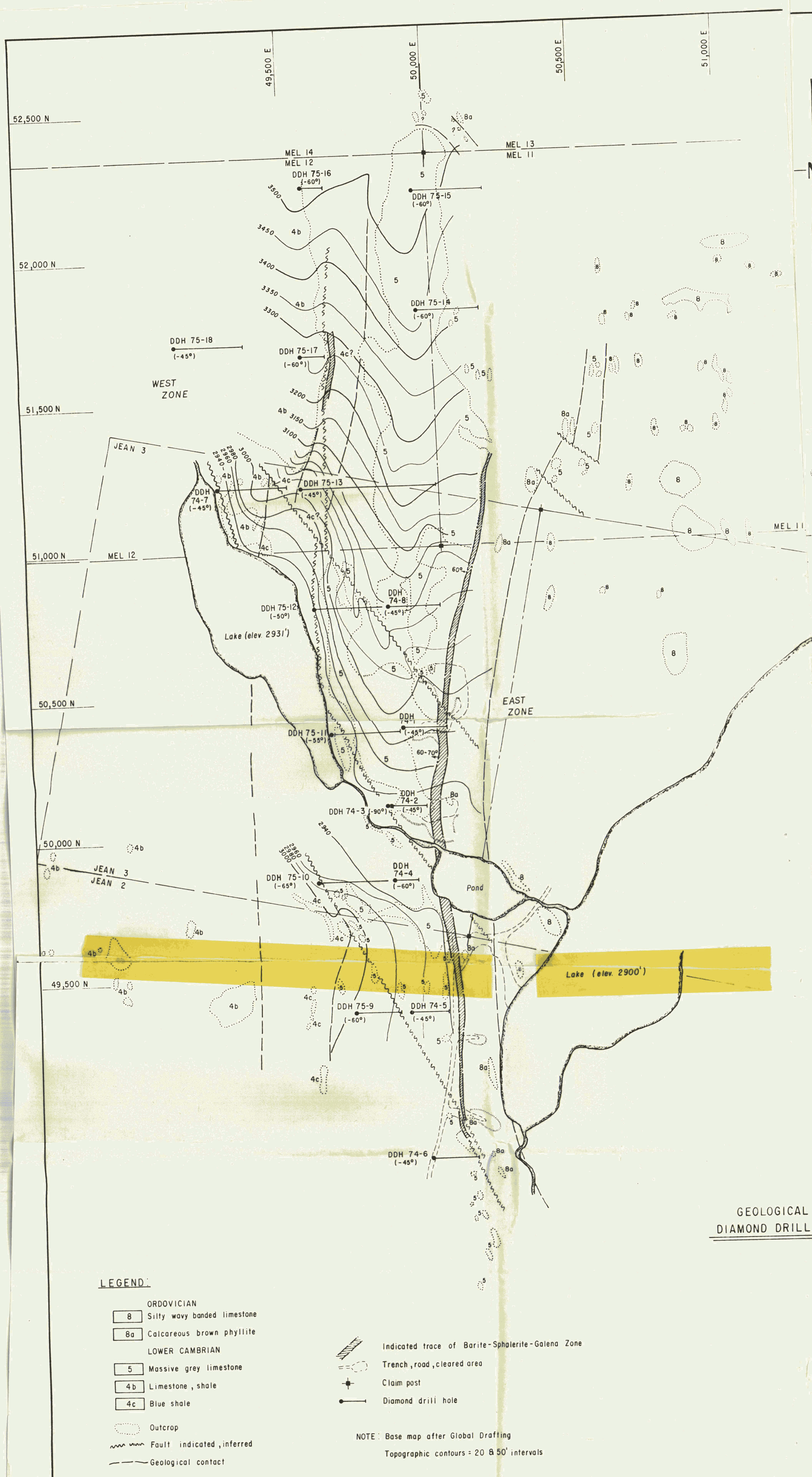
CLAIM

LATITUDE	BEARING	Hole No. <i>18</i>
DEPARTURE	SLOPE	PAGE <i>2/3</i>
ELEVATION	LENGTH	DATE STOPPED

GEOLOGY		SAMPLES				RECOVERY		
FROM	TO	DESCRIPTION	FROM TO	TAG NO.	% CU	AVG.	FROM TO	BHOR
		Brown, 1mm-10cm plus shaled mud seams like 46-69 but not so much fracturing.			Pb	Zn		
		150-on: Moderately fractured (3-10cm apart) healed with light orange calcite.	174-175	22746	4.05	4.05		
175	211 1/2	Mineralized zone: Grey ophanitic limestone (194) mottled with orange patches, fine black crenulations, and 10cm to 1m black shale bands (194-196 - fine banded black shale with distorted white limestone clasts)	175-179	22747	.10	.20		
			179-186	22748	.05	.05		
			186-194	22749	.05	.10		
			194-196	22750	.05	.10		
			196-201 1/2	27076	.25	.95		
		Mineralization: galena, sphalerite on fractures & finely brecciated, irregularly, sparsely distributed. Little or no barite (?). Very minor fine xine pyrite.	201 1/2-211 1/2	27077	4.05	.05	209-211 1/2	1'
			211 1/2-221 1/2	27078	.05	.15		
		196-211 1/2: Fractured, ophanitic grey limestone with fairly consistent sh, ga on fractures. Pyrite more plentiful.						
211 1/2	336'	Grey shale: dark blue-grey, finely banded, somewhat fissile, fairly hard. Small white limestone clasts, some distinct laking banding. Banding 30° off core axis. Plentiful pyrite on fis and minor fault planes.	320-330	27079	4.05	4.05		

LOGGED BY *J. J. Williams*

HOLE NO. *18*



LEGEND:

- ORDOVICIAN
- 8 Silty wavy banded limestone
- 8a Calcareous brown phyllite
- LOWER CAMBRIAN
- 5 Massive grey limestone
- 4b Limestone, shale
- 4c Blue shale
- Outcrop
- Fault indicated, inferred
- Geological contact

- Indicated trace of Barite-Sphalerite-Galena Zone
- Trench, road, cleared area
- Claim post
- Diamond drill hole

NOTE: Base map after Global Drafting
Topographic contours: 20 & 50' intervals

GEOLOGICAL DIAMOND DRILL

LOCATIONS

LEGEND:

- Location and point of drilled intersection.
- True thickness shown, based on 65° dip of mineral zone. Brackets denote weathered surface material.
- Contours showing thickness in feet.

GRADE AND TONNAGE ESTIMATED FROM DRILLING

Drill indicated tonnage: 2,170,000 tons at 1.87% Lead, 5.18% Zinc, 56.74% Barite (above Geologically inferred tonnage: 5,424 tons/vertical foot (below 2,500' elev.)

DATE REVISED	BY	DR
		DR
		CP
		AP
		DA

52,500 N

52,000 N

51,500 N

51,000 N

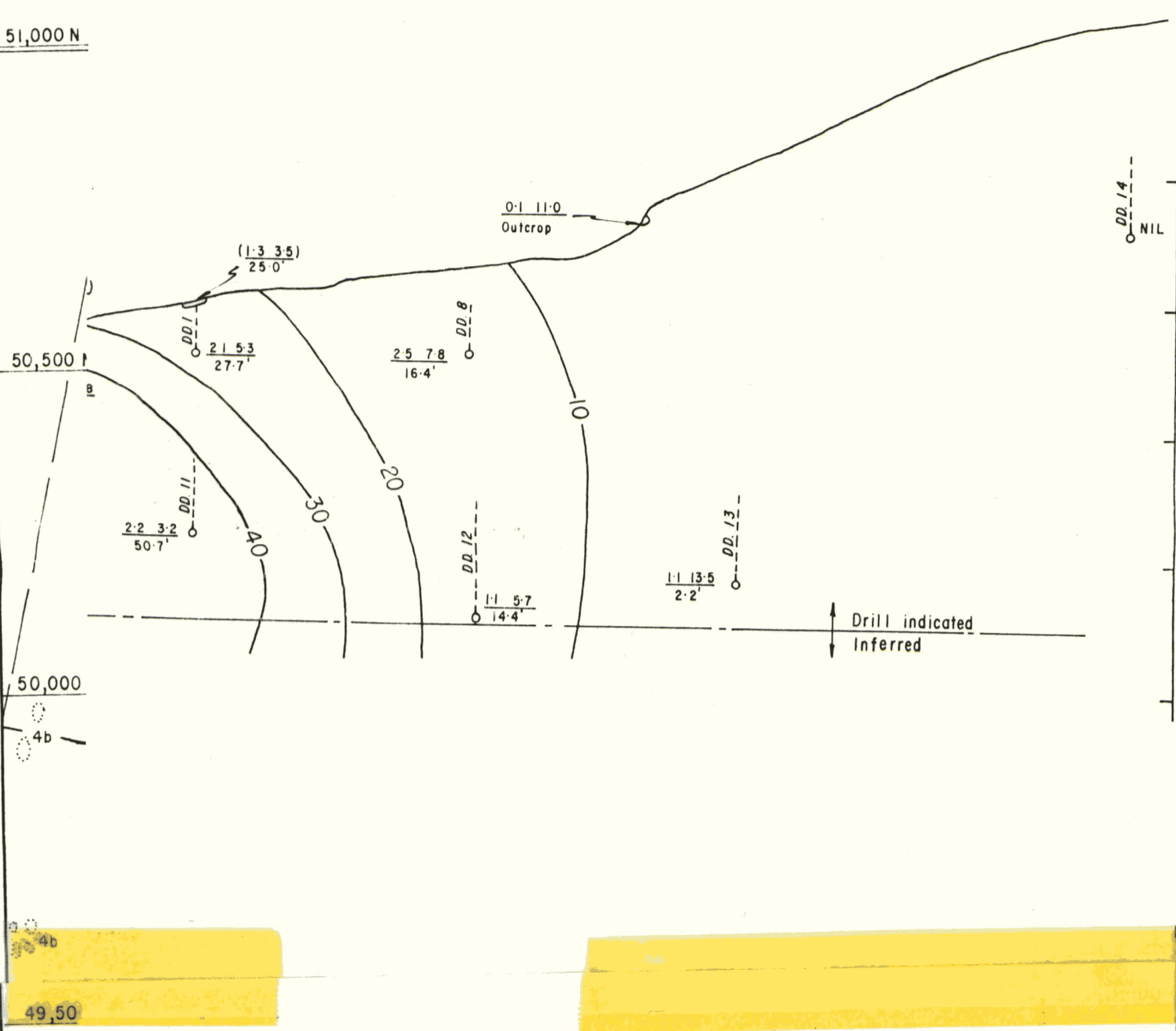
50,500 N

50,000 N

49,500 N

51,000 N

NORTH →



LONGITUDINAL VERTICAL SECTION
50,000 E

2500' elev.)

091090

DRAWN BY: rwr/BW.

THE GRANBY MINING CO. LTD.

TITLE MEL GROUP - WATSON LAKE MD., Y.T. GEOLOGY & LONGITUDINAL VERTICAL SECTION

PROJECT: EMPIRE METALS (OPTION)

NO.