ABMINCO N.L.
CLEVELAND MINE

CATEGORY: C/g Ex.

HOLE No.: C1324 REF No 18556

GENERAL DATA

Objective: Khaki lens CK sect RL 225m

Area of Operation: 11 B south Location: CK section RL 273m

Collar R.L.: 273.128m Co-ordinates: 15243.696 N, 10688.003 E.

Bearing of Hole: 307° 47' 25" (290°) Angle of Hole: 31° 11' 42" (-32°) Final Depth: 136.5m

Drilling Commenced: 18/8/78 Completed: 31/8/78 Logged by: J. C. SIMPSON

DRILLING DATA

Drilled by: A.D.D. Non Coring:

Drilling Rig: E 500 46JT Coring: TT46 mm

Driller(s): G. Archer.

Core Recovery:

HOLE SURVEYS

HOLE No.: 1324

HOLE No.: C 1324

SAMPLE DATA

SHEET No.: 1

LENS	SAMPLE No.	ROCK TYPE	Σ	INTERVAL From	INTERVAL To	Length (L)	Assays (A) % Snt	Assays (A) % Sns	Assays (A) % Cu	Product (A x L) P. Snt	Product (A x L) P. Sns	Product (A x L) P. Cu
	223062	lode.		0.00	0.60		1.78	0.08	0.39			
				72.00			1.06	0.08	1.36			
	223063	lode		62.90	63.10		0.37	0.04	0.12			
	064	"		66.70	67.00		0.81	0.04	0.12			
	065	"		67.00	68.00		1.23	0.05	0.30			
	066	"		68.00	69.00		1.41	0.06	0.29			
	067	"		69.00	70.00		1.02	0.03	0.23			
	068	"		70.00	70.60		0.09	0.02	0.04			
	069	Chert.		70.60	72.00		1.58	0.03	0.16			
	070	Lode.		72.00	72.60		0.02	0.01	0.03			
	071	Chert		72.60	73.00		1.31	0.04	0.43			
	072	Lode		73.00	74.00		0.53	0.03	0.13			
	073	"		74.00	75.00		0.53	0.04	0.11			
	074	"		75.00	76.00		3.09	0.05	0.73			
	075	"		76.00	77.00		2.80	0.03	0.51			
	076	"		77.00	78.00		1.61	0.02	0.31			
	077	"		78.00	79.00		0.31	0.01	0.08			
	078	"		79.00	80.00		0.62	0.01	0.08			
	079	"		80.00	81.00							

allupone

HOLE No.: C 1324

SAMPLE DATA

SHEET No.: 1

LENS	SAMPLE No.	ROCK TYPE	Σ	INTERVAL From	INTERVAL To	Length (L)	Assays (A) % Snt	% Sns	% Cu	Product (A x L) P. Snt	P. Sns	P. Cu
	223062	Lode.		0.00	0.60		1.98	0.08	0.39			
				72.00			1.06	0.08	1.36			
	223063	Lode		62.90	63.10	0.20	0.37	0.04	0.12			
	064	"		66.70	67.00	0.30 collapse	0.81	0.04	0.12			
	065	"		67.00	68.00	1.00	1.23	0.05	0.30			
	066	"		68.00	69.00	1.00	1.41	0.06	0.29			
	067	"		69.00	70.00	1.00	1.02	0.03	0.23			
	068	"		70.00	70.60	0.60	0.09	0.02	0.04			
	069	Chert.		70.60	72.00	1.40	1.68	0.03	0.16			
	070	Lode		72.00	72.60	0.60	0.02	0.01	0.03			
	071	Chert		72.60	73.00	0.40	1.31	0.04	0.43			
	072	Lode		73.00	74.00	1.00	0.53	0.03	0.13			
	073	"		74.00	75.00	1.00	0.53	0.04	0.11			
	074	"		75.00	76.00	1.00	3.09	0.05	0.73			
	075	"		76.00	77.00	1.00	2.80	0.03	0.51			
	076	"		77.00	78.00	1.00	1.61	0.02	0.31			
	077	"		78.00	79.00	1.00	0.31	0.01	0.08			
	078	"		79.00	80.00	1.00	0.62	0.01	0.08			
	079	"		80.00	81.00	1.00	[illegible]					

HOLE No.: C/324

SAMPLE DATA

SHEET No.: 2

LENS	SAMPLE No.	ROCK TYPE	Σ	INTERVAL From	INTERVAL To	Length (L)	Assays (A) % Snt	Assays (A) % Sns	Assays (A) % Cu	Product (A x L) P. Snt	Product (A x L) P. Sns	Product (A x L) P. Cu
	223080	Lode		81.00	81.90		0.46	0.02	0.02			
X	081	"		108.00	109.00		0.48	0.09	0.88			
Kihu	082	"		109.00	110.00		1.00	0.07	0.38			
X	083	"		110.00	111.00		0.38	0.03	0.29			
Khaki East			Σ	66.7	81.9	15.2	1.08	0.03	0.23			
Khaki West			Σ	108.0	111.0	3.0	0.62	0.05	0.52			

N.W.P.S.

HOLE No.: C1324

SAMPLE DATA

SHEET No.: 2

LENS	SAMPLE No.	ROCK TYPE	Σ	INTERVAL From	INTERVAL To	Length (L)	Assays (A) % Snt	Assays (A) % Sns	Assays (A) % Cu		Product (A x L) P. Snt	Product (A x L) P. Sns	Product (A x L) P. Cu	
	223080	Lode		81.00	81.90		0.46	0.02	0.02					
	081	"		108.00	109.00		0.48	0.09	0.88					
	082	"		109.00	110.00		1.00	0.07	0.38					
	083	"		110.00	111.00		0.38	0.03	0.29					

ABMINCO N.L. - Cleveland Mine

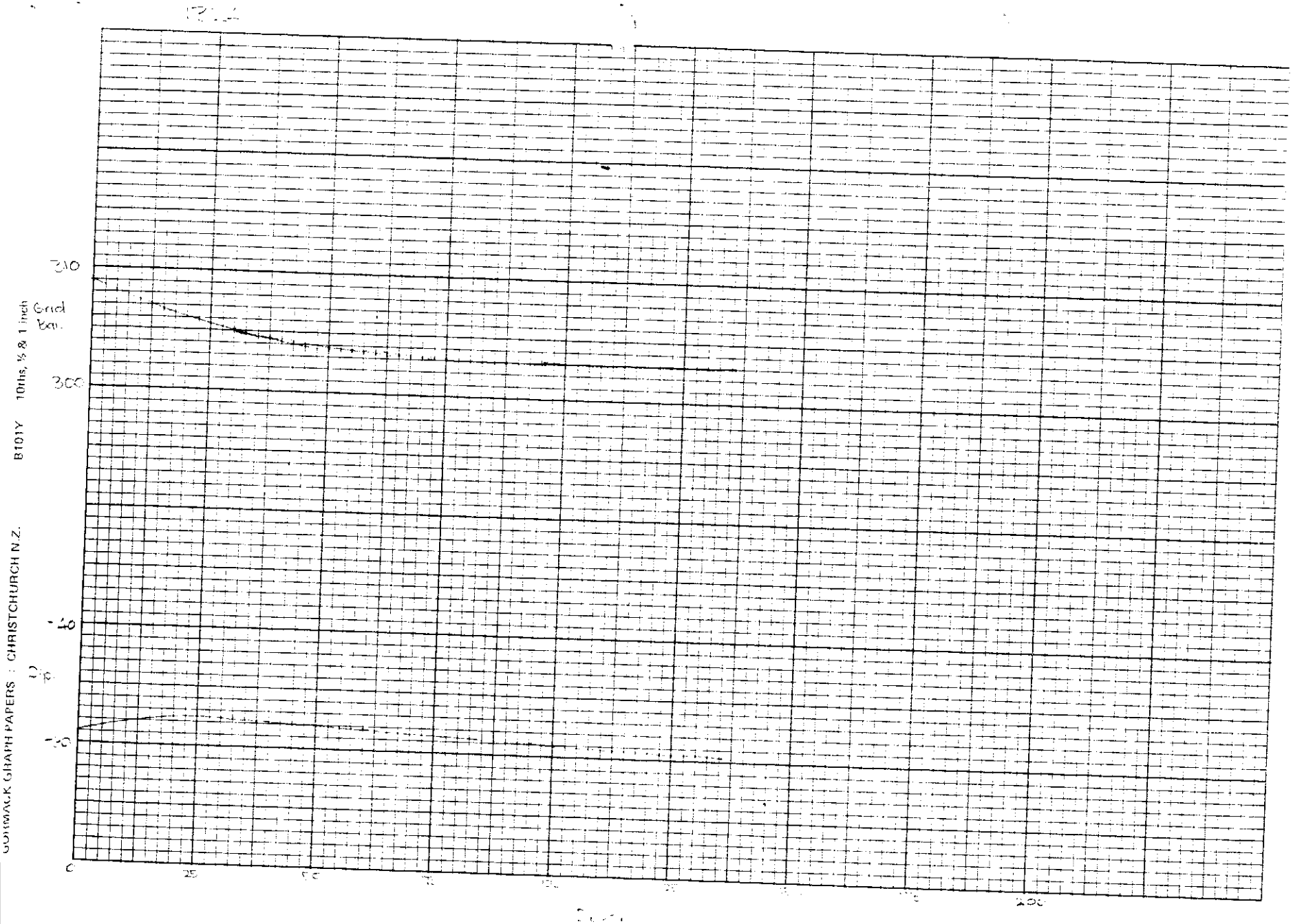
Hole No. C1324

Sheet No.

DIAMOND DRILL HOLE DATA

PROGRAM DATA				SURVEY DATA				INTERPOLATED DATA		
				Instrument Type	Depth	Dip	Azimuth	Depth	Dip	Azimuth
1	Attitude	—	(+) (-)	SURVEY	ϕ	-31	306	12½	[illegible]	[illegible]
2	Hole No.	1324		Camera	30	-32¼	305 (309)	37½	[illegible]	[illegible]
3	Down Hole Interval	25			60	-31¾	306½ (310½)	62½	-31¼	307½
4	Collar Co-ords.	[illegible]	N		96	-31	303 (307)	[illegible]	[illegible]	[illegible]
5		[illegible]	E		136.5	-30¼	303 (307)	[illegible]	[illegible]	[illegible]
6	Collar R.L.	[illegible]						[illegible]		
7	Halls Sect. GK. Intersect Point	15292.444	N							
8		10634.391	E							
9	Battery Sect. AF Intersect. Point	15174.748	N							
10		10751.365	E							
11	Start Plot (Depth)	ϕ	ϕ = Collar							

23 415


SOUTHWARK GRAPH PAPERS : CHRISTCHURCH N.Z.
B101Y 10ths, ½ & 1 inch
Grid
300
0
25

DOWN HOLE PLOT

Hole No: C1324

Sheet No:

DEPTH	PLAN			CROSS SECTION		LONG SECTION				Depth	PLAN			CROSS SECTION		LONG SECTION			
	N	E	RL	Dist.from H.R.P.	Dist.from B.R.P.	Dist. from Halls	Sect.	Dist from Batt.	Sect.		N	E	RL	Dist.from H.R.P.	Dist. from B.R.P.	Dist from Halls	Sect.	Dist from Batt	S
0	15243·696	10689·003	273·122	7246	−83·65	−0·01		42·68											
25	15256·46	10671·07	251·88	51·35	−103·66	−1·96		48·77											
50	15268·43	10653·65	246·54	30·40	−124·16	−4·82		53·95											
75	15279·16	10635·92	233·38	01·29	−144·85	−8·06		58·81											
100	15291·88	10618·05	220·41	−11·72	−165·68	−11·41		63·59											
125	15303·58	10600·03	207·63	−32·92	−186·64	−14·87		68·32											
150	15315·25	10581·91	195·09	−54·24	−207·71	−18·35		73·06											

DIAMOND DRILL LOG

Hole No E1324 Page No 1

Feature : Bedding, Foliation, Fragment - size & shape, Shearing, Fault, Vein (c carbonate, q quartz)

Mineralization : Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive <60%

23 418

CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
6.00	0.00	Lode Qtz-carb-pyrite lode.							Qtz 40-60, Carb 20-30 Py 10-20
2.80		Sandstone Med-m grained pale brown to grey feldspathic sandstone - locally lithic fragments are present.							
			q	5					Qtz vein 2 cms at 2.80m.
3.00									
2.90			qc	6					qc vein 2 spm 1cm at 5.4m.
6.00									
2.85	7.70								
		Shale Pale brown massive shale with local sandstone inclusions.							
	9.00		qc	5					Qtz-carb vein 2 cpy
9.00		Sandstone Medium grained green-brown massive feldspathic sandstone							
			c	6					Chlorite-carb-spk vein 1cm @ 9.8m.
2.90	10.50								
	11.20	Shale Pale brown massive shale with local carbonate veinlets							
12.00		Sandstone Med green grey massive sandstone locally small clastic fragments. Qtz carb veins @ 12.4m, 14.1, 15.6							
2.95									
15.00									
	16.2								
3.00		Shale Pale brown massive shale becoming tuffaceous after 18.0m. Tuffaceous component is represented by a creamy coloured speckling as fine disseminations etc about 3-5% of the rock							Occasional qtz-carb veins occur locally upto 5mm thick.
15.00									
3.05									
21.00									
	22.20								
3.00	22.90	Sandstone Med grey-brown massive sst							
		Shale Pale brown massive shale locally tuffaceous. Slight compositional variation minor slump structures locally. 10cms sst at 24.8m.							
24.00					F				Py veins upto 2mm in sst as stockwork.

DIAMOND DRILL LOG

Hole No E1324 Page No 2

Feature: Bedding; Foliation; Fragment - size & shape; Shearing; Fault; Vein (c carbonate, q quartz)

Mineralization: Trace 1-5%; Common 5-15%; Abundant 15-60%; Massive <60%

23 419

	CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
	2.70			/F						
26.85		27.20								
	2.60		Sandstone mid grey brown massive feldspathic sandstone. Feldspathic component locally up to 50% of rock. From 34m onwards there is an increase in the abundance of dark clastic particles. Also minor interbedded shales towards end of unit.	/F 90						
29.00										Quartz - cpy - fluor - po 3cms wide.
	2.70									
31.										
	2.90									
34.70										Qtz - tm - py - cpy vein at 34.2m.
	1.65	36.30								
36.40			Shale light brown to grey massive shale - locally thin carbonate veins developed. Core broken at 38.0 - 38.4. Locally sandstone interbeds occur. These are often deformed by soft sediment	9 9						
	1.80									
38.10 / 38.20 / 38.30										Qtz - fluor - carb vein 10cm @ 38.6m.
	2.90									
40.85		42.00								
	2.85		Sandstone Dark grey siliceous sandstone fine grained and fresh. Upper contact is marked by quartz carbonate vein with tr. sph + cpy.							
43.30		43.8	Fault - quartz healed sst	/F						
		44.10	Shale and sandstone. Pale brown massive shales with interbeds of medium grained sandstones which are possibly tuffaceous.							
	2.92									
46.80										
	3.00									
49.80			Sandstone Fine grained dark grey	F						Fault 49.6 – 49.8m.

DIAMOND DRILL LOG

Hole Nº C132 4 Page Nº 3

Feature: Bedding · Foliation · Fragment - size & shape · Shearing · Fault (F) · Vein (c carbonate, q quartz)

Mineralization: Trace 1-5% · Common 5-15% · Abundant 15-60% · Massive <60%

23 420

	CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
52.80 55.80 58.80 61.80	3.00 2.85 3.00 2.96	62.90	feldspathic sandstone uneven shearing little flame structure. Beginning of section shows some alteration to a light creamy brown colour. This section is also vesicular with vesicles filled with dark amorphous material. The rock is generally speckled throughout by fine cream coloured carbonate and locally carbonate may be 40% of rock.	cq						Rare py - [illegible] - 1/2 veins up to 2mm wide.
		63.10	Lode Py - po - carb - cpy. Massive cellular							Py 60, po 10, carb 30.
64.	2.98 2.78	66.70	Sandstone fine grained dark green to green-brown sandstone. Lower contact very chaotic and brecciated. Occasional carbonate vein up to 2mm thick	c6						
67.80	2.90	70.60	Lode Quartz - carbonate - pyrrhotite - pyrite - chalcopyrite lode. Generally chaotic structure - however locally crude foliation in ore is present.							
70.80		72.00	Chert Grey to mid brown massive and bedded chert. Core bedding angle 50°	(bedding)						
	2.90	72.6	Lode Quartz - pyrrhotite lode c minor chlorite - tourmaline + carbonate.							Qtz 60-80 ; po 10-15 chl 5-10 tm + carb 5-10.
		73.0	Chert: Pale to mid brown bedded chert.	(bedding)						
73.80			Lode Quartz - carbonate - sulphide lode. Mineralogy in this lode is variable as is grain size of the minerals present.							

DIAMOND DRILL LOG

Hole N° C1324 Page N° 4

Feature : Bedding, Foliation, Fragment - size & shape; Shearing, Fault, Vein (c carbonate, q quartz)

Mineralization : 23 421 — Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive <60%

CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
2.93		the predominant sulphide is pyrrhotite which occurs as aggregates ; minor pyrite and common sphalerite and chalcopyrite. Other gangue minerals locally abundant are: actinolite @ 74-75.5 ; and 79.00 - 81.00 ; Fluorite 77.00. Carbonate is locally common and occurs in aggregates. eg 77.1. Pyrite common 77-78 and about 81.5.							Qtz - 30-60 ; carb 20-40 ; po 10-30 ; cpy 1-2%.
76.80									
4.95									
79.80									
3.00	81.90								
82.80		Shale Royal brown tuffaceous shale or fine grained altered chilled basalt.							
	84.00								
2.96		Sandstone fine grained shale grey-green carbonate rich sandstone.	cg A						
85.20			cg B						
4.90									
89.80									Quartz - carbonate veins occur at low angle to C/A.
3.00			cg B						
91.80									
3.00									Occ. quartz - carb - epi veins.
94.80									
3.00									
97.80									
2.93			qj						Quartz vein 10 cm ± carbonate, cpy.

DIAMOND DRILL LOG

Hole No C1524 Page No 5

Feature : Bedding, Foliation, Fragment - size & shape, Shearing, Fault, Vein (c carbonate, q quartz)

Mineralization : Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive <60%

23 422

CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
100.80	101.80								
3.00		Shale Pale brown to grayish massive shale, laffaceous locally and becoming silicified toward end of section. Disrupted bedding common in last 40cm							Occas quartz-carb sphalerite veins up to 3 mm thick.
103.80									
2.95									
106.80	106.90								
		Chert Pale gray to cream massive and bedded chert, minor quartz carbonate veining.	=						
	109.90								
3.00		Lode Quartz-carbonate-pyrite lode - with local concentration of chalcopyrite. Tourmaline disrupted locally. Chaotic texture developed around 109 m.							Qtz - 40-60; Carb 20-40; Py 10-20 Cpy 1-5 Tm 5
109.80									
	111.00								
2.97		Shale Fine grained gray bedded and disrupted shale, generally locally silicified							
112.80									
	114.60		4						Qtz-chlor-fluor vein 10° ∧ C.A. 114 - 115.
3.00		Qtz vein Coarsely crystalline qtz with chlorite and co. fluorite very friable.							
	115.00								
115.80		Sandstone Fine grained gray-green massive Sandstone/shale; local alteration to a brown colour near joints							Occasional qtz-carb-chlor-sph veins Major vein 10-15 cm wide 116-117.
2.95									
118.80									
3.00									
121.80									
2.97									
124.80									

DIAMOND DRILL LOG

Hole N° C1524 Page N° 6

Feature : Bedding, Foliation, Fragment - size & shape; Shearing, Fault, Vein (c carbonate, q quartz)

Mineralization : Trace 1-5%, Common 5-15%, Abundant 15-60%, Massive <60%

CORE REC'D	DEPTH m	GEOLOGY	VISUAL LOG	TRACE	COMMON	ABUNDANT	MASSIVE	DEPTH m	MINERALIZATION
2.85	127.80	Rock type as for previous entry Tourmaline and of section some shaly inclusions occur locally.							
2.95	130.80		qc 0						5cm qc vein c minor sph + dolomite 80° ^ C.A.
2.95	133.80		q 5						15cm qtz-po vein c minor cpy 20° ^ C.A.
2.80	136.80		qc 4						Qtz-carb vein c minor cpy 20° ^ C.A
		136.80 m = E.O.H. Logged DCS 5 Oct 78							