1990/91 UNDERGROUND EXPLORATION PROGRAM SUMMARY

LANGMUIR # 1 Ni-SULFIDE DEPOSIT

TIMMINS NICKEL INCORPORATED

TECHNICAL SUBMISSION TO ACCOMPANY

OMIP GRANT APPLICATION

DESIGNATION # OM90-118

Prepared by David R Melling, January 15, 1991.

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1.0 Summary

Between August, 1990 and January, 1991 Timmins Nickel Inc. completed an underground exploration program on the Langmuir # 1 Ni-sulfide deposit.

The program included dewatering an existing ramp, extending the ramp (400 ft) to the 315 ft level, substantial exploration drifting (930 ft), raising (390 ft), and underground diamond drilling (4652 ft). In addition, metallurgical testing and ore compatibility studies were completed on bulk samples taken from the deposit.

This exploration work represented a critical step needed to evaluate the feasibility of mining the deposit. Based on the results of this program a production decision is expected in 1991. Underground exploration was still in progress while this report was being written.

This report documents the scope of work completed and accounts for expenditures incurred during the program.

2.0 Introduction

Between August, 1990 and January, 1991 an underground exploration program was completed on the Langmuir # 1 Ni-sulfide deposit by Timmins Nickel Inc. (TNI). The property (Figure 1) on which the deposit occurs is owned 100 % by TNI and all costs for the project were born by TNI. It is located in the Porcupine Mining Division, about 30 km southeast of Timmins, Langmuir Township, Ontario (Figure 2).

The exploration program was designed to evaluate the economic feasibility of mining the Langmuir # 1 Ni deposit which has seen substantial previous exploration, but which has lain idle since 1977. The program described here included the following elements:

1) Site preparation, temporary construction, installations and dewatering of a partially completed ramp;

2) Underground diamond drilling;

3) Extending the ramp, drifting and raising;

4) Bulk sampling and metallurgical testing; and,

5) Geological mapping and sampling.

The purpose of this report is to document the scope of work completed and account for expenditures (Appendix 1) incurred during the program. Background information such as exploration history, property geology/geophysics and deposit geology and reserves were submitted with TNI's "application for designation" and will not be repeated here.

3.0 Site Preparation, Temporary Construction / Installations and Dewatering

Site preparation completed as part of this program included the following activities:

1) Resurfacing, grading and maintenance of site roads;

2) Site clearing and levelling for temporary facilities and waste/ore pads;

3) Construction of 1/4 mile bush road to powder magazine;

4) Construction of 1/8 mile bush road to cap magazine;

5) Stripping of overburden for vent raise break through; and,

6) Re-excavation of settling pond.

One D-7 bull dozer, one 966 loader and 4 dump trucks were required to complete the site preparation.

Temporary construction and the installation of the following surface facilities was completed:

1) Security gate and trailer;

2) Combined shifter / 1st aid office trailer;

3) Powder magazine;

4) Cap magazine;

5) Fuel storage tanks (mine fuel, propane);

6) Self contained 650 Kw generator;

7) 1350 cfm compressor; and,

8) 125 Hp ventilation fan.

Dewatering of the existing ramp (1250 ft) driven by Noranda in 1977 was completed in less than 20 days using a 58 Hp pump. Vent tubing, air, water and power lines were installed underground.

4.0 Underground Exploration Drilling

Two phases of underground diamond drilling were completed involving 19 AQ size DDHs (4652 ft).

Phase 1 was completed after dewatering, but prior to extending the ramp. Nine DDHs (LH-1 to LH-9) were completed between August 20 and September 7, 1990 totalling 3627 ft. The purpose of this drilling was to:

1) Confirm the continuity of the mineralized structures previously identified by 100 ft centre surface drilling;

2) Establish the widths and grades of the mineralization; and,

3) Provide geotechnical information and permit the refinement of exploration drifting layouts.

Phase 2 of underground diamond drilling was initiated after exploration drifting on the 250 level centre zone was largely completed. Between October 15 and 25, 1990 ten AQ size drill holes (LH-10 to LH-19) were completed totalling 1025 ft. The purpose of this drilling was to:

1) Provide further confirmation of the continuity and grades of the mineralized structures previously identified;

2) In some cases attempt to extend zones of known mineralization and expand reserves; and,

3) Refine exploration layouts on the East and West zones.

Drill logs for Phases 1 and 2 are included in Appendix II of this report and illustrated in various plans and sections in Appendix III.

In addition, in excess of 30 underground test holes were drilled with jacklegs using 1 1/4" steel. Sludges from these holes were collected and assayed. This work was completed to establish the limits of the mineralization and the results are illustrated on plans in Appendix III.

5.0 Underground Exploration Drifting and Raising

The purpose of the underground exploration was to confirm the continuity and grade of mineralization indicated by diamond drilling. This was accomplished through a program of ramping, drifting and raising. Extension of the ramp began in September, 1990 and was still in progress at the time this report was written.

The equipment required to complete the underground work included:

1 - 3 boom air jumbo

1 - 13 ton rock truck

2 - 5 yard scoop trams

6 - jack legs

3 - 2 drum 30 Hp slushers

1 - 20" x 30" crusher

To date the ramp (12 X 15) has been extended some 400 ft to the 315 level. Drifting (10 X 10) on the 250 level has amounted to approximately 800 ft. About 300 ft of raising (6 X 6) on mineralization has been completed in 9 raises from the 250 level. Roughly 130 ft of sublevel drifting (10 X 10)has been completed on the 200 ft level. About 90 ft of vent raise (8 X 8) was completed to improve the ventilation. Several remucks and sumps were also excavated and services (power, air, water) were installed as required.

Geological mapping and chip sampling of all exploration headings was also completed. The results of this work is illustrated in various plans in Appendix III.

6.0 Metallurgical Testing and Ore Compatibility Studies

Ore compatibility studies were completed on the Langmuir # 1 underground exploration muck and are documented in Appendix IV. The results of this work indicated that an innovative approach would be required. In fact the concentrate produced during the mill test was rejected by the smelter due to its fine grind and moisture content.

Subsequently a used magnetic cobber was obtained to test an alternative processing method. Approximately 5000 tons were crushed to nominal 1 inch size and processed on site. A reject/concentrate split of 40/60 was obtained prior to milling. It appears that this approach will be cost effective and eliminate a third of the material as waste and produce a third of the material as a middling product for milling and a third of the material as a concentrate for shipping without milling (Appendix IV).

7.0 Discussion of Results

The 1990/91 underground exploration program on the Langmuir # 1 Ni-sulfide deposit was successful in confirming the drill indicated reserves. Although no new reserve calculations have yet been completed it would appear that a modest increase in grade and tonnage may be anticipated. In addition, geological data obtained as a result of this program has delineated new exploration targets.

Based on the results of this program a new mining plan is currently being developed. Information gained from exploration drifting and raising on mineralization has proven valuable for selecting various mining methods and assessing dilution factors. The metallurgical test work has been critical in establishing a process flow sheet and evaluating various milling alternatives.

It is anticipated that this exploration program should lead to a production decision for the Langmuir # 1 Ni-sulfide deposit in 1991. The Ontario Mineral Incentive Program has made a significant contribution to the exploration and evaluation process required to justify this decision.

Appendix I

Detailed Expenditure List

Appendix II

Diamond Drill Logs

N. MORISSETTE
DIAMOND DRILLING LIMITED
HAILEYBURY, ONTARIO

Form FU

FOOTAGE DRILLED during Month of August 15 to 31 1990

Timmins Nickle

Langmuir 1628 AQ VAG #1
Contract

Hole No.	Date Started	Date Finished	From	To	Drilled	Angle of Hole	Length of Pull	Number of Tests
H 1	Aug 20	Aug 24	0	319	319	-20°	10'	✓
LH 4	" 24	" 25	0	244	244	HOR	10'	✓
H 5	" 25	" 27	0	382	382	-22°	10'	✓
LH 2	" 27	" 28	0	360	360	HOR	10'	✓
H 3	" 28	" 30	0	381	381	-20°	10'	✓
LH 4	" 30	" 31	244	355	111	HOR	10'	✓
H 6	" 31	INC	0	143	143	HOR	10'	✓
					1940			

If this Form is not signed by Company Engineer, state if footage has been checked by him NO
Yes or No

Engineer

Foreman

Make three copies of this Form at end of each month and at end of job. Original is mailed to Office, 2nd copy is left with engineer and 3rd copy is for your files.

Form FU

N. MORISSETTE
DIAMOND DRILLING LIMITED
HAILEYBURY, ONTARIO

FOOTAGE DRILLED during Month of September 1 to 15 19 90

Timmens Nickle
Langmuir #1628 AQ VAC #1
Contract

Hole No.	Date Started	Date Finished	From	To	Drilled	Angle of Hole	Length of Pull	Number of Tests
H 6	Sept 1	Sept 1	143	379	236	HOR	10'	~
H 7	Sept 1	Sept 2	0	401	401	-20°	10'	~
H 8	Sept 3	Sept 4	0	403	403	HOR	10'	~
H 9	Sept 4	Sept 7	0	647	647	-30°	10'	~
					1687			

If this Form is not signed by Company Engineer, state if footage has been checked by him ..... Yes or No

Engineer

Foreman

Make three copies of this Form at end of each month and at end of job. Original is mailed to Office, 2nd copy is left with engineer and 3rd copy is for your files.

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY LANGMUIR
HOLE NUMBER LH-1
GRID REFERENCE
TOWNSHIP -20°
CLAIM
AZIMUTH
DIP ANGLE

UG hole drilled from Face of Ramp.

DRILLING COMPANY
FOREMAN
DIP TESTS:
CORE SIZE AQ
CORE STORED AT:
LOGGED BY KHS
DATE Aug 29/93

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS Ni	
0-35	Andesite very green amygdaloidal.				
		40.5-44	66451	0.05	
34-101.8	Ultramafic Peridotite - minor -1% Sulf.	44-48	52	0.06	
	41.0 - Fault gouge 2.8 inches	48-53	53	0.07	
	48-60.6 1% Py w some cubic py	53-58	54	0.06	
	60.6-62.5 Mafic Volc	58-60.6	55	0.06	
	67-68 core fractured.	60.6-62.5	56	0.02	
	69-79 many quartz carb veinlets +	62.5-67.5	57	0.09	
	79-85.5 3-4% Py Po	67.5-71.5	58	0.15	
		71.5-75	59	0.09	
101.8-	Andesite	75-79	60	0.11	
262	130-131 fault w cement on slips also vuggy	79-83	61	0.19	
	Qtz stringer	83-85.5	62	0.01	
	@142 core rusty w 5% Py	85.5-90	63	0.16	
		90-95	64	0.19	
262-280	Dacite - chloritic zones i.e.	95-100	65	0.11	
	270.5 - 272.5 Massive Sulfides 40% Po.	100-101.5	66	0.10	
		101.5-105	66467	0.01	
280-304	Mafic Volcanic-chloritic - minor Py				
	285-304 - very chloritic U/M??	270.5-272.5	68	5.58	
304-319.0	Peridotite - 1% sulf 304-307	280-283	69	0.02	
		283-286	70	0.06	
319.0 ~~309.5~~	END OF HOLE	304-307	71	0.16	

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY [illegible]
HOLE NUMBER LH-2
GRID REFERENCE
TOWNSHIP
CLAIM
AZIMUTH
DIP ANGLE

[illegible] DRILLED FROM FACE OF RAMP

DRILLING COMPANY
FOREMAN
DIP TESTS:
CORE SIZE AQ
CORE STORED AT: [illegible]
LOGGED BY K Hicks
DATE [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0- [illegible]	Basalt-[illegible] - med-dk green, amyg, carb blch local, fg	31-36	66489	0.06	
	[illegible] stringers	36-41	66490	0.08	
	1% py	41-46	66491	0.08	
	0-11 wispy [illegible]?	46-51	66492	0.07	
	11-24 [illegible] sulph - 1-3% diss cubes, bands	51-56	66493	0.08	
	15.4-30 [illegible] chlorite	56-61	66494	0.09	
		61-66	66495	0.07	
[illegible]	[illegible] - greyish grey to dark green, fg, v soft, talcose	66-71	66496	0.07	
	Variable [illegible] carb stringers, carb blch	71-76	66497	0.13	
	Py cubes, bands to 5% locally (PN?)	76-79	66498	0.08	
	32.5-33.5 broken core	79-82.3	66499	0.14	
	37 1.5" crush [illegible] - str sulp				
	sulphides increasing downhole				
57.1- [illegible]	[illegible] - Med grey - tuffaceous / locally amyg				
	Foll bed @ 80° tca				
	minor - 2% diss py				
	[illegible] 1cm py cubes				
[illegible]-122.3	Porph dyke / porph tuff				
	Sheared - ser + chl, carb stringers				
	carb blch, minor qv				
[illegible]-221.2	[illegible] - tuffaceous? banded				
	carb [illegible], local blch, to 1% py				
	min chl				
	188.8-194.2 Porph dyke - shr - ser altn				
	carb veins - [illegible] brick red [illegible]?				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PAGE 2

PROPERTY: LANGMUIR #1 HOLE NUMBER: LR-2

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
	303.6 - 314.1 weakening ser altn - patchy ...				
	FAULT ??				
221.2-222	Carb vn - rusty walls - crush mud				
222-292.2	Dacite l-med grey fg aph tuffaceous				
	carb stringers ; v wk blch				
	tr-2-3% py locally - some seams				
	288-289.7 2-3% Py	276-281	66500	.01	
292.2-300	UM Peridotite - dark grn - fg , V mag	281-286	66401	0.01	
	- wk pact-carb , local chlorite	286-290	66402	.01	
	292.2 - 309 1-2% sulph	290-292.2	66403	.34	
	292.2-293 chlorite altn - perv	292.2 296	66404	~~.47~~	.34
	307-347 ~~st~~ mod talc carb altn	296 - 299	66405	~~.50~~	.47
	Exact blch , tr-1% sulp	299 - 302	66406	~~.15~~	.50
		302 - 307	66407	~~.26~~	.15
		307 - 309	66408	~~.33~~	.26
		309 314	66409	~~.22~~	~~.22~~ .33
		314 317	66410	~~.18~~	~~.18~~ .22
		317 324	66411		.18
		324 329	66412		.16
[illegible]	1-2%				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY Lansdown [illegible]
HOLE NUMBER 11-3
GRID REFERENCE
TOWNSHIP
CLAIM
AZIMUTH
DIP ANGLE

U/G Hole Drilled from face of Ramp

DRILLING COMPANY
FOREMAN
DIP TESTS:
CORE SIZE AQ
CORE STORED AT: REDSTONE
LOGGED BY K Hicks
DATE Aug 30/90

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS
0-35'	Basalt/Andesite - med green, chl, amyg			
	carb, carb strings, tr py			
	0-25 Leucoxene common - [illegible] py white			
	32.3-33 py cubes - 1cm - amyg			
		35-40	66413	0.04
		40-45	66414	0.06
35'-77.7	[illegible] - med [illegible] - grey green	45-50	66415	0.05
	V soft - talc carbonate	50-55	66416	0.06
	mod. St. mag	55-60	66417	0.09
	2-3% diss py cubes throughout	60-65	66418	0.09
		65-70	66419	0.09
	38.6-38.8 pervasive serp alt'n - flt?	70-75	66420	0.10
		75-80	66421	0.19
77.7-111	Dacite - Med grey, hard, tuffaceous, amyg			
	carb amyg, carb strings/bands			
	2-3% py at upper cnt			
111-268	Andesite banded/tuffaceous?			
	Med - dk green, tr - 1% py			
	minor qtz carb veining			
	191-209 Lapilli tuff ??			
	217.5-220.8 - Shearing - carb/ser blch			
	229.8-230.3 as above			
	237-268 sulph common - band - diss locally massive			
	mostly py			
	236-268 amyg common to 4mm dia			

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY:

PAGE 20-2

HOLE NUMBER: 44-3

FOOTAGE	DESCRIPTION OF CORE		SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
268-381	UM peridotite - dgreen to blk wk pc-to local cM					
	268 - 270.4 Massive Sulph Zone	2.4	268-270.4	66422	1.64	
	270.4 - 285.1 Net textural Sulph Zone minor pyrr in mass Stringers	4.6	270.4-275	66423	2.29	
		5.0	275-280	66424	3.04	
	285.1 - 301.3 3-5% diss Sulph	5.0	280-285	66425	3.39	
	301.3 - 303.8 5-5% c/o Hy Sulph	5.0	285-290	66426	1.62	
	303.8 - 310.5 Sulph pods	5.0	290-295	66427	1.22	
	310.5 353 patch to diss sulphs 3-5% local	5.0	295-300	66428	1.12	
	max 1-4 blebs	3.8	300-303.8	66429	1.04	
		5.0	310-315	66430	.66	
		5.0	315-320	66431	.81	
		5.0	320-325	66432	.48	
		5.0	325-330	66433	.50	
		5.0	330-340	66434	.78	
		5.0	340-345	66435	.36	
		5.0	345-350	66436	.34	
			350-355	66437	.24	
			355-360	66438	.34	
			360-365	66439	.35	
			365-370	66440	.33	
			370-375	[illegible]	.55	
381	EOH					

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY:

HOLE NUMBER:

PAGE [redacted]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
	#4 STOPPED AT 244 – WATER SEAM.				
#5	– WILL TRY TO GET BACK ON.				
256-382	CONTACT PERIDOTITE				
	#5 ✓ 256-258.3 – MA SULP DO PX, CPX				
	✓ 258.3-259.3 PERID LARGE BLOB MAS SULP				
	✓ 259.3-261.9 MA SULP				
	#✓ 261.9-264 20% SULP	264 TO 282			
	264-296 ~10% +/- 5% SULP. IN PERID				
	296-301 ~5%				
	301-382 – 1-2% SULP / WEAK CYDS				
	MINOR SHORT SECTIONS OF 3-5%				
	-319.0-319.2 25% MA SULP.				
	[illegible]				
	TRUE WIDTHS ?				
	256-296 – MAS SULP + UP TO 20%				
	296 → EOH – LOW GRADE – SHOULD KICK WEAKLY.				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PAGE _____

PROPERTY: LANGMUIR #1 HOLE NUMBER: #5

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
256-258.3	MA. SULP. P.O. PN CPY		66478		
258.3-259.3	PERD LARGE BLOB MAS Sup		66479		
259.3-261.9	MA SULP		66480		
261.9-264	20% SULP.		66481		
264-283	~10% +/- 5% SULP IN PERID		66482		
283-296	" " " " " "		66483		
296-301	~5%		66484		
301-304	1-2% SULP WEAKLY DIS		66485		
318-317	" " " "		66486		
317-317.4	25% MA SULP		66487		
317.4-320.4			66488		

MACK

705
642 3244

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY [illegible]
HOLE NUMBER [illegible]
GRID REFERENCE
TOWNSHIP CLAIM
AZIMUTH DIP ANGLE

DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE [illegible] CORE STORED AT: LOGGED BY [illegible] DATE [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
[illegible]	[illegible] CARB [illegible] INTERLOCKS				
	[illegible] PY BLEBS				
	14.8 - [illegible] GREY BROWN QTZ-CARB?-K-SPAR ZONE [illegible]	[illegible]	[illegible]	.08	
[illegible]	[illegible], VERY SOFT, TALCOSE.	[illegible]	[illegible]	0.10	
	<1% SPECKLED SULPH PY po?	[illegible] - 61.0	664[illegible]	.20	
		61.0 - 69.0	[illegible]	.31	
	69.6-69.85 QTZ VEIN, MINOR CARB, tr SULP.	[illegible]	[illegible]	.20	
	28.4-28.6 [illegible] GOUGEY, tr SERP.				
	44.1-44.4 GROUND				
	57.0-57.3 5% SULP BLEBS				
	60.3-60.6 " " "				
	60.5 - ~67 NUMEROUS CARB MICRO FRACTURES				
80 [illegible]	[illegible]				
	RARE PY [illegible].				
	[illegible] SERP				
[illegible]	— 194.3 - 19[illegible] - CHL/SERP [illegible], SULP CUBES				
	194.3 - POSSIBLE CONTACT				
193.1-199.5	QTZ VEINING (FELDSPAR?)				
					Cu
[illegible]-271	[illegible] <<1% SULP RARE SULP CUBES, [illegible]				
	19[illegible] - 199.4 - CHLORITE RICH				
	204.3 - 205.2 SERP [illegible] - VERY GREEN.	242-244	66[illegible]	0.01	
	[illegible] 30° TCA.	244-246	[illegible]	0.01	
	242.5 - 243.7 FRACTURED - RUSTY 1% SULP NiCu	246-247	[illegible]	3.77	0.27
	246.[illegible] - 246.7 MA SULP. Po, pn? 10% CPY		[illegible]	0.04	
	252.3-252.5, 252.9-252.8 ~10% py, ±po				
	[illegible] 2				

PAR 21452

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY:

PAGE [illegible]

HOLE NUMBER:

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
	<1% sulp				
[illegible] - 348.1	[illegible] - non magnetic f.g. [illegible] → Black				
	[illegible] - [illegible] [illegible], Breccia <<1% sulp needed	252.0 - [illegible]	66449	0.01	
	[illegible]				
	[illegible] - 279.9 [illegible] vein - [illegible]	[illegible]	66450	0.47	
	[illegible]	[illegible]	1558	0.88	
	[illegible]				
	[illegible] sulp. NEEDS				
	[illegible] 3% sulp INFILLS				
	[illegible] 15%				
	[illegible] trapstone [illegible] 10% assoc. sulp.	[illegible]	1559	0.69	
	[illegible]	[illegible]	1560	0.48	
	[illegible] carb. [illegible]	[illegible] 312	1561	0.36	
	[illegible]	312 - 314.4	1562	1.04	[illegible]
	31[illegible].7 - 315.8 10% sulph	314.4 - 315.8	66801	1.00	[illegible]
	315.8 - 348.1 tr to local 2% py in carb fracts	315.8 - 320	66802	0.19	
	333.8 333.9 weak cup flt with				
	333.9 - 335.1 - sep, talcose carb altn halo				
	344 - 348.1 stA talcose, v soft				
348.1 - 355	Diorite dike - fg chill margins, mg-cg centre				
	upper cnt sharp, lower intercalated in um				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PAGE 1

PROPERTY: [illegible] #1 HOLE NUMBER: [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS
	[illegible]			
	[illegible] WITH SULP.	[illegible]	[illegible]	0.01
	[illegible] PY BAND (2mm)			
	24.5-~40 [illegible] <1% + <<1% [illegible]			
40 - [illegible]	[illegible] POSSIBLY [illegible] <1% SULP.			
	[illegible] FAULT ZONE, GOUGE LIKE,			
	[illegible] DEFORMATION/SHEARING [illegible] FAULT (~30 TCA)			
	[illegible] WEAK [illegible], LOW < T.C.A.			
[illegible] - [illegible]3	[illegible] MOD MAGNETIC, BLUE BLACK, 1-2% OCCASSIONAL SULP BLEBS			
	[illegible] ABUNDANT QTZ-CARB PY, PO. PN?? (PY RICH)	[illegible] - 78.6	[illegible]	0.07
	[illegible] - 88.0 3-5% SULP.	87.[illegible] - 88.[illegible]	[illegible]	0.28
	[illegible] FAULT ZONE CEMENTED GOUGE, MINOR CORE GRINDING			
113 - [illegible]	[illegible] WEAKLY FOLIATED/BANDED.	304 - 308	66442	0.41
	CHL SECTIONS, RARE QTZ VEINS	308 - 312	66443	0.14
	<<1% SULP.	312 - 315	66444	0.35
		315 - 318	66445	0.35
	[illegible] WEAKLY CHL, AMYGDALOIDAL	?		
	[illegible] 0.5-5% SULP BLEBS, STRONGLY MAGNETIC, MAGNETITE + PO	[illegible] - 256	15	0.04
	[illegible] SHARP CONTACT ~70-80° [illegible] 2.3	256.0 - 258.3	[illegible]	8.09
	[illegible] PO, PN, CPY 1.0	258.3 - 259.3	664[illegible]9	1.65
	[illegible].3 - 259.3 [illegible] (2") MASS SULP BLOBS. 2.6	259.3 - 261.9	66480	5.70
	[illegible] - 261.9 MASS SULP (AS 256 - 258.3) 2.1	261.9 - 264.0	664[illegible]	5.23
	[illegible] MAGNETIC. 19.0	264.0 - 283.0	[illegible]	2.88
	[illegible] ~70% SULP. 13.0	283.0 - 296.0	[illegible]	2.84
	[illegible] ~10% SULP +/- 5% SULPH LOCALLY. 5.0	296.0 - 301.0	[illegible]	.83
	[illegible] - 301 ~5% SULP. 3.0	301.0 - 304.0	664[illegible]	.51
	[illegible] 1-2% SULP, WEAKLY DISS, MINOR SHORT SECTIONS OF 3-5%			
	319.0 - 319.2 75% MASS SULP.	318.0 - 319.0	664[illegible]	.29
		319.0 - 319.4	[illegible]	4.45

[illegible] - 324 #1EC2 → 0.25% Ni [illegible] .47

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY [illegible] #1
HOLE NUMBER LH-6
GRID REFERENCE
TOWNSHIP CLAIM
AZIMUTH DIP ANGLE

DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE AQ CORE STORED AT: REDSTONE LOGGED BY K Hicks DATE Sept [illegible] 90

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0 - [illegible]	[illegible] , mod greenish, carb wisps - amygdules??, carb stringers				
	to py blebs locally chloritic				
	[illegible] - 31.5 - Brownish - Eg dyke?? [illegible] cut assimilated?				
	[illegible] - [illegible] as above				
[illegible] - [illegible]	UM Peridotite - mod-dark greenish grey, talcose, carb				
	wk-str mag				
	tr - 1% diss sulph (py) blebs - some po				
	local fracts w carb ff				
	[illegible] chill at top - very magnetic				
	63 - 64.8 Magnetite / Chromite? - massive seam				
	72 - 84 carb veins common - barren				
	94.2 - 94.6 contact shear - serp talcose				
94.6 - 105.2	[illegible] - mod greenish, mod hard				
	carb wisps common, blotchy carb				
	possibly tuffaceous mod lam / fol				
105.2 - 132.8	[illegible] mod grey, v hard ser, chl minor				
	tuffaceous, locally cherty				
	fract w blch halos - sericite				
	mod carb veining w cubic py				
	to diss py				
	121.1 - 132.8 - lapilli tuff?				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PAGE 2 of 5

PROPERTY: LANGMUIR #1 HOLE NUMBER: [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
1??-215.2	Andesite Wacke — med greenish fg tuffaceous locally lam/fol locally 3-4% py cubes carb wisps, stringers, ckbxtic? hard				
	179.4 - 180.7 - porph dyke ?? sulph common at cnt				
	194 - 214.6 magnetite common wk tuffaceous iron fm	179.4-180.7	66803	1.80%	
	214.6 - 215 magnetite seam				
	215. - 215.25 massive sulph po, py	214.6-215.3	66804	[illegible]	
215.2-220	Dacite Flow — med-dark grey aph fg				
	219.6 - 220 - flow top bx				
?-232.5	Dacite Tuff — med-dark grey aph-fg very hard, locally porph xtal tuff cherty magnetite seams				
	227.5 - 231.2 shear ± possible porph dyke rust carb stringers				
232.5-241.6	F-Porph dyke — minor shear, ser altn carb fracts				
241.6-270.4	Andesite — med greenish carb amyg, up to 5% py cubes locally locally porphyritic as bands	262.8-265.4	[illegible]	[illegible]	
	262.8 - 268.4 up to 5% py cubes as bands				
	270.4 - 271 massive sulphide - po, py [illegible]	270.4-271.6	[illegible]	[illegible].60	
	271.4 - 271.6 25% sulph clots				
270.4-??	Dacite/Andesite — d grey, very hard - amyg? porph? local carb blch 1% py blebs				
	281.4 ½ qtz vn				
	284 - 284.2 30% sulph - py some po	283.6-284.6	[illegible]07	[illegible]	
	284.4 - 285.2 bx 30° to CA				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY:

PAGE [illegible]
HOLE NUMBER: LH-6

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
	286.7-293 magnetite seams - massive sections common				
	locally massive magnetite				
	295.7-296.5 5-10% sulph blebs in massive magnetite	295.7-296.5	[illegible]	[illegible]	
296.5-299.1	Massive Sulphide Zone - po, pn?, py				3.83
	c massive magnetite seams / pegs	296.5-299.1	[illegible]	3.42	
[illegible]	Chloritic Rock - unknown origin				5.6
	possible UM				
	299.1-301.3 2-3% po,	299.1-301.3	[illegible]	0.43	
306.0-379	UM Peridotite				
	med-dark greyish green				
	talcose soft - v soft, carb blebs				
	fracts c carb ff				
	330.7-332.1 porph dyke				
	332.1-338.6 - 3-4% diss sulph	332.1-335.5	66817	0.27	
	338.1-343 1-2% diss sulph 0.24/10.9'	335.5-338.6	66817	0.29	
	352.7-353.1 serp flt zone	338.6-343	[illegible]	0.19	
	354.8-356.5 2-3% sulph 0.11/1.7'	354.8-356.5	66814	0.11	
	364.3-366.3 2-3% sulph 0.77/2.0'	364.3-366.3	[illegible]	0.77	
	372-374.3 1-2% sulph 0.63/7.0'	372-374.3	[illegible]	0.46	
	374.3-379 2-3% sulph	374.3-379	[illegible]	[illegible]	
379	EOH				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

UC / [illegible] Ramp

PAGE 1 [illegible]
PROPERTY [illegible]
HOLE NUMBER LN-7
GRID REFERENCE
TOWNSHIP
CLAIM
AZIMUTH
DIP ANGLE

DRILLING COMPANY
FOREMAN
DIP TESTS:
CORE SIZE NK
CORE STORED AT: Redstone
LOGGED BY K Hope
DATE [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0-70	Basalt/Andesite - med green, fg, local tuffaceous				
	local chloritic alt'n / seams				
	mod fract c Q-carb veining				
	carb wisps / blebs, some blk				
	trace to 3-4% py locally				
	33.2-34 Q carb vein - tr py				
	44.4-45.1 Q carb vein, BX, tr py				
70-109.3	UM Peridotite - med greenish, soft talcose				
	wk fract c carb ff - 1-2% sulp				
	70-71.5 aph chill margin - massive - semi massive				
	magnetite / chlorite				
	81-84 2-3% py	81-84	66[illegible]	0.0[illegible]	
	83.2-83.6 Serp fault c 1" chl/serp mud				
	97.6-109.3 fg chill margin - non mag				
10[illegible]-10[illegible]7	Porph dyke - feld porph				
101.7-11[illegible]	Andesite - Med/dark green, aph/fg tuff?				
	carb wisps, stringers				
	5-10% py as cubes to 1" - no po, pn				
	some py stringers				
11[illegible]-201	Dacite - light/Med grey, fg aph v hard, siliceous				
	possible lapilli @ 114-114.3??				
	chloritic fractures - locally porph				
	127.9-145 pyrite common - 10-15% locally				
	some massive seams				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PAGE [illegible]

PROPERTY: LANGMUIR [illegible] HOLE NUMBER: [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
	145-[illegible] tuffaceous?? Sam/ foliation well developed locally porph → possible dykes - contacts [illegible]				
	1[illegible]-1[illegible] ser altn blch zone fault @ 185.5 - 8"				
	186.2-198.2 variable ser altn - possible porph dyke zone				
	190-192 buck wh QV common → barite??				
20[illegible]-2[illegible]	Andesitic/Mafic Tuff - dark green fg laminated locally amyg, porphyritic magnetite rich sections, chloritic py to 5% local clusters				
~~2[illegible]-2[illegible]~~ 261 - 274	PORPH DYKE - Sharp cnt w chl altn wk porphyritic near lower cnt wk fract - carb strings				
~~2[illegible]-2[illegible]~~ 274-	OXIDE FE FORMATION?? very Magnetic possibly a tuff 3-5% cubic py disseminated carb altn + stringers becoming less magnetic & take more tuffaceous	287.1-292.1	[illegible]	0.01	
		292.1-297.1		0.01	
297.1-[illegible]	MASSIVE SULPHIDE ZONE - w magnetite bands/ frags minor QV po, py, pn?? SHOULDER?	297.1-299.5		[illegible]	4.0' / [illegible]
29[illegible]-312.2	CHERTY TUFF/SED -				
312.[illegible]-31[illegible].7	MAGNETITE/SULPHIDE ZONE - OXIDE FE FORMATION?	312.2-316.7	[illegible]	[illegible]	
316.7-3[illegible]	UM PERIDOTITE med/dark green fg - locally talcose - blotchy carb altn mod fract w carb stringers				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY: [illegible] #1 HOLE NUMBER: [illegible]

PAGE [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
	316.7 - 318 3-4% Sulph	316.7-318	66[illegible]	0.85	
	320.3 - 325 2-3% Sulph	320.3-325	66[illegible]	0.20	
	325 - 328.8 3% diss/net sulph	325 - 328.8	[illegible]	0.[illegible]	
	328.8 - 357 1-2% Sulph local 2-3%	328.8-334	[illegible]	0.[illegible]	
	357 - 392.5 - spotty diss sulph	334 - 337	66827	0.27	
		337 - 344	66828	0.32	
		344 - 349	66829	0.25	
		349 - 354	[illegible]830	[illegible]	
	CHECK CHIP TAGS (DUPLICATE 5)	354 - 357.3	[illegible]831	0.36	
		357.3 - 362	66[illegible]	[illegible]	
39[illegible] - 401	PORPHYRY - TURNER DYKE?	362 - 367	[illegible]	0.18	
	Fg phynos to 2mm	367 - 372	[illegible]	0.[illegible]	
	V hard, blch cnt for 13' whole	[illegible] - 377	[illegible]	0.37	

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY [illegible]
HOLE NUMBER LH-7
GRID REFERENCE
TOWNSHIP
CLAIM
AZIMUTH
DIP ANGLE

410/ [illegible] of [illegible]

DRILLING COMPANY
FOREMAN
DIP TESTS:
CORE SIZE AQ
CORE STORED AT: REDSTONE
LOGGED BY K [illegible]
DATE [illegible]

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS
0-108.2	ANDESITE mod/dark green aph-fg mod hard [illegible] amyg			
	minor carb wisps, stringers, some Q vein			
	with blch, local py clotting -3-4%			
	[illegible]-72 sm/col - tuffaceous?			
	5-7 Ground Core			
	10-11 Ground Core			
	15.6 [illegible] dyke?			
	27.[illegible]-[illegible] Q vein - [illegible]			
	36.[illegible]-[illegible] Porph/amyg			
	72.0 Contact			
	72-[illegible].2 Very [illegible] - [illegible]			
108.[illegible]-217.7	UM PERIDOTITE - dark green-black fg mod hard [illegible]	108.2-112	[illegible]	0.06
	local [illegible] /serp altn - minor [illegible]	112-114.6		0.[illegible]
	3-4% diss Py/Po? throughout	114.6-117.6		0.30
	108.[illegible]-114.[illegible] blch cnt zone - serp/talc altn - minor [illegible]	117.6-121		[illegible]
	114.6-147.[illegible] w blch? talc/carb altn - mod fract w carb filling			
	147.8-213.1 relatively fresh UM - black mod fract w	[illegible]25-129	66865	0.16
	carb/QV	124-134	66	0.28
	194.1-194.6 QV Bx	134-139	67	0.15
	195-195.5 broken core	139-144	68	0.14
	197.2-198.3 Q carb vein	144-149	69	0.16
	213.1-219.7 blch cnt zone - pervasive serp	144-154	70	0.10
	214.8-217.2 possible spinifex	154-157	[illegible]71	0.18
		157-162	72	0.13
[illegible]7-232.5	DACITE TUFF? Very magnetic near lower cnt	162-167	73	0.15
	hard fg	167-172	7[illegible]	0.14
	222.7-228.6 Porph dyke, chtd locally [illegible]	17[illegible]-17[illegible]	7[illegible]	0.16

69
.25-.4
.4-.65

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PAGE 2 of 3

PROPERTY: LANGMUIR #1 HOLE NUMBER: LM-8

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS
232.5 - 304	ULTRAMAFIC PERIDOTITE med green to dark green, sl mod / foliated carb stringers, blotches, magnetic	177 - 182	76	0.27
		182 - 186	6.8277	0.29
	232.5 - 234 Semi massive sulphide zone 30-40% sulph	232.5 - 234	66840	4.22
	234 - 237.2 5-10% sulph blotches	234 - 237.2	66841	1.80
	237.2 - 240.3 5% sulph	237.2 - 240.3	66842	1.10
	240.3 - 245 Massive Sulphide	240.3 - 245	66843	6.75
	245 - 247 2-4% disp/net sulph	245 - 247	66844	1.10
	247 - 247.7 Massive Sulph	247 - 247.7	66845	6.11
	247.7 - 248.2 5% Sulph in Massive Magnetite	247.7 - 248.2	66846	1.00
	248.2 - 248.6 Massive Sulph	248.2 - 248.6	66847	6.65
	248.6 - 271.5 5% dis Sulph	248.6 - 254	66848	1.38
	2.17% / 71.5 = 155.387	254 - 259	66849	1.63
		259 - 264	66850	1.51
		264 - 268.0	66851	1.70
		268 - 271.5	66852	0.79
	271.5 - 272.2 Mass Sulph	271.5 - 272.2	66853	3.80
	272.2 - 276.6 5% disp/net Sulph	272.2 - 276.6	66854	1.28
	276.6 - 278.5 Mass Sulph	276.6 - 278.5	66855	4.17
	278.5 - 301.5 3-5% disp Sulph	278.5 - 282	66856	1.59
		282 - 287	66857	1.00
		287 - 292	66858	1.89
		292 - 297	66859	1.29
		297 - 301.5	66860	1.13
	300.8 - 301.5 Massive Magnetite 3-5% Sulph			
	301.5 - 304 Massive Sulph	301.5 - 304	66861	0.42
304 - 332	ANDESITE - tuffaceous w/ interbedded oxide fm ?? or magnetite rich layers amyg - carb, carb stringers	186 - 191	66878	0.59
		191 - 196	79	0.27
	318 - 321.6 Very magnet. - massive magnetite (A/M)	196 - 201	80	0.25
	332 - 4" 80% Sulph.	201 - 206	81	0.38
332 - 375.5	PORPHYRY DYKE / TUFF - 2-4 mm scattered phenos 1.0%	206 - 213	82	0.29
	WK fol locally → sericitic .4%	213 - 217	83	0.35
		217 - 219.7	84	0.29

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY: LANGMUIR H / HOLE NUMBER: LH-8

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
375.5-388.5	ANDESITE greenish, fg fol'd lam - tuff??				
	carb wisps - stringers				
	375.5 - 381.5 3-4% sulph	375.5 - 381.5	66862	0.48	
	381.5 - 388 to 5% local sulph clots	381.5 - 386	66863	0.34	
	388 - 388.5 20% sulph abt	386 - 388.5	66867	0.77	
388.5-401	UM PERIDOTITE - Mod green, s/f non-wk mag				
	to py po. Talcose, serp				
401	EOH?				

Form FU

N. MORISSETTE
DIAMOND DRILLING LIMITED
HAILEYBURY, ONTARIO

FOOTAGE DRILLED during Month of October 15 to 31 1990

Langmuir Timmins #1628 AQ VAC #1
Contract

Hole No.	Date Started	Date Finished	From	To	Drilled	Angle of Hole	Length of Pull	Number of Tests
H 15	Oct 15	Oct 17	0	75'	75'	-30°	10'	✓
H 14	" 17	" 18	0	103'	103'	+27°	10'	✓
H 16	" 19	" 19	0	72'	72'	+80°	5'	✓
H 19	" 20	" 20	0	84'	84'	-30°	10'	✓
H 18	" 20	" 20	0	64'	64'	HOR	10'	✓
H 17	" 22	" 22	0	78'	78'	+30°	10'	✓
H 13	" 22	" 23	0	120'	120'	-20°	10'	✓
H 12	" 23	" 23	0	50'	50'	HOR	10'	✓
H 10	" 23	" 24	0	203'	203	+25°	10'	✓
H 11	" 24	" 25	0	176	176	-25°	10'	✓
					1025			

If this Form is not signed by Company Engineer, state if footage has been checked by him ..... Yes or No

..... Engineer

..... Foreman

Make three copies of this Form at end of each month and at end of job. Original is mailed to Office, 2nd copy is left with engineer and 3rd copy is for your files.

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY [illegible]
HOLE NUMBER LH 10
GRID REFERENCE [illegible]
TOWNSHIP
CLAIM
AZIMUTH [illegible]
DIP ANGLE [illegible]

DRILLING COMPANY
FOREMAN
DIP TESTS:
CORE SIZE
CORE STORED AT:
LOGGED BY JAS
DATE

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0 - 10	[illegible]				
10 - 14	Vo				
14 - 16.4	Um 14 - 15.45 magnetic 10% SULP.				
	15.45 - 15.95 Ma SULP.	14.0 - 16.4	1652		
	15.95 - 16.4 CHLORITIC, mt, 2-3% SULP.				
16.4 - 59	Va WEAK TO MOD CHL	28.5 - 29.5	1653		
	28.6 - 29.1 Ma SULP.				
59 - 65.5	Dike.				
65.5 - 92	Va, WEAK CHL (SILICEOUS? LOCALLY), OCCASSION mt BANDS, AMYGDULES py				
92 - 103	Mafic Vole (TUFFACEOUS)				
103 - [illegible]	Mafic Vole CHL	117.0 - 120.8	[illegible]		
[illegible] - 110.5	Siliceous → Gr? E minor mt BANDING. 2	120.8 - 122.8	[illegible]		
110.5 - 120.8	[illegible] Vole CHLORITIC 1-2% PY PO BLEBS 205	122.8 - 12[illegible]	[illegible]		
	5.15	[illegible] - 130	[illegible]		
120.8 - 124.85	NS po, pn RICH NEAR 121, mt RICH 123 → 124.85 5	[illegible] - 135	[illegible]		
	5.5	[illegible]	4		
124.85 - 203	Um 124.85 - 135 - 10-15% DISS SULP magnetic 3	[illegible]	[illegible]	1.375	
	135 - 140.5 CARB RICH Um < 2% SULP non magnetic 4.5	[illegible]	[illegible]	1.04	
	140.5 - 14?.5 ~10% SULP magnetic 5	[illegible]	[illegible]	0.566	
	147 - [illegible] CARBONATE [illegible]				
	1?? - 203 [illegible] CARBON. + TALC RQD [illegible]				
	[illegible] DISS SULP LOCALLY.		2.17		
	SEVERAL POSSIBLE SHEARS	120.8 - 148	27.2		
203	EOH				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY
HOLE NUMBER 1H11
GRID REFERENCE
TOWNSHIP CLAIM
AZIMUTH DIP ANGLE

DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE CORE STORED AT: LOGGED BY JAS DATE

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
[illegible]	[illegible]				
[illegible]	Va				
	[illegible] ??				
	3.28%				
6.[illegible]	[illegible] 16.[illegible] - 17.[illegible] ACT/TREM + [illegible]% SULP 1.45	[illegible]	[illegible]	1.34	
	[illegible] - 18 [illegible] SULP	[illegible]		5.09	
	Va				
[illegible]	QTZ V[illegible] [illegible]) RARE CHL RICH FRAGS, [illegible] SULP ALONG CONTACT,				
[illegible] 4	[illegible] - 29 [illegible] CORE RECOV. BROKEN [illegible] 1.4'	[illegible]	[illegible]	5.465	
	[illegible] m.s. [illegible]				
[illegible] - 71.[illegible]	[illegible] WEAK [illegible] CHL, F-SPAR AMYGDULES,				
	[illegible] LOOKING SECTIONS				
[illegible]	[illegible] PINKISH [illegible] FRACTURES				
7[illegible]	Va 1-2% SULP BLEBS (PY??)				
	BECOMING MORE CHL RICH TOWARDS 81	79.[illegible] - 81.[illegible]	1678	0.03	
	4.2	81.8 - [illegible]	16[illegible]	3.146	
[illegible]	[illegible] 4	86 - [illegible]	16[illegible]	0.023	
[illegible] 176	[illegible] BRECCIA, 10-15% SULP. MAGNETIC 4	90 [illegible]	16[illegible]	2.557	
	[illegible] 87.7 m.s. DO DA. 4	94 [illegible]	16[illegible]	2.732	
	101 - [illegible] CORE SHEAR/FAULT .2' 4 [illegible]	[illegible]	16	1.48	
	[illegible] - 112 [illegible] RICH, MASSIVE + GRANULAR DO DA??, CHL [illegible] MAS mt 4 [illegible]	10[illegible]	16	0.686	
	112 - [illegible] m.s. [illegible] mt [illegible]	10[illegible]	16	2.491	
	[illegible] - 122 mas mt + DO DA 3'	[illegible]	16	7.803	
	4'	11[illegible]	16	4.013	
	3'	[illegible]	16	4.664	

TIMMINS NICKEL INC.

DIAMOND DRILL LOG

PAGE 1

PROPERTY
HOLE NUMBER LH 11
GRID REFERENCE
TOWNSHIP CLAIM
AZIMUTH DIP ANGLE

DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE CORE STORED AT: LOGGED BY JAS DATE

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS
	131 15-70% SULP 5'	122 - 127	1679	2.835
	133 SULP 4'		1680	1.9
	133		1681	0.07
			1682	0.18
	133.3 5% SULP		1683	0.12
	170. 176 - UNIQUE TEXTURE/FABRIC CRYSTAL ALIGNMENT			
	174.5 -176 SPINIFEX			
176.04				
			2.77	
		81.8 - 131	49.2	

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY [illegible]
HOLE NUMBER [illegible]H 13
GRID REFERENCE
TOWNSHIP
CLAIM
AZIMUTH
DIP ANGLE

DRILLING COMPANY
FOREMAN
DIP TESTS:
CORE SIZE
CORE STORED AT:
LOGGED BY
DATE

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0 - 3	VERY CHLORITIC + [illegible] RICH 3-5% [illegible] DISS SULP + OCCAS. PO PATCH	0 - 3		0.05	
3 - 11	Va WEAKLY CHL 8'-9' 1' GROUND				
11 - 18	CHL + mt BANDED MAFIC (TUFF?)				
18 - 27.5	Va WEAKLY CHL.				
27.5 - 33.2	FELSIC DYKE - PINKISH STAIN ON FRACT.				
33.2 - [illegible]	Va? [illegible] MOD CHL, ZONES OF SILICIFICATION, PO BLEBS, mt BANDING, py? CUBES				
	38.9 - 39.4 - QTZ PATCHES OR FRAGS UP TO .05', SUBANGULAR, BRECCIATED [illegible]				
	[illegible] 40.2 QTZ.				
	[illegible] mt.				
	[illegible] - 43.5 SUGARY [illegible] QTZ, [illegible] MAGNETIC, [illegible]				
	([illegible]) IRON FORM'				
[illegible] - 68.4	MAFIC [illegible] PO, PY BANDS OCC TO COMMON.				
	- [illegible] OF FE FORM QTZ RICH				
	- [illegible] ZONES PROXIMAL TO FE FORM				
	- CARBONITIZED [illegible] - 68	53 - [illegible]		0.013	
	NOTE 41 - 43.5 NOT SAMPLED - [illegible] IN CORE SHACK LH 13 BY 2.				
		68.4 - 72.4	1645		[illegible]
[illegible]	[illegible] 10% mt, 7-15% SULP, INCREASING DOWN HOLE. TO SEMI MASS mt/SULP	72.4 - 74	1646		
	73.7 - 74.1 GRANULAR mt + po pn	74.1 - 77	47		
[illegible] 77	[illegible] SULP [illegible] mt FROM 74.1 - 74.2	77 - 81	48		
	[illegible] - 77 COARSE + FINE GRAIN SULP, PO, c mt, pn? py?	81 - 86	44		
77 - [illegible]	MAFIC, [illegible] SULP				
[illegible] - 91.2	Um, BLUISH, TALCY (SOFT) 2% DISS SULP, FRACTURED (CARB INFILLING)	105.0 - 108			
	89 - 89.3 QTZ CARB VEIN	108 - 112			

-120 [illegible] [illegible] LESS TALC/CARB, MORE MASSIVE, HARDER, WEAKLY MAGNETIC [illegible]
MINERALIZED 105.5 - 112 3-5% SPECKLED PO.

LM6

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY
HOLE NUMBER LH 14
GRID REFERENCE 3200N
TOWNSHIP CLAIM
AZIMUTH 225 DIP ANGLE -30

MAKING H_2O @ ~30'

FACE

DRILLING COMPANY Morrison FOREMAN DIP TESTS:
CORE SIZE CORE STORED AT: LOGGED BY JAS. DATE Oct 24

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS
0 - 71.3	Um.	0 - 5'	1569	0.31
	0 - 21 - Um, TALCY, GENERALLY ~2% FINELY DISS SULPH, UP TO 5%	7 - 13	70	0.32
	(RQD - Vlow) LOCALLY, MODERATE FRACTURING WITH CARB INFILLING	13 - 17	71	0.33
	5.7' - 2' GROUND.	17 - 21	72	0.22
WEAKLY MAGN.	21 - 68 Um - HIGHLY CARBONATED, TALCOSE, NUMEROUS CARB FILLED FRACTURES	21 - 26	73	0.27
	(RQD 60) ~1% FINELY DISS SULP, RARE SULP BLEBS,	26 - 31	74	0.14
	MAJOR CARB FILLED FRACTURES @ 24.4 - .03'	31 - 36	75	0.28
	24.5 - .05'	36 - 41	76	0.17
	24.9 - .03'	41 - 46	77	0.09
	30.2 - .1' LOST CORE? GOUGE	46 - 51		0.12
	34.3 - .1'	51 - 56		0.12
	51 - .13'	56 - 61		0.16
	63 - 68' CONTACT GROUND - WEAK TO MOD MAGNETIC	61 - 68		0.13
	- Um - (FRAGMAR?) MORE MASSIVE, LESS TALC, NO CARB, SOFT	68 - 70.7		1.08
—	68.7 - 71.3'	70.7 - 71.3		2.09
	← 68.7 - 70.7 - 15-20% FINELY DISS SULPH MOD-STRONG MAGNETIC IN Um/MAGNETITE	71.3 - 73.8		0.02
	→ 70.7 - 71.3 - MASSIVE MAGNETITE WITH PO, PY, PA, CPY BLOB WITHIN			
	POSSIBLE GROUND CORE @ 71.3 - CONTACT GROUND			
71.3 - 72.6	Mafic? VERY CHLORITIC, SOFT			
72.6 - 93.0	Possible Tuff? BANDED - 5% MAGNETITE RICH BANDS DECREASING IN FREQUENCY DOWN HOLE. OCCASIONAL AMYGDULES (BARREN. EXCEPT TRACE PY BAND @ 90.5'			
93.0 100	- DYKE. VFG TO MASSIVE, HARD, FELDSPATHIC			
[illegible] 3	Mafic - CHLORITIC			
	4.3 FOOT.			

LANG #1

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

Hit H_2O @ 30'

PAGE 1
PROPERTY LANGMUIR #1
HOLE NUMBER LH 15
GRID REFERENCE
TOWNSHIP CLAIM
AZIMUTH 225° DIP ANGLE

DRILLING COMPANY Morissette FOREMAN DIP TESTS:
CORE SIZE AQ CORE STORED AT: LOGGED BY JAB. DATE

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0-53.3	Um, TALCOSE, MOD TO STRONGLY CARBONATED, MOD MAGNETIC	0-5	1585	0.55	
	3-5% SULP OVERALL, FINELY DISS + SMALL PATCHES	5-10	6	0.38	
	ABUNDANT CARB FILLED FRACTURES, HAIRLINE UP TO .1"	10-15	7	0.39	
	17.7-17.9 CARB FILLED	15-20	8	0.32	
	22.6-22.7 " "	20-25	9	0.30	
	24.8-24.9 " "	25-30	90	0.30	
	29.6-29.7	30-35	1	0.24	
	36.2 SLIP - 1-2mm GOUGE, BRECCIATED. 20°TCA	35-40	2	0.14	
	ONE 1/4 PIECE CORE 39-40 - SHEAR ZONE ~15°TCA.	40-45	3	0.28	
	FOUND @ 54' - MAS MAGN + SULP ~~POSSIBLY OUT OF PLACE~~ 44-45 ~10% SULPH,	45-50	4	0.24	
	PUT IN 52-53.3. 52-53.3 - 3% SULP BLEBS PO PY IN NON CARB Um	50-52	5	0.24	
53.3-55	Vf... CHL MAFIC? NON MAGNETIC	52-53.3	6	0.09	
	54.6-55 VERY COARSE CRYSTALLINE UNIT, MAGNETIC	53.3-55	7	0.05	
		55-60	1598	0.01	
55-75	Va				
75	EOH				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

Hit H_2O @ 25 + 35'

PROPERTY Langmuir #1
HOLE NUMBER LH 16
GRID REFERENCE 3200N
TOWNSHIP CLAIM
AZIMUTH ~~090~~ 270 DIP ANGLE -90

DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE CORE STORED AT: LOGGED BY JAS DATE Oct 06

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS
0 - 72	Um (peridotite) Blue black, homogeneous (massive) 5-10% sulphides (diss), magnetic	0-5	1599	0.45
		5-12	1600	0.26
	6-10 - very broken core possibly slip/or fault indicated by	12-17	1601	0.16
	Qtz carb vein (1") with brecciated Um frags.	17-22	1602	0.21
	17' - .1 Qtz/carb 32° TCA	22-27	1603	0.39
	19.2 - .25' " " 45° TCA	27-32	1604	0.19
	H_2O? 22.6 - .1 " " rusty? 30° TCA.	32-37	1605	0.18
	27 .2 carb talc qtz ~20° TCA shear.	37-42	1606	0.94
	H_2O? 28 .2 " " 38 "	42-47	1607	1.63
	31 - 38 - 2% sulp.	47-52	1608	1.45
	A - 38.4 - 72 Gray blue, grainy Um 3-5% sulp. ~1-2% at present	52-57	1609	1.30
	slightly more magnetic to strongly magnetic	57-62	1610	1.29
		62-67	1611	1.24
		67-72	1612	1.46
72	EOH			
	Hole stopped short due to excess H_2O			

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PROPERTY
HOLE NUMBER [illegible]
GRID REFERENCE [illegible]
TOWNSHIP CLAIM
AZIMUTH 090 DIP ANGLE [illegible]

DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE CORE STORED AT: LOGGED BY DATE

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0 - 5 —	Um, <1% SULP EXCEPT 4.5 - ~3-5% PATCHY SULP BLOBS				
5 - 11 [illegible]	CORE IS BROKEN + RUBBLE 1.5' GROUND FROM 8.5 - 10'				
	- CHL RICH SECTIONS, mt RICH SECTIONS + mag mt.				
-10 - 12.5	ALTERED, HARD, SILICEOUS? ZONES	15 - 17	1640	0.71	
[illegible] - 15.75	mafic ?				
15.75 ~ 17	[illegible] DYKE? Um.				
— ?	15.75 - 16.2 SULP + mt 15.75 - 16 - PO, PN, minor mt				
	16 - 16.2 90% mag mt				
[illegible]	DYKE [illegible] DESCRIBED ABOVE?				
—	24.0 - 24.65 VUGGY QTZ VN.				
[illegible]	Va ? WEAKLY [illegible]				
—	30.5 - 31 RUSTY ZONE				
37.5 - 78	Um →	37.5 - 40.0	[illegible]	1.04	
—	37.5 - 40.0 - 10-15% mt + 3-5% SULPH in Um	40.0 - 42.0	[illegible]	0.15	
	40.0 .05' CARB	42.0 - 45.0	[illegible]3	0.42	
	40.1 - 47 - Um [illegible]	45 - 50	16[illegible]	0.12	
	4[illegible] - [illegible] - MORE CHL SECTION 44 - 44.3 30% mt, 15% PN? 10% po				
	45 - 49 - [illegible] CHL ALT.				
	50 - 68.5 - ~2% PY PO PATCHES, BLOBS.				
	68.5 - [illegible] TALCOSE Um, BLUE BLACK, [illegible] SULP, CARB FRACTURING				
78	EOH.				

TIMMINS NICKEL INC.
DIAMOND DRILL LOG

PAGE 1

PROPERTY [illegible]
HOLE NUMBER [illegible] 18
GRID REFERENCE [illegible]
TOWNSHIP CLAIM
AZIMUTH 090 DIP ANGLE [illegible]

DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE CORE STORED AT: LOGGED BY DATE

FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0-6	Um [illegible] ~1% SULP.	0 - 4	1629	0.14	
	3' - .1' TALC/CARB FRACT 25° TCA	4 - 6	1630	0.20	
	3.5 .2' SOAPSTONE TALC FRACTURE ?				
	4.2 - 4.5 5% SULP.				
	4.5 - 7.6 BROKEN + RUBBLE CORE.	13 - 14.6	1631	0.02	
	→ 5.6 - 5.65 Mas mt + po pn?	14.6 - 15.0	1632	0.20	
	5.[illegible] - 6.0 CHL [illegible]	15.0 - 19	1633	0.28	
6.0 - 14.6	- [illegible] MAFIC → ULTRAMAFIC UNIT ?				
	8 - 0.15 QTZ VN.				
	9.7 0.1 QTZ VN.				
	11 - 11.6 RUBBLE.				
	11.6 - 13 1.4' GROUND CORE				
	13 - 14.2 - VERY SILICEOUS, HARD.				
	14.2 - 14.6 - BECOMING CHL RICH				
14.6 - 19.0	[illegible] Um - MORE CRYSTALLINE TEXT - POSSIBLE POOR SPINIFEX				
	14.6 - 14.8 - 90% Ma mt, THIN SULPHIDE BAND AT BOTH WALL ROCK SIDES.				
	CONTACT NEAR 90° TCA.				
19.0 - 26.6	DIKE, QTZ, F SPAR, A FEW POORLY DEVELOPED PORPHYRY, PINKISH ALONG FRACTURES.				
	19.0 - 20.2 ALTERATION ZONE	38.5 - 40.5	[illegible]	0.01	
	19.7 - CHL + mt	40.5 - 45	1635	0.01	
26.6 - 38.5	Va ?? WEAK CHL + CARB, WEAK LINEATION OR BANDING (TUFF?) BARREN, NON MAGNETIC				
38.5 - 61	CHL MAFIC ROCK, HAS A VERY FINE GRAINED TEXTURE, VERY MAGNETIC, SOME CARB.	45 - 50	[illegible]6	0.01	
	45.6 .1' Q.V.	50 - 55	16[illegible]7	0.06	
	50.3 - 59 3% PATCHY SULPHIDES INCREASING TO ~10% FROM 55.5 → 58	55 - 59	16[illegible]8	0.48	
	MAINLY po, py, mt, SOME pn?, tr cpy.	59 - 64	1639	0.08	
61 - 64	POSSIBLY Um - BARREN.				
	60 - 61 GRADATIONAL CONTACT.				

64 EOH

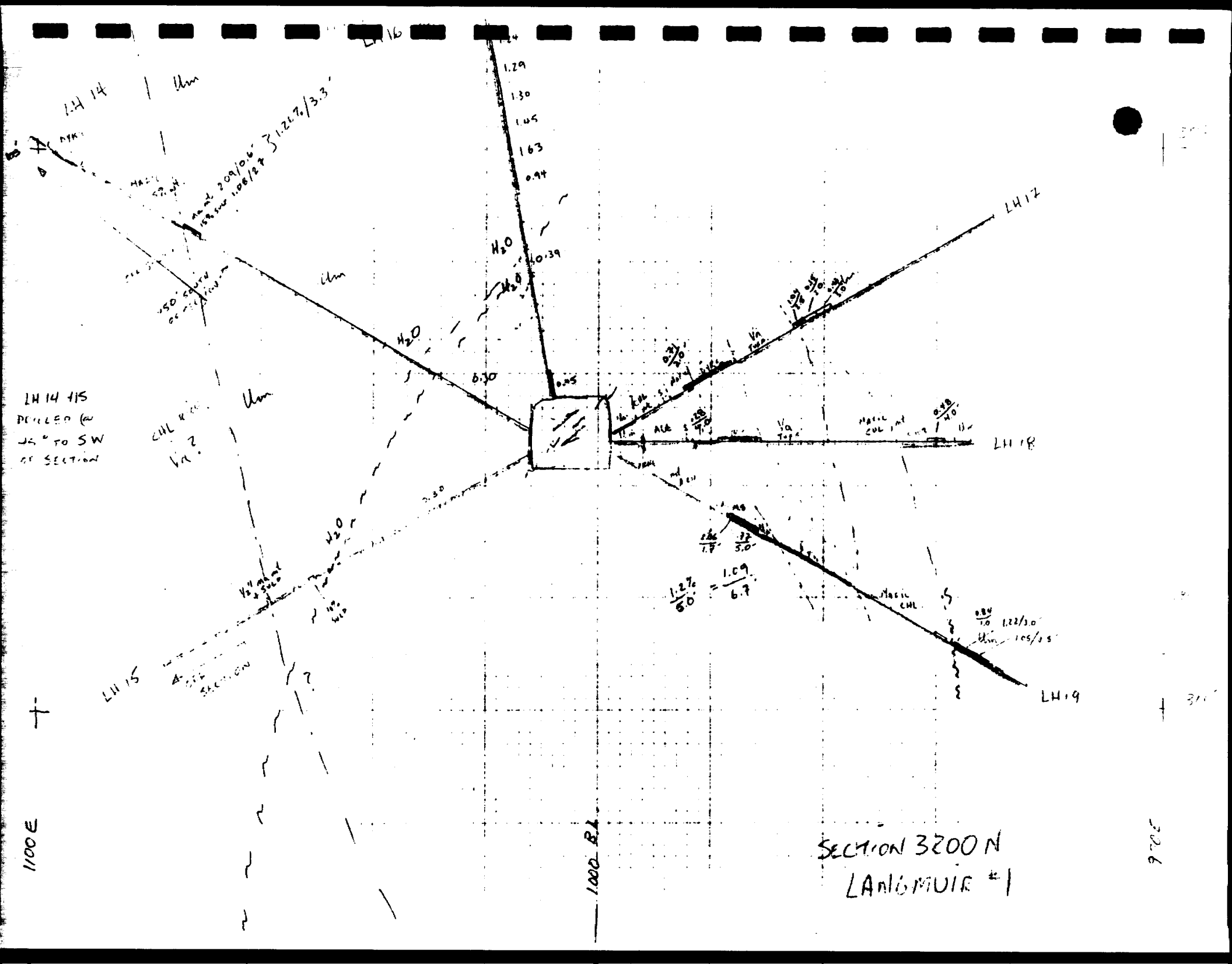
TIMMINS NICKEL INC.
DIAMOND DRILL LOG

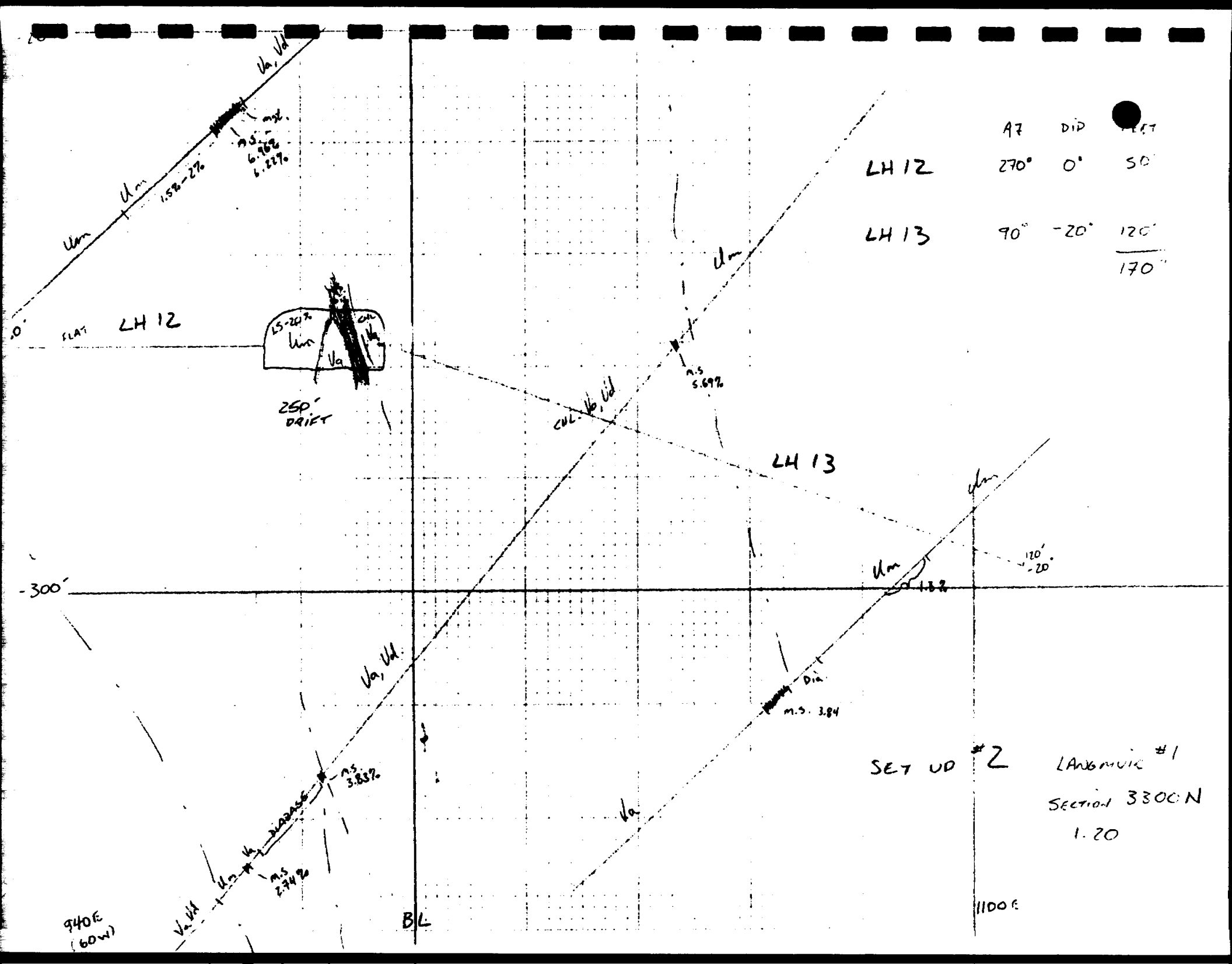
PROPERTY [illegible]
HOLE NUMBER LH 19
GRID REFERENCE 3200
TOWNSHIP CLAIM
AZIMUTH 090 DIP ANGLE

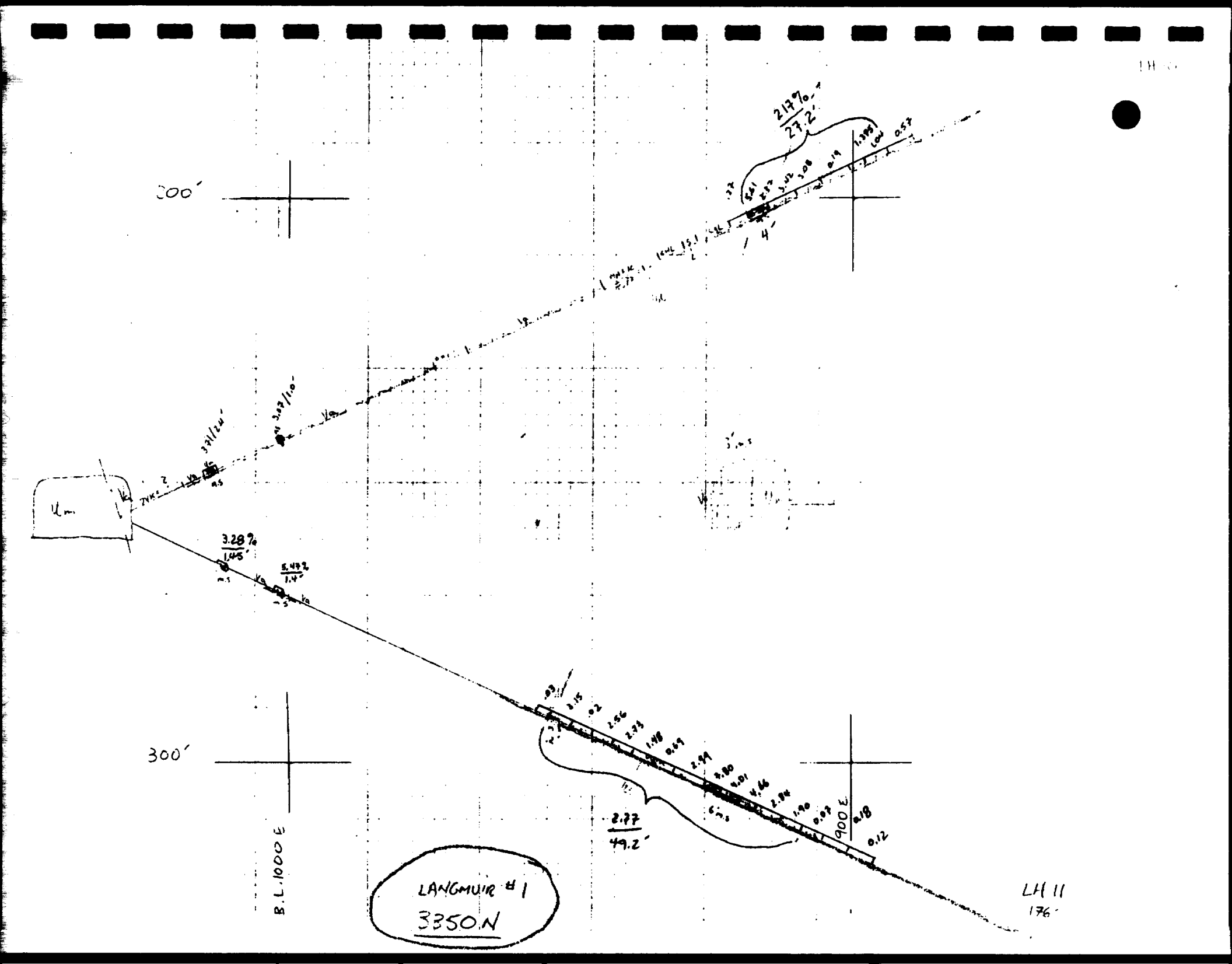
DRILLING COMPANY FOREMAN DIP TESTS:
CORE SIZE CORE STORED AT: LOGGED BY JAS. DATE Oct 76

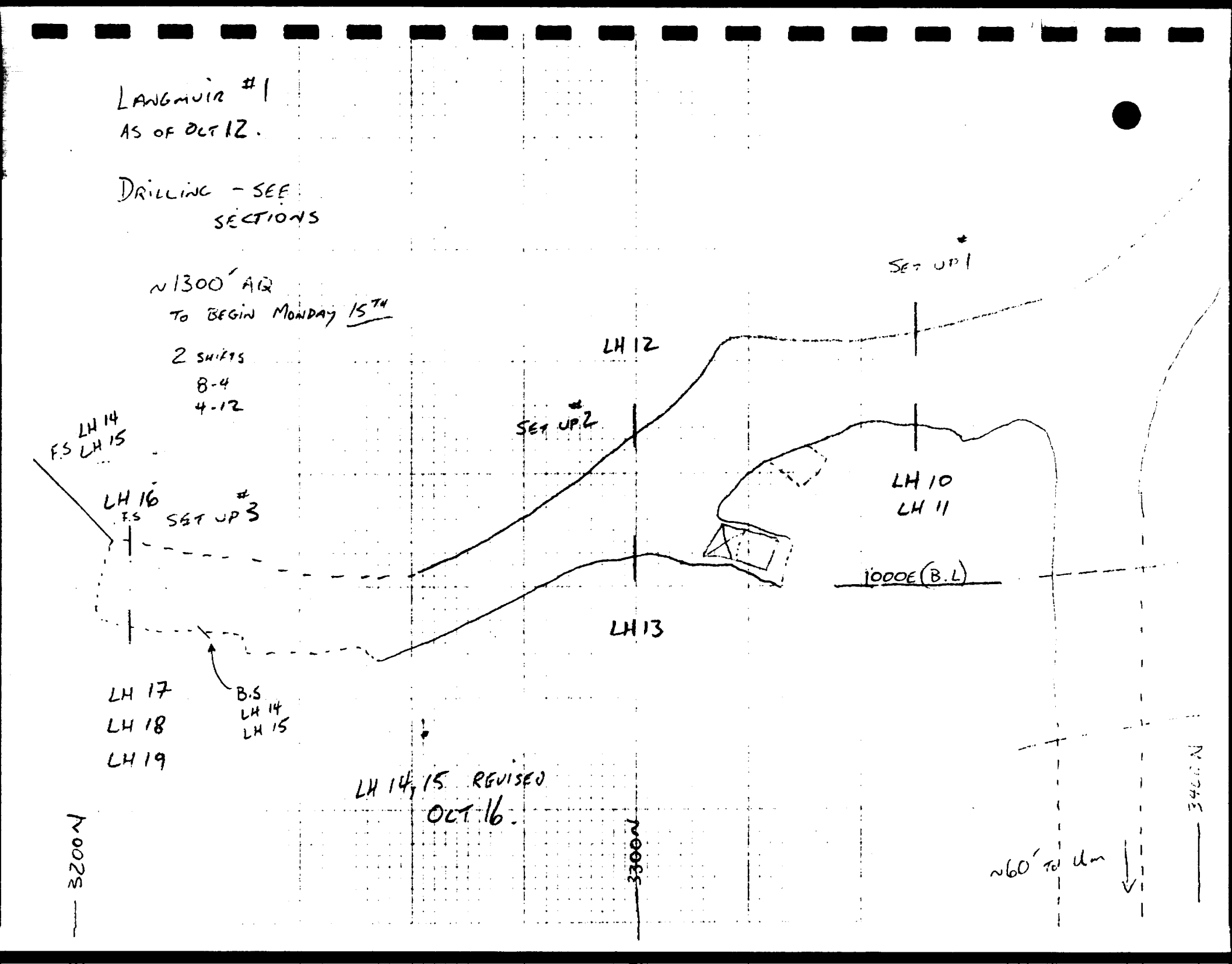
FOOTAGE	DESCRIPTION OF CORE	SAMPLE INTERVAL	SAMPLE NUMBER	ASSAYS	
0-5.5	Um, BLUISH, MOD TALCY 2% FINELY DISS SULP, WEAKLY MAGN.	0-5.5	1613	0.20	
5.5-23.3	VERY CHLORITIC @ CONTACT BECOMING LESS CHLORITIC	5.5-11	14	0.05	
	9.5-10.5 · 2' GROUND. 6.5-8.5 - RUBBLE.	11-15	15	0.01	
	VERY HARD CHERT LIKE UNIT WITH 10-70% WISPY TO POORLY BANDED mt	15-20	16	0.01	
	TO SEMI MASSIVE (60-80%) mt	20-[illegible]	[illegible]	0.01	
	[illegible] MORE CHLORITIC TOWARDS 20'-23'.	23.[illegible]		2.06	
		[illegible] 30		0.77	
23.3-30	SULPHIDE ZONE MASSIVE, SEMI MASSIVE + 15% DISS in Um, VERY MAGNETIC	30-34.5		0.03	
	23.3-23.8 80% M.S. po, pn?, cpy				
	24.2-24.5 40% " " po pn				
	2[illegible] - 29.3 Ma mt.				
30-32	CHL RICH MAFIC c̄ 5% mt BANDING				
32-34.5	[illegible] FAIRLY SOFT Um??				
34.5-40.5	DYKE FELSPATHIC? OCCASSIONAL PORPHYRITIC OR QTZ EYES. MORE COMMON #2·119.5				
[redacted]					
40.5-69	MAFIC? CHLORITIC BARREN. MINOR SULPHIDE 62.5-62.55				
	65.4 .05' QTZ VEIN 50° TCA	63-65.4	1621	0.01	
	65.4-68 - ~5% SULPHIDES py po.	65.4-68	22	0.41	
	68-69 - <1% SULP	68-69	23	0.11	
69-	SULPHIDE ZONE	69-70	24	0.84	
	69.0-69.3 - GOUGEY/BRECCIATED ZONE (POSSIBLY FAULT OR MOVEMENT)	70-73	25	1.22	[illegible]
[illegible]	69.3-69.7 - CHL Um? 5% SULPH	73-76.5	26	1.05	
	69.7-70 MAS TO SEMI MAS SULP. po pn mt? py?	76.5-80	27	0.28	
	70-79 30-10% FINELY DISS SULP.	80-85	28	0.29	
	76.5 QTZ? FILLED FAULT .07'				
79.5-	Um 5-10% SULP				

[illegible] (in ore)


LH 16
LH 14
LH 14 415
DRILLED @ 45° TO SW OF SECTION
LH 17
LH 18
LH 19
LH 15
1.29
1.30
1.05
1.63
0.94
H_2O
6.30
0.05
0.39
1.2%/6.0 = 1.09/6.7
1100 E
1000 RL
SECTION 3200 N
LANGMUIR #1


Va, Vd
Um
1.5%-2%
m.s. -
6.96%
6.22%
0°
FLAT
LH 12
LS-20%
Um
Va
250'
DRIFT
CUL. Va, Vd
m.s
5.69%
LH 13
120'
-20°
-300'
1.8%
Va, Vd
Dia
m.s. 3.84
m.s
3.83%
DIABASE
m.s
2.74%
940E
(60W)
BL
1100E
LH 12 270° 0° 50'
LH 13 90° -20° 120'
170'
SET UP #2
LANGMUIR #1
SECTION 330°N
1.20


200'
300'
B.L. 1000 E
900 E
LANGMUIR #1
3350 N
LH 11
176'


LANGMUIR #1
AS OF OCT 12.
DRILLING - SEE SECTIONS
~1300' AQ
TO BEGIN MONDAY 15TH
2 SHIFTS
8-4
4-12
SET UP 1
LH 12
SET UP 2
LH 14
F.S LH 15
LH 16
F.S
SET UP 3
LH 10
LH 11
1000E (B.L)
LH 13
LH 17
LH 18
LH 19
B.S
LH 14
LH 15
LH 14, 15 REVISED
OCT 16.
3200N
3300N
~60' TO dm
3400N

Appendix III

Underground Plans and Sections

Appendix IV

Metallurgical Studies

MEMO

LANGMUIR TEST RUN (Preliminary Report)

To: Don MacKinnon
From: Tony Lipiec

SUMMARY:

The test run on the Langmuir ore started at 2:30 a.m. on Saturday, October 6, and finished at 12:30 p.m. on October 9. Approximately 1250 wet tons were milled with an preliminary recovery of 81.5 % on a 1.80 % Ni feed grade. Concentrate grade produced was on the average in the range of 11 - 11.5 % Ni.

INTRODUCTION:

The purpose of this test run was to determine how well the Langmuir No. 1 ore would react in the flotation circuit presently used for the Redstone ore. In order to accomodate this test, it was arranged with Giant Yellowknife Mines to make room for this run by increasing at their expense the tonnage run through of the Redstone ore.

The test run was conducted by Tony Lipiec, the TNI production metallurgist, with the assistance of Mike Yu, metallurgical engineer with BHP-Utah Mines International. Extra manpower was employed to produce good quality sampling through out the day shift runs.

TEST OBSERVATIONS

Immediately as the run began, it became apparent that the muck was significantly different from the Redstone ore. The principal difference is the much higher pyrrhotite content in the Langmuir No. 1 ore. This was apparent both visually in the crushed muck, in the flotation froth, by the X-met samples, and by the lab assays. Unlike the Redstone, where the Fe:Ni ratio is approximately 2.5:1, the Langmuir ore is at 10.0:1. The consequences of this difference is the relative difficulty of making a high nickel grade concentrate, due to the problem of rejecting the pyrrhotite. Unlike the Redstone where all the sulphides are basically pulled into the concentrate, to do this with this ore would produce a Langmuir con under 8 % Ni.

After the problem was determined, it was decided to follow a flotation strategy different from the Redstone in that both the xanthate, frother and copper sulphate were cut back substantially. Keeping the latter two reagents at approximately half

the Redstone dosage allowed a significant increase in con grade to over 11 % Ni. The other change was the running of the floats sufficiently slow as not to overload the cleaning circuit. Tonnage was run at 330 tpd to determine the recovery at these dosages and grind. On the second day of the test it was decided to run the ore through at 410 tpd to determine the importance of grind. Recovery suffered at the higher throughput, decreasing from the low 80s to the high 70s.

Among other criteria looked at was how magnetic the various products were. Using a bar magnet both the nickel bearing minerals and the gangue were very magnetic. Another point, more positive, is the relative consistency of feed grade compared to the Redstone ore which fluctuates greatly. The Langmuir ore also is relatively easy to crush while in grinding a relatively fine grind will have to be employed. Environmentally, the Langmuir ore poses a problem because of its high pyrrhotite content. Although an acid generating test has not been done yet, it will likely be required before the MOE will allow its continued disposal into the ballpark.

FURTHER WORK

Further work should be done to both increase recovery and to improve the concentrate grade on the Langmuir ore. Sufficient samples were taken to aid in environmental work, X-met calibration models (for circuit control), mineralogical work, and some lab work. Possible methods to improve the circuit performance would be to try alternate collectors (pyrrhotite rejecting) and possibly pH control in the cleaning circuit.

CONCLUSIONS

At this point, the test run has produced some preliminary data and pointed out the need for improving certain aspects of the circuit. It also produced sufficient concentrate to allow Sherritt Gordon an idea of its refining characteristics.

From the way it was necessary to run the Langmuir flotation, it would be inappropriate to consider mixing the ore at any stage of flotation. It might be beneficial to the Redstone concentrate to mix it with Langmuir concentrate if the arsenic content proves to be low. It would certainly be beneficial to the Langmuir tailings to mix it with the more benign Redstone tailings.

REDSTONE JOINT VENTURE - METALLURGICAL BALANCE

October 6L

PRODUCTS	Weight Tons	Weight %	Assay % Ni	Pounds Ni	Dist Ni
FLOT FEED	189	100.0	1.77	6678	100.0
FLOT CONC	26	13.6	11.20	5732	85.8
FLOT TAIL	163	86.4	0.29	946	14.2

PRODUCTION FOR OCTOBER

FLOT FEED	189	100.0	1.77	6678	100.0
FLOT CONC	26	13.6	11.20	5732	85.8
FLOT TAIL	163	86.4	0.29	946	14.2

MOISTURE: 2.26 % H2O
FINAL CONC D/S 11.2 % Ni 25.4 % Fe
FINAL CONC N/S 11.2 % Ni 25.4 % Fe

REAGENT CONSUMPTIONS:

XANTHATE 0.40 lbs/T
COPPER SULFATE 0.40 lbs/T (CuSO4*5H2O)
GUARTEC 2.00 lbs/T

DOWN TIME 0.0 Hours

COMMENTS:

I. A. Lipiec

REDSTONE JOINT VENTURE - METALLURGICAL BALANCE

October 7L

PRODUCTS	Weight Tons	Weight %	Assay % Ni	Pounds Ni	Dist Ni
FLOT FEED	331	100.0	1.76	11665	100.0
FLOT CONC	43	13.1	11.10	9617	82.4
FLOT TAIL	288	86.9	0.36	2048	17.6

PRODUCTION FOR OCTOBER

FLOT FEED	520	100.0	1.76	18343	100.0
FLOT CONC	69	13.3	11.07	15349	83.7
FLOT TAIL	451	86.7	0.33	2994	16.3

MOISTURE: 2.26 % H20
FINAL CONC D/S 11.0 % Ni 28.2 % Fe
FINAL CONC N/S 11.2 % Ni 23.9 % Fe

REAGENT CONSUMPTIONS:

XANTHATE 0.25 lbs/T
COPPER SULFATE 0.20 lbs/T (CuSO4*5H2O)
GUARTEC 0.50 lbs/T

DOWN TIME 0.0 Hours

COMMENTS:

I. A. Lipiec

REDSTONE JOINT VENTURE - METALLURGICAL BALANCE

October 8L

PRODUCTS	Weight Tons	Weight %	Assay % Ni	Pounds Ni	Dist Ni
FLOT FEED	412	100.0	1.86	15325	100.0
FLOT CONC	55	13.3	11.13	12214	79.7
FLOT TAIL	357	86.7	0.44	3111	20.3
PRODUCTION FOR OCTOBER					
FLOT FEED	932	100.0	1.81	33668	100.0
FLOT CONC	124	13.3	11.12	27563	81.9
FLOT TAIL	808	86.7	0.38	6105	18.1

MOISTURE: 2.38 % H2O
FINAL CONC D/S 11.7 % Ni 24.8 % Fe
FINAL CONC N/S 10.7 % Ni 24.5 % Fe

REAGENT CONSUMPTIONS:

XANTHATE 0.25 lbs/T
COPPER SULFATE 0.20 lbs/T (CuSO4*5H2O)
GUARTEC 0.50 lbs/T

DOWN TIME 0.0 Hours

COMMENTS:

I. A. Lipiec

REDSTONE JOINT VENTURE - METALLURGICAL BALANCE

October 9L

PRODUCTS	Weight Tons	Weight %	Assay % Ni	Pounds Ni	Dist Ni
FLOT FEED	299	100.0	2.05	12267	100.0
FLOT CONC	38	12.7	12.87	9758	79.5
FLOT TAIL	261	87.3	0.48	2510	20.5

PRODUCTION FOR OCTOBER (LANGMUIR ONLY)

FLOT FEED	1231	100.0	1.87	45935	100.0
FLOT CONC	162	13.2	11.52	37321	81.2
FLOT TAIL	1069	86.8	0.40	8615	18.8

MOISTURE: 2.22 % H2O
FINAL CONC D/S 14.6 % Ni 26.4 % Fe
FINAL CONC M/S 11.6 % Ni 25.6 % Fe

REAGENT CONSUMPTIONS:

XANTHATE 0.25 lbs/T
COPPER SULFATE 0.20 lbs/T (CuSO4*5H2O)
GUARTEC 0.50 lbs/T

DOWN TIME 0.0 Hours

COMMENTS: The run finished 18 hrs into the day.

I. A. Lipiec

15.00 -
30.00 11.00
45.00

LAKEFIELD RESEARCH

185 Concession Street
Postal Bag 4300
Lakefield, Ontario
K0L 2H0

Facsimile No. (705) 652-6365
Telephone No. (705) 652-3341

To: Mike Ross

Company: Timmins Nickel

From: Dave Evans

Fax No.: (705)264-2170

Date: 1990 11 28

Reference: LR#4075, Dome Mountain

This transmission consists of---6--- page(s) including this one.

Enclosed are the metallurgical results from Tests 5 and 6. Sorry for the delay but our XRF unit was down on Monday.

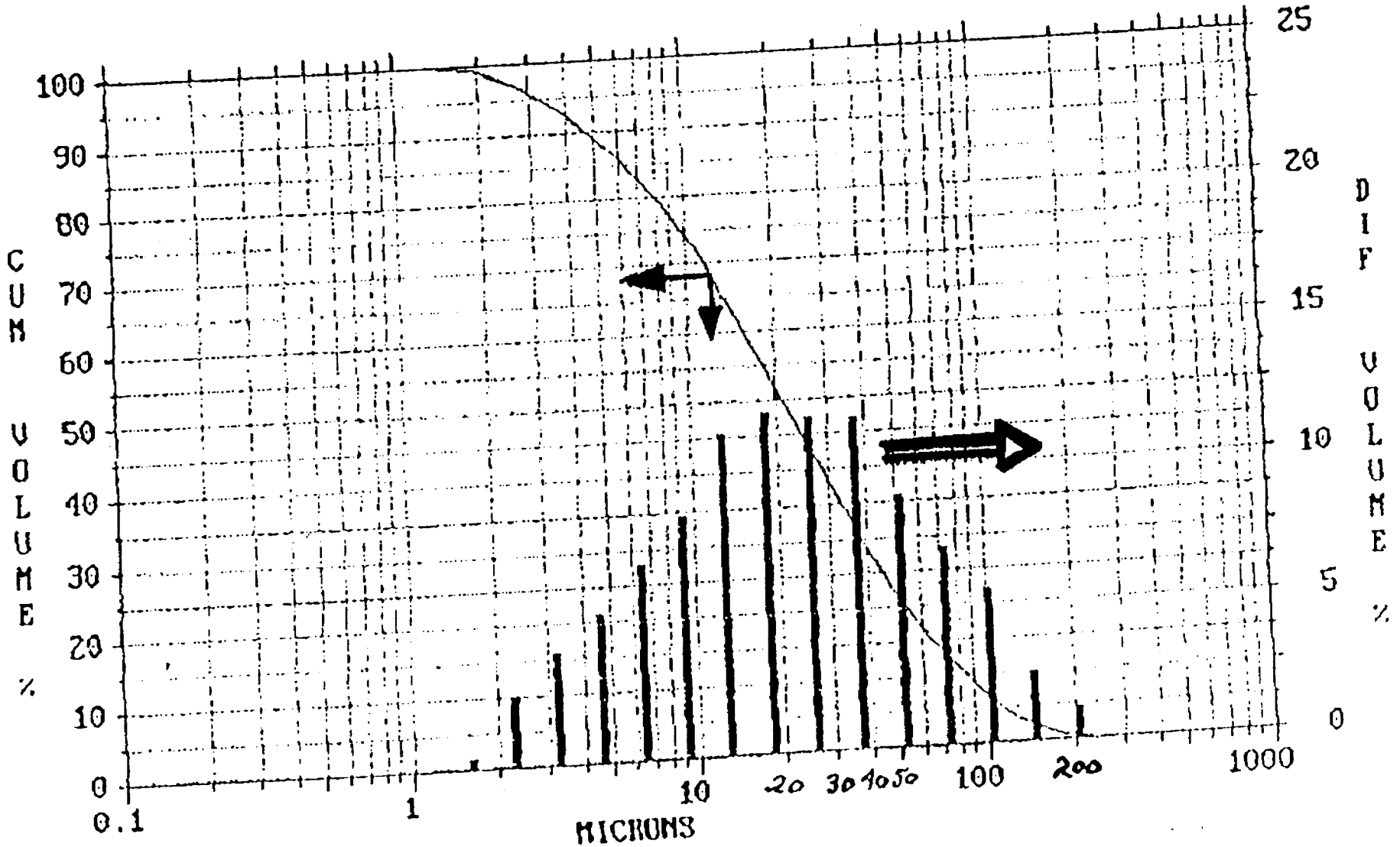
Also summarized is the preliminary results of the magnetic pre-concentration of Langmuir ore.

Product	Weight %	Assays, %		Distribution, %	
		Ni	S	Ni	S
Mags	25.5	-	7.00	-	77.6
Non-mags	74.5	-	0.69	-	22.4
Feed(calc)	100.0	-	2.30	-	100.0
Feed(assay)	-	1.33	2.19		

Nickel assays will be available tomorrow.

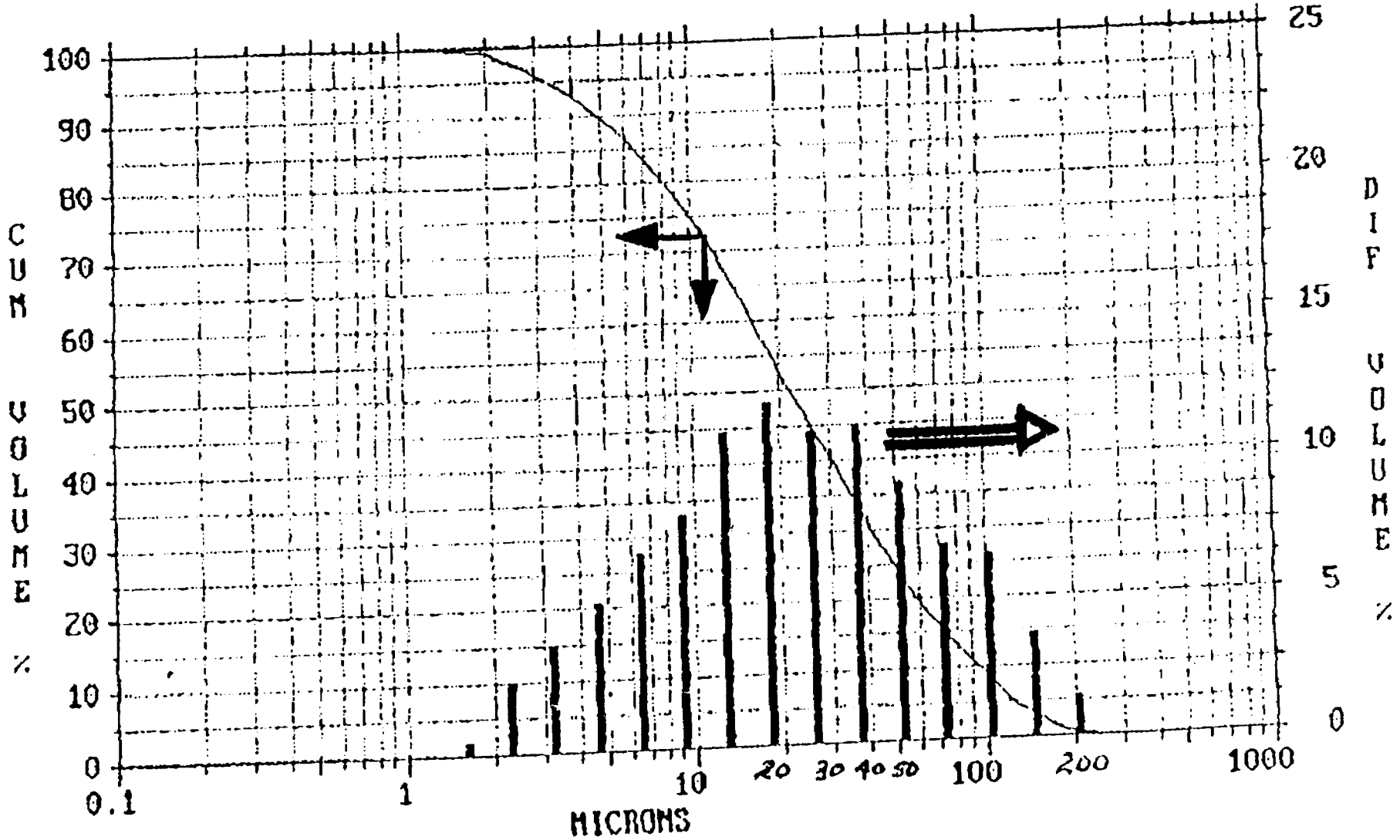
Sue Parker has been in contact with Tony Lipiec about the flotation conditions, etc.

CN 137675 (07-90-01)
MT-785
Record Number: 550



FROM SHERRITT GORDON - ANALYTICAL SERVICES 11.02.1990 10:12 NO.11 P. 3

CN 136743 (07-90-02)
MT-786
Record Number: 554



900

November 11, 1990

Mr. S. McIntyre
Timmins Nickel, Inc.
Suite 205, 155 University Avenue
Toronto, Ontario M5H 3B7

Dear Steve:

I have attached a report from Mark Benz, our Refinery Production Superintendent, regarding the two trial railcars of Langmuir concentrate. As advised previously, we are already experiencing severe problems due to the high Mg content of your regular production and cannot consider any action that might further disrupt an already serious situation.

I am therefore confirming our previous advise that we are rejecting the two railcars. I realize that this material is not necessarily representative of the concentrate that would be produced from Langmuir on a production basis. Hopefully after your current milling problems are resolved, a more suitable concentrate would be available.

We have contacted Inco and requested that they consider the purchase of this material.

Yours truly,

Brian

B.J. Shea
Manager, Metals Marketing
Metals Division
Sherritt Gordon Limited

sherritt

inter-office letter

date November 5, 1990

to B. J. Shea

from M. R. Benz

copies to

RMGarvey	Tor.
MDDay	#11
PAmarnath	#99
RSabourin	#57
GIngram-Johnson	#57
File: Timmins Nickel - Tech	

subject TIMMINS NICKEL - LANGMUIR CONCENTRATE

Please find attached the physical, chemical and moisture analyses of Lots 07-90-01, 02 (CN cars 137675 and 136743). Also attached are photographs of the material. The cars are currently still at Fort Saskatchewan and are not yet unloaded.

Unfortunately, we must reject these cars for the following reasons.

1. High Moisture Content. These cars are at 14.7 and 16.2% H_2O. The material in both cars has the consistency of gumbo (see attached photographs). Only one car could even be considered for feeding, and then only in a "teaspoon" fashion. Thus piloting these cars is out of the question. In the winter these cars would freeze and be impossible to unload and to sample representatively.

2. Fines Analysis. The medium particle size in these cars is only about 20 microns. In fact, only about 20% is plus 200 mesh. This probably contributes to the consistency of the material. Feeding this material with its high Mg content (almost 6%) will cause solid-liquid separation problems in our primary leach circuit. This would seriously risk the copper boil heat exchanger to scaling, causing complete production interruption as well as sliming of the copper sulphide. The copper sulphide could well become so wet as to cause severe problems in shipping this important by-product.

Note that the low nickel grade, high sulphur content and high Mg content make this a very marginal concentrate to treat, even without the above problems.

M R Benz

M. R. Benz
Production Superintendent,
Metals Refinery

MRB*bp
Attachment

LAKEFIELD RESEARCH

185 Concession Street
P.O. Bag 4300
Lakefield, Ontario
KOL 2HO

Facsimile No. 705-652-6365
Telephone No. (705) 652-3341

To: Tony Lipiec and Coos Schippers

Company: Timmins Nickel

From: Sue Parker

Fax No.: 705 268 0455 and 416 367 8965

Date: Nov 30, 1990

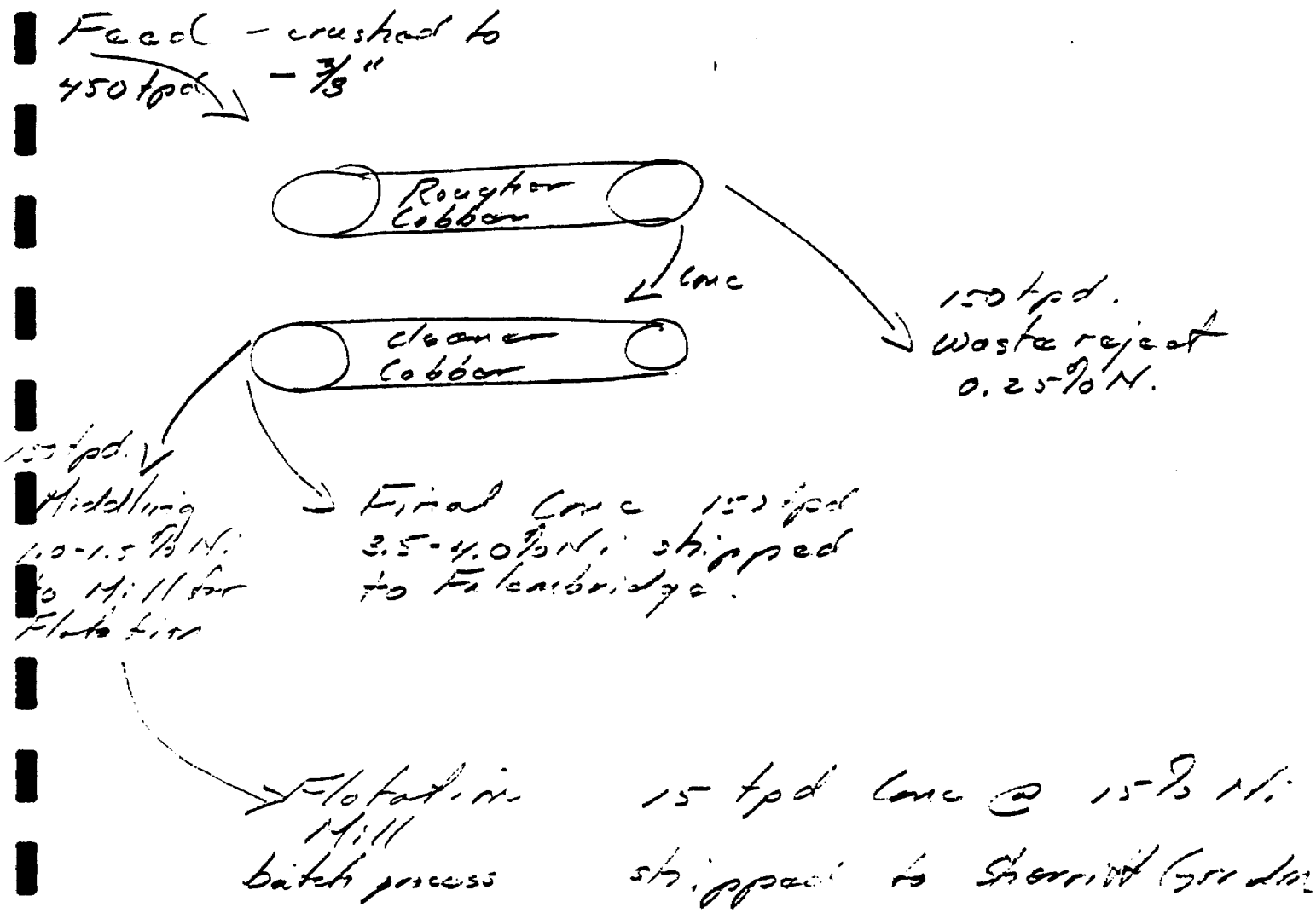
Reference: 4082

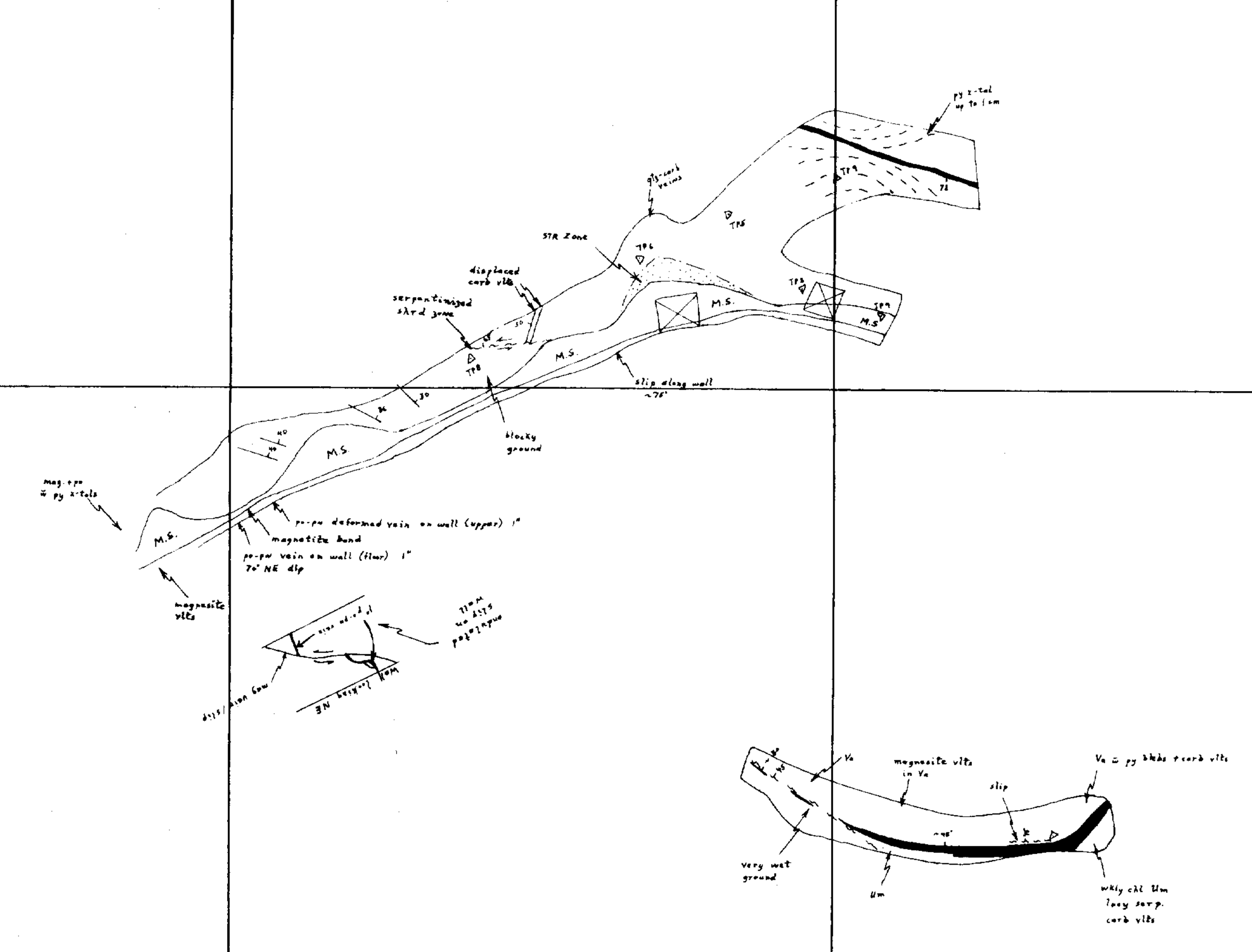
This transmission consists of 1 page including this one.

One 10 kilogram charge of minus 1 inch Langmuir Ore was crushed to minus 10 mesh and a head sample riffled out. The sample confirms the low head grade. The % Ni was 0.84. The orginal head analyses on the minus 1 inch material will be deducted from your account.

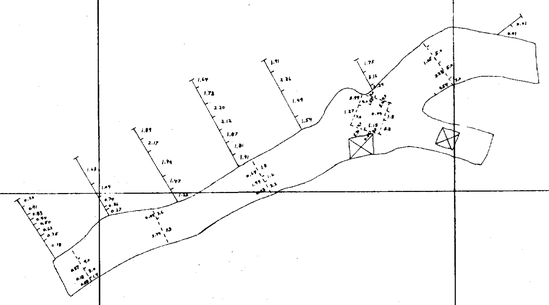
We will repeat the testwork with the new sample as soon as it arrives.

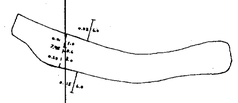
LANGMUIR ORE PROCESS CHART





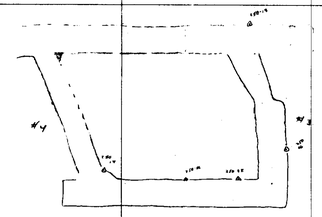
SAJ 1989





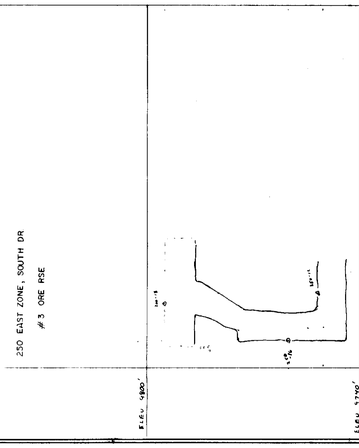
LANGMUIR ASSAY PLAN

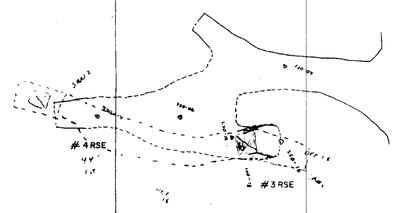
200 SUBLEVEL



200 EAST ZONE SUB DR

LONGITUDINAL
SECTION





200 EAST ZONE SUB DR
PLAN VIEW

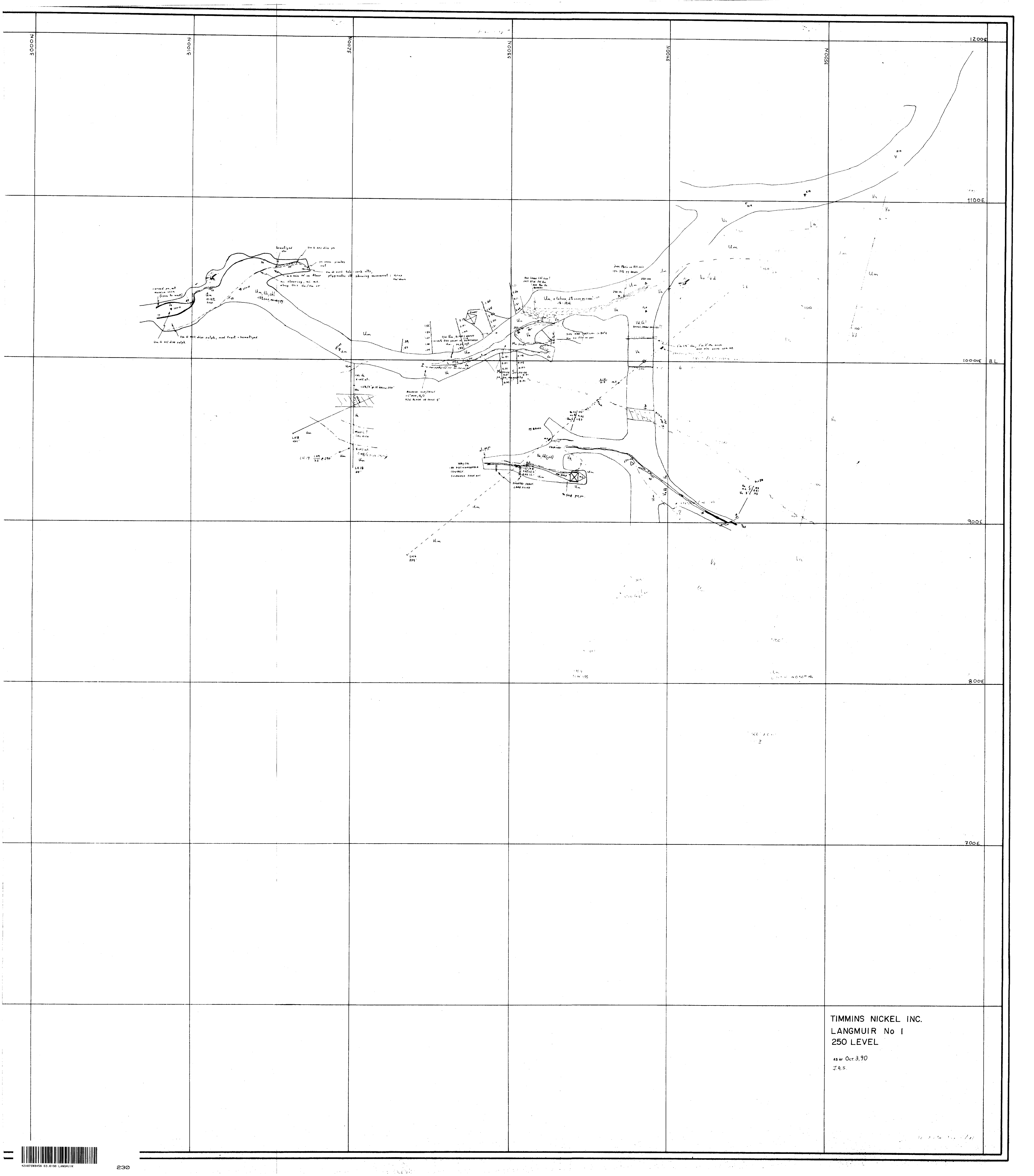
No	REVISION DESCRIPTION	DATE	BY	GEO	ENG	SUPT
3						
2						
1						

TIMMINS NICKEL - BHP UTAH

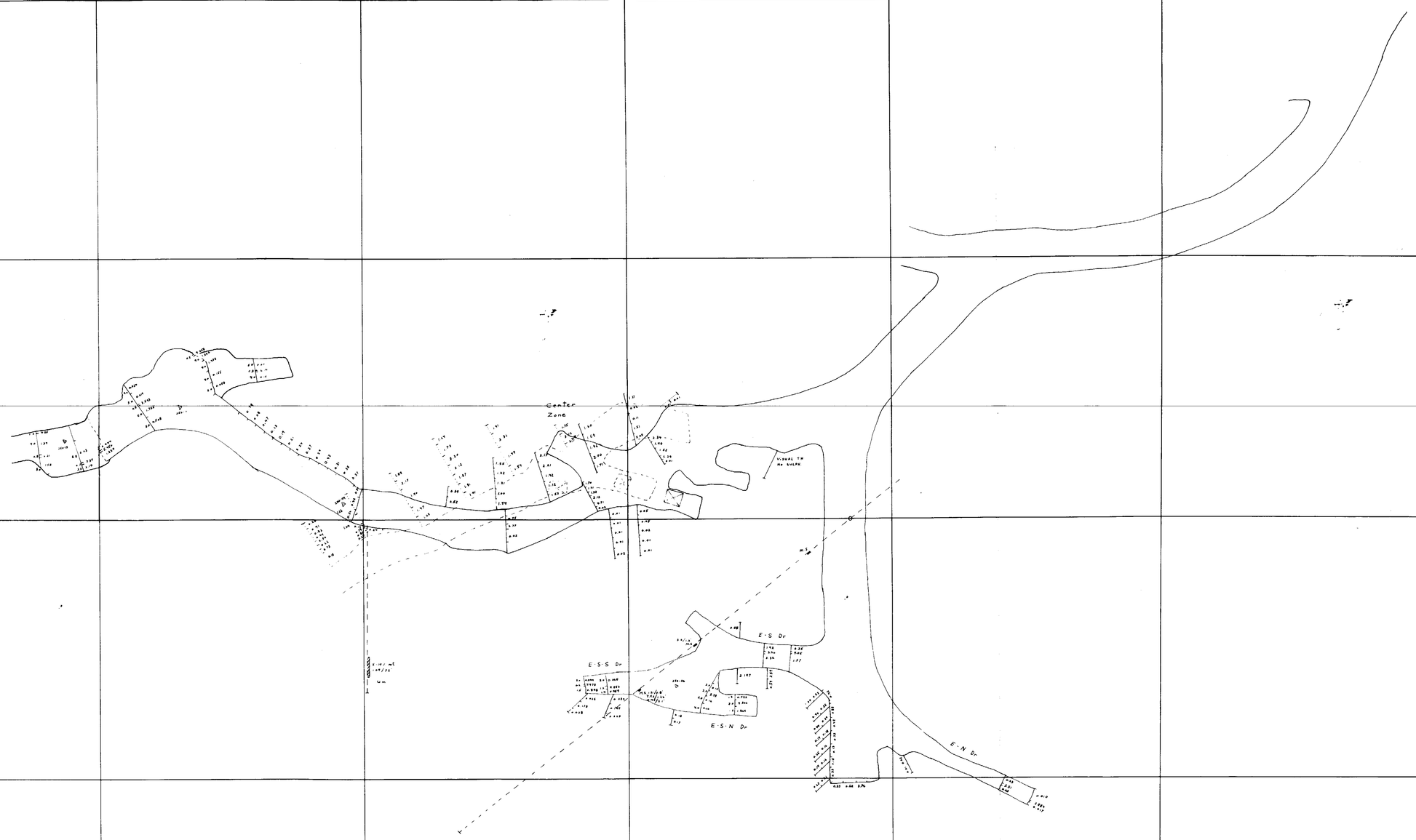
REDSTONE PROJECT

1 250 EAST ZONE SOUTH DR.
#3

DRAWN BY	DATE
CHECKED BY	SCALE
DRAWING No	REVISION



230



SAJ 1989

LANGMUIR
ASSAY PLAN
250 LEVEL

N325N N350N N375N N400N N425N N450N

9000 9250 9500 9750 10,000

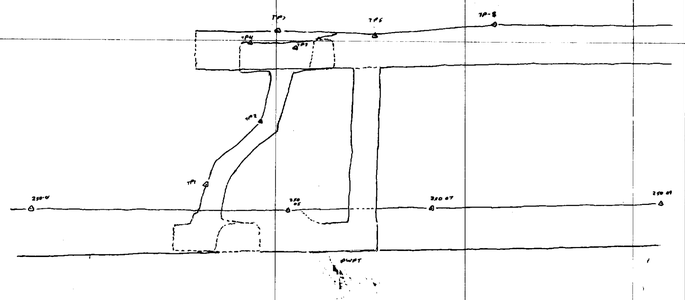
GARAGE
PORTAL
RAMP
COMPRESSOR BUILDING
FUEL TANK
TRAILER
SWITCH HOUSE
LUNCH ROOM
POND
VENTILATION RAISE
HEATER LOCATION
PROPOSED SITE FOR PROPANE TANKS
ROAD
CAP MAG
POWDER MAG
Δ01 Δ02 Δ03 Δ04 Δ05 Δ06 Δ07 Δ08 Δ09 Δ10

No	REVISION DESCRIPTION	DATE	BY	GEO	ENG	SUPT
3						
2						
1						

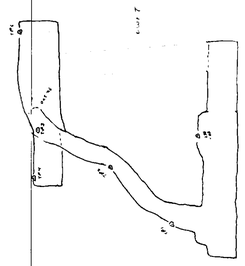
TIMMINS NICKEL

LANGMUIR # 1
SURFACE PLAN

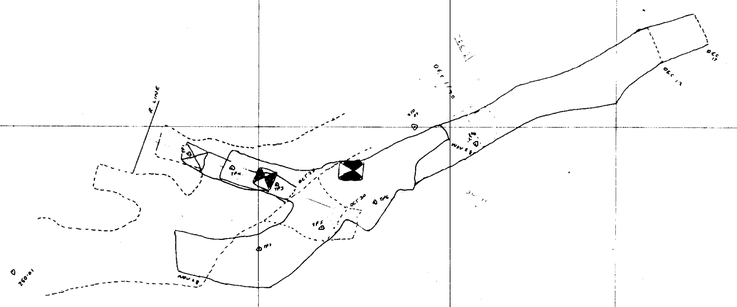
DRAWN BY	DATE
CHECKED BY	SCALE 1"=50'-0"
DRAWING No	REVISION



LONGITUDINAL SECTION
C - ZONE



ORE RAISE X-SECTION
LOOKING EAST
220 C w/ RAISE



200 C - ZONE SUB DR.
LANGMUIR
PLAN VIEW

TIMMINS NICKEL - BHP UTAH

REDSTONE PROJECT

LANGMUIR ORE RAISE

No	REVISION DESCRIPTION	DATE	BY	GEO	ENG	SUPT
3						
2						
1						

DRAWN BY	DATE
CHECKED BY	SCALE
DRAWING No	REVISION

42A0739A56 63.6198 LANGMUIR

260