REPORT ON A DIAMOND DRILL PROGRAM DONE ON THE WEST GROUP OF LENORA EXPLORATION LIMITED IN MCVITTIE TOWNSHIP, ONTARIO

Sudbury, Ontario

May 1, 1981

G.J. Hinse, P.Eng.

Project 1022 - NTS 32D4/203

G. J.

LIST OF CONTENTS

Attached to this report:

Drill logs of holes 80-1, 80-2A, 80-2B, 80-3, 80-4, 80-5, 80-6, 80-7, 80-8, 80-9, 80-10, and 80-11

Drill section of holes 80-1, 80-2A and 80-2B

Drill section of holes 80-3, 80-4, 80-5

Drill section of holes 80-6 and 80-7

Drill section of holes 80-8 and 80-9

Drill section of hole 80-10

Drill section of hole 80-11

In back pocket:

Compilation map of the Omega area properties of Lenora Exploration Limited at a scale of 1" = 400 feet.

REPORT ON A DIAMOND DRILL PROGRAM DONE ON THE WEST GROUP OF LENORA EXPLORATION LIMITED

INTRODUCTION

This report has been prepared at the request of Lenora Exploration Limited and it describes the results of a drill program done by that Company on their west group of claims located in McVittie township, Larder Lake Mining Area. The purpose of the program was to test an horizon of carbonate rock where surface work done lately by Lenora Exploration and previously by Grasset Lake Mines has indicated the presence of gold values.

The West group property consists of 7 unpatented and 1 patented mining claims located in the southwest quarter of McVittie township immediately north of the town of Larder Lake. The claims are registered under the following numbers: L 20399, L 411208, L 411209, L 341811, L 441494, L 419377, L 313769 and L 313770.

The claim group is adjacent and crossed by Highway 66, thus access is relatively easy.

GEOLOGY

All the rocks found on the property are Precambrian in age and consist of mafic to ultramafic volcanic rocks belonging to the Larder Lake group, interlayered and overlain by carbonate rock belonging to the Kerr group. These older rocks are in conformable contact with clastic sedimentary rocks belonging to the Barber Lake group. Furthermore, on the property, all the above rocks are in faulted contact with a suite of sedimentary rocks containing at the base an horizon of conglomerate rich in iron formation

clasts. The relationship of this unit to the older rocks is unknown.

All the rocks have been subjected to several periods of deformation with some of these accompanied by intrusive activities including hydrothermal alteration.

The property lies on the south limb of an overturned anticline with the axis lying close to the north boundary of the property. There are numerous faults on the property. Most of these faults control a pattern of block faulting found where the formations turn from east-west to north-south in the showing area. There are also a few strike faults and possibly some thrust faults. The overall structural pattern is complex and not yet fully understood.

In the current program of diamond drilling, only rocks belonging to the Larder Lake and Kerr groups were intersected. The carbonate rock of the Kerr group are found within ultramafic rock of the Larder Lake group. The carbonate rock consists of conglomerate at the base grading into carbonate-rich mudstone, then into rhythmic-layered chemical carbonate rock. In places, the conglomerate contains sections of mass-flow tuff with volcanic and mica-rich shards of the base. The carbonate rock are repetitive in the volcanic rock.

In the carbonate rock, gold is found associated to an end-cycle composed of chert, feldspar, pyrite and carbonate.

The carbonate rock are grey, green or buff subject to the type of mica which can either be muscovite, sericite or fuchsite. In places the carbonate rock also contains up to 40% very fine volcanic material which appears to be basaltic in composition. In such a case the carbonate rock is massive. Where it contains ultramafic material, it usually schisted and called a chlorite-carbonate schist.

DIAMOND DRILL PROGRAM

A total of 3,722 feet (1,134.5 meters) of BQ and NQ diamond drilling in 11 holes was done to test the gold-bearing carbonate rock in the showing area located on claims L 341811 and L 441494. All the holes were drilled from south to north to intersect the carbonate rock horizon to the ultramafic footwall.

The location of the holes is shown on the compilation map at 1" = 400 feet attached to this report. The map legend also explains the abbreviations used in the drill logs.

Holes 80-1, 80-2A and 80-2B were drilled on a section 50 feet west of hole 75-4 drilled by Grasset Lake Mines in 1975, and 100 feet west of holes 75-1, 75-2, 75-3 and 75-6 also drilled by Grasset Lake Mines. Hole 80-1 collared into carbonate rock which was intersected to a depth of 114 feet, followed by conglomerate to a depth of 142 feet and ultramafic. The hole was completed at a depth of 206 feet. Hole 80-2A was lost at a depth of 97.0 feet when the casing broke. Hole 80-2B, at the same location, was drilled at a steeper angle to attain a better penetration of the overburden. This hole collared into ultramafic at a depth of 117 feet. This was followed by carbonate rock from 240 to 346 feet where it intersected conglomerate to 367 feet followed by ultramafic. The hole was completed at a depth of 447 feet.

The best values intersected in hole 80-1 are 0.17 opt of gold along a core length of 4.2 feet at 69.1 feet and 0.13 opt of gold along a core length of 5.0 feet at 100.0 feet. In both cases, values are related to the pyrite and chert content of the carbonate host rock. Hole 80-2B returned low values.

Holes 80-3, 80-4 and 80-5 were drilled on a section 150 feet east of holes 80-1 and 80-2 or 50 feet east of holes 75-1, 75-2, 75-3 and 75-6. The main purpose of holes 80-3 and 80-4 was to follow up the values intersected

in a surface trench which returned 0.15 opt of gold along a surface width of 20.0 feet. Hole 80-3 collared into carbonate rock to a depth of 48.0 feet followed by conglomerate to a depth of 81.0 feet where the hole was stopped. Hole 80-4 collared into carbonate rock at 13.0 feet to a depth of 141.0 feet where it was ended. Hole 80-5 drilled 160 feet south of holes 80-3 and 80-4 collared into ultramafic to a depth of 121 feet, followed by carbonate rock to 220 feet, conglomerate to 275 feet and ended in ultramafic at 297 feet.

The best values intersected in hole 80-3 are 0.13 opt of gold along a core length of 11.0 feet at 22.0 or 0.08 opt of gold along a core length of 25.3 feet at 19.5 feet. Hole 80-4 returned 0.06 opt of gold along a core length of 5.0 feet at 118.5 feet while hole 80-5 returned 0.06 opt of gold along a core length of 1.2 feet at 197.0 feet.

Holes 80-6, 80-7 and 80-10 were drilled to test the carbonate horizon in the fold area where the strike changes from east-west to north-south. All the holes intersected narrow carbonate horizons varying in widths to a maximum of 65.0 feet, these interlayered with conglomerate and mass-flow tuff. The holes returned low values.

Holes 80-8 and 80-9 were drilled on a section 100 feet west of holes 80-1 and 80-2, to the west of a north-south striking cross fault. The upper hole, 80-8, intersected only part of the main carbonate horizon due to an unexpected displacement to the south of the west block. This hole was extended to the north and cored through a parallel carbonate horizon, some 100 feet to the north of the main carbonate. This carbonate horizon contains more chert and sulfide than the main carbonate. It is not exposed on surface in the vicinity of the main showing, but it is suggested that it can be correlated with the carbonate horizon exposed on surface some 500 feet to the west along the south side of a large outcrop. It is also suggested that this unit extends along strike to the west along the nose of the anitcline and was intersected in hole no. 4 drilled by Riocanex on the adjoining property to the north. Hole 80-8 collared into carbonate at 13.5 feet, then conglomerate at 18.0 feet and ultramafic at 35.0 feet to a

depth of 173.0 feet. It intersected the north carbonate horizon to a depth of 278.0 feet and was completed at 297.0 feet in ultramafic. Hole 80-9 collared in ultramafic at 102.0 feet. It intersected the main carbonate horizon to a depth of 256.0 and the north carbonate from 445.0 to 524.0 feet. It was completed in ultramafic at 597.0 feet.

The best values intersected in hole 80-8 were 0.03 opt of gold along a core length of 1.5 and 3.0 feet in the north carbonate while in hole 80-9, low values were intersected in the main carbonate horizon and 0.06 opt of gold was intersected along a core length of 4.0 feet in the north carbonate horizon.

Hole 80-11 was drilled in the vicinity of hole 75-5 done by Grasset Lake in 1975. This hole collared in ultramafic at 25.0 feet, then into carbonate to a depth of 141.0 feet, ultramafic to 316.5, carbonate to 429.0 and was completed in ultramafic at 438.0 feet.

The best values intersected were 0.31 opt of gold along a core length of 14.0 feet at 43.0 feet and 0.03 opt of gold along a core length of 4.0 feet and 5.0 feet at 378.0 feet and 397.0 feet. The first section at 43.0 feet includes 1.3 feet which contained 8 specks of visible gold and assayed 2.20 opt of gold.

CONCLUSIONS

Gold values intersected to-date are related to two distinct carbonate horizons found in ultramafic volcanic rock. Both carbonate horizons, the main and north, are composed of units consisting of a basal mudstone grading into a carbonate of increasing mica content and into a carbonate with up to 40% volcanic dust. In either the main or north carbonate horizons, the units are repetitive. Both carbonate horizons are overlying units of mainly basal conglomerate composed of carbonate, chert and jasper clasts.

Gold values are related to the pyrite and chert content of the host carbonate rock.

Results to-date show that the gold mineralization has a steep plunge to the west and is controlled by a pattern of block faulting.

Sudbury, Ontario
May 1, 1981

G.J. Hinse, P.Eng.

REGISTERED PROFESSIONAL ENGINEER
G. J. HINSE
PROVINCE OF ONTARIO

DIAMOND DRILL RECORD

Company..... Lenora Exploration Limited ..... Hole No..... 80-1 .....

Location..... McVittie Twp ..... Date Started..... Dec. 6, 1980 ..... Page No..... 1 .....

Level..... Surface ..... Date Finished..... Dec. 17 1980 ..... Core Size..... BQ .....

Bearing..... North ..... Logged..... G. Hinse ..... Test - Acid [X] Tropari [ ]

Inclination..... -45° ..... Core Saved [X] Discarded [ ]

			Strike	Dip
Total Depth..... 206.0' ..... Elevation..... 979	At	150'	.....	40°
	At	.....	.....	.....
Coordinates Collar - Lat..... 527W ..... Dep..... 562N	At	.....	.....	.....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 14.0	Casing				
14.0- 15.0	Basalt, possibly boulders				
15.0- 15.7	Acid porphyry, 70-80 F, 20-30% Q				
	low grey pink, 3-5% fine py.				
	Contacts with above and below				
	destroyed. Boulders?	11601	15.0- 15.7	.002	
15.7- 20.3	Bf cb sc, 60-90° to c.a., cherty,				
	3-5% f. py, 30-40% chert, 20%	11602	15.7- 17.6	.002	
	sericite	3	17.6- 20.3	.002	
	16.7-17.6 irregular Q-cb vein				
20.3- 54.0	Cb Sc, 10% sericite, 10-20% chert	4	20.3- 22.5	.002	
	in clast & gash vnlets, 30-40% gn	5	22.5- 25.0	NIL	
	chl, 1-3% py, wkly contorted, 80°	6	25.0- 27.5	NIL	
	to c.a.	7	27.5- 30.0	NIL	
		8	30.0- 32.5	NIL	
		9	32.5- 35.0	NIL	
		11610	35.0- 37.5	NIL	
		1	37.5- 40.0	NIL	
		2	40.0- 42.5	NIL	
		3	42.5- 45.0	NIL	
		4	45.0- 47.5	NIL	
		5	47.5- 50.0	NIL	
		6	50.0- 52.5	NIL	
		7	52.5- 54.0	NIL	
54.0- 84.0	Bf cb sc, 70° to c.a., 20-30% chert				
	in clasts, gash fractures, vnlets,				
	wkly cont'd. 1-3% py				
		11618	54.0- 56.5	NIL	
		9	56.5- 59.0	NIL	
		11620	59.0- 61.5	NIL	

DIAMOND DRILL RECORD

Hole No. 80-1

Page No. 2

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
		11621	61.5- 64.0	.005	
		11622	64.0- 66.5	.005	
		11623	66.5- 69.1	.01	
	Up to 10% py	11624	69.1- 70.8	.09	.17/4.2
		11625	70.8- 73.3	.22	
		11626	73.3- 75.8	.002	
	70.8-79.0 Bf, 50-60% ser.				
		11627	75.8- 79.0	.002	
	79.0 incr. in volc. mat.,				
	gradual change to bf-grey cb.	11628	79.0- 81.5	.003	
		11629	81.5- 84.0	N.I	
84.0- 85.9	Contorted Q-cb, chert clasts at	11630	84.0- 85.9	.005	
	85.9, 5-10% py in matrix				
85.9- 95.0	Md , up to 10% chert & Q, 70-80°				
	to c.a. Gradual change to Bf cb				
95.0-109.3	Bf cb, almost mass, 20-30% chert in	11631	95.0- 97.5	.005	check
	vnlets, patches, 1-3% f. py	11632	97.5-100.0	.08	.03
		11633	100.0-102.5	.12	.13/5.0
		11634	102.5- 105.0	.14	
		11635	105.0-107.5	.03	
		11640	107.5-109.3	.002	
109.3-112.3	Gn cb with up to 10% chert.	11641	109.3-112.3	.002	
112.3-113.8	Gn cb breccia, 60% Q & cb	11642	112.3-113.8	N.I	
113.8-114.5	Cgl, 20% chert clasts, 3/8" in ba	11643	113.8-116.9	N.I	
	matrix				
114.5-120.0	Gy cb, 10% chert, greater than 1%				
	py	11644	116.9-120.0	.002	
120.0-133.9	Cgl, 10% clasts, chert, iron				
	formation, chlorite, in an Um-Ba				
	matrix with 30-40% cb. Last 1',	117044		N.I	
	syenitized	117045	130.5 - 134.0	.002	
133.9-141.8	50% Q, minor cb, highly irreg,				
	related to 2 small sy dikes at				

138.0 and 139.5.

DIAMOND DRILL RECORD

Hole No. 80-1

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
		11645	133.9-138.0	Nil	
		11646	138.0-138.8	Nil	
		11647	138.8-141.8	Nil	
141.8-206.0	Um, mass, dk gy-gn, broken up,				
	sev muddy fractures. Contains few				
	well-rounded flat clasts of				
	lamprophyre up to 2". 45-90° c.a.				
	147.0-149.0, mud, fault				
	contains sev. lamprophyre dikes,				
	163.4-172.6; 196.0-199.0; 202.0-				
	206.0, 45-60° to c.a.				
206.0	End of hole		SLUDGES		
			17-27	.002	
	Drilled by Heath & Sherwood Drilling		27-37	.002	
	P.O. Box 998		37-47	.002	
	Kirkland Lake, Ontario		47-57	.002	
			57-67	.01	
	Core stored at Kenogami Lake, Ontario		67-77	.01	
			77-87	.002	
			87-97	.002	
			97-102	.09	
			97-107	Nil	
			107-117	.002	
			117-127	.04	
			127-137	.07	
			137-147	.08	
			147-157	.06	
			157-167	.03	
			167-177	.02	
			177-187	.01	
			187-197	.002	
			187-177	.02	
			197-206	.03	

DIAMOND DRILL RECORD

Company: Lenora Exploration Limited — Hole No: 80-2A

Location: McVittie Twp — Date Started: Dec. 18, 1980 — Page No: 1

Level: Surface — Date Finished: Dec. 23, 1980 1 — Core Size: BQ

Bearing: North — Logged: G. Hinse (signed) G. Hinse — Test - Acid [X] Tropari [ ]

Inclination: 55^{o} — Core Saved [X] Discarded [ ] — Strike — Dip

Total Depth: 97.0' — Elevation: 970 — At ....

At ....

Coordinates Collar - Lat: 626 W — Dep: 322 N — At ....

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 97.0	Casing				
97.0	End of hole				
	Hole abandoned, casing broke				
	Drilled by Heath & Sherwood Drilling				
	P.O. Box 998				
	Kirkland Lake, Ontario				
	Core stored at Kenogami Lake, Ontario				

DIAMOND DRILL RECORD

Company.....Lenora Exploration Limited.....Hole No....80-2B.....

Location....Larder Lake.....Date Started.....Page No.....1.....

Level.....Surface.....Date Finished..Jan. 11, 1981.....Core Size.....BQ.....

Bearing.....N.....Logged.....G. Hinse.....Test - Acid [X] Tropari [ ]

Inclination..60°.....Core Saved [X] Discarded [ ]

Total Depth..447.0'.....Elevation.....970..... At .150. Strike ..... Dip 58°

At .300. ....70.....

Coordinates Collar - Lat....626 N.....Dep.....522 W..... At ....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0-117.0	Casing				
	NQ Casing to 97.0				
117.0-240.2	Um, f. gr'd, dk gy-bk, fairly mass,				
	well lin'd 45° to c.a. Soft, talcy				
	Lamprophyre, 118.0-120.3;				
	134.5-136.5; 223.7-227.0; 227.8-235.0				
	Lost core 140.0-149.5				
	206.0-208.7 syenite, v.f. gr'd,				
	tr py, 30-70° to c.a.				
	208.7-220.0, 10-20% well-rounded				
	clasts of above, bondinage?				
240.2-287.0	Carbonate, ~~gy-gn~~, 20-30% ser., less				
	than 10% chert & Q, 20-30% gn chl,				
	3-5% py. Well lin'd 45° to c.a.				
	At 247.0 ser decreasing to less				
	than 10%				
		11648	240.2-241.5	.007	
		11649	241.5-247.0	.008	
	2" chert, Q, 20-25% py @ 251.0,	11650	250.9-252.9	N.I	
	20% Q-cb				
	30% wh Q-cb	11651	252.9-254.9	.102	
	50% wh Q, 10% chert, 10% sericite	11652	254.9-256.8	.002	
	60% wh Q-cb	11653	258.2-259.6	.002	
	70% wh Q-cb, 10% sericite	11654	262.0-264.1	N.I	
	277.0 gradual change to gy-bf cb,	11655	277.0-279.5	N.I	

DIAMOND DRILL RECORD

Hole No...80-2B.....

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
	up to 10% Q-ch-cb, 1-2% f. py	11656	279.5-284.5	.002	
		11657	284.5-287.0	.002	
287.0-321.8	Bf-gy cb, 10-30% chert-Q, 40-50%				
	ser., 10% py, changing to a more				
	Md cb at 291.0 with 1-2% py	11658	287.0-291.0	.002	
		11659	291.0-295.6	N.I	
		11660	295.6-299.3	N.I	
		11661	299.3-301.8	N.I	
		11662	301.8-304.3	N.I	
		11663	304.3-306.5	N.I	
		11664	306.5-309.0	N.I	
		11665	309.0-314.0	N.I	
		11666	314.0-317.0	N.I	
		11667	317.0-319.7	N.I	
		11668	319.7-321.8	N.I	
	320.0, gradual change to bf cb				
321.8-341.0	Bf cb, 70° to c.a., 60-80% ser,				
	1-2% py				
		11669	321.8-324.3	.002	
		11670	324.3-327.0	.002	
		11671	327.0-329.5	N.I	
		11672	329.5-332.0	.002	
	80% Q-cb, 1-2% aspy, 3-5% py	11673	332.0-333.7	N.I	
		11674	333.7-335.5	.002	
		11675	322.0-324.5	N.I	
		11676	324.5-328.0	.002	
	40% wh Q-cb, 2-3% py	11677	328.0-329.0	N.I	
		11678	329.0-332.4	.005	
	50% wh Q-cb	11679	332.4-333.5		
		11680	333.5-337.0		
	335.0 gradual change to				
	mudstone, then at 337.0, gy-bf				
	carb.				

DIAMOND DRILL RECORD

Hole No.....80-2B...

Page No.....3...

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
	Wedge at 342.7				
	New hole at 310.0				
	310.0 as in above hole				
	322.0 bf carb as at 321.8 in above				
	hole	11681	322.0-324.5		
		11682	324.5-327.7		
		11683	327.7-328.8		
		11684	328.8-332.4		
		11685	332.4-333.4		
		11686	333.4-335.2		
		11687	335.2-339.0		
		11688	339.0-340.0		
	340.0 gradual change to gy X'talline	11689	340.0-341.0		
	cb, then to gy-gn cb at 341.0				
341.0-346.0	Cb sc, 60° to c.a., 30-40% gn chl				
346.0-367.0	Cg, bf carb and chert clasts in a				
	carb matrix				
	360.0-363.0 gn mica shards, bf carb				
	and chert clasts				
	363.0 gradual change in matrix				
	from gy-gn cb to Um.				
	3-5% py, 3" pk acid clast with				
	10-20% py	11690	345.6-347.0	N/	
367.0-447.0	Um, cg?, several narrow lamprophyre				
	dike, schisted 60° c.a., soft,				
	talcy, in places contains				
	bondinage clasts as in hole 80-1,				
	probably carb migration along				
	schistosity planes				
	372.0 gouge, mud				
447.0	End of hole				

Drilled by Heath & Sherwood Drilling, P.O. Box 998, Kirkland Lake, Ontario

Core stored at Kenogami Lake, Ontario

DIAMOND DRILL RECORD

Hole No.....80-28....

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
			SLUDGES		
	Drilled by Heath & Sherwood Drilling		102-107	NIL	
	P.O. Box 998		107-117	NIL	
	Kirkland Lake, Ontario		117-127	NIL	
			127-137	NIL	
	Core stored at Kenogami Lake, Ontario		137-147	NIL	
			147-157	NIL	
			157-167	NIL	
			167-177	NIL	
			177-187	NIL	
			187-197	NIL	
			197-207	NIL	
			207-217	NIL	
			217-227	NIL	
			227-237	NIL	
			237-247	.002	
			247-257	NIL	
			257-267	NIL	
			267-277	NIL	
			277-287	.002	
			287-297	NIL	
			297-307	NIL	
			307-317	NIL	
			317-327	NIL	
	417-427 NIL				
	427-437 .002				
			347-357	NIL	
			357-367	.002	
			367-377	.002	
			377-387	.002	
			387-397	NIL	
			397-407	NIL	
			407-417	.002	

DIAMOND DRILL RECORD

Company..... Lenora Exploration Limited ..... Hole No..... 80-3

Location..... Larder Lake ..... Date Started..... Jan. 12, 1981 ..... Page No..... 1

Level..... Surface ..... Date Finished..... Jan. 16, 1981 ..... Core Size..... NQ

Bearing..... Grid North ..... Logged..... G. Hinge G. Hinge ..... Test - Acid ☐ Tropari ☐

Inclination..... -45° ..... Core Saved ☑ Discarded ☐ Strike Dip

Total Depth..... 81.0' ..... Elevation..... 997 ..... At ....

At ....

Coordinates Collar - Lat..... Dep..... At ....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 12.0	Casing				
12.0- 47.8	Gn-gy carb sc, 60° to c.a. Avge				
	10-20% wh Q, chert and cb, 3-5%				
	f. py. Locally up to 50-60% sericite				
		11690	12.0- 14.5	Nil	
		11691	14.5- 17.0	Nil	
		11692	17.0- 19.5	.002	
		11693	19.5- 22.0	.105	
		11694	22.0- 24.5	.18	0.13 / 11.0'
		11695	24.5- 27.0	.16	
		11696	27.0- 30.5	.08	
		11697	30.5- 33.0	.11	.08
	30% wh Q-cb	11698	33.0- 36.2	.03	25.3
		11699	36.2- 38.5	.05	
		11700	38.5- 42.0	.04	
		11701	42.0- 44.8	.05	
		11702	44.8- 47.8	.005	
	47.8 gradual change to mudstone	11703	47.8-49.5	.01	
	then at 52, into gy-gn carb				
	sc., top of cg				
47.8- 81.0	Cg, chert clasts in a gy-gn carb				
	matrix, at 62.0, chert clasts, gn				
	mica shards. At 67.0 matrix				
	grading into mostly Um with chert,				
	minor iron form. clasts, green chl				
	shards	No water return - No sludge			
81.0	End of hole	assay.			
	Drilled by Heath & Sherwood Drilling, P.O. Box 998, Kirkland Lake, Ontario				
	Core stored at Kenogami Lake, Ontario				

DIAMOND DRILL RECORD

Company..... Lenora Exploration Limited ..... Hole No.... 80-4 .....

Location..... Larder Lake ..... Date Started..... Jan. 17, 1981 ..... Page No..... 1 .....

Level..... Surface ..... Date Finished..... Jan. 19, 1981 ..... Core Size..... NQ .....

Bearing..... ..... Logged..... G. Hinse ..... Test - Acid ☐ Tropari ☐

Inclination..... 90° ..... Core Saved ☐ Discarded ☐ Strike Dip

Total Depth 141.0' ..... Elevation..... 997 ..... At ....

At ....

Coordinates Collar - Lat..... Dep..... At ....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 13.0	Casing				
13.0- 21.0	Bf cb, 10-30% ser, 10-20% chert &	7706	13.0- 15.5	N.I	
	cb, 3-10% v. f. py, 30° to c.a.	7	15.5- 17.0	N.I	
		8	17.0- 19.5	N.I	
		9	19.5- 21.0	.002	
21.0- 28.3	Cb, 10% ser, 30% gn chl, 10% chert,	7710	21.0- 24.0	N.I	
	1-3% v. f. py	1	24.0- 27.0	N.I	
	27.0-28.0 more than 50% volc.	2	27.0- 28.3	.002	
	shards and clasts of bf cb and chert				
28.3- 33.2	Bf cb, 20% ser, 30-50% chert & cb	7713	28.3- 30.3	.005	
	1-3%	4	30.3-33.2	N.I	
33.2- 37.0	Cb, 10-20% ser, 30-40% gn chl, 30-	5	33.2- 34.8	N.I	
	40% chert & cb, 1-3% py	6	34.8- 37.0	N.I	
37.0- 42.7	Bf cb, as above, 5-10% py	7717	37.0- 39.8	.01	
		8	39.8- 42.7	.03	
42.7- 44.0	Cb, 30-40% gn chl., 3-5% py	9	42.7- 44.0	.002	
44.0- 47.0	Lost core				
47.0-106.0	Bf cb, 30-40% ser, 30% chert & cb,	7720	47.0- 50.0	.002	
	3-5% py, 5-10% volc.	1	50.0- 53.0	.002	
		2	53.0- 55.5	N.I	
	From 57.0 on, 10-30% volc., 1-3% py	3	55.5- 58.0	N.I	
		4	58.0- 60.5	.002	
		5	60.5- 63.0	N.I	
		6	63.0- 65.5	N.I	
		7	65.5- 68.0	N.I	
		8	68.0- 70.5	N.I	
		9	70.5- 73.0	N.I	
		7730	73.0- 75.5	N.I	
		1	75.5- 78.0	.002	
		2	78.0- 80.5	.002	

DIAMOND DRILL RECORD

Hole No. 80-4

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
		7733	80.5- 83.0	.005	
		4	83.0- 84.8	N.I	
	Md, 30-50% cb, 30° to c.a.	5	84.8- 85.2	.002	
	Bf, 3-5% py	6	85.2- 88.0	.04	
	" "	7	88.0- 90.5	.01	
		8	90.5- 93.0	.03	
		9	93.0- 95.5	.02	
	95.5 gy bf cb, granular, less than	7740	95.5- 98.0	.002	
	1% py	1	98.0-100.5	.002	
	Mud slip at 87.0	2	100.5-103.0	.002	
106.0-129.3	Bf cb, 30-50% ser, 20-50% chert, 1-	3	103.0-106.0	.002	
	3% py	4	106.0-108.5	N.I	
		5	108.5-111.0	.03	
		6	111.0-113.5	.02	
		7	113.5-116.0	.005	
		8	116.0-118.5	.02	
		9	118.5-121.0	.04	.06/5.0
		7750	121.0-123.5	.07	
	Mud slip at 123.0	1	123.5-126.0	.02	
		2	126.0-120.3	.002	
129.3-135.0	Md, 70° cb, tr of py				
135.0-141.0	Gn cb, less than 10% chert, less	7753	135.0-138.0	N.I	
	than 1% py	4	138.0-141.0	.002	
141.0	End of hole				
			SLUDGES		
	Drilled by Heath & Sherwood Drilling		17- 27	.05	
	P.O. Box 998		27- 37	.02	
	Kirkland Lake, Ontario		37- 47	.01	
			47- 57	.002	
	Core stored at Kenogami Lake, Ontario		57- 67	.002	
			67- 77	.002	
			77 87	.02	
			87- 97	.02	

DIAMOND DRILL RECORD

Hole No. 80-4

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
			97-107	.005	
			107-117	.03	
			117-137	.05	
			137-150	.005	

DIAMOND DRILL RECORD

Company.....Lenora Exploration Limited.....Hole No.....80-5.....

Location.....Larder Lake.....Date Started.....Jan. 19, 1981..Page No.....1.....

Level.....Surface.....Date Finished.....Jan. 21, 1981..Core Size.....NQ.....

Bearing.....N.....Logged.....G. Hinse.....Test - Acid ☐ Tropari ☐

Inclination..-50°.....Core Saved [X] Discarded ☐

		Strike	Dip
Total Depth..297.0'.....Elevation.....970.....	At 150'	.....	-49°
	At 297'	.....	-41°
Coordinates Collar - Lat....427N.....Dep....413N.....	At	.....	.....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 48.0	Casing				
48.0- 70.3	Lamprophyre, lower ct 70° to c.a.,				
	3-10% py locally				
70-3-107.4	Um, gy-bk, talcy, soft, weakly sh'd,				
	60° to c.a. Contains some narrow				
	lamp. dikes				
107.4-109.6	Feldspar-porphyry, f. gr'd, 60-70%				
	pk and wh F, 10-20% mica, 1% f. py				
109.6-121.0	Um, as above				
121.0-132.0	Cb, gradual change to bf cb at				
	132.0 with decrease in volc. and				
	increase in ser.				
132.0-176.8	Bf cb, 40-50% ser, 20-40% chert	7755	131.7-134.7	N.I	
	& cb, 3-5% py	6	134.7-137.0	.002	
		7	137.0-139.0	N.I	
		8	139.0-141.5	N.I	
		9 7760	144.0-146.0	.002 N.I	
		1	146.0-148.1	N.I	
		2	148.1-150.1	N.I	
		3	150.1-152.2	N.I	
		4	152.2-155.0	N.I	
	Cherty, 10% py	5	155.0-155.8	.002	
		6	155.8-159.5	.002	
		7	159.5-162.0	.002	
		8	162.0-167.0	.002	
		9	167.0-172.0	N.I	
		7770	172.0-176.8	.005	
176.8-180.5	Cb, 40-50% gn chl, few clasts &				
	shards towards 180.5				

DIAMOND DRILL RECORD

Hole No. 80-5

Page No. 2

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
180-5-213.0	Bf cb, 30-40% ser, 3-5% py	7771	180.5-185.2	.002	
		2	185.2-188.6	.002	
		3	188.6-191.7	.002	
		4	191.7-193.6	.002	
		5	193.6-197.0	.01	
	5-10% py	6	197.0-198.2	.06	
	Mud seam at 195.0				
		7	198.2-203.0	.01	
213.0-219.5	Md, 40-50% cb, 10% ser., granular,				
	lineated 60° to c.a., tr py				
219.5-254.0	Cg., stretched clasts of gy cb,				
	chert in a gn cb matrix				
	At 242 matrix changing gradually				
	to Ba at 252				
254.0-275.0	Contact zone, destroyed and				
	disturbed by syenitization accom.				
	by Q veining and several dikes				
275.0-297.0	Um				
	277 few mud slips				
297.0	End of hole				
			SLUDGES		
	Drilled by Heath & Sherwood Drilling		48- 57	.002	
	P.O. Box 998		57- 67	NIL	
	Kirkland Lake, Ontario		67- 77	NIL	
			77- 87	NIL	
	Core stored at Kenogame Lake, Ontario		87- 97	NIL	
			97-107	.002	
			107-117	NIL	
			117-127	.002	
			127-137	.002	
			137-147	.002	
			147-157	NIL	
			157-167	.002	

DIAMOND DRILL RECORD

Hole No. 80-5

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
			167-177	.002	
			177-187	NIL	
			187-197	.002	
			197-207	.02	
			207-217	.01	
			217-227	.01	
			227-237	.002	
			237-247	.002	
			247-257	.002	
			257-267	.002	
			267-277	.01	
			277-287	.005	

DIAMOND DRILL RECORD

Company.....Lenora Exploration Limited.....Hole No....80-6.....

Location.....Larder Lake.....Date Started....Jan. 21, 1981....Page No.....1.....

Level.....Surface.....Date Finished...Jan. 25, 1981....Core Size...NQ.....

Bearing.....N47°E.....Logged.....G. Hinse.....Test - Acid [X] Tropari [ ]

Inclination...-45°.....Core Saved [X] Discarded [ ]

		Strike	Dip
Total Depth...286.0'.....Elevation.....968.....	At ..150'	.....	-41°
	At	.....	.....
Coordinates Collar - Lat.....250W.....Dep.....360N.....	At	.....	.....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 20.0	Casing				
20.0- 25.8	Cb, muddy, 20% ser, up to 10% py	7778	20.0- 22.2	.002	
		9	22.2- 23.4	.002	
		7780	23.4- 25.8	N.I	
25.8- 57.5	Bf cb, 40% ser, 30-40% chert & cb,	1	25.8- 28.0	N.I	
	3-5% py, lin'd 60° to c.a.	2	28.0- 30.0	N.I	
		3	30.0- 32.2	N.I	
		4	32.2- 35.0	N.I	
		5	35.0- 37.0	N.I	
		6	37.0- 40.5	N.I	
		7	40.5- 43.9	N.I	
		8	43.9- 46.2	N.I	
		9	46.2- 49.4	N.I	
		7790	49.4- 51.6	N.I	
		1	51.6- 55.4	N.I	
		2	55.4- 57.5	N.I	
57.5- 58.0	Md, 70-80% cb, 10% ser				
58.0-116.0	Cg, mostly stretched chert and Q				
	clasts, minor cb clasts in a cb-				
	volc matrix, grading into a volc				
	matrix at 77. At 97 on, volc.				
	shards.				
	113.5 top towards collar, base of				
	above unit.				
116.0-144.0	Mass Flow tuff, 30% cb, 30% volc,				
	20-30% chert. Good tops, all				
	towards collar				
144.0-164.0	Bf cb, 30-40% ser, 30-40% chert &				
	cb, 1-2% py				

DIAMOND DRILL RECORD

Hole No....80-6.....

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
		7793	144.0-146.5	N.I	
		4	146.5-148.5	N.I	
	3" cb tf @ 148.5				
		5	148.5-151.1	N.I	
		6	151.1-153.0	N.I	
	6" cb tf @ 153.0				
		7	153.0-155.0	.002	
		8	155.0-158.0	.002	
	158.0 base				
	30-50% chert, 3-5% py	9	158.0-159.3	.002	
	Shards & clasts	7800	159.3-160.6	.002	
	10-20% py, 30-50% chert & Q	1	160.6-162.5	.002	
	70% chert, 1-2% f. py	2	162.5-164.00	N.I	
	162.7 3" shards				
164.0-195.0	Cg., shards and clasts in a Ba				
	matrix				
	182.0 muddy matrix with grey cb				
	clasts, 10% ser.				
195.0-247.0	Sections of bf cb M-F Tf with cherty				
	tops, shards at base. At 211 top				
	facing downhole?				
	60% Q, chert & cb, 1% py	7803	206.0-209.3	.002	
	30% Q, chert & cb, 1% py	4	212.2-214.5	N.I	
	20% Q, chert & cb, 1% py	• 5	215.5-217.0	.01	
	1% py	6	226.2-228.1	.002	
	40% chert, 20% py	7	228.1-229.3	N.I	
	229.3 bf cb grading to a muddy				
	matrix at 242.0 with shards of				
	volc., grading into an Um at 247				
247.0-286.0	Um, sev. short Qmp. and locally				
	syenitized, possibly a tuff,				
	last 3', cgl with a Ba matrix				

DIAMOND DRILL RECORD

Hole No. 80-6

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
286.0	End of hole				
	Drilled by Heath & Sherwood Drilling		SLUDGES		
	P.O. Box 998		18- 27	NIL	
	Kirkland Lake, Ontario		27- 37	NIL	
			37- 47	NIL	
	Core stored at Kenogami Lake, Ontario		47- 57	.002	
			57- 67	.002	
			67- 77	NIL	
			77- 87	.002	
			87- 97	.002	
			97-107	nil	
			107-117	NIL	
			117-127	NIL	
			127-137	NIL	
			137-147	NIL	
			147-157	NIL	
			157-167	NIL	
			167-177	NIL	
			177-187	NIL	
			187-197	.002	
			197-207	.01	
			207-217	.01	
			227-237	.002	
			227-237	.005	
			237-247	.002	
			247-257	.002	
			257-267	.002	
			267-277	.005	
			277-287	.002	
			277-287	.005	

DIAMOND DRILL RECORD

Company.... Lenora Exploration Limited .... Hole No.... 80-7

Location.... Larder Lake .... Date Started.... Jan. 25, 1981 .... Page No.... 1

Level.... Surface .... Date Finished.... Feb. 5, 1981 .... Core Size.... NQ

Bearing.... N47°E .... Logged.... G. Hinse .... Test - Acid [X] Tropari [ ]

Inclination.... -55° .... Core Saved [X] Discarded [ ]

		Strike	Dip
Total Depth.... 418.0 .... Elevation....	At 150	....	-43
	At 300	....	-41
Coordinates Collar - Lat.... 390W .... Dep.... 305N	At	....	....
	At	....	....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0-106.0	Casing				
106.0-176.0	Um, Black, soft, talcy				
	127.0-135.0 broken up, 2" mud at				
	132.0				
	122.5-124.0 acid dikes, 5-7% py				
	Contains sev. short acid dikes and				
	the odd clasts of lamp.				
	Brick-red syenite, 10% py Q	7843	172.0-173.0	.002	
		4	173.0-176.0	.005	
176.0-183.0	Cgl, 30% stretched cb clasts in Ba				
	matrix				
183.0-201.0	Cb, 30-40% volc. material				
201.0-267.0	Cgl, odd clasts of chert, carb in a				
	matrix with 50% volc. material				
	233.0-267.0 50% clasts of chert &				
	carb.				
267.0-296.0	Carb, 40% volc. material				
296.0-311.0	Bf cb, 40% ser, 10% chert, tr py				
		7845	296.0-300.0	N.I	
		6	300.0-305.0	N.I	
		7	305.0-311.0	N.I	
311.0-312.0	Md, 10% cb, 30% cb clasts	8	311.0-312.0	.002	
312.0-317.0	Bf cb, 40-50% ser, 10% chert	9	312.0-317.0	N.I	
317.0-322.0	Md, 10% cb, 30% cb clasts				
322.0-331.0	Wk gy-gncb, 10-20% Q				
331.0-332.5	Md, 20-30% pea size clasts				
332.5-342.5	Cgl, 30-40% chert, carb clasts				
	and Ba shards in a cb matrix				
342.5-353.0	Cb, buff, 30% sericite, 10% chert				
	60% cherty, white Q-cb	7850	347.5-349.5	.002	

DIAMOND DRILL RECORD

Hole No. 80-7

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
353.0-359.5	Md, 60-70% cb, short sect. of Bf				
	cb towards 359.5				
359.5-363.5	Bf cb, 50-60% ser, 10% chert	7851	359.5-361.5	.002	
	Md	2	361.5-362.5	.002	
	50% wh Q	3	362.5-363.5	N.I	
363.5-368.0	Cb, 20-30% volc. material				
368.0-398.0	Cgl, 10-20% cherty, cb clasts in				
	cb matrix. At 382.0 matrix changing				
	to gn chl with few acid clasts.				
	Odd shards of gn chl and mica at				
	377.0				
396.0-401.5	Brick-red syenite, 45° to c.a.				
		7854	396.0-398.5	N.I	
		5	398.5-401.5	N.I	
401.5-403.0	Ba, cut by sev. dikes.				
403.0-405.5	Sye, med, red, 20% irreg. Q, 1%				
	f. py				
		7856	403.0-404.0	.002	
		7	404.0-405.5	.005	
405.5-418.0	Um, cut by sev. short dikes of				
	syenite				
	Sy, 20% Q, 1-2% py	7858	409.0-410.3	.002	
418.0	End of hole				

DIAMOND DRILL RECORD

Hole No. 80-7

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
			SLUDGE		
			103-117	N.I	
			117-127	N.I	
			127-137	N.I	
			137-147	N.I	
			147-157	N.I	
			157-167	N.I	
			167-177	.002	
			177-187	N.I	
			187-197	N.I	
			197-207	N.I	
			207-217	.005	
			217-227	N.I	
			227-237	N.I	
			281-297	.002	
			237-247	N.I	
			243-257	N.I	
			243-253		
			257-267	N.I	
			267-276	.002	
			276-286	N.I	
			286-296	N.I	
			296-297	N.I	
			296-307		
			297-307	N.I	
			317-327	N.I	
			333-346	.005	
			346-356	.002	
			356-367	.002	
			367-377	N.I	
			387-397	.002	
			397-407	.01	
			407-417	.02	

DIAMOND DRILL RECORD

Company: Lenora Exploration Limited — Hole No: 80-8
Location: Larder Lake — Date Started: Feb. 6, 1981 — Page No: 1
Level: Surface — Date Finished: Feb. 8 1981 — Core Size: NQ
Bearing: N — Logged: G. Hurst — Test - Acid [X] Tropari [ ]
Inclination: -45° — Core Saved [X] Discarded [ ]

	Strike	Dip
Total Depth 297.0 — Elevation — At 150'	.....	-41°
	At	.....	.....
Coordinates Collar - Lat. 600W — Dep. 660N	At	.....	.....

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 13.5	Casing				
13.5- 15.5	Bf cb, 20-30% chert, 1-3% aspy	7829	13.5- 15.5	.005	
15.5- 18.0	Md, 70-80% cb				
18.0- 35.0	Cgl, 30% bf cb & chert clasts in gn				
	cb matrix				
35.0- 47.5	Contact zone, gy cb with incr. volc.				
	material down hole				
47.5-173.0	Um, dk gy-bk, soft talcy,				
	tuffaceous to 57.0, then contains				
	odd clast of lamp.			-	
	49.0-52.0 ba tf				
	150.0-169.0 contorted Um, 20-30%				
	wh cb, tuff?				
	169.0-173.0 increased in cb content				
	40-50% volc. material				
173.0-177.5	Bf cb, 10% chert, 1-3% py				
177.5-218.5	Gn cb, muddy matrix, cgl? few				
	clasts of gn & bf cb.				
	5% py	7830	188.0-191.5	.005	
	7% py	1	191.0-192.5	.03	
218.5-220.0	Md, 60% cb				
220.0-223.5	M. F. Tf, gn mica shards, 4-5% py	2	220.0-223.5	.01	
223.5-230.5	Bf cb, 40% ser, 10% chert				
230.5-237.0	Chert, 20-30% gy cb, 1% py	7833	230.5-234.0	.01	
		4	234.0-237.0	.03	
237.0-278.0	Gn cb, 10-20% Q-cb				
	30% Q	5	249.0-252.0	N.I	
	10% Q	6	252.0-254.0	.002	
	60% Q	7	254.0-256.5	.002	
	10% Q	8	256.5-258.5	N.I	

DIAMOND DRILL RECORD

Hole No. 80-8

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
	20% Q	9	258.5-263.0	.002	
	20% Q	7840	263.0-268.0	.005	
	20% Q	1	268.0-273.0	.002	
	30% Q	2	273.0-278.0	.002	
278.0-297.0	Um, 20-30% wh. cb, contorted				
297.0	End of hole				

DIAMOND DRILL RECORD

Hole No. 80-8

Page No. 3

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
			SLUDGE		
			14-27	.002	
			27-37	.002	
			37-47	.002	
			47-57	.002	
			57-67	Nil	
			67-77	.002	
			77-87	Nil	
			87-97	Nil	
			97-107	Nil	
			107-117	Nil	
			117-127	Nil	
			127-137	Nil	
			137-147	.002	
			147-157	Nil	
			157-167	.002	
			167-177	.005	
			177-187	.005	
			187-197	.01	
			197-207	.005	
			207-217	Nil	
			217-227	.04	
			227-237	.01	
			237-247	.02	
			247-257	.02	
			257-267	.01	
			267-277	.005	
			277-287	.002	
			287-297	Nil	

DIAMOND DRILL RECORD

Company.....Lenora Exploration Limited.....Hole No.....80-9.....

Location.....Larder Lake.....Date Started.....Feb. 9, 1981....Page No.....1.....

Level.....Surface.....Date Finished....Feb.15, 1981....Core Size.....NQ.....

Bearing.....N.....Logged.....G. Hunt.....Test - Acid [X] Tropari [ ]

Inclination..-57°.....Core Saved [X] Discarded [ ]

		Strike	Dip
Total Depth..597.0'.....Elevation.....	At 150'	.....	-53
	At 300'	.....	-48
Coordinates Collar - Lat....692W.....Dep.....437N.....	At 450'	.....	-46
	597'		-46

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0-102.0	Casing				
102.0-148.8	Um. dark gy-bk. soft, talcy, massive				
	105.0-108.5 Lamp. with up to 10%				
	py				
	129.0-132.0 Sev. irreg porph				
	146.5-148.8 50% proph, up to 10% py				
	in best devel. sections	7809	146.5-147.8	.002	
148.8-207.4	Cb, up to 40-50% volc. mat., 10-20%				
	chert, tr. of py. Well lin'd				
	60-70% to c.a. Locally, wkly buff,				
	up 20% ser.				
	Up to 20% irreg Q, 1-2% py	7810	187.5-192.0	.002	
	192.0 gradual change to a mass cb				
207.4-208.4	Cb, up to 40% chert, very irreg.,				
	some fuchsite	7811	207.4-208.4	Nil	
208-4-211.4	Bf cb, up to 40% ser.				
211.4-212.5	Md, 60% cb				
212.5-236.2	Bf cb, as at 208.4				
	Brecc'd, 70% Q-cb, tr of py	7812	221.4-223.0	.002	
	224.7-225.2 Md				
	1-3% of py	7813	225.2-227.0	.002	
	1-3% of py	7814	227.0-229.0	Nil	
	232.0-234.7 brecc'd, cb frag.				
	in bk chl matrix (10-20%)				
236.2-256.2	Cgl, bf cb & chert clasts, stretched				
	up to 2" long dimen. in a gn cb				
	matrix.				
	3-5% py	7815	246.2-247.7	.02	
	247.7-251.0 brecc'd, frag. of cb in				
	fuchsite, gn & bl chl matrix				

DIAMOND DRILL RECORD

Hole No. 80-9

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
	1-2% f. py	7816	225.6-257.3	.002	
257.0-277.0	Contact zone, ba tf, 60° to c.a.,				
	some alt'd sect'ns related to				
	narrow Q veining in Um tf, some				
	narrow cb-rich sect.				
277.0-425.0	Um, dark gy bk, soft, talcy, mass.				
	Contains 10-20% stretched clasts of				
	lamp., bondinage.				
	279.0-280.0 two ½" gouge seams				
	with a 2" Q vn				
	½" gouge at 285.0, 287.0, 304.0,				
	295.0, 316.0, 321.0, 5" at 373.0,				
	12" at 382.0, 6" at 383.0				
	Lamprophyre, 369.0-371.5;				
	383.5-388.0; 388.5-389.0; 390.0-				
	391.5; 399.0-421.0				
	423.0-424.0 acid dike, purple to				
	pink, v. f. gr'd, 1-3% py				
425.0-445.0	Contact 422.0-423.0, 10-20% Q-cb				
	veining, acid dike, as before				
	Tf, Um to Ba, 45° to c.a., contains				
	some lamp. material				
	436.0 on gradual dev. of carb. in				
	short sections				
	440.0 cb with volc. material				
445.0-455.5	Gy cb, well lin'd, 45-55° to c.a.				
	Acid dikes with up to 3-5% py,				
	3" at 450, 2" at 451				
455.5-457.0	Md, highly chert, 1-3% py	7817	455.5-457.0	.005	
457.0-473.0	Gy cb, 10-20% chert, 1-3% py	7818	457.0-462.0	.01	
		9	462.0-467.0	.005	
		7820	467.0-470.0	.01	
		1	470.0-473.0	.01	

DIAMOND DRILL RECORD

Hole No....80-9.....

Page No.....3.....

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
473.0-484.0	Chert with 20-30% f. py	7822	473.0-475.0	.06	
		3	475.0-477.0	.06	
	10-20% py	4	477.0-480.0	.03	
	1-2% py, 30% wh Q	5	480.0-481.5	.005	
	60% gy cb, 30% chert, 1-2 % py	6	481.5-484.0	.002	
484.0-488.8	Gy cb, 1-2% py	7	484.0-488.8	.005	
488.8-524.0	Gn cb, 10% chert, 1% py, sharp				
	contact with above				
	60% wh Q with 20% bk tourm.	8	511.0-512.0	N.I	
	512.0-513.0 cb dike? cb with mica				
524.0-597.0	Gn cb grading gradually to an Um				
	at 532.0 with an increasing				
	amount of volc. material. 10-20%				
	Q-cb vnlets, very irreg. Few				
	specks of py				
597.0	End of hole.				

DIAMOND DRILL RECORD

Hole No. 80-9

Page No. 4

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
	437-447 .005		SLUDGE		
	447-457 .002		102-107	.002	
	457-467 .005		107-117	.002	
	467-477 .04		117-127	.002	
	477-487 .04		127-137	.002	
	487-497 .03		137-147	.002	
	497-507 .005		147-157	.01	
	507-517 .01		157-167	.005	
	517-527 .005		167-177	.005	
	527-537 .01		177-187	.002	
	537-547 .005		187-197	.002	
	547-557 .002		197-207	.002	
	557-567 .002		207-217	.01	
	567-577 .002		217-227	.005	
	577-587 .002		227-237	.002	
	587-597 .002		237-247	.01	
			247-257	.03	
			257-267	.005	
			267-277	.005	
			277-287	.005	
			287-297	.002	
			297-307	.002	
			307-317	.002	
			317-327	.002	
			327-337	.002	
			337-347	.002	
			347-357	.002	
			357-367	.002	
			367-377	.002	
			377-387	.002	
			387-397	.002	
			397-407	Nil	
			407-417	Nil	
			417-427	.005	
			427-437	.002	

DIAMOND DRILL RECORD

Company..... Lenora Exploration Limited ..... Hole No.... 80-10 .....

Location.... Larder Lake ..... Date Started.... Feb. 16, 1981 ... Page No .....

Level..... Surface ..... Date Finished... Feb. 24, 1981 ... Core Size .....

Bearing..... N45°E ..... Logged..... G. Hesk ..... Test - Acid ☐ Tropari ☐

Inclination.. 58° ..... Core Saved ☐ Discarded ☐

		Strike	Dip
Total Depth.. 417.0' ..... Elevation.....	At 150'.	.....	53°
	At 300'.	.....	52°
Coordinates Collar - Lat..... 125N ..... Dep..... 295W	At	.....	.....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 79.0	Casing				
79.0-185.0	Um, Sev. narrow lamp				
	139.0-147.0 lamp. dike				
185.0-197.0	Cg, chert, minor and clasts in a				
	md matrix?				
197.0-225.0	Cb, 30-40% volc. material, 45° to				
	c.a.				
225.0-291.0	Cg, as above				
291.0-293.0	Md				
293.0-329.5	Cg, 50-60% cb, chert, mass-flow				
	clasts in a Ba matrix				
329.5-342.0	Bf cb, 30-40% ser, 1-3% py	7892	329.5-335.5		
		3	335.5-342.0		
342.0-348.0	Cg, few cb & chert clasts in a bf				
	cb matrix				
348.0-361.0	Bf cb, 30% ser, 1-3% f py	7894	348.0-353.0		
		5	353.0-358.0		
		6	358.0-361.0		
361.0	Cg, few clasts of chert, carb and				
	shards in a bf cb matrix				
	394.0 5" mud				
417.0	End of hole				

DIAMOND DRILL RECORD

Hole No. 80-10

Page No. 2

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
			SLUDGE		
			84-107	.002	
			107-117	N.I	
			117-127	N.I	
			127-137	N.I	
			137-147	N.I	
			147-157	N.I	
			157-167	N.I	
			167-177	N.I	
			177-187	N.I	
			187-197	N.I	
			197-207	N.I	
			207-217	N.I	
			217-227	N.I	
			227-237	N.I	
			237-247	N.I	
			247-257	.002	
			117-127	.002	
			257-267	N.I	
			267-277	N.I	
			277-287	.002	
			287-297	.002	
			297-307	N.I	
			307-317	N.I	
			327-337	N.I	
			337-347	.002	
			347-357	N.I	
			367-377	N.I	
			377-387	N.I	
			387-397	N.I	
			407-417	N.I	

DIAMOND DRILL RECORD

Company: Lenora Exploration Limited — Hole No: 80-11
Location: Larder Lake — Date Started: Feb 25, 1981 — Page No: 1
Level: Surface — Date Finished: March 5, 1981 — Core Size: NQ
Bearing: N — Logged: G. Hinse — Test - Acid [X] Tropari [ ]
Inclination: 45° — Core Saved [X] Discarded [ ]

		Strike	Dip
Total Depth: 438.0' — Elevation	At 150'	.....	41°
	At 300'	.....	37°
Coordinates Collar - Lat. ..... Dep.	At 438'	.....	33°
	At	.....	.....

Pootage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
0.0- 25.0	Casing				
25.0- 31.0	Um, 20-30% chert & cb. Some bn				
	tourm? at 26.0 tr py				
31.0- 36.0	Cb, 30-40% volc. material, 10-20%				
	chert, 1-3% py, 70° to c.a.				
36.0- 73.3	Bf cb, 10-20% ser, 20-30% chert,				
	1-2% py	7863	36.0- 39.5	.105	
		4	39.5- 43.0	.002	
	43.0 20-30% chert & Q, some X-	5	43.0- 44.5	.10	
	cutting Q, 1-5% fine py	6	44.5- 49.7	.13	0.31 / 14.0
	20-30% Q & chert, 8 specks of V.G.	7	49.7- 51.0	2.20	
	30-40% ser, 20% chert, 1-2% py	8	51.0- 52.7	.13	
		9	52.7- 55.7	.04	
	10-15% wh Q	7870	55.7- 57.0	.14	
		1	57.0- 59.0	.04	
	20-30% wh Q	2	59.0- 62.0	.01	
	62.0-63.0 Md	3	62.0- 63.0	.002	
	40% ser, 10% chert, less than 1 %				
	py	4	63.0- 67.0	.005	
		5	67.0- 69.0	.05	
		6	69.0- 71.5	.02	
		7	71.5- 73.3	.002	
73.3- 82.8	Cb, 30-40% volc. mat.	8	73.3- 77.5	N.I	
		9	77.5 81.4	N.I	
	30% wh X-C Q, 1-2% py	7880	81.4- 82.8	N.I	
82.8- 96.7	Bf cb, 30-40% ser, less than 10%	1	82.8- 87.0	.002	
	chert, 1% py	2	87.0- 92.0	.005	
		3	92.0- 96.7	.002	
96.7-102.0	Md, grey, massive, some X-C wh Q				
102.0-123.0	Cg, few clasts of chert, jasper,				

DIAMOND DRILL RECORD

Hole No.....80-11....

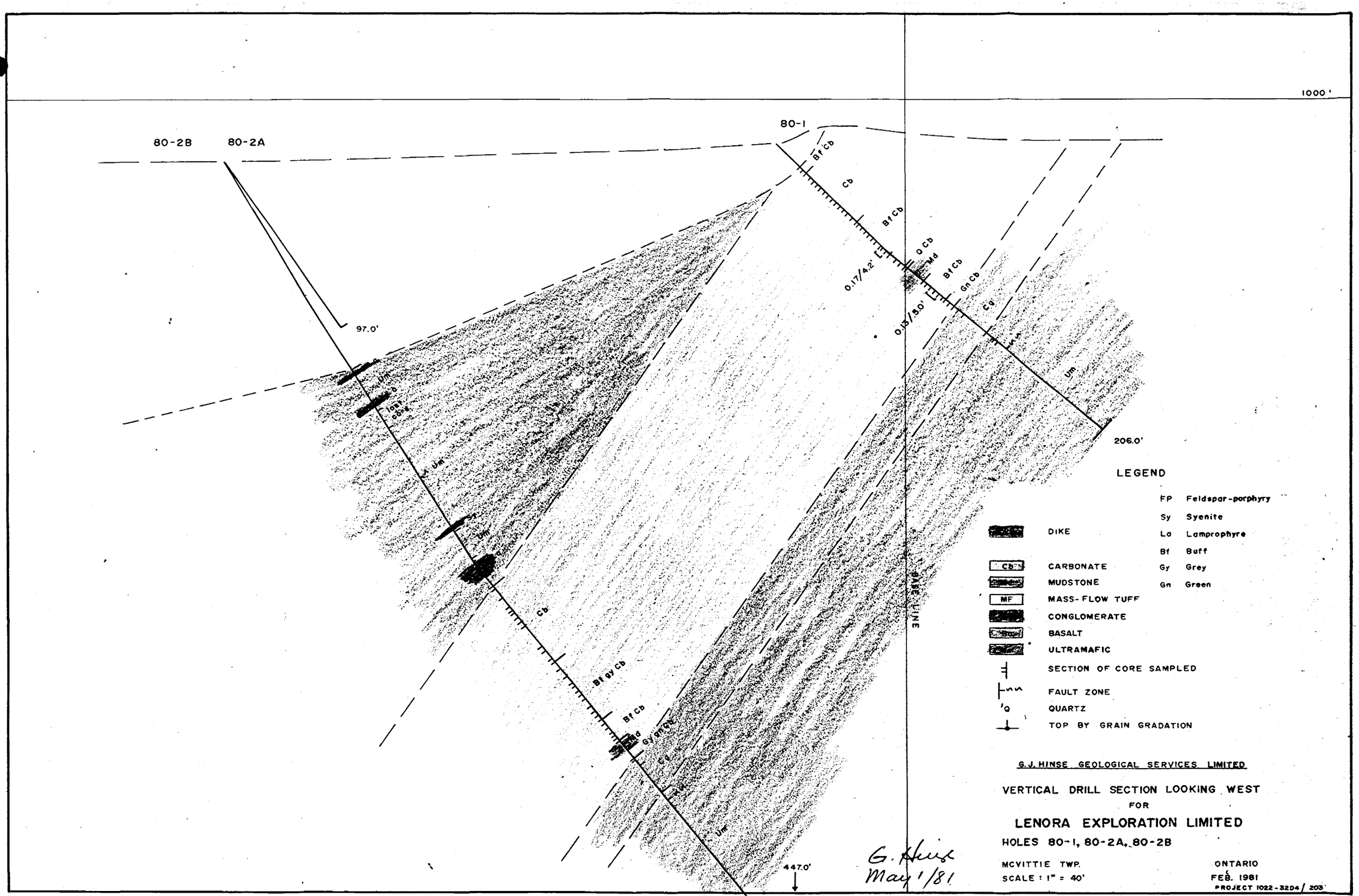
Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
	carb. in a green cb matrix. Shards				
	of volc. at 117.0				
123.0-141.0	Cg, few clasts of chert, jasper,				
	shards of volc. in a cb-volc. matrix				
141.0-177.0	Contact zone, sev. acid dikes in Um				
	some cb clasts				
	154.0-156.0 60% Q				
	163.0-172.0 up to 10% py with dikes				
	172.0-173.0 gouge seams				
177.0-304.0	Um, some clasts of lamp.				
304.0-307.0	Lamp.				
307.0-316.5	Um. 20-30% cb, monor bf-gy cb				
316.5-352.0	Gn cb, less than 10% quartz & chert.				
	This section could be a cgl. Few				
	small clasts of bf cb throughout				
352.0-364.5	Cgl, few clasts, mainly gn mica				
	shards.				
		7884	354.0-356.8	.01	
		5	359.5-362.0	.02	
364.5-384.0	Md, poor, some cb, getting cherty				
	towards 382.0				
	3% py	6	378.0-382.0	.03	
	3% py	7	382.0-384.0	.01	
384.0-388.0	Gn cb, 10-20% wh Q	8	384.0-388.0	N.V	
388.0-397.0	Bf-gy cb				
397.0-429.0	Gn cb, 20-30% wh Q	9	397.0-402.0	.03	
		7890	402.0-407.0	.01	
	20% wh Q & chert	1	414.0-419.0	N.V	
429.0-438.0	Um				
438.0	End of hole				

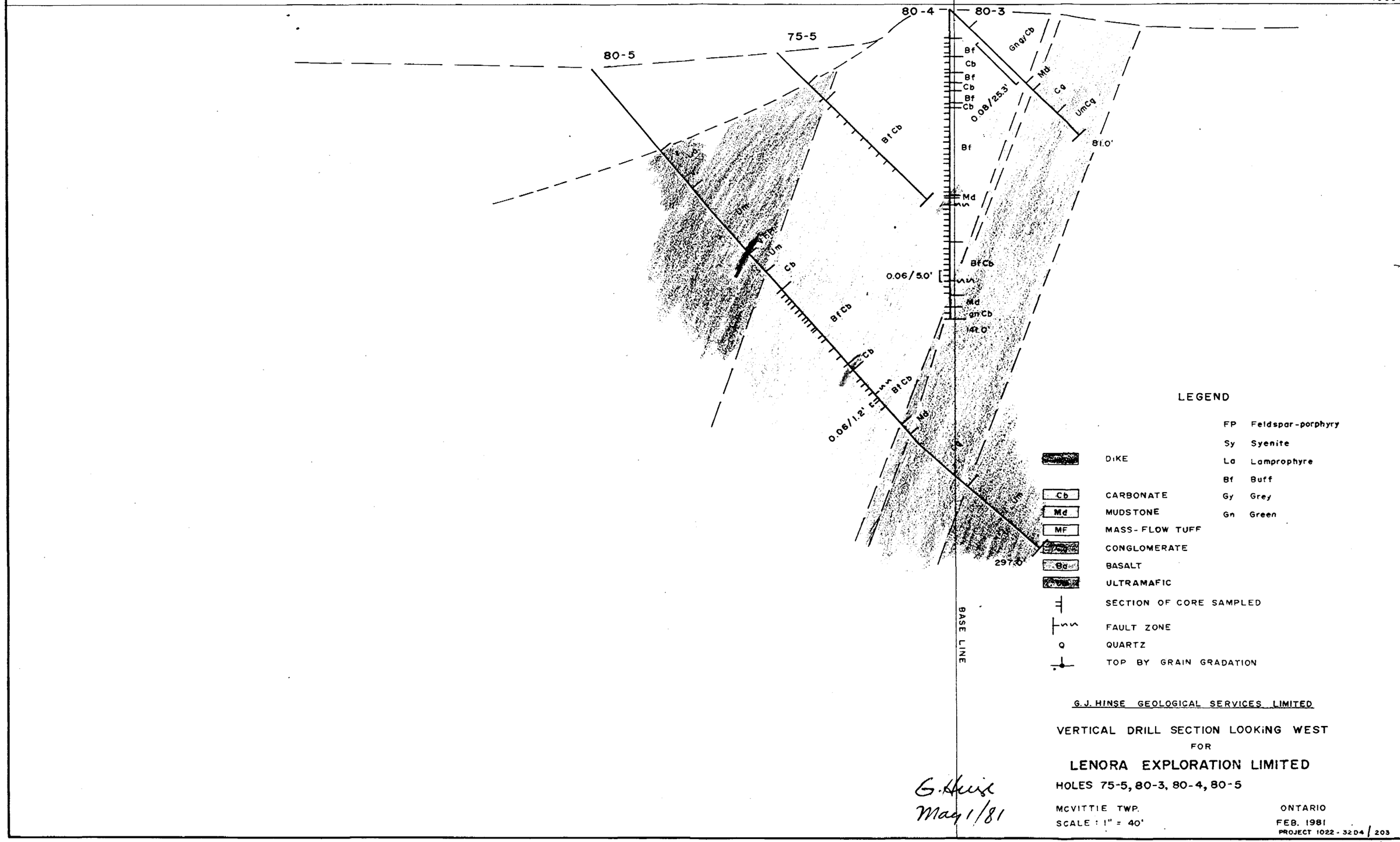
DIAMOND DRILL RECORD

Hole No. 80-11

Page No. 3

Footage From - To	Geological & Physical Description	Sample Number	From - To	Au oz/ton	
	357-367 .02		SLUDGE		
	367-377 .02		27-37	.005	
	377-387 .02		37-47	.11	
	387-397 .02		47-57	.74	
	394-404 .01		57-67	.13	
	404-407 .01		67-77	.06	
	407-417 .01		77-87	.02	
	411-427 .005		87-97	.02	
			97-107	.03	
			107-117	.02	
			117-125	.01	
			125-135	.002	
			135-145	.002	
			145-155	.002	
			155-165	.02	
			165-177	.002	
			177-187	.002	
			187-197	.005	
			197 207	Nil	
			207-217	.002	
			217-227	.002	
			221-237	.002	
			137-147	Nil	
			247-257	.005	
			256-265	.005	
			265-275	Nil	
			277-287	.01	
			287-297	.002	
			297-307	.02	
			307-317	.01	
			317-327	.005	
			327-337	.01	
			337-347	.005	
			347-357	.01	


1000'
80-1
80-2B
80-2A
Bf Cb
Cb
Bf Cb
Q Cb
Md
Bf Cb
Gn Cb
Cg
Um
0.17/4.2'
0.13/5.0'
206.0'
97.0'
Um
Lost Core
Um
Cb
Bf gy Cb
Bf Cb
Md
Gy gn Cb
Cg
Um
BASE LINE
447.0'
LEGEND
FP Feldspar-porphyry
Sy Syenite
La Lamprophyre
Bf Buff
Gy Grey
Gn Green
DIKE
CARBONATE
MUDSTONE
MF MASS-FLOW TUFF
CONGLOMERATE
BASALT
ULTRAMAFIC
SECTION OF CORE SAMPLED
FAULT ZONE
Q QUARTZ
TOP BY GRAIN GRADATION
G.J. HINSE GEOLOGICAL SERVICES LIMITED
VERTICAL DRILL SECTION LOOKING WEST
FOR
LENORA EXPLORATION LIMITED
HOLES 80-1, 80-2A, 80-2B
MCVITTIE TWP. ONTARIO
SCALE : 1" = 40'
FEB. 1981
PROJECT 1022-3204/203
G. Hinse
May 1/81



G.J. HINSE GEOLOGICAL SERVICES LIMITED

VERTICAL DRILL SECTION LOOKING WEST

FOR

LENORA EXPLORATION LIMITED

HOLES 75-5, 80-3, 80-4, 80-5

McVITTIE TWP. ONTARIO

SCALE : 1" = 40' FEB. 1981

PROJECT 1022-3204 / 203

G. Hinse
May 1/81

1000'

80-7

80-6

Cb

BrCb

Md

Cg

MFTf

BrCb

Cg

MFTf

Um

Cg

Cb

Cb

BrCb

Md

BrCb

GnCb

BrCb

Md

BrCb

Cb

Cg

Um

418.0'

LEGEND

	FP	Feldspar-porphyry
	Sy	Syenite
LAKE	La	Lamprophyre
286.0'	Bf	Buff
CARBONATE	Gy	Grey
MUDSTONE	Gn	Green
MASS-FLOW TUFF		
CONGLOMERATE		
BASALT		
ULTRAMAFIC		
SECTION OF CORE SAMPLED		
FAULT ZONE		
QUARTZ		
TOP BY GRAIN GRADATION		

G.J. HINSE GEOLOGICAL SERVICES LIMITED

VERTICAL DRILL SECTION LOOKING WEST

FOR

LENORA EXPLORATION LIMITED

HOLES 80-6, 80-7

MCVITTIE TWP. ONTARIO

SCALE : 1" = 40' FEB. 1981

PROJECT 1022-3204 203

G. Hinse
May 1/81

1000'

80-9

80-8

Um

Um

Um

Cg

Cb

BrCb
Md

BrCb

0.10/1.5'

Batr

BrCb

Md

Cg

Um

BrCb

GnCb

0.03/1.5'

MFTf

BrCb

Chert

0.03/3.0'

GnCb

Um

297.0'

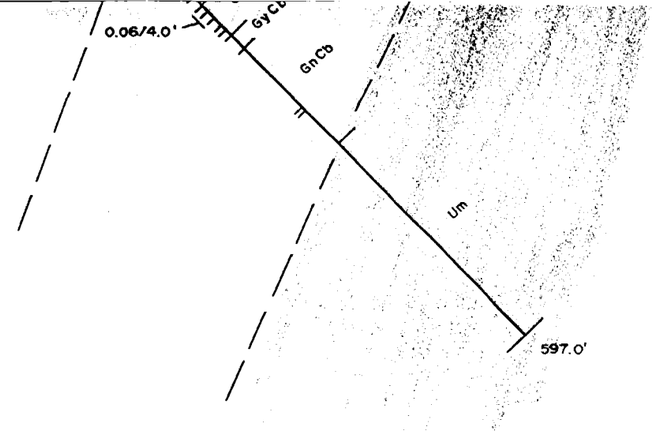
Batr

GyCb

Md

GyCb

Chert



BASE LINE

LEGEND

	DIKE	FP	Feldspar-porphyry
		Sy	Syenite
		La	Lamprophyre
		Bf	Buff
Cb	CARBONATE	Gy	Grey
Md	MUDSTONE	Gn	Green
MF	MASS-FLOW TUFF		
	CONGLOMERATE		
Ba	BASALT		
Um	ULTRAMAFIC		
	SECTION OF CORE SAMPLED		
	FAULT ZONE		
Q	QUARTZ		
	TOP BY GRAIN GRADATION		

G. Hinse
May 1/81

G.J. HINSE GEOLOGICAL SERVICES LIMITED

VERTICAL DRILL SECTION LOOKING WEST

FOR

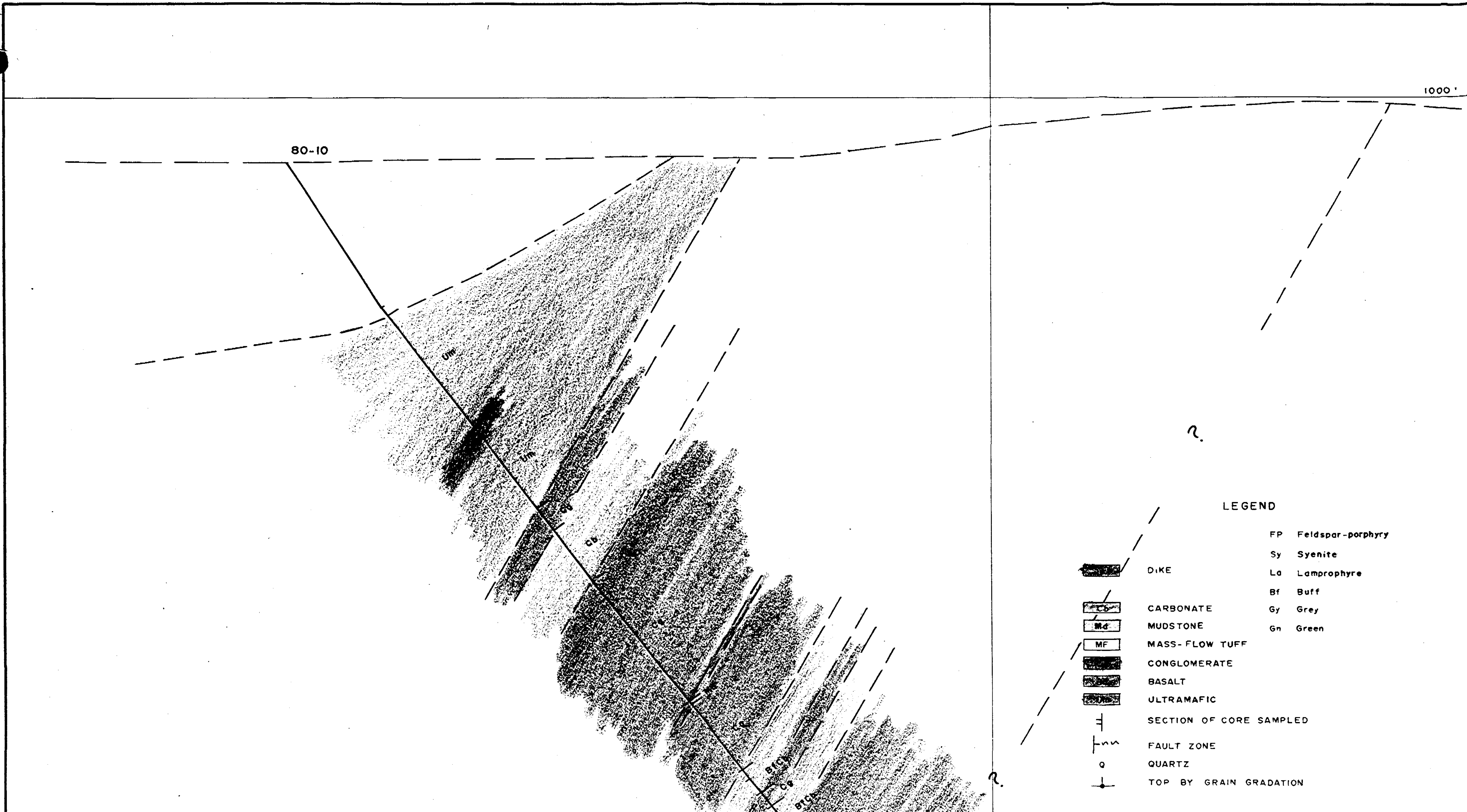
LENORA EXPLORATION LIMITED

HOLES 80-8, 80-9

MCVITTIE TWP. ONTARIO

SCALE 1" = 40' FEB. 1981

PROJECT 1022-3204/203



G. J. HINSE GEOLOGICAL SERVICES LIMITED

VERTICAL DRILL SECTION LOOKING WEST

FOR

LENORA EXPLORATION LIMITED

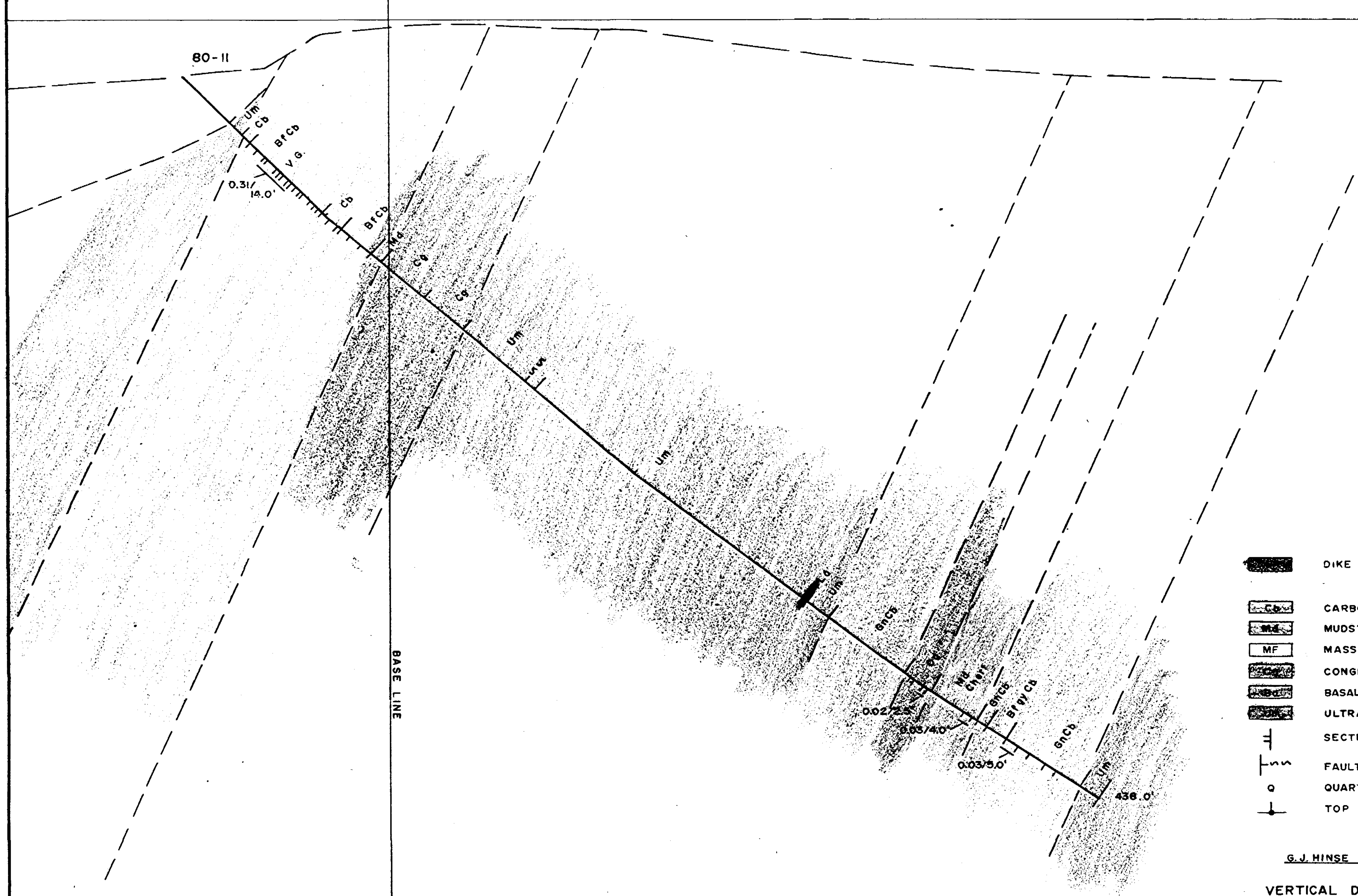
HOLE 80-10

MCVITTIE TWP. ONTARIO

SCALE: 1" = 40' FEB. 1981

PROJECT 1022-3204 / 203

G. Hinse
May 1/81



LEGEND

FP	Feldspar-porphyry
Sy	Syenite
La	Lamprophyre
Bf	Buff
Gy	Grey
Gn	Green

- DIKE
- Cb — CARBONATE
- Md — MUDSTONE
- MF — MASS-FLOW TUFF
- Cg — CONGLOMERATE
- Bd — BASALT
- Um — ULTRAMAFIC
- SECTION OF CORE SAMPLED
- FAULT ZONE
- Q — QUARTZ
- TOP BY GRAIN GRADATION

G.J. HINSE GEOLOGICAL SERVICES LIMITED

VERTICAL DRILL SECTION LOOKING WEST

FOR

LENORA EXPLORATION LIMITED

HOLE 80-11

G. Hinse
May 1/81

MCVITTIE TWP. ONTARIO

SCALE : 1" = 40' FEB. 1981

PROJECT 1022-3204 203

1000'

75-6

75-3 75-2

75-1

Um

Q

Cb

0.17/150'

0.09/350'

0.08/250'

0.07/300

Jm

Lm

Intrusive

BASE LINE

LEGEND

	DIKE	FP	Feldspar-porphyry
		Sy	Syenite
		La	Lamprophyre
		Bf	Buff
Cb	CARBONATE	Gy	Grey
Md	MUDSTONE	Gn	Green
MF	MASS-FLOW TUFF		
	CONGLOMERATE		
Bslt	BASALT		
	ULTRAMAFIC		
	SECTION OF CORE SAMPLED		
	FAULT ZONE		
Q	QUARTZ		
	TOP BY GRAIN GRADATION		

G.J. HINSE GEOLOGICAL SERVICES LIMITED

VERTICAL DRILL SECTION LOOKING WEST

FOR

LENORA EXPLORATION LIMITED

HOLES 75-1, 75-2, 75-3, 75-6

McVITTIE TWP. ONTARIO

SCALE : 1" = 40' FEB. 1981

PROJECT 1022-3204/203

G. Hinse
May 1/81

OM 78-PE73-C-81

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 50709 Date: Dec.17, 1980

Received Dec.11, 1980 7 Samples of ore

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
8679	0.002
8680	NIL
8681	0.005
8682	NIL
8683	NIL
8684	NIL
8685	0.005

Per G. Lebel
G. Lebel, Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 50771 Date: January 16 1981

Received January 15 1981 12 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
11601	0.002
11602	0.002
11603	0.002
11604	0.002
11605	Nil
11606	Nil
11607	Nil
11608	Nil
11609	Nil
11610	Nil
11611	Nil
11612	Nil

Per G. Lebel
G. Lebel - Manager

ESTABLISHED 1928

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Certificate of Analysis

Certificate No. 50790 Date: January 23 1981

Received Jan.21/81 18 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
11613	Nil
11614	Nil
11615	Nil
11616	Nil
11617	Nil
11618	Nil
11619	Nil
11620	Nil
11621	0.005
11622	0.005
11623	0.01
11624	0.09
11625	0.22
11626	0.002
11627	0.002
11628	0.005
11629	Nil
11630	0.005

Per G. Lebel
G. Lebel - Manager

SWASTIKA LABORATORIES LIMITED

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Certificate of Analysis

Certificate No. 50793 Date: January 26 1981

Received Jan.21/81 13 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
11631	0.005
11632	0.03
11633	0.12
11634	0.14
11635	0.03
11640	0.002
11641	0.002
11642	Nil
11643	Nil
11644	0.002
11645	Nil
11646	Nil
11647	Nil

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50802 Date: January 26 1981

Received Jan.22/81 22 Samples of Split Core

Submitted by Lenora Exploration, Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
11648	0.002
11649	0.002
11650	Nil
11651	0.002
11652	0.002
11653	0.002
11654	Nil
11655	Nil
11656	0.002
11657	0.002
11658	0.002
11659	Nil
11660	Nil
11661	Nil
11662	Nil
11663	Nil
11664	Nil
11665	Nil
11666	Nil
11667	Nil
11668	Nil
11669	0.002

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50805 Date: January 26 1981

Received January 23/81 9 Samples of Split Core

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
11670	0.002
11671	Nil
11672	0.002
11673	Nil
11674	0.002
11675	Nil
11676	0.002
11677	Nil
11678	0.005

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50810 Date: January 28 1981

Received Jan.26/81 16 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
7701	0.05
7702	0.005
7703	0.01
7704	Nil
7705	0.002
11690	Nil
11691	Nil
11692	0.002
11693	0.05
11694	0.17
11695	0.16
11696	0.08
11697	0.11
11698	0.03
11699	0.05
11700	0.04

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50843 Date: February 4 1981

Received Feb.2/81 49 Samples of Whole Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Att'n: R. Kasner

SAMPLE NO.	GOLD Oz./ton	SAMPLE NO.	GOLD Oz./ton
7706	Nil	7731	0.002
7707	Nil	7732	0.002
7708	Nil	7733	0.005
7709	0.002	7734	Nil
7710	Nil	7735	0.002
7711	Nil	7736	0.04
7712	0.002	7737	0.01
7713	0.005	7738	0.03
7714	Nil	7739	0.02
7715	Nil	7740	0.002
7716	Nil	7741	0.002
7717	0.01	7742	0.002
7718	0.03	7743	0.002
7719	0.002	7744	Nil
7720	0.002	7745	0.03
7721	0.002	7746	0.02
7722	Nil	7747	0.005
7723	Nil	7748	0.02
7724	0.002	7749	0.04
7725	Nil	7750	0.07
7726	Nil	7751	0.02
7727	Nil	7752	0.002
7728	Nil	7753	Nil
7729	Nil	7754	0.002
7730	Nil		

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

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Certificate of Analysis

Certificate No. 50851 Date: February 5 1981

Received Feb. 3/81 19 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7755	Nil
7756	0.002
7757	Nil
7758	Nil
7759	0.002
7760	Nil
7761	Nil
7762	Nil
7763	Nil
7764	Nil
7765	0.002
7766	0.002
7767	0.002
7768	0.002
7769	Nil
7770	0.005
7771	0.002
7772	0.002
7773	0.002

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50860 Date: February 6 1981

Received Feb.4/81 12 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7797	0.002
7798	0.002
7799	0.002
7800	0.002
7801	0.002
7802	Nil
7803	0.002
7804	Nil
7805	0.01
7806	0.002
7807	Nil
7808	Nil

Per G. Lebel
G. Lebel - Manager

ESTABLISHED 1928

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Certificate of Analysis

Certificate No. 50853 Date: February 6 1981

Received Feb.4/81 23 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7774	0.002
7775	0.01
7776	0.06
7777	0.01
7778	0.002
7779	0.002
7780	Nil
7781	Nil
7782	Nil
7783	Nil
7784	Nil
7785	Nil
7786	Nil
7787	Nil
7788	Nil
7789	Nil
7790	Nil
7791	Nil
7792	Nil
7793	Nil
7794	Nil
7795	Nil
7796	Nil

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

BELL-WHITE ANALYTICAL LABORATORIES LTD.
P.O. BOX 187. HAILEYBURY, ONTARIO TEL: 672-3107

Certificate of Analysis

NO. 4253 DATE: February 12, 1981.

SAMPLE(S) OF: Pulps & Rejects(49) RECEIVED: February 1981.

SAMPLE(S) FROM: Lenore Explorations, P. O. Box 993, Kirkland Lake, Ont.

Sample No.	Oz. Gold
D7701	0.048
2	0.015
D7717	0.005
8	0.033
9	Trace
D7736	Trace
7	0.005
8	0.023
9	0.018
D7740	Trace
4	Trace
C11621	0.013
2	0.01
3	0.01
4	0.108
5	0.215
6	0.003
7	<0.003
8	0.003
9	Trace
C11630	0.003
1	0.005
2	0.035
3	0.135
4	0.135

Sample No.	Oz. Gold
C11635	0.043
C11640	0.003
1	Trace
2	Trace
3	Trace
4	<0.003
5	Trace
7	Trace
8	Trace
9	Trace
C11650	<0.003
1	<0.003
2	0.005
3	Trace
C11691	<0.003
2	0.005
3	0.055
4	0.175
5	0.175
6	0.075
7	0.105
8	0.023
9	0.058
C11700	0.050

IN ACCORDANCE WITH LONG-ESTABLISHED NORTH AMERICAN CUSTOM, UNLESS IT IS SPECIFICALLY STATED OTHERWISE GOLD AND SILVER VALUES REPORTED ON THESE SHEETS HAVE NOT BEEN ADJUSTED TO COMPENSATE FOR LOSSES AND GAINS INHERENT IN THE FIRE ASSAY PROCESS.

BELL-WHITE ANALYTICAL LABORATORIES LTD.

PER

SWASTIKA LABORATORIES LIMITED

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Certificate of Analysis

Certificate No. 50979 Date: March 4, 1981

Received Feb.25, 1981 20 Samples of split core

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7809	0.002
7810	0.002
7811	NIL
7812	0.002
7813	0.002
7814	NIL
7815	0.02
7816	0.002
7817	0.005
7818	0.01
7819	0.005
7820	0.01
7821	0.01
7822	0.06
7823	0.06
7824	0.03
7825	0.005
7826	0.002
7827	0.005
7828	NIL

Per G. Lebel
G. Lebel, Manager

SWASTIKA LABORATORIES LIMITED

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Certificate of Analysis

Certificate No. 51001 Date: March 9 1981

Received Mar.2/81 15 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

	SAMPLE NO.	GOLD Oz./ton
	7843	0.002
	7844	0.005
	7845	Nil
	7846	Nil
	7847	Nil
	7848	0.002
	7849	Nil
	7850	0.002
**	7851 & 7852	0.002
	7853	Nil
	7854	Nil
	7855	Nil
	7856	0.002
	7857	0.005
	7858	0.002

NOTE: ** We found two tags in the same sample bag.

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 51000 Date: March 9 1981

Received Mar.2/81 14 Samples of Split Core

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7829	0.005
7830	0.005
7831	0.03
7832	0.01
7833	0.01
7834	0.03
7835	Nil
7836	0.002
7837	0.002
7838	Nil
7839	0.002
7840	0.005
7841	0.002
7842	0.002

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No 51119 Date: April 1, 1981

Received March 23, 1981 16 Samples of split core

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7863	0.005
7864	0.002
7865	0.10
7866	0.13
7868	0.13
7869	0.04
7870	0.14
7871	0.04
7872	0.01
7873	0.002
7874	0.005
7892	NIL
7893	0.002
7894	NIL
7895	0.002
7896	NIL

67-222

Per G. Lebel, Manager

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Certificate of Analysis

Certificate No. 51155 Date: April 3, 1981

Received March 30, 1981 1 Samples of split core

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton	GOLD Oz./ton	GOLD Oz./ton
7867	2.18	2.21	2.22

Per G. Lebel
G. Lebel, Manager

ESTABLISHED 1928

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Certificate of Analysis

Certificate No. 51139 Date: April 3, 1981

Received March 26, 1981 17 Samples of split core

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7875	0.05
7876	0.02
7877	0.002
7878	NIL
7879	NIL
7880	NIL
7881	0.002
7882	0.005
7883	0.002
7884	0.01
7885	0.02
7886	0.03
7887	0.01
7888	NIL
7889	0.03
7890	0.005
7891	NIL

Per G. Lebel
G. Lebel, Manager

SWASTIKA LABORATORIES LIMITED

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Certificate of Analysis

Certificate No. 51188 Date: April 9, 1981

Received April 3, 1981 1 Samples of ore

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7897	NIL

Per G. Lebel
G. Lebel, Manager

ESTABLISHED 1928

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Certificate of Analysis

Certificate No. 51194 Date: April 10, 1981

Received April 6, 1981 19 Samples of split core and ore

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
7898	0.005
7899	NIL
7900	NIL
11901	NIL
11902	0.002
11903	0.04
11904	0.002
11905	0.005
11906	0.02
11907	0.005
11908	0.002
11909	NIL
11910	0.002
11911	0.01
11912	NIL
11913	0.002
11914	0.002
11915	0.002
11916	NIL

Per G. Lebel
G. Lebel, Manager

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Certificate of Analysis

Certificate No. 50750 Date: Jan.7, 1981

Received Dec.31, 1980 21 Samples of sludges

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario

SAMPLE NO.		GOLD Oz./ton
80-1	17-27'	0.002
	27-37'	0.002
	37-47'	0.002
	47-57'	0.002
	57-67'	0.01
	67-77'	0.09
	77-87'	0.02
	87-97'	0.002
	97-102'	0.09
	97-107'	NIL
	107-117'	0.002
	117-127'	0.04
	127-137'	0.07
	137-147'	0.08
	147-157'	0.06
	157-167'	0.03
	167-177'	0.02
	177-187'	0.01
	187-197A'	0.002
	187-197B'	0.02
	197-206'	0.03

Per G. Lebel
G. Lebel, Manager

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Certificate of Analysis

Certificate No. 50772 Date: January 19 1981

Received Jan.15/81 24 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO. Hole 80-2	GOLD Oz./ton
102-107'	Nil
107-117'	Nil
117-127'	Nil
117-227'	Nil
127-137'	Nil
137-147'	Nil
147-157'	Nil
157-167'	Nil
167-177'	Nil
177-187'	Nil
187-197'	Nil
197-207'	Nil
207-217'	Nil
217-227'	Nil
227-237'	Nil
237-247'	0.002
247-257'	Nil
257-267'	Nil
267-277'	Nil
277-287'	0.002
287-297'	Nil
297-307'	Nil
307-317'	Nil
317-327'	Nil

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50779 Date: January 21 1981

Received Jan.16/81 9 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
Hole 80-2	
347-357'	Nil
357-367'	0.002
367-377'	0.002
377-387'	0.002
387-397'	Nil
397-407'	Nil
407-417'	0.002
417-427'	Nil
427-437'	0.002

Per G. Lebel

G. Lebel-Manager

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Certificate of Analysis

Certificate No. 50792 Date: January 23 1981

Received Jan.20/81 27 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kusner

SAMPLE NO.	GOLD Oz./ton
Hole 80-4	
17-27'	0.05
27-37'	0.02
37-47'	0.01
47-57'	0.002
57-67'	0.002
67-77'	0.002
77-87'	0.02
87-97'	0.02
97-107'	0.005
107-117'	0.03
127-137'	0.05
137-150'	0.005
Hole 80-5	
48-57'	0.002
57-67'	Nil
67-77'	Nil
77-87'	Nil
87-97'	Nil
97-107'	0.002
107-117'	Nil
117-127'	0.002
127-137'	0.002
137-147'	0.002
147-157'	Nil
157-167'	0.002
167-177'	0.002
177-187'	Nil
187-197'	0.002

Per G. Lebel
G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50796 Date: January 26 1981

Received Jan.21/81 9 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
Hole 80-5	
197-207'	0.02
207-217'	0.01
217-227'	0.01
227-237'	0.002
237-247'	0.002
247-257'	0.002
257-267'	0.002
267-277'	0.01
277-287'	0.005

Per G. Lebel
G. Lebel - Manager

SWASTIKA LABORATORIES LIMITED

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Certificate of Analysis

Certificate No. 50799 Date: January 26 1981

Received Jan. 22/81 7 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
HOLE 80-6	
18-27'	Nil
27-37'	Nil
37-47'	Nil
47-57'	0.002
57-67'	0.002
67-77'	Nil
77-87'	0.002

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50804 Date: January 27 1981

Received January 23/81 14 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
Hole 80-6	
87-97'	0.002
97-107'	Nil
107-117'	Nil
117-127'	Nil
127-137'	Nil
137-147'	Nil
147-157'	Nil
157-167'	Nil
167-177'	Nil
177-187'	Nil
187-197'	0.002
197-207'	0.01
207-217'	0.01
227-237'	0.002

Per G. Lebel
G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50811 Date: January 27 1981

Received Jan.26/81 6 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
Hole 80-6	
227'237'	0.005
237-247'	0.002
247-257'	0.002
257-267'	0.002
267-277'	0.005
277-287'	0.002

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50840 Date: February 3 1981

Received Jan.30/81 14 Samples of Sludge

Submitted by Lenora Exploration Limited, Kirkland Lake, Ontario Att'n: R. Kasner

SAMPLE NO.	GOLD Oz./ton
Hole 80-7	
103-117'	Nil
117-127'	Nil
127-137'	Nil
137-147'	Nil
147-157'	Nil
157-167'	Nil
167-177'	0.002
177-187'	Nil
187-197'	Nil
197-207'	Nil
207-217'	0.005
217-227'	Nil
227-237'	Nil
287-297'	0.002

Per G. Lebel
G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

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ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 50844 Date: February 4 1981

Received Feb.2/81 9 Samples of Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario Per: R. Kasner

SAMPLE NO.	GOLD Oz./ton
Hole 80-7	
237-247'	Nil
243-257'	Nil
** 243-253'	
257-267'	Nil
267-276'	0.002
276-286'	Nil
286-296'	Nil
296-297'	Nil
** 296-307'	
297-307	Nil
317-327'	Nil

NOTE: ** Denotes sample numbers taken from wooden markers found with sludge.

Per G. Lebel
G Lebel - Manager

ESTABLISHED 1928

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Certificate of Analysis

Certificate No. 50852 Date: February 5 1981

Received Feb.4/81 5 Samples of D.D. Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
Hole 80-6	
277-287'	0.005
Hole 80-7	
333-346'	0.005
346-356'	0.002
356-367'	0.002
367-377'	Nil

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

SWASTIKA LABORATORIES LIMITED

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Certificate of Analysis

Certificate No. 50910 Date: February 19 1981

Received Feb.12/81 31 Samples of D.D. Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
Hole #80-8	
14-27'	0.002
27-37'	0.002
37-47'	0.002
47-57'	0.002
57-67'	Nil
67-77'	0.002
77-87'	Nil
87-97'	Nil
97-107'	Nil
107-117'	Nil
117-127'	Nil
127-137'	Nil
137-147'	0.002
147-157'	Nil
157-167'	0.002
167-177'	0.005
177-187'	0.005
187-197'	0.01
197-207'	0.005
207-217'	Nil
217-227'	0.04
227-237'	0.01
237-247'	0.02
247-257'	0.02
257-267'	0.01
267-277'	0.005
277-287'	0.002
287-297'	Nil
Hole 80-7	
387-397'	0.002
397-407'	0.01
407-417'	0.02

Per G. Lebel
G. Lebel - Manager

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ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 50918 Date: February 24 1981

Received Feb.16/81 49 Samples of D.D. Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton		SAMPLE NO.	GOLD Oz./ton
Hole 81-9				
102-107'	0.002		357-367'	0.002
107-117'	0.002		367-377'	0.002
117-127'	0.002	**	377-367'	0.002
127-137'	0.002		387-397'	0.002
137-147'	0.002		397-407'	Nil
147-157'	0.01		407-417'	Nil
157-167'	0.005		417-427'	0.005
167-177'	0.005		427-437'	0.002
177-187'	0.002		437-447'	0.005
187-197'	0.002		447-457'	0.002
197-207'	0.002		457-467'	0.005
207-217'	0.01		467-477'	0.04
217-227'	0.005		477-487'	0.04
227-237'	0.002		487-497'	0.03
237-247'	0.01		497-507'	0.005
247-257'	0.03		507-517'	0.01
257-267'	0.005		517-527'	0.005
267-277'	0.005		527-537'	0.01
277-287'	0.005		537-547'	0.005
287-297'	0.002		547-557'	0.002
297-307'	0.002		557-567'	0.002
307-327'	0.002		567-577'	0.002
327-337	0.002		577-587'	0.002
337-347'	0.002		587-597'	0.002
347-357'	0.002			

NOTE: ** 377-367' appeared on the stick that was with the sludge sample.

Per _____
G. Lebel - Manager

ESTABLISHED 1928

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Certificate of Analysis

Certificate No. 50977 Date: March 5 1981

Received Feb. 24/81 16 Samples of D.D. Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
Hole #81-10	
84-107'	0.002
107-117'	Nil
117-127'	Nil
127-137'	Nil
137-147'	Nil
147-157'	Nil
157-167'	Nil
167-177'	Nil
177-187'	Nil
187-197'	Nil
197-207'	Nil
207-217'	Nil
217-227'	Nil
227-237'	Nil
237-247'	Nil
247-257'	0.002

Per G. Lebel

G. Lebel - Manager

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Certificate of Analysis

Certificate No. 50998 Date: March 6, 1981

Received February 26, 1981 14 Samples of D D Sludges

Submitted by Lenora Exploration Limited, Kirkland Lake Attn. Mr. R. Kasner

SAMPLE NO.	GOLD Oz/ton
Hole 81-10	
117-127	0.002
257-267	Nil
267-277	Nil
277-287	0.002
287-297	0.002
297-307	Nil
307-317	Nil
327-337	Nil
337-347	0.002
347-357	Nil
367-377	Nil
377-387	Nil
387-397	Nil
407-417	Nil

Per G. Lebel

G. Lebel - Manager

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
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Certificate of Analysis

Certificate No. 50999 Date: March 9 1981

Received Mar.2/81 21 Samples of D.D. Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
Hole #81-11	
27-37'	0.005
37-47'	0.11
47-57'	0.74
57-67'	0.13
67-77'	0.06
77-87'	0.02
87-97'	0.02
97-107'	0.03
107-117'	0.02
117-125'	0.01
125-135'	0.002
135-145'	0.002
145-155'	0.002
155-165'	0.02
165-177'	0.002
177-187'	0.002
187-197'	0.005
197-207'	Nil
207-217'	0.002
217-227'	0.002
227-237'	0.002

Per G. Lebel
G. Lebel - Manager

SWASTIKA LABORATORIES LIMITED

P.O. BOX 10, SWASTIKA, ONTARIO P0K 1T0
TELEPHONE: (705) 642-3244
ANALYTICAL CHEMISTS • ASSAYERS • CONSULTANTS

Certificate of Analysis

Certificate No. 51011 Date: March 11 1981

Received Mar.4/81 17 Samples of D.D. Sludge

Submitted by Lenora Exploration Ltd., Kirkland Lake, Ontario

SAMPLE NO.	GOLD Oz./ton
HOLE #81-11	
137-147'	Nil
247-257'	0.005
256-265'	0.005
265-275	Nil
277-287'	0.01
287-297'	0.002
297-307'	0.002
307-317'	0.01
317-327'	0.005
327-337'	0.01
337-347'	0.005
347-357'	0.01
357-367'	0.02
367-377'	0.02
377-387'	0.02
387-397'	0.02
394-404'	0.01

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

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SWASTIKA LABORATORIES LIMITED

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Certificate of Analysis

Certificate No. 51027 Date: March 10 1981

Received Mar.5/81 3 Samples of D.D. Sludge

Submitted by Lenora Explorations Ltd., Kirkland Lake, Ontario

SAMPLE NO. Hole #81-11	GOLD Oz./ton
404-407'	0.01
407-417'	0.01
417-427'	0.005

Per G. Lebel

G. Lebel - Manager

ESTABLISHED 1928

OM78-PE73-C-81

~~OM80-781~~

ONTARIO RESEARCH FOUNDATION

SHERIDAN PARK RESEARCH COMMUNITY

MISSISSAUGA, ONTARIO, CANADA L5K 1B3 • (416) 822-4111 • TELEX 06-982311

May 12, 1981

020

Mr. John Hemstock, P.Eng.
Metallurgical Consultant
258 Westwood Drive
Oakville, Ontario
L6L 4X9

Dear John:

Subject: Lenora Exploration Omega Tailing
ORF Investigation No. 71222-81

We have conducted additional testwork on the Omega tailing sample submitted to us in November 1980. The work consisted of cyanidation at three pH levels on the tailings ground to -400 and -500 mesh and on test or unground material. A thiourea leach was also carried out.

Difficulties were experienced in obtaining consistent head assays. Approximately 10 head samples were split from the bulk sample and fire assayed. The gold values ranged from a low of 0.14 oz/ton to 0.32 oz/ton. Also, assay problems were experienced with the ground samples before cyanidation. The head material before and after grinding did not correspond to each other, thus an attempt was made to determine the discrepancies.

Grinding tests were carried out on samples split from the total sample on hand. The sample was dried, screened to -10 mesh and blended. Grinding times were 1, 2 and 3 hours. The mill charge was filtered and dried and submitted to two assay laboratories for gold-determination. The results were:

...cont./2....

Grinding Time	Au oz/ton Lab. A	Au oz/ton Lab A Duplicate	Au oz/ton Lab. B
1 hour	0.23	0.24	0.216
2 hours	0.20	0.20	0.182
3 hours	0.18	0.17	0.172
3 hours	0.15	0.16	0.142
3 hours	0.15	0.14	

Head assay before grinding - Average - 0.23 oz/ton

Atomic Absorption analysis of the filtrate from a three hour grind showed a gold content of 2.7 ppm in the filtrate.

Due to the limit of accuracy in gold determination by atomic absorption only an approximate mass balance can be given.

Product	Wt. in Grams	Au in Grams	Au Distribution %
Mill feed	694	(0.23 oz/ton) 0.0055	100.0
Water	500	nil	nil
Mill Discharge	652	(0.15 oz/ton) 0.0028	65.1
Filtrate	544	(2.7 ppm) 0.0015	34.9

In the grinding tests, to eliminate any chance of contamination, the mill was ground out with silica prior to each tailings grind. Analysis showed only a trace of gold in the filtrate from the silica grinding and thus contamination from the mill was not a factor in the testwork.

It must be assumed that part of the gold in the tailings exists as precipitated gold or is adsorbed in the carbon contained in the tailings. This gold was re-dissolved in the grinding, possibly along

....cont./3.....

with some residual cyanide. This may explain the fact that the before and after grinding assays did not balance in the previous testwork. In a plant operation this phenomena would occur and the material must go directly to cyanidation from grinding.

Cyanidation tests were conducted on the filtered tailings after grinding for 2 hours to nominal 400 mesh and 3 hours to nominal 500 mesh. These tests and one without grinding were at a pH level of 8.5 for a period of 48 hours. Three tests were on finely ground tailings at pH levels of 8.5, 10.5 and +11.

The residues assayed from 0.089 to 0.10 oz/ton. Assuming a value of 0.23 oz/ton for the tailing sample on hand, this would give a recovery of 56 to 61% of the gold through grinding and cyanidation. Assays of 0.26 and 0.28 oz/ton Au on the feed of tests 2 and 3 are probably high. Arsenic content of the pregnant solution from Test 7 showed 7 ppm As in solution. The test conditions and results are shown in the attached Table I.

The reducing power, was checked in the solutions of Tests 5 to 7. The readings indicate that at a high pH level the reducing power remains below the fouling level. Whether exchange of the solution with new solution will aid in the recovery of additional gold remains to be investigated.

A leach test with 6.67 oz/ton ferric sulfate as an oxidant and 10 lbs/ton thiourea as leachant was conducted at a pH of 2.5 for 6 hours. Feed was a tailing sample ground to 500 mesh. Concentrated H_2SO_4 was used to maintain the pH at 2.5. Residue assay was 0.13 oz/ton Au.

From the testwork to date the following conclusions may be made:

1. The head sample received most likely contains discrete particles of free gold which causes difficulties in sampling on a bench-scale.

...cont./4....

2. The gold cyanided originally during plant operation may not have been thoroughly washed from the residue thus rendering some soluble gold complexes upon re-grinding of the tails.

3. Residue analyses after grinding and cyanidation ranged from 0.089 to 0.10 oz/ton. The leach conditions, namely grind and pH had little effect on the recovery.

4. It may be assumed for calculation purposes that a tail of 0.09 may be obtained by direct cyanidation. For estimating purposes the circuit design must either have a wash step prior to cyanidation or tolerate a lime consumption of 50 - 100 lbs/ton. With adequate lime present 7 - 8 lbs/ton of cyanide will be needed.

5. Thiourea leaching did not produce promising results and is very expensive to utilize as the reagent cannot be regenerated .

Recommendations for future work are the following:

1. Confirm head analysis by studying old mill records and re-assaying of new head sample. If a head analysis can be agreed upon an extraction value may be calculated.

2. Activated carbon may be used to remove the gold both from the milling solutions and the leach solutions. It is a remote possibility that more of the gold is leaching and is re-adsorbing on the clay material in the ore. Carbon in pulp would help alleviate this phenomena.

3. Changing the leach solution after 24 hours of cyanidation. This would remove impurities which may be inhibiting cyanidation.

We would be happy to discuss this further with you. As you already know the overall economics of such a project are dependant on the average grade of the tailings deposit.

Yours very truly

M. K. Witte
Assistant Director
Department of Metallurgy

J. Biskupski
Technologist III
Department of Metallurgy

JB:aac

TABLE I

LENORA CYANIDATION CONDITIONS AND RESULTS

	TEST 1*	TEST 2*	TEST 3	TEST 4	TEST 5	TEST 6	TEST 7
Grind	-500	No Grind	-400	-500	-500	-500	-400
pH at start	2.0	2.0	3.6	3.6	3.9	3.9	3.9
pH level of Test	7-8.5	8.5	8.5	8.5	8.5	+11	10.5
$Ca(OH)_2$ Cons. lbs/ton	27.7	80.0	10.0	10.0	22.1	96.8	30.3
NaCN Cons. lbs/ton	42.0	6.07	7.80	6.77	12.86	3.87	7.92
Au oz/ton Head after grinding	0.16	0.26	0.28	0.15	0.16	0.16	0.20
Au oz/ton Residue	0.089	0.096	0.10	0.09	0.09	0.10	0.09
Au Recovery %	45.4	63.1	64.3	40.0	43.7	37.5	55.0

* Tests 1 and 2 were ground and cyanided directly. In all other tests the head material was ground, filtered, and repulped with fresh water.

Solution Reducing Power	24hr.	ND	ND	ND	ND	836	253	528
	48hr.	ND	ND	ND	ND	900	400	540

NOTE: Tests 1 to 4 NaCN maintained at 0.3%
Tests 5 to 7 NaCN at 0.1%

TABLE II

THIOUREA LEACH TEST OMEGA TAILING

Grind	-500 Mesh (Repulped)
pH at start	2.5 with H_2SO_4
$Fe_2(SO_4)_3$ Addition	8 lbs/ton
H_2SO_4 Addition	20 lbs/ton
Thiourea Addition	10 lbs/ton
Au oz/ton in Head	0.016 oz/ton
Au oz/ton Residue	0.013 oz/ton
Au recovery	20%

6 Hour Leach

ASSAYERS LIMITED

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ONTARIO: 20 VICTORIA STREET, SUITE 506 - TORONTO, M5C 2N8 - TEL: (416) 366-3100

CERTIFICATE OF ANALYSIS

FOR Lenora Exploration

SHIPPER LOT. NO.	SMELTER LOT NO.	GOLD OZ. PER TON	SILVER OZ. PER TON	COPPER %	ZINC %	LEAD %
1	734	0.129				

DATE March 19, 1981

CERTIFIED CORRECT

UNLESS IT IS SPECIFICALLY STATED OTHERWISE GOLD AND SILVER VALUES REPORTED ON THESE SHEETS HAVE NOT BEEN ADJUSTED TO COMPENSATE FOR LOSSES AND GAINS INHERENT IN THE FIRE ASSAY PROCESS.
SAUF MENTION CONTRAIRE, LES ESSAIS POUR L'OR ET L'ARGENT, NE SONT PAS CORRIGES POUR LES PERTES ET GAINS QUI SONT INHERENTS AU PROCEDE D'ANALYSE.

CTA

NORANDA MINES LIMITED
NORANDA, QUÉBEC

RAPPORT DE L'ESSAI
ASSAY REPORT

noranda

EXPÉDITEUR SHIPPER	CODE	FONDERIE/SMELTER LOT NO	EXPÉDITEUR/SHIPPER LOT NO	DATE
LENORA EXPLORATION	680-50	734	1	April 7, 1981
MATÉRIEL MATERIAL: CUSTOM FLUX				

	AU ON/TONNE - OZS/TON	AG ON/TONNE - OZS/TON	CU %	SIO2 %	Fe %	As %
- 200 pulp	,125	,40	0.04	54.30	5.8	0.03
#200 Met. ,22 gr.	tr	7.95				
#20 Met 2,07	,253	1856,85				

135 LF T-451

CHEF CHIMISTE — CHIEF CHEMIST

MINES NORANDA LIMITÉE
DIVISION HORNE

noranda

343

RAPPORT DE LA SALLE D'ÉCHANTILLONNAGE
SAMPLE MILL REPORT

EXPÉDITEUR
SHIPPER

LENORA EXPLORATION

57520.00 52120.00 58700.00
21680.00 21300.00 22120.00

35840.00 30820.00 36580.00
30820.00
36580.00
103240.00 lbs.
51.62 tons.

MATÉRIEL - MATERIAL

ORE SLAG

FONDERIE LOT NO / SMELTER LOT NO.	EXPÉDITEUR LOT NO / SHIPPER LOT NO.	WAGON NO. / CAR NO.	DATE REÇU MOIS / DATE REC'D MO	JOUR / DAY	AN / YR	DATE ÉCHANT. MOIS / DATE SAMP. MO	JOUR / DAY	TONNAGE NET HUMIDE / NET WET TONS	HUMIDITÉ / MOISTURE	TONNAGE NET SEC / NET DRY TONS	NUMÉRO DE CODE / CODE NUMBER
734	1	TPT	2	17	81	2	18	51.62			680 501

ÉCHANTILLON - SAMPLE			TONNAGE NET HUMIDE / NET WET TONS	HUMIDITÉ / MOISTURE	TONNAGE NET SEC / NET DRY TONS
GRAMMES HUMIDES WET GRAMS	GRAMMES D'HUMIDITÉ MOISTURE GRAMS	GRAMMES SECS DRY GRAMS			
46380	1890	44550	51.62	3.9	49.61

PESANTEUR DE L'ÉCHANTILLON SAMPLE WEIGHT ____ GMS.

TAMISÉ À THROUGH 20 MAILLE MESH # 20/met : 2.07 gms.
SÉPARÉ À RIFFLED TO 9830 gms. GMS
-20m mixed

TAMISÉ À THROUGH 50 MAILLE MESH # 50 met : nil.
SÉPARÉ À RIFFLED TO 3310 gms. GMS
-50m mixed

TAMISÉ À THROUGH 200 MAILLE MESH # 200 met : 0.22 gms.
SÉPARÉ À RIFFLED TO ____ GMS.

TAMISÉ À THROUGH ____ MAILLE MESH ____

ASSAYERS LIMITED

REPRÉSENTANT DE L'EXPÉDITEUR
SHIPPER'S REPRESENTATIVE

R Lunn

CONTREMAITRE DE LA SALLE D'ÉCHANTILLONNAGE
SAMPLE MILL FOREMAN

A REPORT ON THE PROPERTY OF LENORA EXPLORATION LIMITED IN McVITTIE TOWNSHIP, LARDER LAKE AREA, ONTARIO.

Sudbury, Ontario

June 12, 1981

G.J. Hinse, P.Eng.

Listing of Tables:

Listing of Appendices

Listing of Figures:

Listing of Maps:

Map 1022-7	Induced Polarization Survey of the Southwest Group	In Pocket
Map 1022-8	E-W V.L.F. Electromagnetic Survey of the Omega Group	In Pocket
Map 1022-9	N-S V.L.F. Electromagnetic Survey of the Omega Group	In Pocket
Map 1022-10	Magnetic Survey of the Omega Group	In Pocket
Map 1022-11	Horizontal Loop Survey of the Omega Group	In Pocket
Map 1022-12	Induced Polarization Survey of the Omega Group	In Pocket
Map 1022-13	Geological Cross-Section through No. 1 and 3 Shafts	In Pocket

SUMMARY

This report has been prepared for Lenora Exploration Limited and it summarizes the information available on their property located in McVittie township, Larder Lake Mining Division, Northeastern Ontario. The property consists of 17 claims comprising approximately 634 acres. The property is an irregular contiguous block, part of which covers a former producer, the Omega mine. Highway 66 crosses the property, thus access is easy through secondary roads.

The early work in the area dates back to 1906 as a follow up of the Cobalt boom. Gold was first discovered on the property in 1914, what is known as the No. 1 ore zone of Omega mine. Development of this discovery began after the war. The early work did not provide sufficient encouragements to bring the property into continued production. In 1935, The Omega Gold Mines, Limited was formed and the property was brought to production at a rate of 300 tons per day. The rate was gradually increased to 500 tons per day. The mine ceased operating in May 1947 and total production amounted to 1,584,264 tons grading 0.158 ounce per ton. In 1950, the Omega was re-organized into Lomega Gold Mines. A deep drill hole was done to test the ore horizon at depth. There appears to have been no further work of consequence on the Omega portion of the property until acquired by the present interests. On the Southwest group, a gold discovery in 1973 made by Davy Lowe was subsequently drilled by Grasset Lake Mines. This discovery is now the Main showing of the Southwest group.

Work done to-date by Lenora Exploration consists of extensive surface work, geophysical surveying and eleven drill holes.

Geological evidence indicates the gold deposits in the area to be associated with a unique condition which can be readily recognizable.

In essence, sedimentary tuffaceous carbonate rocks, which form the "green carbonate" of the area are paleobasinal deposits overlying tholeiitic and ultramafic volcanic rocks. These paleobasins existed and were formed in a shallow marine environment during the waning cycle of a volcanic centre to the south so that the gold-bearing rocks overlie and are interlayered with the volcanic rocks. The interface between the waning volcanic centre and a high-energy sedimentary event to the north was severely faulted and folded. This interface, the Larder Lake "break" structure, hosts most of the gold deposits in the area.

The property is very well located in terms of the Larder Lake structure and thus constitutes an exceptionally attractive exploration situation. Based on the above concept, a study of the information available pinpoints several targets warranting further work. They are: (1) the Omega ore horizon from the last ore zone mined, No. 17, to the east boundary; (2) A green carbonate occurrence on claim 410317 where values of 0.60 ounce of gold per ton have been reported; (3) the Southwest group Main showing where results obtained to-date permit to envisage the continuity of a gold-bearing zone; and (4) several geophysical anomalies. Furthermore, Lenora holds the rights to the Omega mine flotation tailings. These are estimated to total approximately 200,000 tons at a grade of 0.10 ounce of gold per ton. Metallurgical research is currently in progress. This should be continued to outline a process permitting the economic recovery of the gold contained in the tailings.

Accordingly, a program has been developed to further assess the potential of the property. This program is highly recommended at an estimated cost of $487,000.00.

A REPORT ON THE PROPERTY OF LENORA EXPLORATION LIMITED IN McVITTIE TOWNSHIP, LARDER LAKE AREA, ONTARIO

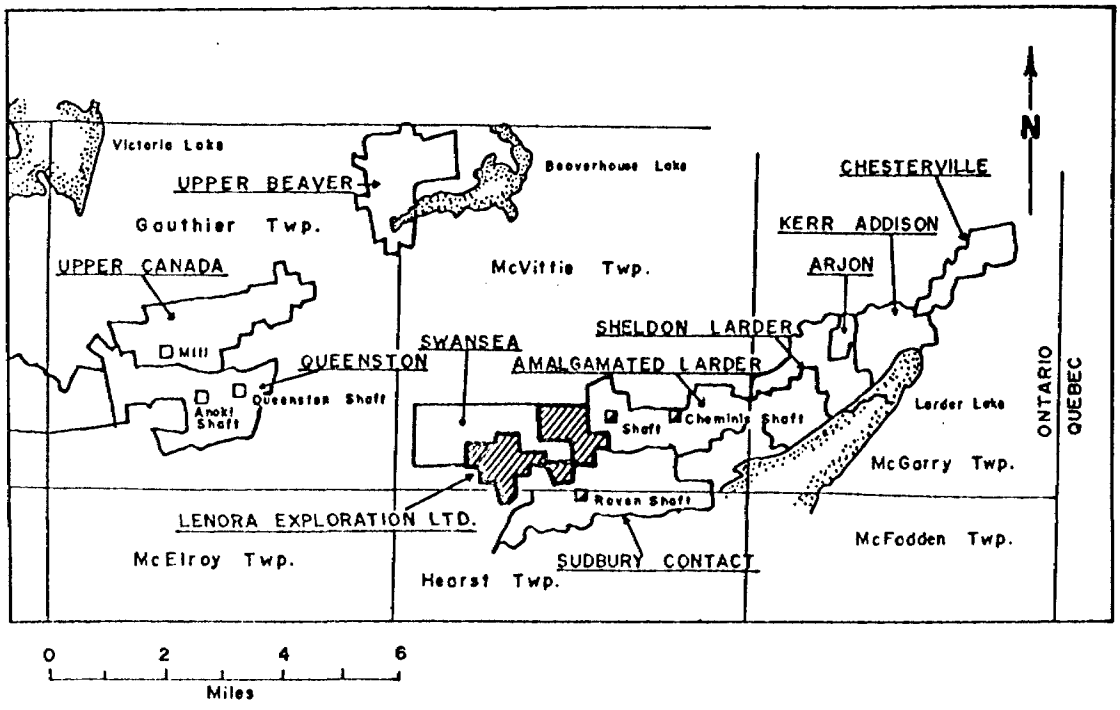
INTRODUCTION

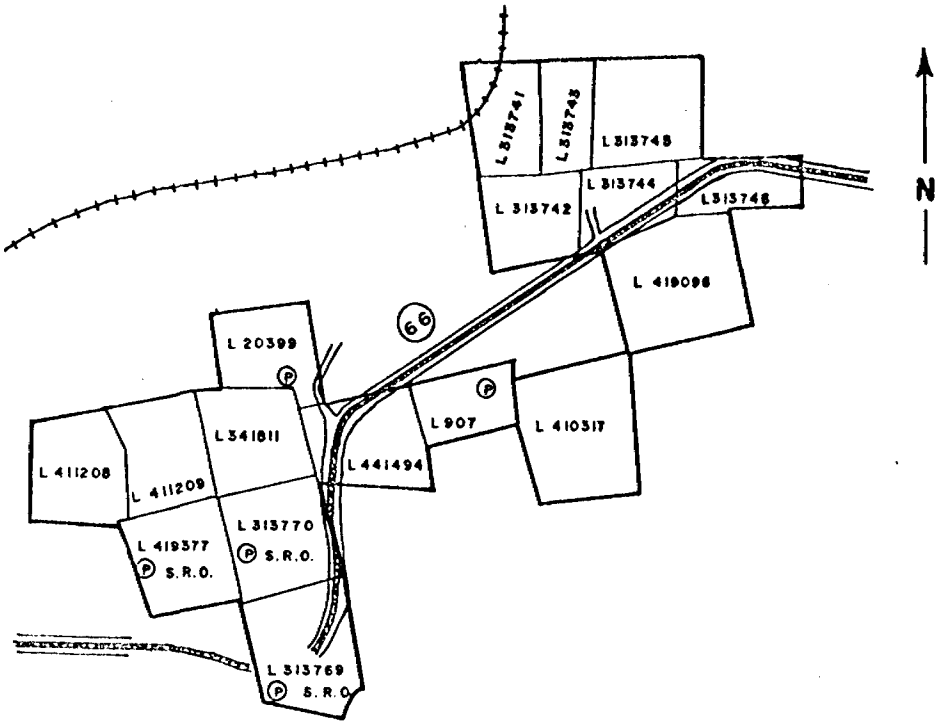
This report has been prepared at the request of Mr. R. J. Kasner, President of Lenora Exploration Limited and it summarizes the production history, the exploration and development work done on the property held by Lenora Exploration Limited, located in Mc Vittie township, to the north and northeast of the Town of Larder Lake, Northeastern Ontario.

The property consists of two claim-groups, now adjoining since the acquisition of the intervening claims. It comprises 17 claims covering approximately 634 acres. The property includes a major portion of the claims previously held by Omega Gold Mines Limited, where production from Feb. 1936 to March 1947 totalled 1,584,264 tons grading 0.158 ounce of gold per ton.

The main attraction of the property is the Larder Lake - Cadillac "break" structure. In the area, all the major gold deposits including the Omega, are associated with this structure. It is best defined as a series of faults and folds found in carbonate and volcanic rocks. In these rocks, gold values are stratabound and are related to volcanic-carbonate rock interface or to end-cycles in carbonate rock.

Work done to-date by Lenora Exploration consists of line cutting, geophysical surveying, extensive stripping, rock trenching and channel-sampling followed by 3,722 feet of diamond drilling in eleven holes. Metallurgical research is also currently being done by the Ontario Research Foundation





G. J. Hinse

REGISTERED PROFESSIONAL ENGINEER
G. J. HINSE
PROVINCE OF ONTARIO

Scale: 1" = 1/2 Mile

Figure 1

LOCATION AND PROPERTY MAP

of

LENORA EXPLORATION LIMITED

McVITTIE TWP. ONTARIO

© J. HINSE, JUNE 1981

PROJECT 1022-3204/203

on the Omega concentrate tailings. These are estimated to total approximately 200,000 tons at a grade of more or less 0.10 ounce of gold per ton.

The writer is familiar with the property and the area, having performed and supervised exploration work in the region for the past several years. Furthermore, diamond drilling done recently by the Company was supervised by the writer. All the available records of the property were examined and reviewed. Additional information was also supplied by Mssrs. R. J. Kasner and G. Kasner of Lenora Exploration and their aid and cooperation is gratefully acknowledge.

The purpose of this report is to provide an independent assessment of the property, and, if appropriate, to recommend an exploratory program to further evaluate its potential.

Since the discovery of the Omega and Kerr Addison deposits, followed later by the discovery of the Barber Lake, the Cheminis, and the Upper Canada deposits, the Larder Lake "break" structure has been actively explored for gold and has been recognized as favorable in terms of potential for the occurrence of gold deposits. Within the Lenora property, the "break" is present. On one of the claim-group, the Omega, Omega Gold Mines produced 1,584,264 tons grading 0.158 ounce of gold per ton. On the Southwest group, work done to-date has outlined a gold-bearing zone in carbonate rock. The property covers several other targets which should be explored. The Lenora property is thus very well located and warrant careful exploratory attention.

LOCATION AND ACCESS

The Lenora property lies in the south-centre portion of McVittie township within the Larder Lake Mining Division. It is located approximately fifteen miles east of the Town of Kirkland Lake. The west portion of the property

is adjacent to the north limit of the Town of Larder Lake. The property is crossed by Highway 66 connecting Kirkland Lake to Noranda and is thus easily accessible through various service roads such as those to the Omega shaft and the Larder Lake station.

Power and infrastructure are available in the immediate area for mining purposes. The mining centres of Noranda to the east and Kirkland Lake to the west afford convenient major supplies centres.

The property, including approximately 634 acres is characterized by rounded outcrops interspersed with swampy or clayey flats. Outcrop are relatively abundant in the property area, covering approximately 10 to 20% of the area. Spruces and poplars are common in well-drained areas while low areas are covered with alders.

The area is topographically gentle, exhibiting a maximum local relief of about fifty feet. It drains into Larder Lake.

PROPERTY AND OWNERSHIP

The property held by Lenora Exploration Limited consists of 17 contiguous claims in two groups, the Omega and Southwest groups. Fourteen claims were acquired outright, two patented claims are held under option and one unpatented claim is subject to a 10% net profit interest. Sufficient work has been done to fullfil the assessment work requirements of 200 days per claim to bring them to lease.

The claims are held under the following numbers:

Omega Group

Claim Number	Acres	Staking Date	Remarks
L 313741	53.61	Jan. 15, 1972	Surveyed
L 313742	31.99	Jan. 15, 1972	Surveyed
L 313743	13.85	Jan. 15, 1971	Surveyed
L 313744	24.77	Jan. 15, 1972	Surveyed

Claim Number	Acres	Staking Date	Remarks
L 313745	51.20	Jan. 15, 1972	Surveyed
L 313746	24.49	Jan. 15, 1972	Surveyed
L 419096	57.17	Aug. 19, 1974	Surveyed
L 410317	40	Nov. 11, 1974	Unsurveyed

8 claims for 297.08 acres

The first seven claims are wholly owned by Lenora. They have been surveyed and a lease has been applied for. The last claim is not surveyed and is assumed to cover 40 acres. It was purchased by Lenora and is subject to a 10% net profit interest. Part of claim 410317 is covered by patented surface rights.

Southwest Group

Claim Number	Acres	Staking Date	Remarks
L 411208	40	Sept. 13, 1974	Unsurveyed
L 411209	40	Sept. 13, 1974	Unsurveyed
L 341811	40	Aug. 15, 1972	Unsurveyed
L 441494	40	Oct. 10, 1975	Unsurveyed
L 419377	40	Sept. 16, 1974	Unsurveyed
L 313769	40	Jan. 9, 1972	Unsurveyed
L 313770	40	Jan. 9, 1972	Unsurveyed
L 907	25.3		Patented
L 20399	31.7		Patented

9 claims for 337.0 acres.

The first seven claims were purchased outright and are estimated to cover 40 acres. They are currently being surveyed to bring them to lease. Patented surface rights cover three claims, L 313769, 313770 and 419377. The surface rights are not owned by Lenora. The last two claims are held

under option agreement requiring cash payments and work commitment of $75,000.00 over a period of three years. Any production is also subjected to a royalty of 70¢ per metric tonne.

HISTORY OF EXPLORATION, DEVELOPMENT AND PRODUCTION

The Larder Lake area was the scene of the first gold rush in the north-eastern part of Ontario. The discovery of rich silver ores at Cobalt in 1903 stimulated widespread prospecting, which extended farther and farther afield until August, 1906, a gold discovery was made by Dr. Reddick on ground now owned by Kerr-Addison Mines near the northeast arm of Larder Lake. News of the find caused a stampede of prospectors into the area during the autumn and winter of that year, and a large part of the country was indiscriminately staked. Development work on this ground during the following summer failed to uncover any important gold showings. The resulting disappointment of prospectors and investors gave the camp a serious set-back for many years.

Much of the early work was done on stockworks of gold-bearing quartz veins and stringers in rusty-weathering carbonate rock, locally called"dolomite". Extensive exposures of these intersecting veins were uncovered, but it was found that values were erratically distributed and confined to areas of visible gold in the quartz. Exploratory operations were carried on sporadically over a period of several years on the Reddick, Kerr-Addison, and Harris-Maxwell properties. At the Reddick property about 100 tons of ore was run through a 20-stamp mill in 1908, and a small production recorded. In 1914 Associated Goldfields, Limited, purchased the Reddick and Kerr-Addison claims and did a considerable amount of underground work and surface drilling. Underground operations were also carried on at the Harris-Maxwell property (now owned by Sudbury Contact), and a small amount of gold was recovered from a 40-stamp mill in 1912 and 1913.

Parts of the present Omega ground were staked and prospected but nothing of importance was discovered until 1914. In that year Jack Costello found gold on claim L-1794 in the surface outcrop of what is now known as the No. 1 ore zone. The discovery was described as a "rusty reddish schist and quartz" and is said to have assayed $5.00 across several feet.

After the war, Costello began development on his claim and in 1920 and 1921 the adjoining claims to the east were staked by the Crown Reserve Mining Company Limited. Deep trenching and diamond drilling located the extension of the Costello vein on the Crown Reserve property, and in the fall of 1921 underground exploration was inaugurated. The Costello claim was sold to Canadian Associated Goldfields Limited for $6,000.00 and their underground exploration was carried on at the same time.

Two vertical three-compartment shafts were sunk, 360 feet apart, both shafts being located in or near the footwall of the orebody. The Goldfields shaft was eventually put down 1,000 feet, with levels as 110, 235, 360, 500, 750 and 1,000 feet. The Crown Reserve shaft went to 1,175 feet with levels at 170, 300, 425, 550, 675, 800, 925, 1,050, and 1,175 feet. Early development outlined ore shoots, mainly on the No. 1 zone along the graphite fault, although some values were found in veins 2 and 3 on the Crown Reserve (reorganized in 1926 as the Crown Reserve Consolidated). A mill (reported at 200 tons) was constructed by Associated Goldfields during 1926, and between April 1927 and March 1928 treated 22,585 tons for a recovery of $52,295.00. It was then shut down. Crown Reserve operations were discontinued in May 1929 and, subsequently, both properties went into bankruptcy. In March 1929 Crown Reserve ore reserves were reported to be 200,000 tons of .25 ounces, above the 500 foot level.

In May 1934 the Larder Lake claims of Crown Reserve and the adjacent Costello property of Associated Goldfields were merged in a new company known as Canadian Reserve Mines Limited. The old Crown Reserve Consolidated, which was adjudged bankrupt in 1931, was taken out of the custodians' hands by payment of all debts by Canadian Reserve. The Goldfields Creditors Syndicate, which had taken over the Associated Goldfields property in 1928, turned it over to Proprietary Mines Limited. In

June 1934 Proprietary sold the Costello property to Canadian Reserve for a reported 2,000,000 shares of the new company. Canadian Reserve was capitalized at 5,000,000 shares and owned the old Associated mill and power development plants as well as the two properties. After the reorganization in May 1934, the combined properties were sampled by Noranda Mines Limited

In 1935 Castle Thretheway Mines Limited agreed to form the Omega Gold Mines, Limited and put it on an operating basis at 300 tons per day. The milling rate was gradually increased to about 500 tons daily.

In April 1936, Kerr-Addison Gold Mines, Limited, acquired from Proprietary Mines, Limited, the old Kerr-Addison and Reddick properties. Exploration in the immediate vicinity of the old workings indicated a large tonnage of ore. The mine began production in May, 1938, at the initial rate of from 500 to 600 tons daily, but this was increased until, in the latter part of 1941, about 2,100 tons were treated daily.

The resumption of mining operations at the Omega Mine combined with the important ore discoveries at the Kerr-Addison mine caused a renewal of exploration throughout the Larder Lake area. In 1937 drilling indicated an ore body on the Chesterville claim adjoining the Kerr-Addison mine. After underground development had checked these indications a 500-ton mill was constructed and began production in the summer of 1939. In 1940 the mill capacity was increased to 700 tons daily. Underground operations have also been carried on at the Barber-Larder, Cheminis, Fernland, Raven River, Laguerre, and Kir-Vit properties. In addition, a large amount of surface work and drilling has been done by several companies including Sheldon-Larder, Arjon, Proprietary, Pelangio-Larder, Wesley, Armistice, Lar-Add, Sarcee, Thib, McVittie Kirkland, and others.

Production at Omega Gold Mines ceased on May 10, 1947 and the mill closed on July 12 of the same year. Mentions are made of low grade reserves in the deeper portions of the mine, but it appears that the loss in premium on the Canadian dollar in 1946 made these reserves uneconomical.

Total production amounted to 1,584,264 tons grading 0.158 ounce of gold per ton. During the last years of operation, Omega did surface prospecting and diamond drilling. To 1944, a total of 37 surface holes had been drilled.

In 1950 Omega was reorganized into Lomega Gold Mines on a one-for-three basis. A deep hole was done to test the ore zone at depth. This hole was drilled to a depth of 2,347 feet and is reported to have intersected a characteristic graphitic section. No assays and no further work was reported.

In 1962, it was known as the Larcon property.

In 1975 part of the Southwest group was held by Grasset Lake Mines Limited. Six holes were drilled to test a surface discovery by Davy Lowe, what is now known as the Main showing of the Southwest group. These claims and the Omega claims were subsequently acquired by Mr. R.J. Kasner who eventually incorporated Lenora Exploration Limited to develop the property.

GEOLOGY

All the rocks found on the property are Precambrian in age and belong to the Superior Province of the Canadian Shield.

The older rocks consist of tholeiitic and komatiitic volcanic flows and associated clastics belonging to the Larder Lake group; interlayered and overlain by chemogenic carbonate rock and clastic carbonate sedimentary rock of the Kerr group; in turn overlain by a contemporaneous high energy sedimentary event, the Barber Lake group. Of unknown relationship to the above, the south portion of the Southwest group is underlain by greywacke and conglomerate of unknown relationship to the older rocks. What appears to be the basal unit of this conglomerate contains a high

percentage of iron formation clasts. In the northeast corner of the Omega group, some trachyte belonging to the Temiscaming group is exposed.

All the above rocks are intruded by lamprophyre, acid and "syenitic" dikes related to an intrusive event now inferred as a collapsed dome, the Pancake Bay intrusive dome. It is suggested that the lamprophyres are more or less restricted to the ultramafics and the majority of the acid and "syenitic" dikes appears to be concentrated at the contact of the ultramafics and the sedimentary rocks underlying the carbonate rocks and those overlying the Larder Lake and Kerr groups.

As was previously mentioned, the property lies along a major "break" structure and the rocks are thus heavily faulted and folded. The "break" can be best defined as a suite of strike and thrust faults occurring in a series of rock deposited in a shallow marine environment at the interface of an older volcanic centre to the south and a younger one to the north, such that the older volcanic flows are interlayered with marine sedimentary rocks. The collapse of the older volcanic centre and the emergence of a new volcanic centre in the high-energy sedimentary basin to the north caused folding of the basin and the occurrence of several normal faults. On some of these faults, later tectonic forces caused a reversal of displacement. The major thrust faults are those found at the contacts between rock groups such as the Kerr-Barber Lake contact, the Barber Lake-Temiscaming contact and the contact between the Larder Lake group and the iron-formation conglomerate. Essentially, in the area, horsts of older rocks are exposed between grabens of younger rocks.

There are several cross faults on the property. They can be classed in two categories. The first one, the oldest cross faults are more or less restricted to the Larder Lake and Kerr groups while the second one, the youngest are linear and extend across all the groups.

On the Omega group, the rocks of the Larder Lake "break" face north and are overturned at 60° to the south. In the mine workings, this dip is

Table 1. TABLE OF FORMATIONS

LATE-MIDDLE ARCHEAN

Intrusive Contact

"Syenite" and border facies brown dikes

Intrusive Contact

Temiscaming Group

Greywacke, conglomerate

Trachyte and associated clastics

Intrusive Contact

Quartz and/or feldspar prophyries, "syenite"

Intrusive Contact

Blake River Group

Calc-alkaline volcanic rocks

Unconformity

Unnamed Group

Greywack, conglomerate

Unconformity

Barber Lake Group

Calcarenite, stretched-pebbles conglomerate

Green carbonate-pebbles conglomerate

Conformable contact - local unconformity

Kerr Group

Carbonate, chert, feldspar, pyrite

Mudstone, carbonate rocks

Mass-flow carbonate tuff

Conglomerate

Virginiatown Group

Basalt, massive, pillowed and associated clastics

Ultramafite, poly-sutured, spinifex texture, and associated clastics

shown to flatten to 45° south near the 1500'-level. Along strike to the west, a fold develops in the Larder Lake group so that the Main showing area of the Southwest group faces to the south and dip 50 to 60° to the south. South of the Omega group, the axis of the fold is not readily recognizable and it has possibly been destroyed by the intrusive activity of the Pancake Bay intrusive dome.

On the Southwest group, the north limb of the syncline, the Omega mine horizon lies near the north boundary of the claim- group.

ECONOMIC GEOLOGY

General Statement

In general, gold values found along the Kirkland Lake-Larder Lake "break" structure in the area extending from Virginiatown to Upper Canada are stratabound and located at volcanic-carbonate interfaces or at what is defined as an end-cycle in the carbonate rock. The interface which represents within the volcanic sequence periods of basinal accumulation of gold values are intercalated pyritic, carbonate and tuffaceous sedimentary units characterized by a basal conglomerate and units rich in graphite, mudstone and carbonate. Within the carbonate, gold values are related to end-cycles. These cycles are characterized by an increase in plagioclase, pyrite and chert. Later deformation and metamorphism could well result in the redistribution of the contained gold into configurations such as quartz stockworks such as found at the Kerr Addison mine. Locally this type of gold zone is called "carbonate ore" while the pyritic mudstone interface is called flow ore.

Gold values are basinal accumulations in a shallow marine environment so that conglomerates are found in channels and in the shoreward portion of the paleobasin.

Paleobasinal accumulations of gold are intercalated within and overlies the

Larder Lake group. The activity of the old volcanic centre to the south was decreasing with time so that longer periods of accumulation were possible, thus in general, gold values would increase with stratigraphy.

Omega Gold Mines, Limited

Omega Gold Mines produced on ground which is now the Omega group 1,584,264 tons grading 0.158 ounce of gold per ton. The ore was won from a dacite unit largely altered to quartz, albite, sericite and carbonate. In places, the veins are described as consisting of introduced material, quartz, chert, iron sulphides, albite and carbonate. As described previously the ore is quite similar to those in the area. The history of the mine shows that it was largely a marginal operation. Undoubtedly there remains an unknown quantity of low grade material in the walls of the mined out ore zones as the ore was outlined in the work place with assay walls. There are no records to indicate the extent and grade of the material left in place. At this time, this can only be a matter of speculation.

On September 27, 1946, the Northern Miner reports that:

> "Omega Gold Mines is methodically prosecuting a thorough geological examination of the mine workings in order to exhaust all possible ore chances before a decision has to be made to close down the operation. The program has been meeting with modest amount of success. The Northern Miner found on visiting the property last week, and as a result ore reserves have been maintained in the four months since the fiscal year end on March 31st when reserves were calculated at 195,867 tons averaging 0.147 oz. ($5.14) per ton, sufficient for about 15 months' supply at the present rate.
>
> One of the spots that has shown some promise is a big, low grade flow-type mass, lying off to the south of the mine workings. When first investigated some time ago, it was figured to carry around 300 tons per vertical foot. Now, deeper work on the 900-ft. level has doubled that estimate and found a couple of other subsidiary occurrences. Grade is calculated at a sub-ore figure of 0.10 oz. per ton but it might be running a little better than that since this source is supplying about 15% of current mill feed and the mill heads haven't suffered any.

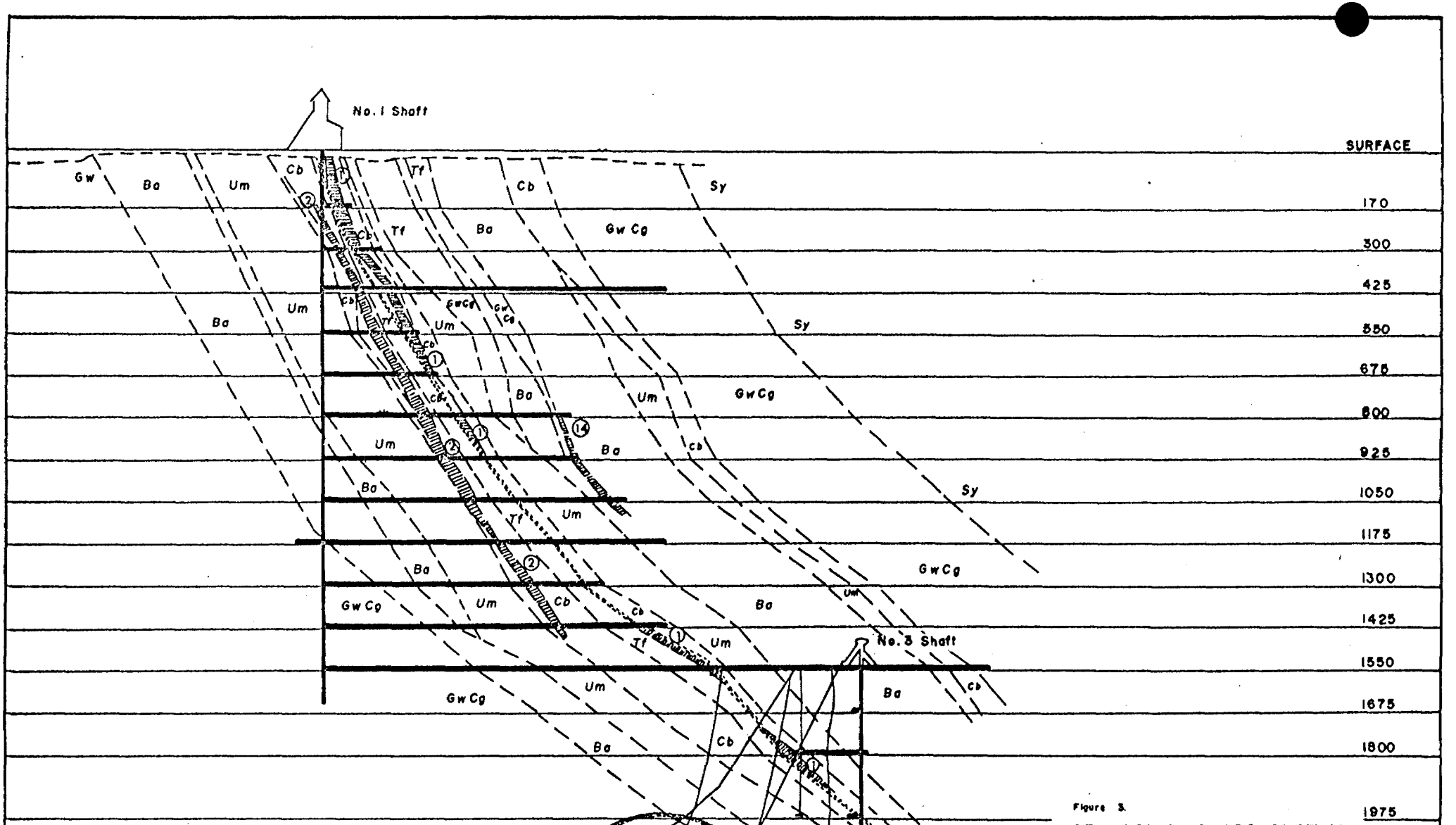


Figure 3.

GEOLOGICAL CROSS-SECTION
THROUGH NO. 1 and 3 SHAFTS
of
OMEGA GOLD MINES LIMITED
for
LENORA EXPLORATION LIMITED
MCVITTIE TOWNSHIP ONTARIO
SCALE: 1"= 400' APRIL 1981

Copied from mine records

G.J. HINSE, JUNE 1981

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> Actually, grade to the mill is running 0.13 oz. per ton which is just about what the ore reserves say they should be. But last year when this extra low grade stuff wasn't being handled mill heads were running somewhat below the reserve estimate so it could be that the carbonate ore is not quite as low grade as it seems. Nevertheless, accepting the calculated 0.10 oz. grade the management would be prepared to class the stuff as ore on a milling rate of 1,000 tons daily, or with an improvement of only 2/100ths of an ounce in grade it could be called ore on the basis of present mill capacity. The stope mines a width of 50 to 60 ft. and the similarity to the flow-type ores at Kerr-Addison suggest that a small increase in grade may easily happen."

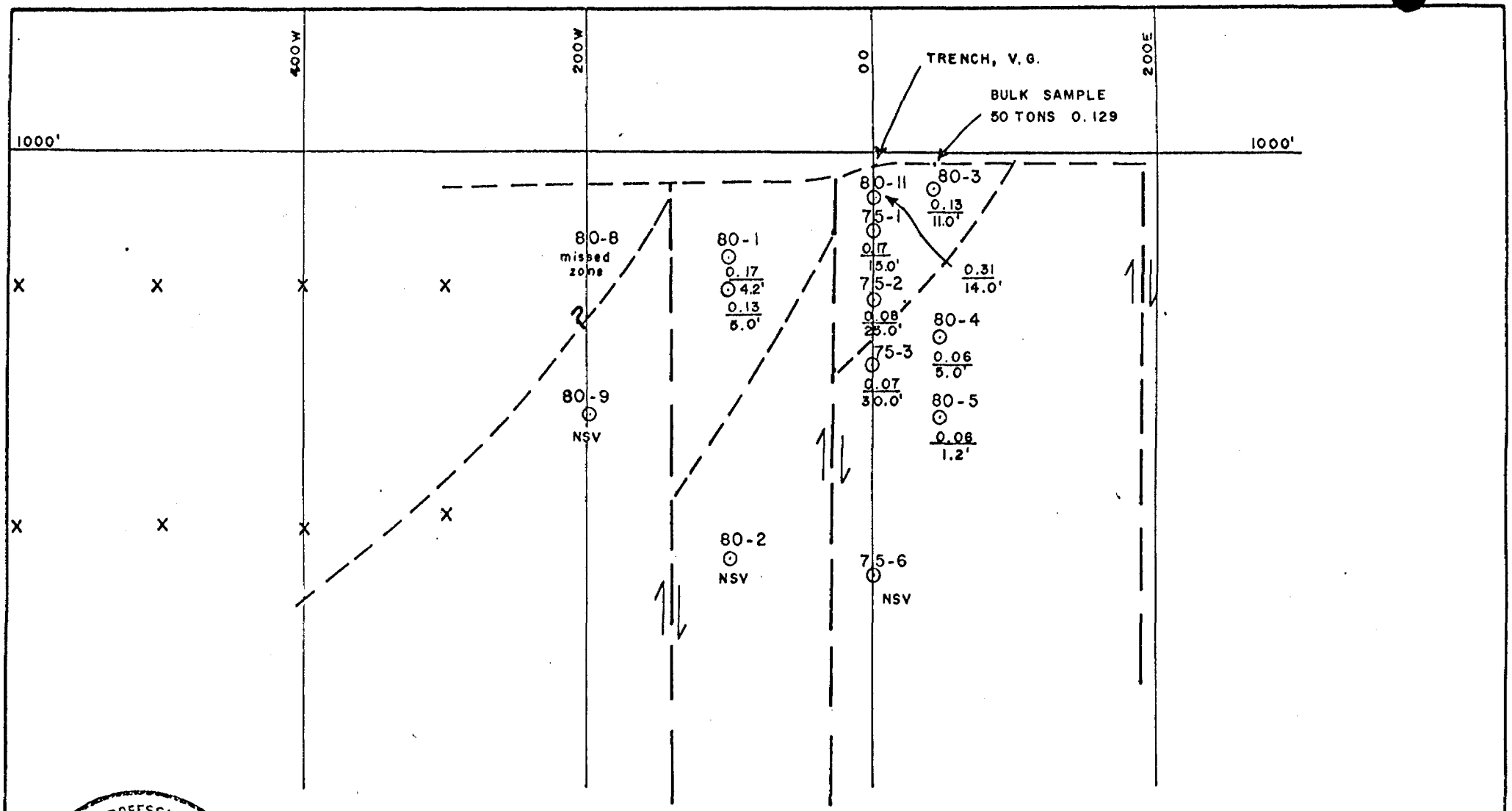
On November 27, 1947, the Northern Miner quotes the miner manager:

> "...in the year ending March 31, 1947, the company treated 101,986 tons at a grade of 0.126, again considerably lower than the previous ore reserve estimate. The main producer, the No. 1 vein, provided 38% of the production, with 28% from above the 170-ft. level. The No. 14 vein gave 13% of the production but proved very disappointing as to grade.
>
> Work was concentrated during the year on the larger and better grade stopes in the mine, most of which were mined out during year year. Tonnage and grade were approximately the same as in the preceeding year.
>
> The manager says that owing to the rising costs of mining and the parity loss the remnants of the previously estimated reserves can no longer be considered as ore."

On February 10, 1949, it is stated in the Northern Miner that estimated reserves at time of closure were 50,000 tons grading 0.14 ounce of gold per ton.

During the last few years, the operations were marginal and in 1946, the loss in premium on the Canadian dollar sufficed to make the operation unprofitable. A grade of 0.10 as reported in the new zone could not be mined at profit.

As can be seen on Figure 3. the thickness of the ore horizon decreases at depth. In the concept outlined in the preceeding paragraph that gold was deposited in paleobasin in a shallow marine environment, it is suggested that at depth, the disappearance of the ore is related to the outlying edge



LEGEND

80-1	HOLE NUMBER
0.17 / 4.2'	OZ. OF GOLD/TON / CORE LENGTH
———	FAULT
X	PROPOSED HOLE
– – –	ASSUMED ORE OUTLINE

REGISTERED PROFESSIONAL ENGINEER
G. J. HINSE
PROVINCE OF ONTARIO

G. J. HINSE, JUNE 1981

Figure 5.

LONGITUDINAL SECTION
of the
SOUTHWEST GROUP MAIN SHOWING
for
LENORA EXPLORATION LIMITED

MCVITTIE TOWNSHIP ONTARIO
SCALE: 1" = 100' JUNE 1981

PROJECT 1022-8204/203

of the basin so that in the immediate vicinity of the deeper levels, the chances of finding additional ore appear slim.

This is more or less confirmed by the deep drilling done by Lomega.

Taking the concept further, Figure 4. shows that as gold values were deposited, the basin was tilting slowly to the east and southward, so that from surface to depth, there is a gradual movement of the ore to the east and a decrease of values at depth. Furthermore, it indicates that there could be another basin at depth, but more to the east below the No. 17 zone. In due course, considerations should be given to test the ore horizon at depth in this area.

Zone No. 17

This zone, No. 17, is located some 1,450 feet east of the shaft. It consists of a gold-bearing quartz stockwork in green carbonate. The zone was mined on the 300 and 400'-level. Values are found in parallel and interlocking quartz stringers containing some sulfides. Visible gold occurs in the quartz and along the quartz-schist contacts. To March 31, 1943, mining of this zone amounted to 8,982 tons grading .204 ounce of gold per ton out of reserves estimated at 10,000 tons grading 0.179 ounce per ton. The ore horizon extends from this zone to the east boundary and surface drilling done in 1943 to the east of the mine workings is described as follows by J.W. Baker in mine correspondence:

> "In the core of some surface holes drilled recently on Omega ground to the east of the mine workings, widths up to 200' of carbonate zone are indicated. While the total width is not all green carbonate some fair sections of typical green carbonate were observed. The Omega does not assay the drill core unless the sludge, which they run for each 5' section, assays. If the sludge runs ore values, the core for that section is split and assayed. In the writer's opinion, this method is not accurate enough, particularly in the case of free gold carbonate ore."

The writer concur with the above observations that the core should be analysed. As the gold values in carbonate are related to the contact area of the quartz with the enclosing carbonate, the absence or presence of values is of lesser importance than the amount of quartz veining. There is on the Omega group 700 to 800 feet of strike length between the No. 17 zone and the east boundary which should be checked further with diamond drilling at 50'-centre in the vicinity of the No. 17 mine workings. The spacing can be increased towards the east to the boundary. At least 10 holes of 500 feet each are required here to test the horizon at more or less 300 feet below surface.

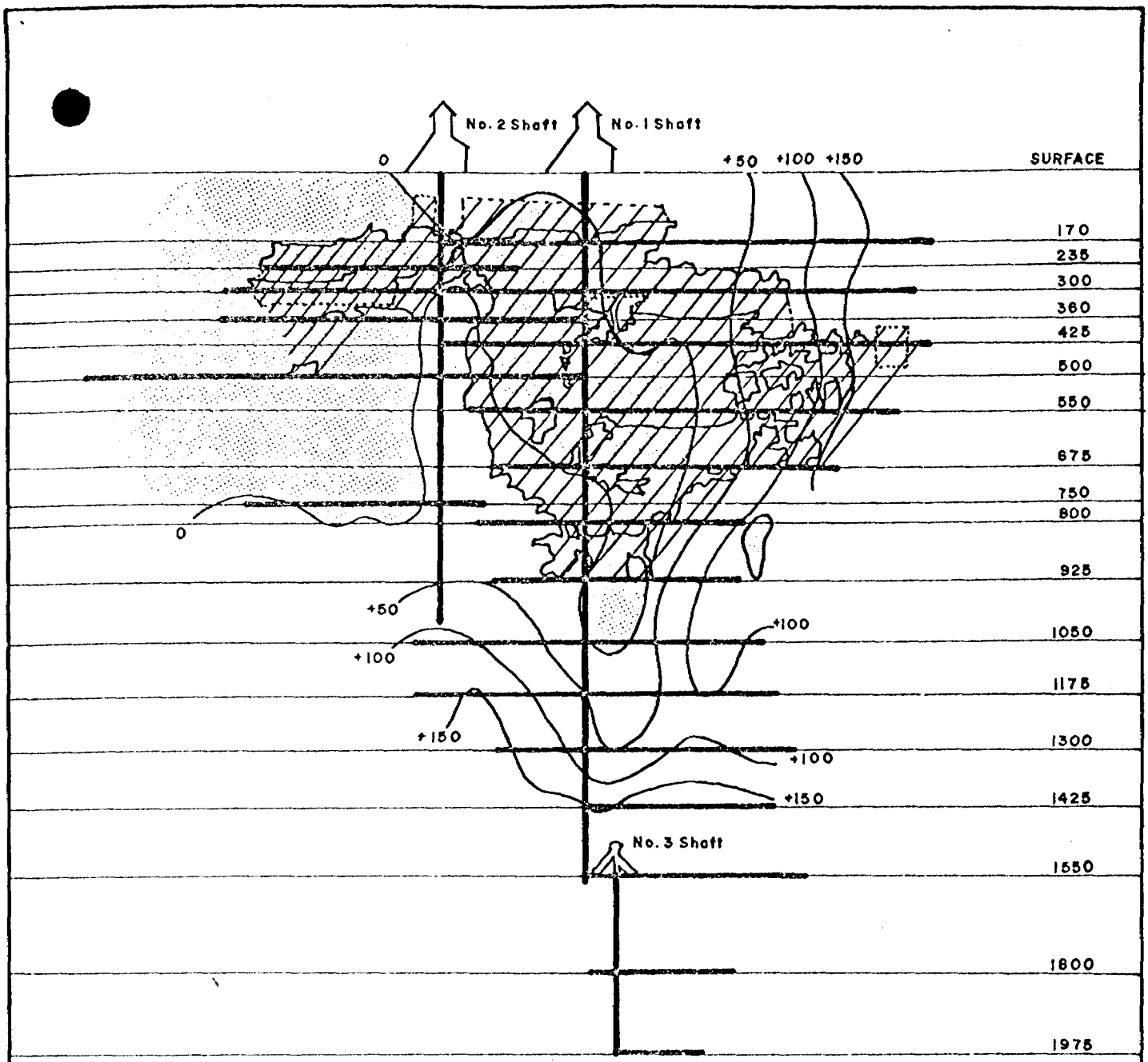
Claim L 410317

This claim has recently been acquired by Lenora Exploration. On this claim, a quartz stockwork in green carbonate is described in a report dated Sept. 20, 1962 on the Larcon property by G.L. Holbrooke:

> "A third S 55° W striking shear zone branches from the Larder Lake "break" at the west end of the Fernland property about 800 feet east of the Larcon boundary. The southwestern projection of this zone crosses the southeastern section of the Larcon ground on claims 76029 and 76024. For most of this length it is indicated as being masked or obliterated by the large irregular syenite intrusion in this area. However, in the south-central part of claim 76024 the zone crosses sediments for some 400 feet before re-entering the syenite. This area of re-entry into the syenite is the site of a body of green dolomite cut by a stockwork of quartz veinlets on which a number of very old and deep pits have been sunk. One grab sample of this quartz and carbonate assayed 0.60 oz. gold per ton."

(Claim 76024 is now 410317)

The presence of mineralized carbonate at this location, in an area of shoreward conglomerate is intriguing and may represent a folded or faulted slice of the paleobasin.



REGISTERED PROFESSIONAL ENGINEER
G. J. HINSE
PROVINCE OF ONTARIO

G. J. Hinse

G. J. HINSE, JUNE 1981

LEGEND

ORE

DENOTES A DEPRESSION

DENOTES ELEVATION OR RIDGE

Copied from mine records dated 1943

Figure 4.

INCLINED LONGITUDINAL SECTION

of the

OMEGA GOLD MINE LIMITED

SHOWING THE RELATION BETWEEN

THE NO.1 ORE ZONE TO THE MAIN FAULT

for

LENORA EXPLORATION LIMITED

MCVITTIE TOWNSHIP ONTARIO

SCALE: 1"= 400' JUNE 1981

PROJECT 1022-3204/203

At this time, there is very little information available on this showing and its attitude and structural control are speculative. However, the occurrence is very interesting and definetely warrants further work. This work should initially consist of surface work such as cleaning the old trenches, stripping and trenching to be followed by diamond drilling.

Southwest Group Main Showing

This showing located on claim L 341811 was discovered by Davy Lowe in 1973. It was later, optioned to Grasset Lake Mines who did a limited amount of surface work followed by 1,091 feet of diamond drilling in six holes. The property was subsequently acquired by R.J. Kasner and lately by Lenora Exploration. Extensive surface work was done last year and early this year in the Main showing area. This work included eleven drill holes for 3,722 feet.

The showing consists of visible gold in chert and quartz veining and in places, of gold values associated with sulfide mineralization. The zone occurs in carbonate rock and dips 50-60° to the south. In the showing area, stratigraphic tops by grain gradation face to the south. The zone is located along the south limb of an anticline. This structure has its axis near the north boundary of the Southwest group. It is suggested that the axis plunges to the west. Essentially, the south limb of the anticline is correlating with the Omega ore horizon and is thus a prime exploration target.

There are several faults in the showing area and the overall structural pattern is complex and not fully understood. Of importance here are the cross faults which control a pattern of block faulting found where the formation turns from east-west to north-south in the showing area. Displacement along these faults is mainly vertical and in a few cases, horizontal. The vertical displacement is usually the west side up. As suggested on Figure 5. showing the relation of the gold values to the cross faults, the horizon plunges more or less at 60° to the west.

Figure 5., a longitudinal section of the Main showing area shows the results obtained to-date. The gold-bearing zone is interpreted as plunging to the west, more or less parallel to the plunge of the fold axis to the north. In this interpretation, displacement on the cross faults is assumed to be the west side up. This is supported by the large exposure of shoreward conglomerate found to the southeast. Furthermore, plunge in the area is to the west towards the Misema river which more or less lies along a north-south synclinal axis.

During this winter, a 50-ton bulk sample was shipped to the Noranda smelter to check the results of surface channel-sampling. In this case the bulk sample was blasted out of a trench which returned 0.15 ounce of gold across 20.0 feet compared to 0.127 ounce of gold obtained in the bulk sample. Considering a certain dilution added to the bulk sample, the results of the channel-sampling done by the Lenora Exploration crew are very reliable.

Of course, the work done to-date was of a preliminary nature, serving mainly to define the type, attitude and structural control of the gold mineralization. However, this work has provided sufficient information to envisage a continuity of the gold-bearing zone along its strike to the west.

Undoubtedly, the Main showing constitutes a prime exploration target where the chances of finding economically important gold concentrations are considered excellent. Diamond drilling on sections 100 feet apart should be resumed to outline the gold-bearing zone further to the west. At this time, at least four sections should be tested for a total of 3,600 feet of diamond drilling.

Tailings

Records indicate that Omega Gold Mines milled 1,584,264 tons at a grade of 0.158 ounce per ton. A high gold recovery was difficult to attain and the

sulfides in the ore were recovered in a flotation concentrate which was ground to 93% minus 325 mesh and treated by conventional cyanidation to recover the gold. A certain part of the gold in the sulfide concentrate was locked in the sulfide so that it was not recoverable. The treated sulfide concentrate was then discarded and stored in a separate tailing pond, thus the concentrates are still intact and accessible.

Kerr Addison secured an option on these tailings from the Ontario Ministry of Natural Resources in 1977. The first tests carried out on a 500 lb-sample grading more or less 0.10 ounce of gold per ton were disappointing due to the fact that the concentrate could not be roasted due to their fine grinding and conventional 48 hour cyanidation and longer contact time returned only a 20% recovery.

The rights to the sulfide tailings are now held by Lenora Exploration. Further tests have been carried out since last year by the Ontario Research Foundation to improve the recovery of the gold in the tailings. Results are encouraging and further work is needed.

GEOPHYSICAL WORK

General Statement

Both groups were covered with a line grid, the Omega group at 400'-centre and the Southwest group at 200'-centre. Detailed lines were also cut on the latter group in an east-west direction in the Main showing area. The grids were covered with geophysics, this includes complete coverage with magnetic and V.L.F. electromagnetic surveys and local coverage with Maxmin electromagnetic and induced polarization surveys. This work outlined several anomalies warranting further work. Initially and where the anomalies occur in outcrop areas, surface work should be done to test the anomalies. This work should be followed by diamond drilling in deep overburden areas at a later date.

Omega Group

Essentially on this group, most of the anomalies can be grouped into three main east-west striking trends: (1) located close to the base line; (2) at 600 to 700 feet north of the base line; and (3) at more or less 1,200 feet north of the base line. The first two trends are coincident with geological contacts which could be mineralized while the most northerly is coincident with the No. 17 ore zone horizon. On this group, the trends are defined by induced polarization and locally by Maximum anomalies. The former offers wide target definitions. In the case of the No. 17 horizon, work will be done as outlined previously so that the geophysical definition of the horizon is not too important, but in the southerly trends, an effort should be made to relate the geophysical response to a better understanding of the underlying geology. Undoubtedly, the anomalies are well located in respect to geology and thus certainly warrants further work. In the case of the most southerly trend, it lies close to the highway and special attention should be paid to man-made sources. The two southerly anomalous trends lies in areas of overburden and decisions as to the type of work to be done should await the results of the geological work.

A V.L.F. anomaly lying south of the highway, striking NS between lines 8 and 12E , is inferred as being caused by an edge effect of the overburden. No work is needed here.

Southwest Group

On this group, there are five main anomalous trends, These are located as follows: (1) more or less parallel to the highway near base line 200W; (2) at 1300 N on lines 4 and 6W; (3) from lines 4W to 22W, from 200N to 900N; (4) a north-south trends in the vicinity of base line 18W; and (5) at 1700S on line 20W.

The first anomaly, a north-south striking trend of several V.L.F. anomalies of medium strength is found near the highway and the Larder Lake station road. This trend is interpreted as being caused by man-made conductors.

The second anomaly, located at 1300 N on lines 4 and 6W is the surface expression of two "Input" conductors found in this area. The anomaly consists of coincident E-W and N-S V.L.F. response of medium strength. It lies close to the projection of a fault found in tuffaceous meta-sedimentary rock. The anomaly is inferred as to being caused by graphite, but this type of mineralization is important as gold values are usually related to graphite-rich horizon. If the anomaly cannot be explained by surface work, drilling is warranted.

The third anomaly, located to the north of the base line at more or less 500N has locally coincident induced polarization response. This anomaly is long and linear and lies over an ultramafic horizon in deep overburden. The anomaly is inferred to be caused partly by edge-effects, the ultramafic and shearing in the ultramafic. No work is warranted on this anomaly.

The fourth anomalous trend strikes north-south in the area of line 20W. This area is characterized by several poorly defined Maxmin and induced polarization conductors which suggest possibly poor coupling. The anomalous trend lies in an outcrop area of conglomerate and surface work should be done to investigate the anomaly. This work should consist of geology, stripping, trenching and possibly, if warranted, detailed geophysics along E-W striking lines.

The fifth anomaly is a weak V.L.F. response which is the surface expression of two "Input" conductors. The anomaly lies along a fault inferred from the V.L.F. results and projected from the east. The anomaly lies in an outcrop area and should be checked together with the above anomaly.

Although at this time, surface work appears to be the best approach to test the conductors, some of them present enough interesting characteristics to plan for later diamond drilling. It is suggested that a total of 2,000 feet of diamond drilling will be required.

PROPOSED WORK PROGRAM

General Statement

As discussed, theoritical considerations of the data available on the Lenora property has indicated several possibilities to exist for the occurrence of gold in economic proportions. An evaluation program will be hereby developed to test the priorities identified in the previous section. A program of geological mapping with provisions of surface work and test drilling is undoubtedly the most desirable approach. While continued drilling of the Southwest group Main showing area should be emphasized, surface work testing of claim 410317 and the geophysical anomalies, and diamond drilling of the No. 17 zone along strike to the east should not be neglected.

Of lower priorities, considerations should be given to establish the grade of the enclosing walls of the stoped out areas. These areas could in certain cases supply a certain amount of low grade material. At this point, this is only a speculation until further studies are done. It is further suggested that in due course, the lower area of the No. 17 zone be tested with drilling.

Specifically, it is suggested that (1) the property be covered with geological mapping; (2) that the No. 17 ore horizon be tested in details with diamond drilling to determine the possibilities of defining a large low grade gold deposit in this area; (3) that the gold values reported on claim 410317 be located and followed up with surface prospecting and diamond drilling; (4) that sectional diamond drilling be done to follow up the Southwest group Main showing along strike to the west and; (5) that the most interesting geophysical anomalies be followed up with surface work and diamond drilling. It will be recognized that the program is of fundamental importance and, will require a flexible approach.

Accordingly, it is not possible at this time to be specific about some of the drilling locations such as on claim 410317 and on the geophysical anomalies.

Estimated Costs

The following cost estimates are developed for the suggested proposed work program to be completed on the Lenora property. No provision is made for the detailed evaluation of new prospects that may be located in the course of this work, nor for a deep test of the No. 17 ore zone area. The work outlined hereinafter is considered a minimum requirement.

A. Geological Mapping:

Mapping, structural analysis	$10,000.00
Geochemical analysis, assaying	1,000.00
Compilation, report preparation	3,000.00

B. Claim 410317:

Mapping, trenching	10,000.00
Drilling, 2,000 ft. @ $20/ft.	40,000.00
Assaying	2,000.00
Supervision	5,000.00

C. No. 17 Ore Zone Area:

Drilling, 5,000 ft. @ $20/ft.	100,000.00
Assaying	5,000.00
Supervision	15,000.00

D. Southwest Zone Main Showing:

Drilling, 3,600 ft @ $20/ft.	72,000.00
Assaying	4,000.00
Supervision	10,000.00

E. Evaluation of Geophysical Anomalies:	
Trenching, stripping	10,000.00
Drilling, 2,000 ft. @ $20/ft.	40,000.00
Supervision	5,000.00
F. Metallurgical Research	50,000.00
G. General Items:	
General Supervision	50,000.00
Consulting Services	10,000.00
Sub-total	$442,000.00
Contingencies @ 10%	45,000.00
Total Estimated Cost	$487,000.00

CONCLUSIONS

1. The Lenora property includes 17 claims covering more or less an area of 634 acres, located in McVittie township, Northeastern Ontario. The property is well located in terms of accessibility, and favorable for the occurrence of economically significant concentrations of gold.

2. The property is held by Lenora Exploration Limited. Ownership is secure, and as represented.

3. The Lenora property includes a past producer, the Omega Gold Mines, Limited which from Feb. 1936 to March 1947 produced 1,584,264 tons grading 0.158 ounce of gold per ton. The property also includes several gold occurrences. The most promising is the Southwest group Main showing which is related stratigraphically to the Omega mine horizon.

4. The Lenora property is underlain by the Larder Lake "break" structure, a regional structure favorable for gold occurrence. It is a prime exploration target for gold concentrations of paleobasinal origin, and warrants thorough evaluation.

5. The Main showing of the Southwest group is the most promising exploration area at this time. Further diamond drilling is proposed for a continued evaluation. Such a program is fully justified, and urgently required.

6. Within the Omega mine area, it is suggested that the most easterly portion of the ore horizon was not fully explored. It requires further evaluation.

7. Further work is required to explore a zone of green carbonate where gold values have been reported.

8. Several geophysical anomalies have been outlined by Lenora. Some are more than sufficiently interesting to warrant further work.

9. Metallurgical research is currently in progress on the recovery of gold from the Omega flotation tailings. This work should be continued.

10. A program for the further evaluation of the Lenora property has been proposed. The cost of this program is estimated at $487,000.00.

RECOMMENDATIONS

The Lenora property constitutes a large area, favorable situated for the occurrence of gold deposits. The concept of basinal accumulation of gold in metasedimentary environments, either within a primarily volcanic system or at a major sedimentary-volcanic interface, appears effective in the area. Its application will aid in the exploration of the property.

The exploration program as suggested is highly recommended. The property has been demonstrated as an attractive environment for gold occurrences, and is of the highest exploration priority.

The basic exploration program proposed herein is estimated to involve the expenditure of $487,000.00. The implementation of this program is highly recommended.

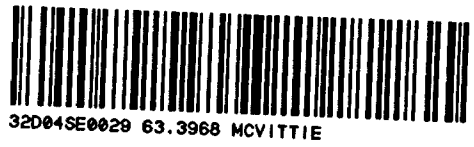
Respectfully submitted,

G. J. Hinse

G.J. Hinse, P.Eng.

Sudbury, Ontario
June 12, 1981

REGISTERED PROFESSIONAL ENGINEER
G. J. HINSE
PROVINCE OF ONTARIO



A REPORT ON A V.L.F. ELECTROMAGNETIC SURVEY ON THE SOUTHWEST GROUP OF LENORA EXPLORATION LIMITED

Sudbury, Ontario
September 1, 1981

G.J. Hinse, P.Eng.

A REPORT ON A V.L.F. ELECTROMAGNETIC SURVEY ON THE SOUTHWEST GROUP OF LENORA EXPLORATION LIMITED

INTRODUCTION

This report has prepared at the request of Lenora Exploration and it summarizes the methods and results of a V.L.F. electromagnetic survey done on their Southwest group of claims, located in McVittie township, Larder Lake Mining Area.

The Southwest group consists of 9 contiguous claims covering approximately 337.0 acres. They are numbered L 411208, L 411209, L 341811, L 441494, L 419377, L 313769, L 313770, L 907 and L 20399.

LOCATION AND ACCESS

The property lies in the southwest portion of McVittie township. It is located approximately fifteen miles east of the Town of Kirkland Lake. It is adjacent to the north limit of the Town of Larder Lake. The property is crossed by Highway 66 connecting Kirkland Lake to Noranda and is thus easily accessible through various roads such as those to the Larder Lake Station.

PREVIOUS WORK

The property was part of the holdings of Omega Gold Mines who did surface work and diamond drilling. The results of this work are not known. In 1950 Omega was reorganized into Lomega Gold Mines and little work of consequence appears to have been done on the property by that

Company. Later in 1962, the claims were part of the Larcon property, but no work was done.

In 1975 part of this group was held by Grasset Lake Mines Limited. Six holes were drilled to test a surface discovery by Davy Low, what is now known as the Main showing of the Southwest group. These claims were subsequently acquired by Mr. R.J. Kasner who eventually incorporated Lenora Exploration to develop the property.

GEOLOGY

All the rocks found on the property are Precambrian in age and belong to the Superior Province of the Canadian Shield.

The older rocks consist of tholeiitic and komatiitic volcanic flows and associated clastics belonging to the Larder Lake group; interlayered and overlain by chemogenic carbonate rock and clastic carbonate sedimentary rock of the Kerr group; in turn overlain by a contemporaneous high energy sedimentary event, the Barber Lake group. Of unknown relationship to the above, the south portion of the property is underlain by greywacke and conglomerate of unknown relationship to the older rocks. What appears to be the basal unit of this conglomerate contains a high percentage of iron formation clasts.

All the above rocks are intruded by lamprophyre, acid and "syenitic" dikes. It is suggested that the lamprophyres are more or less restricted to the ultramafics and the majority of the acid and "syenitic" dikes appears to be concentrated at the contact of the ultramafics and the sedimentary rocks underlying the carbonate rocks and those overlying the Larder Lake and Kerr groups.

The property lies along a major "break" structure and the rocks are thus heavily faulted and folded. The "break" can be best defined as a suite of strike and thrust faults occurring in a series of rock deposited in a shallow marine environment at the interface of an older volca-

nic centre to the south and a younger one to the north.

There are several cross faults on the property. The rocks of the Larder Lake "break face north and are overturned at 60^{0} to the south.
A fold develops in the Larder Lake group so that the Main showing area faces and dips to the south. The axis of this syncline lies near the north boundary of the claim-group.

V.L.F. ELECTROMAGNETIC SURVEY

Readings were taken at every 100 feet on north-south-striking lines cut at 200-foot centre, using a Phoenix VLF-2 instrument, with two signal sources, Cutler, Maine and Annapolis, Maryland. The VLF method uses the military and time standard very low frequency transmissions as primary field. Only a receiver is thus used to measure the secondary fields radiating from local conductive targets. The method provides the in-phase and quadrature given here in percent, both components of the secondary field with the polarities indicated.

The VLF-EM survey method is a very sensitive one, well suited to the definition of weakly conductive zones such as areas of disseminated sulphide mineralization, and non-graphitic fault or fracture zone. However it is also often susceptible to the effects of a number of other conditions such as bedrock/overburden interfaces, variations in overburden character, groundwater distribution, etcetera. Because of these sensitivities, the method is normally used in conjunction with other geophysical methods.

The results are presented on the attached maps at 1" = 200 feet, using the Fraser VLF-EM data processing system. This method is described in Appendix 1. attached to this report. It is useful in defining VLF conductor configuration clearly, as well as better identifying areas of strongest conductivity.

The survey has outlined five main anomalous trends. These are located as follows: (1) more or less parallel to the highway near base line 200W; (2) at 1300N on lines 4 and 6W; (3) from lines 4W to 22W, from 200N to 900N; (4) a north-south trend in the vicinity of base line 18W; and (5) at 1700S on line 20W.

The first anomaly, a north-south striking trend of several V.L.F. anomalies of medium strength is found near the highway and the Larder Lake station road. This trend is interpreted as being caused by man-made conductors.

The second anomaly, located at 1300N on lines 4 and 6W is the surface expression of two "Input" conductors found in this area. The anomaly consists of coincident E-W and N-S V.L.F. responses of medium strength. It lies close to the projection of a fault found in tuffaceous meta-sedimentary rocks. The anomaly is inferred as to being cause by graphite, but this type of mineralization is important as gold values are usually related to graphite-rich horizon. If the anomaly cannot be explained by surface work, drilling is warranted.

The third anomaly, located to the north of the base line at more or less 500N has locally coincident induced polarization response. This anomaly is long and linear and lies over an ultramafic horizon in deep overburden. The anomaly is inferred to be caused partly by edge-effects, the ultramafic and shearing in the ultramafic. No work is warranted on this anomaly.

The fourth anomalous trend strikes north-south in the area of line 20W. This area is characterized by several poorly defined MaxMin and induced polarization conductors which suggest possibly poor coupling. The anomalous trend lies in an outcrop area of conglomerate and surface work should be done to investigate the anomaly. This work should consist of geology, stripping, trenching and possibly, if warranted, detailed geophysics along E-W lines.

The fifth anomaly is a weak V.L.F. response which is the surface expression of two "Input" conductors. The anomaly lies along a fault inferred from the V.L.F. results and projected from the east. The anomaly lies in an outcrop area and should be checked together with the above anomaly.

Although at this time, surface work appears to be the best approach to test the conductors, some of them present enough interesting characteristics to plan for later diamond drilling. It is suggested that a total of 2,000 feet of diamond drilling will be required.

PROPOSED WORK PROGRAM

Initially, a program of surface work is envisaged to test the V.L.F. anomalies where possible, this program to be followed later with diamond drilling to test further the most interesting anomalies and those that could not be explained satisfactorily with the initial work. The program requires a flexible approach and accordingly, it is not possible at this time to be specific about some of the drilling locations.

Estimated Cost:

Trenching, stripping	$10,000.00
Drilling, 2,000 ft. @ $20/ft.	40,000.00
Supervision	5,000.00
	$55,000.00

CONCLUSIONS

1. The Lenora Southwest group includes 9 contiguous claims covering more or less 337.0 acres, located in McVittie township, Northeastern Ontario. The property is well located in terms of accessibility, and favorable for the occurrence of economically significant concentrations of gold.

2. The property is held by Lenora Exploration Limited.

3. Several geophysical anomalies have been outlined by Lenora. Some are more than sufficiently interesting to warrant further work.

4. A program for the further evaluation of the most interesting anomalies has been proposed. The cost of this program is estimated $55,000.00

RECOMMENDATIONS

The exploration program as suggested is highly recommended. The property is an attractive environment for gold occurrences, and is of the highest exploration priority.

The basic exploration program proposed herein is estimated to involve the expenditure of $55,000.00. The implementation of this program is highly recommended.

Respectfully submitted,

G.J Hinse, P.Eng.

Sudbury, Ontario
September 1, 1981

REGISTERED PROFESSIONAL ENGINEER
G. J. HINSE
PROVINCE OF ONTARIO

APPENDIX 1

VLF-EM Data Processing by D.C. Fraser

VLF-EM Data Processing

D. C. FRASER, Chief Geophysicist,
Geophysical Engineering and Surveys Limited,
(Keevil Mining Group Limited),
Toronto, Ontario

ABSTRACT

Geophysical Engineering and Surveys Limited of the Keevil Mining Group have routinely conducted ground surveys with VLF-EM receivers for the past two years. Both Crone's Radem and Ronka's EM16 have been used.

VLF-EM dip-angle data often yield complex patterns which require considerable study for a proper interpretation. A method was developed which allows field operators to transform the noncontourable dip angles into contourable data, producing conductor patterns which are immediately apparent to exploration personnel untrained in VLF-EM interpretation.

VLF-EM contoured data generally peak very close to the top of a conductor, thereby allowing drill holes to be spotted accurately. However, the data generally should not be used alone to select drill targets because structures may be sufficiently conductive to yield strong anomalies. Thus, magnetic and/or vertical-loop EM correlations may be considered as necessary criteria for drilling.

VLF-EM surveys can replace IP surveys in certain environments. For example, the Restigouche orebody in the Bathurst camp of New Brunswick yielded a VLF-EM anomaly as distinct as that obtained by IP, although the body did not respond to vertical- or horizontal-loop EM. However, the cupriferous breccia pipes of the Tribag mine near Batchawana, Ontario yield strong IP anomalies but not VLF-EM anomalies, illustrating that disseminated ore targets should be sought with IP rather than with VLF-EM.

INTRODUCTION

A METHOD HAS BEEN DESCRIBED (Fraser, 1969) which enables somewhat noisy, noncontourable dip-angle data to be transformed into less noisy, contourable data. This data processing is performed routinely by field personnel, and simply involves additions and subtractions.

Both magnetic and VLF-EM data can be collected by a single individual as part of a ground evaluation program. The VLF-EM method can provide contour maps which may be as useful to exploration geologists as magnetic maps. The key to the usefulness, however, lies in the data processing, because raw dip-angle data frequently are more confusing than elucidating. This point is illustrated in *Figure 1*, which presents dip-angle data from the Temagami mine in Ontario. Clearly, the complex pattern requires some thought for proper interpretation. Conversely, *Figure 2* provides a conductor pattern which is immediately apparent even to those untrained in VLF-EM interpretation. It is obtained from the data of *Figure 1*, using the method described in the Appendix. The contoured units are expressed in degrees. Only the positive quantities are contoured.

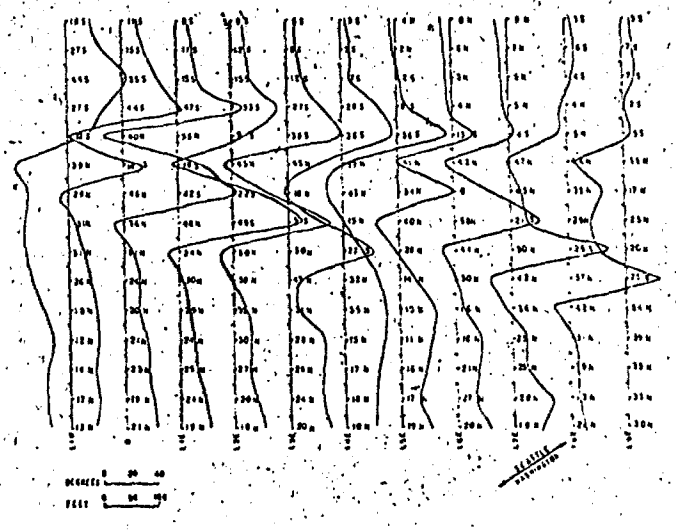


FIGURE 1 — Dip-angle VLF-EM data in the vicinity of the Temagami mine. The arrow defines the primary field direction from the transmitter at Seattle, Washington (after Fraser, 1969).

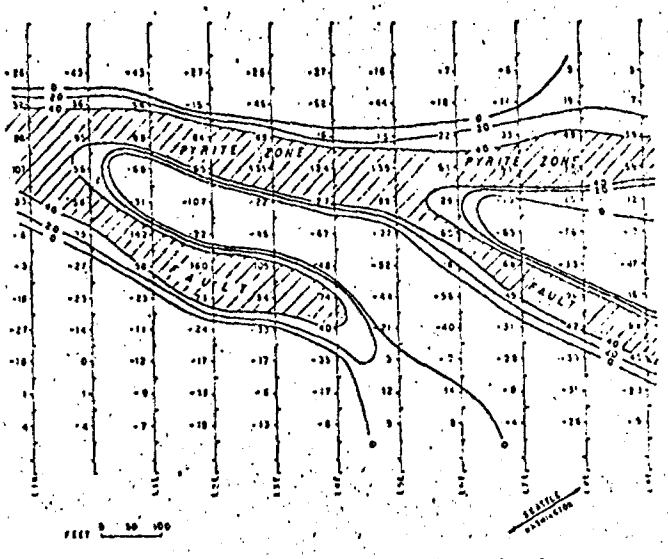


FIGURE 2 — Contoured VLF-EM data, in degrees, as calculated from the map of Figure 1 (after Fraser, 1969).

D. C. FRASER obtained a Bachelor's and a Master's degree in geology at the University of New Brunswick and, in 1966, a Ph.D. degree in geophysics at the University of California at Berkeley. He has performed research on induced polarization, resistivity, magnetics, gravity and electromagnetics, including the design of new interpretation methods employing, in part, digital filtering and correlation techniques. Recently, he has been involved to a considerable extent in mapping conductivity inhomogeneities, first with ground equipment as a thesis problem, and then with airborne equipment in collaboration with Barringer Research Limited.

Dr. Fraser has worked for several petroleum and mining companies and currently is chief geophysicist of Geophysical Engineering & Surveys Limited, a member of the Society of Exploration Geophysicists and of the CIM, and a past president of the Canadian Exploration Geophysical Society.

PAPER PRESENTED: at the 72nd Annual General Meeting of the CIM, Toronto, April, 1970.

KEYWORDS: Geophysical exploration, Data processing, Electromagnetic surveys, Dip angles, VLF-EM surveys, Filter theory, Contouring.

CIM TRANSACTIONS: Vol. LXXIV, pp. 11-18, 1971.

FIELD EXAMPLES

The following field examples were chosen to illustrate the three primary uses to which VLF-EM has been applied by Geophysical Engineering and Surveys Limited.

General Prospecting

General prospecting or ground evaluation provides the most common use for VLF-EM. Ground often is obtained which requires only a general approach to exploration, as when there is insufficient geological information regarding the specific target sought. In such cases, magnetic and VLF-EM surveys are routinely performed without the guidance of a geophysicist. VLF-EM conductors are tested by short traverses with vertical-loop EM. The anomaly patterns generally are sufficiently clear so that mapping, trenching, drilling or abandonment will be decided without consulting a geophysicist. Exceptions can occur when patterns become complex.

Figure 3 illustrates a survey in which two strong VLF-EM conductors were obtained. The southern anomaly has vertical-loop EM correlation and the northern one does not. The VLF-EM anomaly with vertical-loop correlation also coincides with a magnetic anomaly, and probably is due to magnetic sulphides. It will be drilled shortly. The other equally strong VLF-EM anomaly without vertical-loop correlation does not parallel the magnetic patterns, and probably is due to a fault.

In Place of IP

There are certain environments where VLF-EM can be used as an alternate to IP. These are the environments characterized by massive or heavily disseminated sulphides which occur within 300 feet of surface and yet do not respond to conventional EM. IP was considered to be the most suitable geophysical method for the detection of such bodies (Hallof, 1967). However, it is well worth testing VLF-EM in these environments because of the very substantial cost savings that result if the method is responsive. As an example, *Figure 4* illustrates a VLF-EM survey over the Restigouche orebody in the Bathurst area of New Brunswick. *Figure 5*, showing IP chargeability contours, allows a comparison to be made of the relative merits of IP and VLF-EM for this type of mineralization. The Restigouche body did not respond to vertical- or horizontal-loop EM because of the high sphalerite content of the massive sulphides.

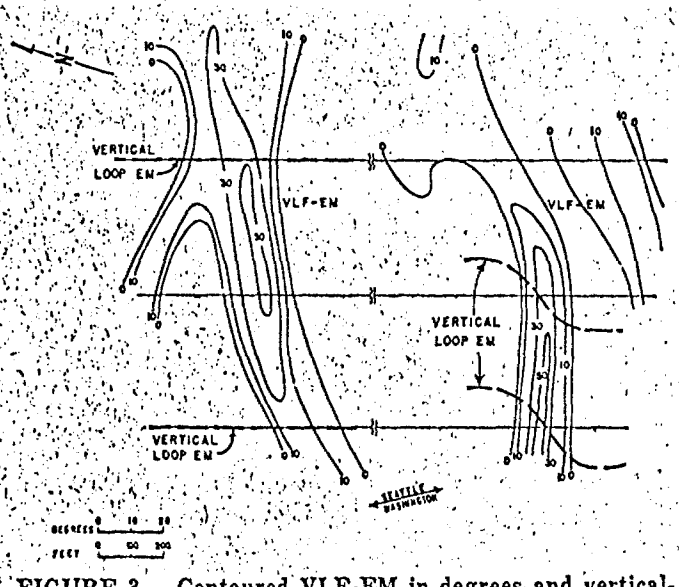


FIGURE 3 — Contoured VLF-EM in degrees and vertical-loop EM profiles (1,200 hz) from a property evaluation survey in the Uchi Lake area.

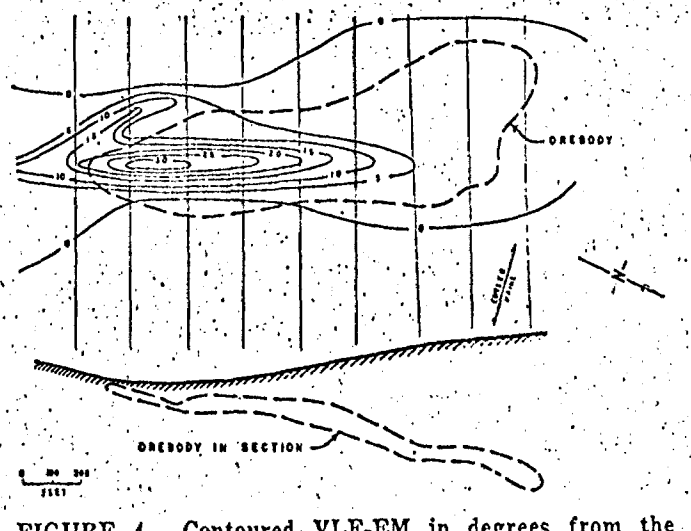


FIGURE 4 — Contoured VLF-EM in degrees from the Restigouche orebody, illustrating that the method is a viable alternate to IP in this environment (cf. Figure 5).

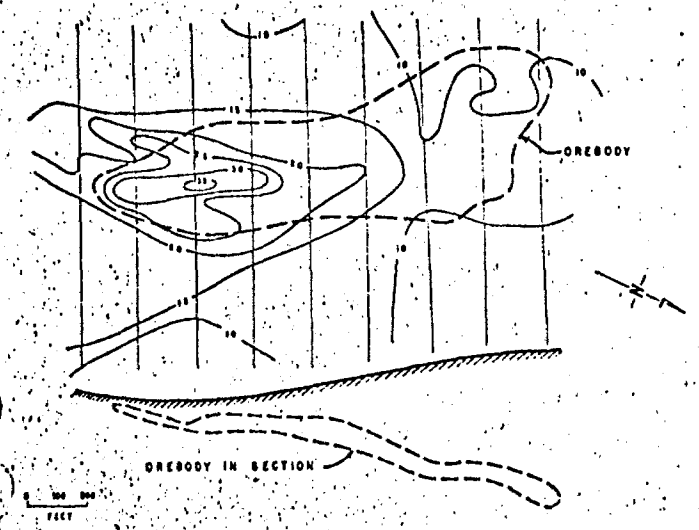


FIGURE 5 — Gradient-array IP chargeability in milliseconds over the Restigouche orebody, for comparison with the VLF-EM data of Figure 4.

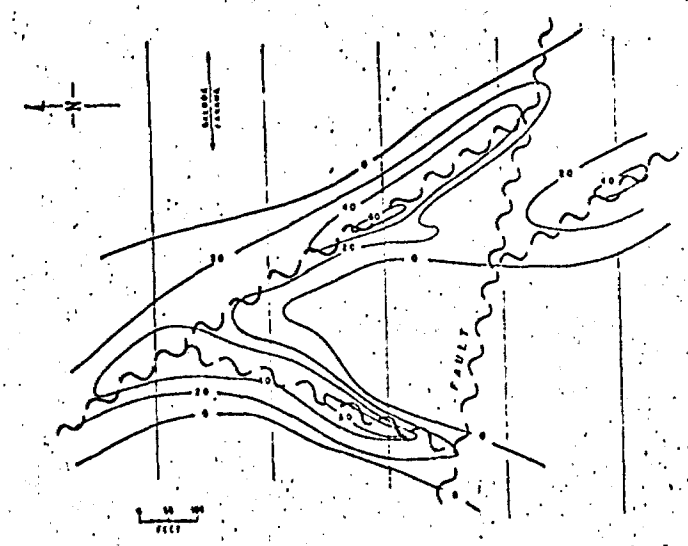


FIGURE 6 — Contoured VLF-EM in degrees from a fault-mapping survey in the Cobalt area.

Other environments described in Hallof (1967) would not be as amenable to the use of VLF-EM in place of IP. A truly disseminated copper deposit will not provide a VLF-EM anomaly but will yield a large I[illegible]ffect, as was found to be the case for the breccia pipes of the Tribag mine near Batchawana, Ontario.

Structural Interpretation

Inasmuch as VLF-EM responds well to structures, the method has been applied to the mapping of faults. An example is shown in *Figure 6*, which depicts a portion of a survey in the Cobalt area of Ontario. The property was a silver prospect where the veins were postulated to be associated with faults. VLF-EM appeared to be the most reasonable geophysical method available to aid in tracing these faults. Considerable drilling has been done on this property, and the fault interpretation was verified.

Figure 2 illustrates that faults can be as conductive to VLF-EM as massive pyrite. In this Temagami example, the faults contain a brecciated matrix with some hematite cementing. They yield a strong IP anomaly, but are non-conductive to conventional EM.

DEPTH OF EXPLORATION

The relatively high transmitted frequency of approximately 20,000 hz severely limits the depth of exploration in areas of conductive overburden. As an example, penetration of the 100 to 200 feet of clay in the Timmins area often is not achieved.

In regions where the overburden has a less exceptional conductivity, such as the Bathurst area, depth of exploration generally is limited to about 300 feet. This depth was predicted from model curves in Fraser (1969), and appears to be true in practice, as over the Restigouche deposit (*Figure 4*).

CONCLUDING REMARKS

VLF-EM surveys are exceptionally easy to perform, but the dip-angle data may be exceedingly difficult to interpret correctly. This latter point has produced unfavourable comments regarding the utility of VLF-EM as a prospecting tool. The data-processing method used to transform somewhat noisy, noncontourable dip angles into less noisy, contourable data greatly increases the value of VLF-EM surveys.

The efficiency of data flow is significantly increased in the case of an active mining company performing such surveys in large quantities. This is because the contoured maps may be used directly by geologists in charge of their various projects, rather than requiring a geophysicist to study each dip-angle map.

Contoured VLF-EM maps form a useful complement to magnetic maps. The survey and data-processing cost is similar to that for a hand-held fluxgate magnetometer.

For general exploration in the Shield, VLF-EM conductors generally should be tested with vertical-loop EM to separate massive sulphides (and graphite) from conductive structures. As such structures can be mapped with VLF-EM, this provides another use for the method. Further, some massive and heavily disseminated sulphides, which do not respond to conventional EM, will yield VLF-EM anomalies as distinct as those obtained by IP. These three uses of VLF-EM, i.e., for general prospecting, mapping of structures and as a judicious alternate to IP, form our primary applications of VLF-EM to property evaluation.

APPENDIX

The Data-Processing Technique

THE DATA-PROCESSING TECHNIQUE is described in detail by Fraser (1969), where it is also discussed in terms of filter theory*. The method is very simple to apply, as is shown by the example of *Figure 7*. This figure illustrates that the contourable quantity is the sum of the values at two adjacent stations minus the sum at the next two adjacent stations. The above-referenced paper presents a tabulation method suited to the processing of this dip-angle data. The calculations are performed in the field by the instrument operators.

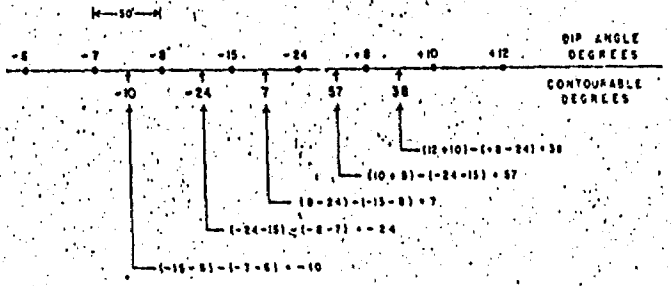


FIGURE 7 — Example of the data processing calculations, illustrating that the contoured quantities are obtained simply from additions and subtractions performed on the dip angles.

A 50-foot station interval is recommended to avoid the problem of near-surface conductors appearing as deeper conductors, as could occur if the station spacing was larger. In actual practice, data are collected at 100-foot intervals, with 50-foot readings being taken where anomalies occur. Later, 50-foot artificial data are interpolated in non-anomalous areas prior to performing the calculations. This procedure avoids some confusion in the contour patterns which would result from near-surface 'geological noise'.

Normally, only the positive values are contoured, because the negative quantities generally represent anomaly flanks. Consequently, the inclusion of negative contours would serve only to confuse the conductor patterns. However, if a backward crossover was produced by a geological source, an erroneous interpretation of the contour map and the dip-angle profiles would result. To date, such a crossover has not been recognized on the predominantly in-phase dip-angle data.

REFERENCES

Fraser, D. C., (1969), Contouring of VLF-EM Data; *Geophysics*, Vol. 34, pp. 958-967.

Hallof, P. G., (1967), The Use of Induced Polarization Measurements to Locate Massive Sulphide Mineralization in Environments in which EM Methods Fail; paper presented at Canadian Centennial Conference on Mining and Groundwater Geophysics, Niagara, Ontario.

*The technique is analogous to passing the dip-angle data through a bandpass filter which (1) completely removes DC bias and greatly attenuates long wave lengths, (2) completely removes Nyquist frequency noise, (3) phase-shifts all frequencies by 90 degrees and (4) has the bandpass centered at a wave length of five times the station spacing.

APPENDIX 2

References and Sources of Information.

APPENDIX 2

References and sources of information:

Cunningham, L.J., 1979 and 1980, A report on the Kasner properties, McVittie and Hearst townships, Larder Lake Area, Ontario: Private Report.

Holbrooke, G.L., 1962, Report on Omega property for Larcon Mines Ltd.

Jenny, C.P., 1941, Geology of the Omega mine, Larder Lake, Ontario: Ec. Geol., v. 36, 1941

Thomson, J.E., 1941, Geology of McVittie township: O.D.M. v. 50, pt. 7

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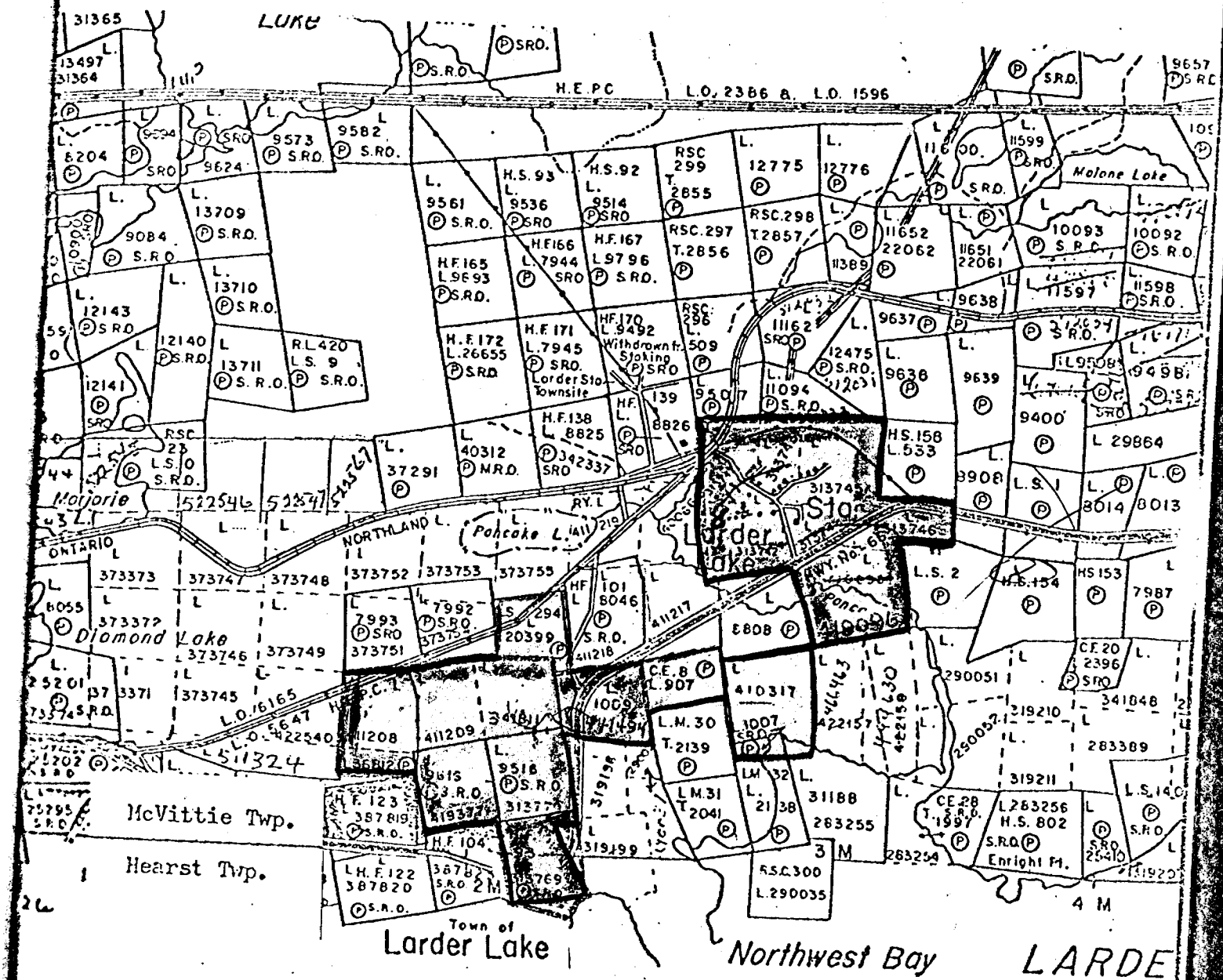

PROPERTY MAP

showing

KASNER PROPERTIES

McVITTIE & HEARST TWPS.

Scale 1" = 1/2 mile

15 May, 1979

L. J. Cunningham, B.Sc., P.Eng.

From: Claim Map, McVittie Twp.

FIGURE 2

G.J. HINSE GEOLOGICAL SERVICES LTD.

COMPILATION MAP OF THE OMEGA AREA PROPERTIES

OF

LENORA EXPLORATION LIMITED

IN

MCVITTIE TOWNSHIP, ONTARIO

SCALE 1"= 400' DEC. 1980

G.J. Hinse May/81

63.3968

PROJECT 1022-3204/203

200

L 20399

L 411208

L 411209

L 341811

L 419377

L 313770

L 313769

L 441494

L 907

POWER LINE

HIGHWAY 66

N

LEGEND

- Power Line
- Input Anomaly
- Tractor Road
- Trench
- Swamp
- Outcrop area
- Fence
- Surveyed Claim Post

Values shown thus are:

28S 200
10N 100

28S Dip angle in percent
200 Field strength
Conductor
Instrument used:
Station: Cutler, ME., NAA, 17.8 kHz
Survey done by R. Kasner
20 Fraser filter contour
Inferred fault
ZZZZZZ N-S Conductor

G.J. Hinse Geological Services Ltd.

V.L.F. ELECTROMAGNETIC SURVEY

of the

SOUTHWEST GROUP

for

LENORA EXPLORATION LIMITED

McVittie Twp. Ontario

Scale : 1 inch = 200 feet

63.3968

MAP 1022-4

Project 1022- NTS 32D4/203

REGISTERED PROFESSIONAL ENGINEER G. J. HINSE PROVINCE OF ONTARIO

Map 1/81

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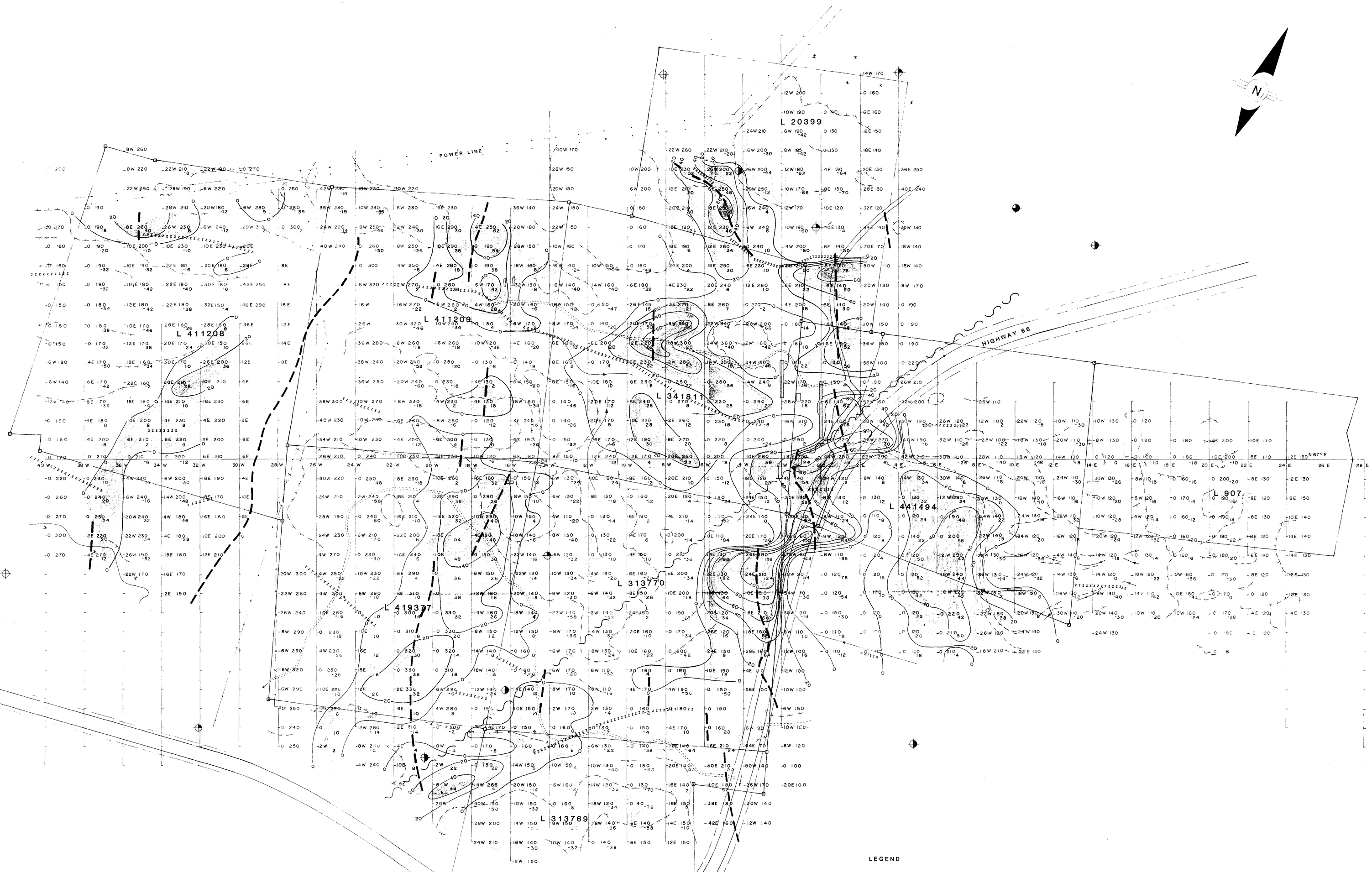

LEGEND

- Power Line
- Input Anomaly
- Tractor Road
- Trench
- Swamp
- Outcrop area
- Fence
- Surveyed Claim Post

Values shown thus are:

- 28E 200
- 10W 100
- 28E Dip angle in percent
- 200 Field strength
- Conductor

Instrument used:

Station: Annapolis, Md., NSS 19.0 kHz

Survey done by R. Kasner

- 20 Fraser filter contour
- Inferred fault
- E-W conductor

G.J. Hinse Geological Services Ltd.

REGISTERED PROFESSIONAL ENGINEER G. J. HINSE PROVINCE OF ONTARIO

G. J. Hinse Sept 1/81

V.L.F. ELECTROMAGNETIC SURVEY

of the

SOUTHWEST GROUP

for

LENORA EXPLORATION LIMITED

McVittie Twp. Ontario

Scale : 1 inch = 200 feet

63.3968

MAP 1022-3 Project 1022- NTS 32O4/2O3

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