GM 50470

1990 EXPLORATION PROGRAM REPORT (GEOLOGICAL RE-INTERPRETATION AND DIAMOND DRILLING), LANDRIENNE TOWNSHIP PROPERTY

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THE LANDRIENNE TOWNSHIP PROPERTY
NORTHGATE EXPLORATION LIMITED
PROJECT 709
1990 EXPLORATION PROGRAM REPORT
(GEOLOGICAL RE-INTERPRETATION AND DIAMOND DRILLING)

FOR GRACEFIELD EXPLORATION INC.
N.T.S. 32C 05/12

LANDRIENNE TOWNSHIP - ABITIBI OUEST

QUEBEC

December 1990

Work By:

Peter Tschipper
Contract Geologist

K. Cook
Contract Geologist

Compiled By:

T.N. McKillen
Manager of Exploration

P.J. Doyle
Senior Exploration Geologist

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I. INTRODUCTION

Northgate Exploration Limited completed an exploration program of diamond drilling, lithogeochemistry, geophysical re-interpretation, geological mapping as well as a substantial amount of line-cutting, on the Landrienne Township prospect acquired through an option agreement with Gracefield Exploration Inc., signed August 21, 1990. Under the terms of the agreement, Northgate has the right to earn a 100% interest in the property through a series of staged cash payments totally $40,000 and by conducting exploration on the claims totalling $200,000 prior to August 31, 1993.

In September 1990, Excalibur International Consultants Ltd. was commissioned by Northgate Exploration to conduct a regional re-interpretation and re-evaluation of existing geological and geophysical data, in the hopes of better defining the regional elements that may control the localization of both precious and base metal mineralization on the property. The initial phase of the program focussed on a further evaluation of gold targets situated in the northeast section of the property, an area previously identified by Gracefield Exploration.

A five hole (934 m/3064.3 FT.) diamond drill program was completed in October. Three hundred and seventy-six core samples were split over widths of either 0.5 m, 1.0 m, or 1.5 m. Five samples returned gold values in excess 100 ppb Au with the results varying from 125 ppb Au to 580 ppb Au. Although the fall 1990 drill program did not produce any economically significant gold intersections, the drilling did confirm a good correlation between the interpreted VLF-EM responses and structural features such as faults or shear zones. In addition, the I.P. anomalies are attributable to concentrations of up to 10% disseminated pyrite usually associated with Unit 3a, a felsic dyke. Boniwell has demonstrated that the property has considerable potential for

both precious metal and base metal mineralization; therefore in order to further evaluate this potential, a program of ground geophysics consisting of magnetics and VLF-EM surveys is recommended on the unsurveyed portions of the property, in the hopes of delineating targets that can be further tested through a combination of detailed I.P. and diamond drilling.

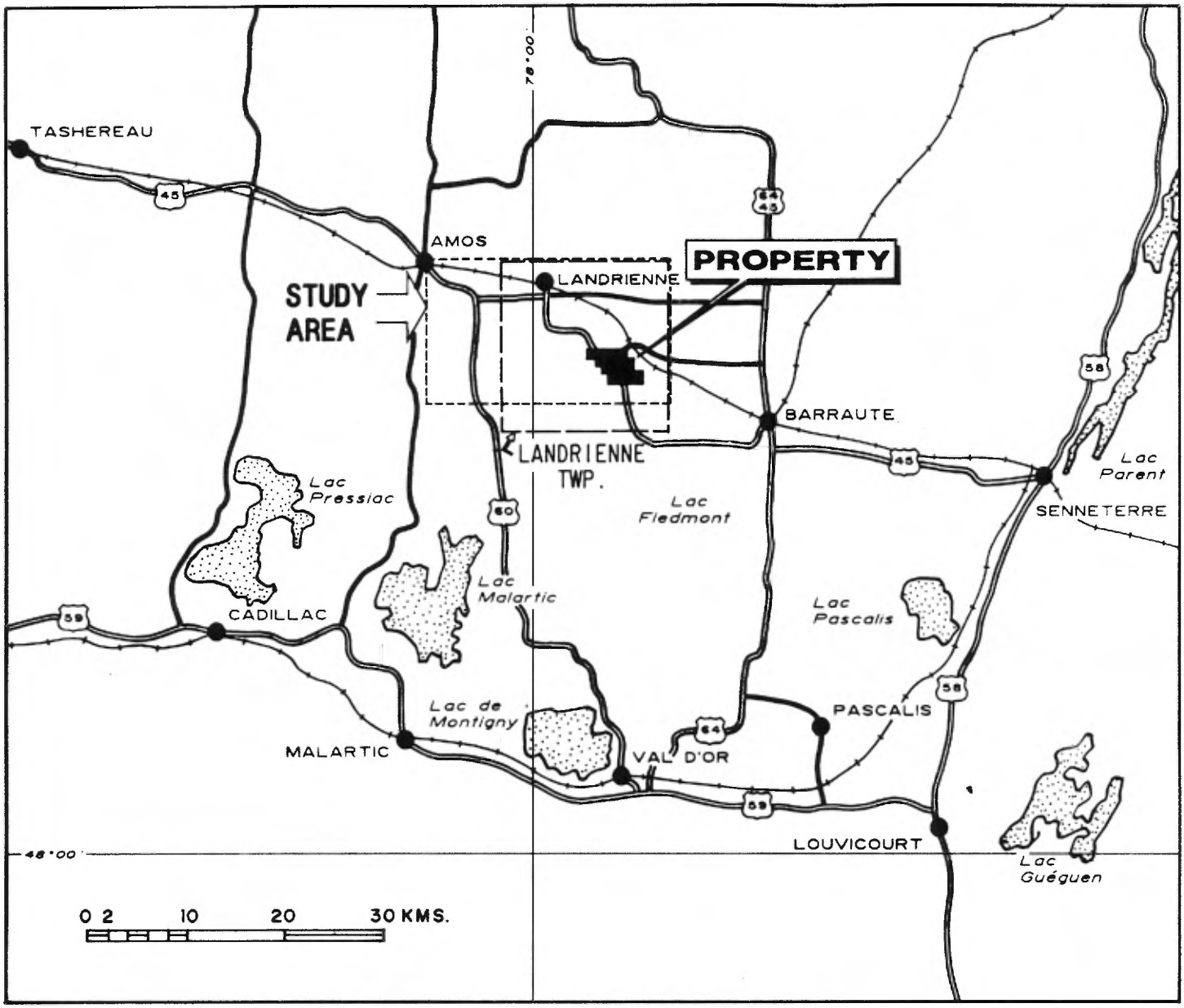
II. PROPERTY LOCATION AND ACCESS

The property is situated in Landrienne Township approximately 25 kilometres southeast of the town of Amos and 40 kilometres north of the city of Val D'Or, within the Abitibi-Ouest region of Northwestern Quebec. (N.T.S. (32C05/12) (See Figure 1).

The property can be accessed via the nearby hamlet of Barraute located 15 kilometres to the east, over an all weather road consisting of both gravel and asphalt covered sections. The drive normally takes 15 to 20 minutes depending on weather conditions. Barraute offers a limited number of services including 3 motels, 2 restaurants, a grocery store, general store and daily bus services. The 1990 program was staged from Barraute with both contract crews and Northgate personnel living in town and commuting daily to the work site.

The drilling area was accessed via a sand covered subsidiary road that roughly parallels the main Barraute-Landrienne highway and runs along the topographic high ground formed by the esker. During the 1987 Gracefield drilling access to collars GL-87-03 and GL-87-04 was gained by widening the borderline between Ranges IV and V. Muskeg tractor trails accessed each collar position north of the rangeline (See Figures 2 and 4). The 1987 roads and trails were re-used to mobilize the rig during the 1990 program.

Mr. G.A. Lacroix, a Val D'Or based certified Forestry Engineer was consulted as to drill road layout. All government approvals and permitting were completed prior to commencement of on-site operations.



Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUEBEC N.T.S.32 C/12

PROPERTY LOCATION MAP

0 10 20 30 40

KILOMETRES

DRAWN BY: RODEL E. ORTIZ Nov.'90

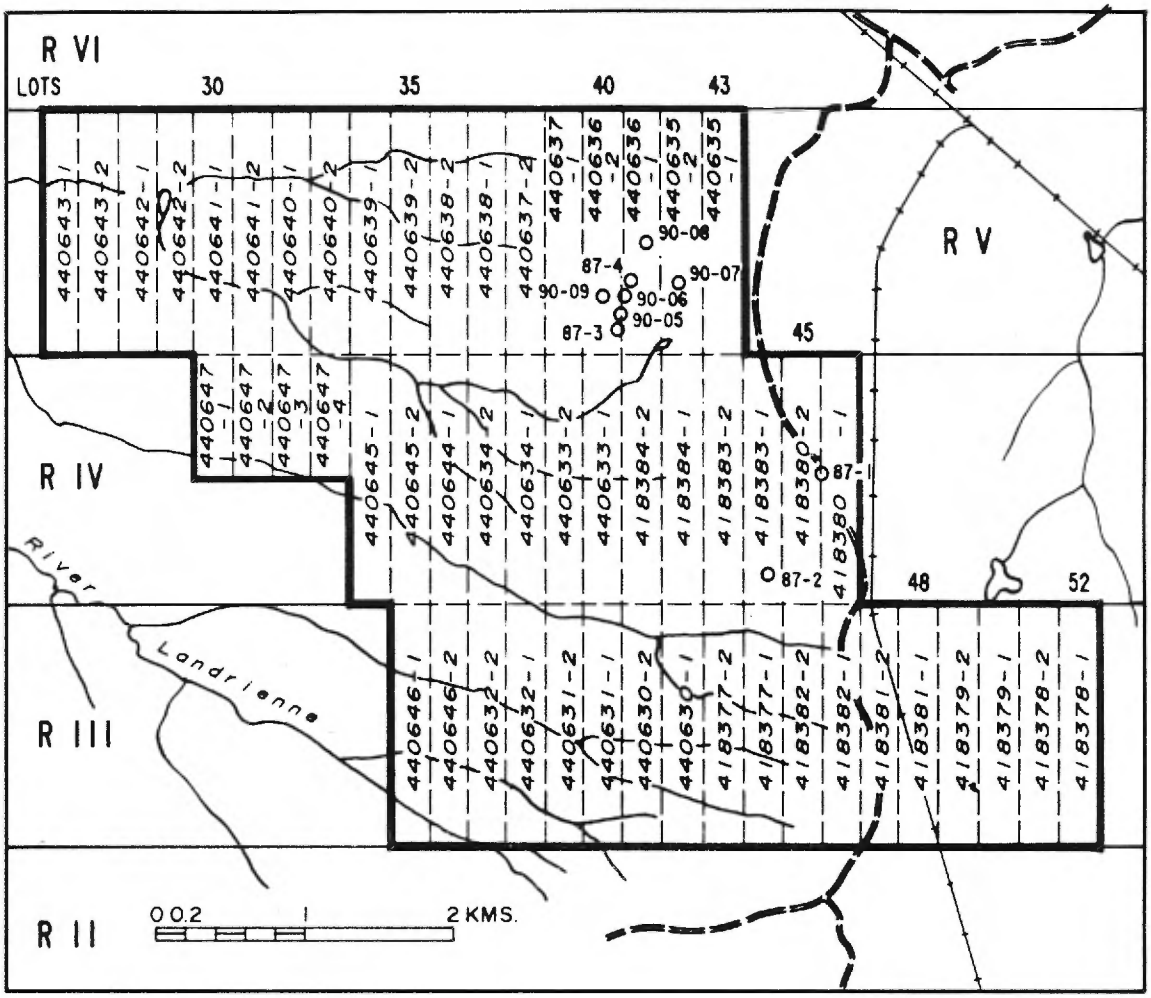
Fig. 1

III. THE PROPERTY

The Landrienne Township property acquired by Northgate Exploration Limited, through an option agreement with Gracefield Exploration Inc. dated August 21st, 1990, consists of 51 lots (2040 hectares) located in Ranges III, IV, and V in the southern and eastern portions of Landrienne Township within the Abitibi-Ouest region. (See Figure 2)

Prior to the August 21st, 1990 agreement all claims were registered in the name of Gracefield Exploration Inc. which have recently been transferred to Northgate that will hold the claims "in trust" subject to execution of all payments and expenditures stipulated in the option agreement.

Detailed listings of all 51 dispositions are displayed in Table 1.



Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUEBEC N.T.S.32 C/12

(1990)

CLAIM MAP

Scale 1:50000

0 1000 3000

METRES

DRAWN BY: RODEL E. ORTIZ Nov.'90

Fig. 2

TABLE 1
CLAIM SUMMARY - PROJECT 709
LANDRIENNE TOWNSHIP, ABITIBI-OUEST, QUEBEC

CLAIM NO.	RECORDING DATE	LOTS	RANGE	ASSESSMENT APPROVED	ASSESSMENT REQUIRED	EXPIRY DATE
4183771	28/9/86	43	III	-	1200.00	91/09/28
4183772	28/9/86	44	III	-	1200.00	91/09/28
4183781	26/9/86	51	III	-	1200.00	91/09/86
4183782	26/9/86	52	III	-	1200.00	91/09/26
4183791	26/9/86	49	III	-	1200.00	91/09/26
4183792	26/9/86	50	III	-	1200.00	91/09/26
4183801	30/9/86	45	IV	2703.00	1200.00	91/09/30
4183802	30/9/86	46	IV	2703.00	1200.00	91/09/30
4183811	27/9/86	47	III	327.73	1200.00	91/09/27
4183812	27/9/86	48	III	327.73	1200.00	91/09/27
4183821	27/9/86	45	III	-	1200.00	91/09/27
4183822	27/9/86	46	III	-	1200.00	91/09/27
4183831	30/9/86	43	IV	3989.32	800.00	91/09/30
4183832	30/9/86	44	IV	3989.32	800.00	91/09/30
4183841	01/10/86	41	IV	107.95	1200.00	91/10/01
4183842	01/10/86	42	IV	107.95	1200.00	91/10/01
4406301	17/12/86	41	III	-	1200.00	90/12/16
4406302	17/12/86	42	III	-	1200.00	90/12/16
4406311	17/12/86	40	III	-	1200.00	90/12/16
4406312	17/12/86	39	III	-	1200.00	90/12/16
4406321	17/12/86	38	III	-	1200.00	90/12/16
4406322	17/12/86	37	III	-	1200.00	90/12/16
4406331	17/12/86	40	IV	-	1200.00	90/12/16
4406332	17/12/86	39	IV	-	1200.00	90/12/16
4406341	17/12/86	38	IV	-	1200.00	90/12/16
4406342	17/12/86	37	IV	-	1200.00	90/12/16
4406351	19/12/86	43	V	-	1200.00	90/12/18
4406352	19/12/86	42	V	-	1200.00	90/12/18
4406361	19/12/86	41	V	6712.00	1200.00	90/12/18
4406362	19/12/86	40	V	6712.00	1200.00	90/12/18
4406371	19/12/86	39	V	-	1200.00	90/12/18
4406372	19/12/86	38	V	-	1200.00	90/12/18
4406381	19/12/86	37	V	-	1200.00	90/12/18
4406382	19/12/86	36	V	-	1200.00	90/12/18
4406391	19/12/86	34	V	-	1200.00	90/12/18
4406392	19/12/86	35	V	-	1200.00	90/12/18
4406401	19/12/86	32	V	-	1200.00	90/12/18
4406402	19/12/86	33	V	-	1200.00	90/12/18
4406411	19/12/86	30	V	-	1200.00	90/12/18
4406412	19/12/86	31	V	-	1200.00	90/12/18
4406421	19/12/86	28	V	-	1200.00	90/12/18
4406422	19/12/86	29	V	-	1200.00	90/12/18
4406431	19/12/86	26	V	-	1200.00	90/12/18
4406432	19/12/86	27	V	-	1200.00	90/12/18

TABLE 1 (CONTINUED)

CLAIM NO.	RECORDING DATE	LOTS	RANGE	ASSESSMENT APPROVED	ASSESSMENT REQUIRED	EXPIRY DATE
4406441	18/12/86	36	IV	-	1200.00	90/12/17
4406451	18/12/86	34	IV	-	1200.00	90/12/17
4406452	18/12/86	35	IV	-	1200.00	90/12/17
4406461	17/12/86	35	III	-	1200.00	90/12/16
4406462	17/12/86	35	III	-	1200.00	90/12/16
4406471	18/12/86	N.½30	IV	-	500.00	90/12/17
4406472	18/12/86	N.½31	IV	-	500.00	90/12/17
4406473	18/12/86	N.½32	IV	-	500.00	90/12/17
4406474	18/12/86	N.½33	IV	-	500.00	90/12/17

IV. PREVIOUS WORK/EXPLORATION HISTORY

The project area is characterized by high ground areas underlain by thick glacial sand deposits and low lying areas of extensive muskeg cover, which undoubtedly has deterred and limited exploration interest and activity until recently.

The claims are very well situated in a favourable greenstone belt with significant mineral occurrences discovered along strike and within the same stratigraphy that has been interpreted to underlie the property.

The following is a brief summary of the property's exploration history.

1951 Dome Mines: Carried out a TURAM-EM and magnetics survey over the southern part of the present claim block.

1954 Malartic Gold Fields: completes an airborne EM survey over the property.

1956 Malartic Gold Fields conducts a ground follow-up program of geological mapping, geochemical sampling and a TURAM-EM survey.

1971 Malartic Gold Fields re-investigates ground EM anomalies through geological mapping, sampling and prospecting.

1972 Dome Mines drills 3 holes targeted at TURAM-EM anomalies situated just south of the present claim boundary.

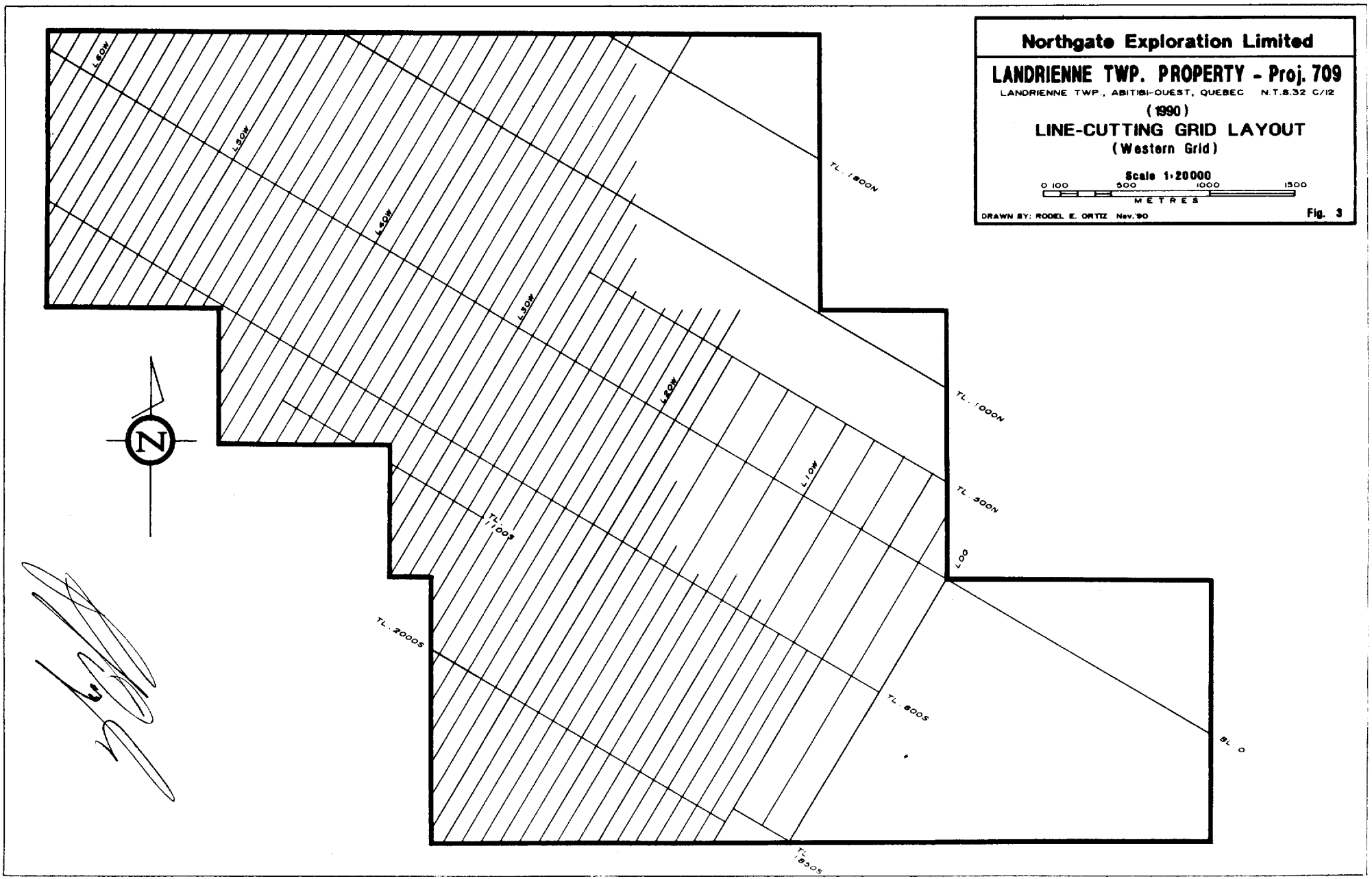
1984 Gracefield Exploration acquires 16 claims totalling 640 hectares.

1984-1985	Gracefield Exploration Inc. initiated two geophysical programmes of ground magnetics and VLF-EM. (See Reports J.T. Ward 1984, J.B. Boniwell 1985)
1986	Gracefield Exploration enlarges claim holding to 51 lots and completes additional geophysical work. (I.P./Resistivity Survey See Report J.B. Bonniwell 1986)
1987	Gracefield Exploration completes a 4 hole 532.8 m drill program. (See Report N.W. Gow August 1987)
1990	Northgate Exploration Limited acquired the Gracefield property through an option agreement dated August 21st, 1990.

V. LINE-CUTTING

Initially a limited program of line-cutting was completed in early September 1990 by Northgate personnel. The 1984-1986 baselines were re-located, re-chained, flagged and re-established in order to provide a framework from which additional line-cutting as well as property-wide geological mapping and prospecting could be completed. Sections of lines L2000W, L2400W, L2500W and L2600W were re-chained, re-flagged and in places cut and blazed in order to property locate drill collar positions. The three pre-existing property baselines are oriented at 30° W of N with flagged crosslines established at 100 meter intervals. Line stations were flagged every 25 meters along the crosslines. A total of 11.5 kilometres of baseline were re-established and 5.0 kilometres of crossline were re-flagged. Northgate personnel involved in the line-cutting operations included P. Tschipper, K. Cook and P. Doyle. A total of 8 person-days of work were required.

A second more comprehensive phase of line-cutting was initiated in September 1990 and completed in October under the supervision of TechTerrex Inc. of Mississauga Ontario. The line-cutting operation was implemented to assist with geological mapping and in preparation for subsequent expansion of the ground geophysical coverage in the western and northern sectors of the property. A total of 151 kilometres of grid line were cut utilizing the re-established, refurbished property baselines. All crosslines were spaced 100 meters apart with survey stations flagged and picketed every 25 meters along each line. (See Grid Layout Figure 4)


Northgate Exploration Limited
LANDRIENNE TWP. PROPERTY - Proj. 709
LANDRIENNE TWP., ABITIBI-OUEST, QUEBEC N.T.S.32 C/12
(1990)
LINE-CUTTING GRID LAYOUT
(Western Grid)
Scale 1:20000
0 100 500 1000 1500
METRES
DRAWN BY: RODEL E. ORTIZ Nov.'90
Fig. 3
L 60W
L 50W
L 40W
L 30W
L 20W
L 10W
L 0
TL. 1800N
TL. 1000N
TL. 300N
TL. 1100S
TL. 2000S
TL. 800S
TL. 1830S
BL. 0
N

7(a)

VI. REGIONAL GEOLOGY AND GEOPHYSICAL INTERPRETATION

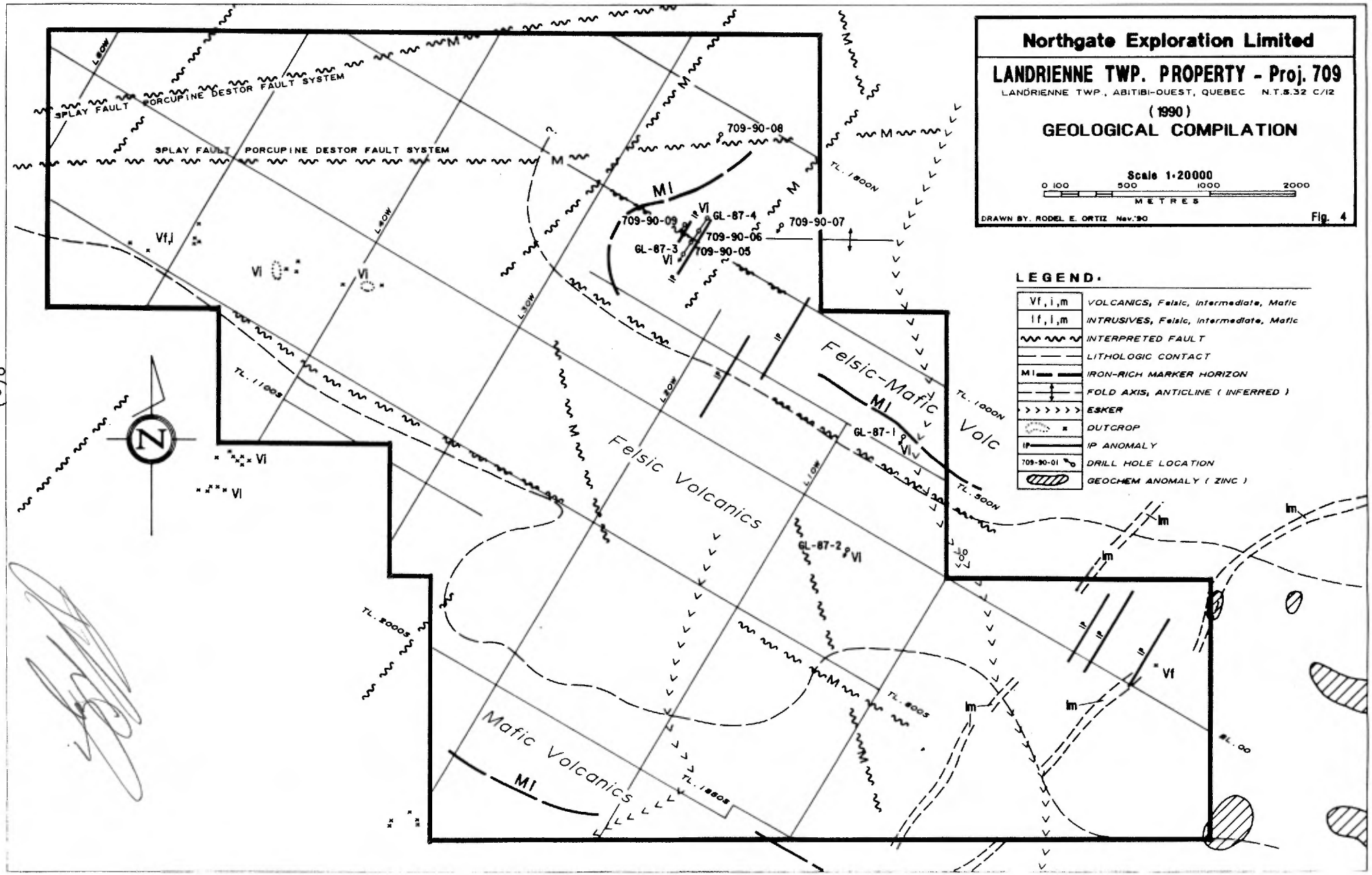
(After J.B. Boniwell 1990)

Regionally, the property is situated within the Abitibi greenstone belt which host numerous gold and base metal occurrences, deposits and producers. In the Timmins area some 260 kilometres west of the claim block, the chief structural element is referred to as the Porcupine-Destor Fault Zone (PDFZ). This major regional break can be traced eastwards and is interpreted to pass through or very close to the Landrienne Township claims.

Although almost no outcrop is exposed within the property boundaries, regional mapping and compilation work suggest that the area is underlain by a series of interbedded Archean mafic to intermediate flows and pyroclastics, some felsic flows and pyroclastics and several bands of sedimentary rocks. These rocks have been cut by a number of small intrusive units ranging in composition from granite to peridotite. At least two diabase dykes cut the project area in a northeasterly direction.

The volcanics are predominantly mafic and display either a schistose texture or in places are found as well preserved pillowed flows. These units range compositionally from andesite to basalt. The southern part of the township is underlain by a distinct band of felsic flows that range in composition from dacite to rhyolite. Many flow contacts are marked by thin continuous tuffaceous bands. Pyroclastic rocks are represented by tuffs and agglomerates and that occur interbedded with the andestic and rhyolite flows.

The sedimentary rocks consist of conglomerate, siltstone, quartzite and greywacke units that display a E to W facies changes with conglomerates dominant in Barraute area and siltstone predominant in Landrienne Township.


Northgate Exploration Limited
LANDRIENNE TWP. PROPERTY - Proj. 709
LANDRIENNE TWP., ABITIBI-OUEST, QUEBEC N.T.S.32 C/12
(1990)
GEOLOGICAL COMPILATION
Scale 1:20000
0 100 500 1000 2000
METRES
DRAWN BY. RODEL E. ORTIZ Nov.'90
Fig. 4
LEGEND:
Vf,i,m VOLCANICS, Felsic, Intermediate, Mafic
If,i,m INTRUSIVES, Felsic, Intermediate, Mafic
INTERPRETED FAULT
LITHOLOGIC CONTACT
MI IRON-RICH MARKER HORIZON
FOLD AXIS, ANTICLINE (INFERRED)
ESKER
OUTCROP
IP ANOMALY
709-90-01 DRILL HOLE LOCATION
GEOCHEM ANOMALY (ZINC)
SPLAY FAULT
PORCUPINE DESTOR FAULT SYSTEM
SPLAY FAULT PORCUPINE DESTOR FAULT SYSTEM
L.GOW
709-90-08
709-90-09
709-90-07
709-90-06
709-90-05
GL-87-4
GL-87-3
GL-87-1
GL-87-2
TL. 1800N
TL. 1600N
TL. 500N
TL. 800S
TL. 1600S
Felsic Volcanics
Felsic-Mafic Volc
Mafic Volcanics
Vf,i
Vf
Vl
Im
IP
MI
M
N

8(a)

The Dester-Porcupine Fault Zone, as interpreted from the regional aeromagnetics, appears as a deformation zone up to 2.5 kilometres wide with a major lateral displacement. The PDFZ break marks a dramatic change from strongly folded formations south of the zone to much less deformed sequence of formations north of the PDFZ. The folding is defined by magnetic marker horizons (weak iron formations) which display a pattern of relatively large open folds resulting from regional tectonism. A compressional force from the south is suggested by the disposition of the folds and may be attributable to the La Motte batholith.

The property as described by the magnetics is located just off the western edge of an open regional fold whose axis is believed to arc westwards. To the east, both the Randall and Fisher gold occurrence are associated with this fold but occur at the folds intersection with two crosscutting diabase dykes. Ground magnetics data from the northeast corner of the grid appears to delineate a set of four individual units that sweep across the survey area under the governance of the regional fold structure. (See Figure 3 and Attachment "A")

Whether the fold is an anticlinal or synclinal structure cannot be established from the geophysical data but dilation zones and fracturing associated with the fold structure offer considerable potential for the localization of gold mineralization. Boniwell further suggests the presence of a central magnetic low feature within the fold structure may represent a focussed alteration zone.

Ground magnetics and VLM-EM data suggest the northeast corner of the property has been cut by several regional E-W trending regional structures. The prominent structures that dominate the northern part of the claims are interpreted to be splay structures off the PDFZ. Locally these features appear

segmented and arranged in an "en echelon" pattern indicative of a shear zone.

Boniwell suggests that the combination of faults bearing NE, NNE and NNW that crosscut the claims may be the result of the emplacement of the La Motte batholith could form conduits for mineralized hydrothermal fluids emanating from the intrusion.

The property's underlying stratigraphy appears to sweep diagonally across the claim block as suggested by the NW-SE trends visible from the aeromagnetic data. Government mapping suggests that a number of felsic horizons are intercalated within a predominantly mafic package of rocks. These felsic-mafic contacts deserve further investigation especially in light of the fact a noteworthy no-conducting zinc deposit the Barvue mine is located along strike. In addition, a Quebec government regional geochemical survey has identified a series of zinc anomalies along strike and just east of the property's southeastern margin.

The non-conductive zinc rich nature of the nearby past producer and the extensive sand and muskeg overburden cover will make detection and delineation of these potentially favourable horizons a difficult task.

VII. ROCK GRAB SAMPLING, PROSPECTING AND GEOLOGICAL MAPPING

A 30 person-day geological mapping prospecting and lithogeochemical program was conducted over the claim block prior to and during the fall drill program. Two bedrock outcrops were encountered and a total of four samples were submitted for Au, Cu, Zn, Ag and Whole Rock analysis.

One of the outcrops situated on claim 418378-2 was identified in the field as a silicified intermediate or possibly a felsic (rhyolite) while the second bedrock exposure was field identified as a sheared, silicified andesite.

All four samples produced gold values ranging from the detection limit of <5 ppb Au up to 10 ppb Au. Copper analysis displayed the widest variation with values from 42 ppm Cu to 1555 ppm Cu resulting from the andesite and a 82 ppm Cu value produced from the silicified (felsic) sample. Zinc values for all four ranged from a low of 85 ppm Zn up to 101 ppm Zn. Silver values ranged from the detection limited of <.2 ppm Ag up to 1.8 ppm Ag for the andesite. The rhyolite/silicified intermediate sample underwent lead analysis which produced a value less than <2 ppm Pb detection limited.

The three samples collected from the outcrop situated on claim 440640-2 produced tholeiitic whole rock classifications ranging from basalt to andesite. The fourth sample collected from a bedrock exposure on claim 418378-2 produced a Hawaiite whole rock classification.

The 1990 mapping program was prematurely terminated due to poor weather conditions and snow cover. (see Appendices IV and V).

VIII. DIAMOND DRILLING

VIII (A). Diamond Drill Data

A five hole (934 m/3064.3 FT.) diamond drill program was completed by Bradley Bros. Limited of Rouyn-Noranda, Quebec in October 1990. Drilling commenced on October 12, 1990 and was completed October 23, 1990. (See Table 2 and Figure 4)

All of the core was drilled as BQ size and placed in 6 metre (20 ft.) wooden storage boxes. The core was logged and sampled on site. The core for all 5 holes (140 core storage trays) was placed in a storage rack situated at the intersection point of the Range IV and Range V borderline and the sand covered subsidiary road. Each box was clearly marked and an aluminum identification tag was placed on every box that indicated the hole and box number.

A total of 376 core samples varying in width from 0.5 m to 1.5 m were split and submitted to Technical Services Laboratory in Timmins for gold geochemical analysis. (See Appendix III) Twenty-six core samples were also submitted for whole rock analysis.

VIII (B). Diamond Drill Results

Diamond drill hole 709-90-05 was collared at L2400W/0976N and drilled to a depth of 179.0 m (587.3 FT.) to further test the geophysical (I.P. and VLF-EM) in the vicinity of Gracefield Exploration D.D.H. GL-87-03. (See Figure 6)

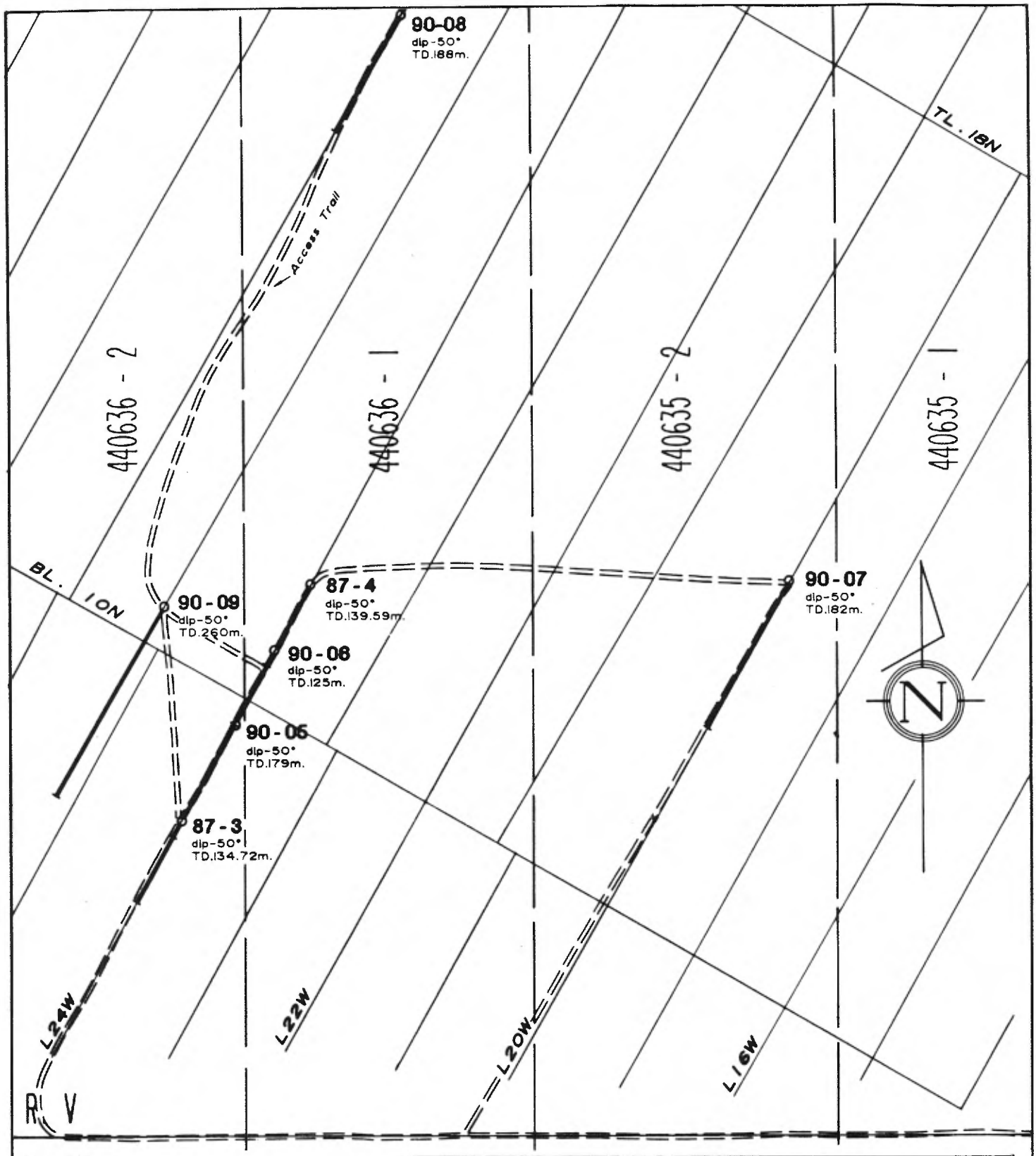
The casing was placed to a depth of 15.9 m in bedrock after a section of mud, sand, clay and boulders were penetrated.

TABLE 2

DRILLING SUMMARY
(April 1987 to October 1990)

LANDRIENNE TOWNSHIP PROPERTY

DRILL HOLE NUMBER	HOLE LOCATION GRID CO-ORDINATES	CLAIM NUMBER	CORE SIZE	AZIMUTH AT COLLAR	AZIMUTH AT EOH	DIP AT COLLAR	DIP AT EOH	CASING DEPTH M	CASING DEPTH FT	HOLE DEPTH M	HOLE DEPTH FT
1990 NORTHGATE DRILLING											
709-90-05	2400W/0976N	440636-1,2	BQ	210°	223°	-50°	-47°	15.9	52.0	179.0	587.3
709-90-06	2400W/1051N	440636-1,2	BQ	210°	230°	-50°	-52°	16.0	52.5	125.0	410.1
709-90-07	2000W/1352N	440636-1	BQ	210°	225°	-50°	-45.5°	22.0	72.2	182.0	597.1
709-90-08	2600W/1632N	440636-1	BQ	210°	227°	-50°	-45.5°	46.0	150.9	188.0	616.8
709-90-09	2500W/1037W	440636-1	BQ	210°	221°	-50°	-40.5°	22.0	72.2	260.0	853.0
							TOTAL: 5 HOLES: 934M/3064.3 FT				
1987 GRACEFIELD DRILLING											
GL-87-01	0700W/0627N	418380-2	BQ	210°	-	-45°	-48°	45.7	150.0	136.6	448.0
GL-87-02	0600W/0174S	418383-1,2	BQ	210°	-	-50°	-50°	36.6	120.1	121.9	400.0
GL-87-03	2400W/0868N	440636-1	BQ	210°	-	-50°	-52°	36.6	120.1	139.6	458.0
GL-87-04	2400W/1122N	440636-1	BQ	210°	-	-50°	-50°	12.2	40.0	134.7	442.0
							TOTAL: 4 HOLES: 532.8M/1748 FT				



Scale 1:5000

0 50 100 250

METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

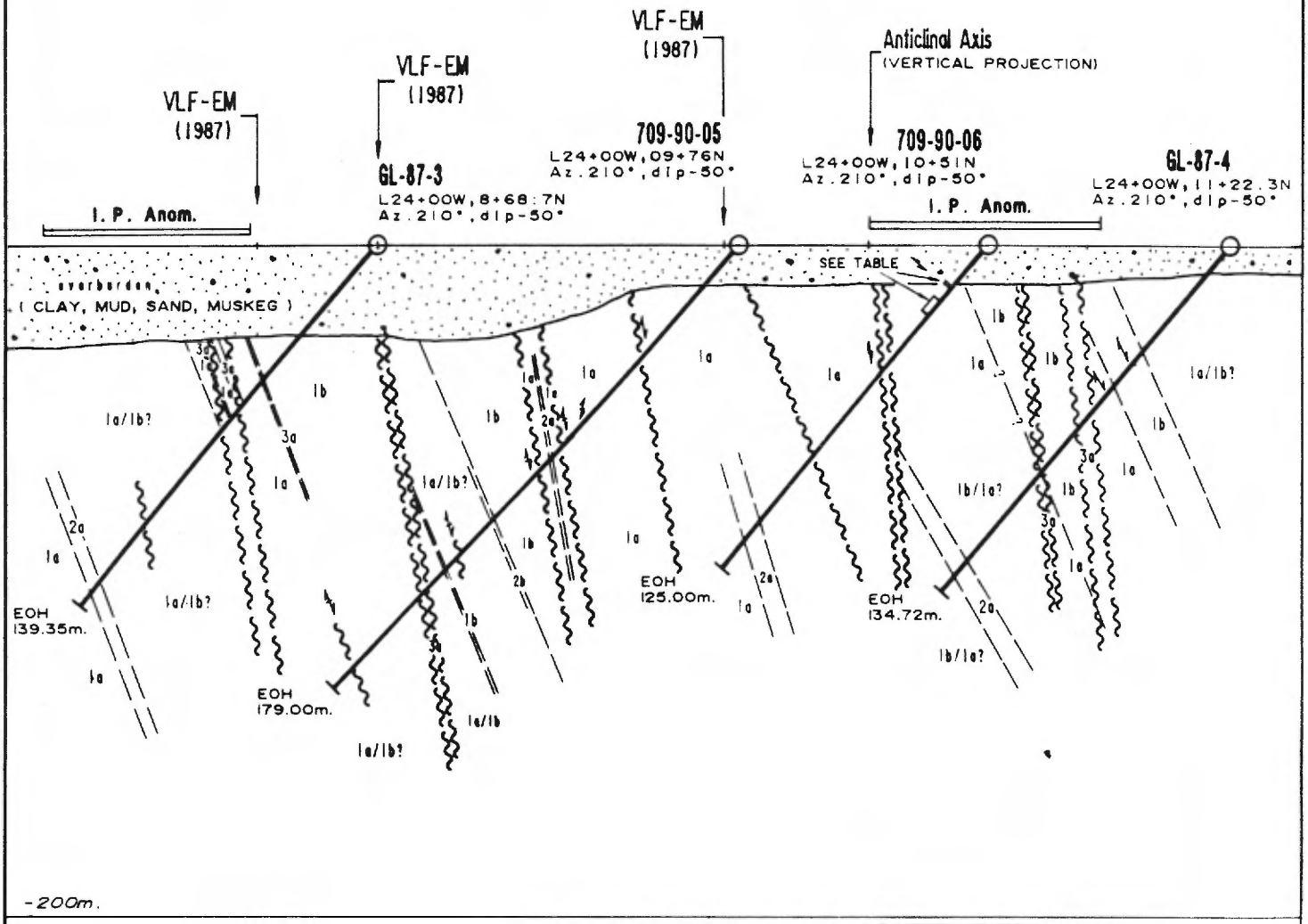
LANDRIENNE TWP., ABITIBI-OUEST, QUEBEC N.T.S.32 C/12

(1990)

DRILL HOLE LOCATION MAP

DRAWN BY: RODEL E. ORTIZ Nov.'90

Fig. 5



Ddh 709-90-06			
FOOTAGE From	To	m	Au (ppb)
16.50	17.50	1.0	20
20.80	21.80	1.0	20
21.80	22.80	1.0	15
22.80	23.80	1.0	45
23.80	24.80	1.0	20
24.80	25.80	1.0	10
25.80	26.80	1.0	20
26.80	27.80	1.0	125
27.80	28.80	1.0	15

Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1b MAFIC TUFF
- 2a DIORITE (Dyke/Sill)
- 2b INTERMEDIATE INTRUSIVE
- 3a FELSIC DYKE (Pyritic)
- FAULT/SHEAR ZONE

Scale 1:2000

0 10 50 100

METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-05/06, GL-87-3/4

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

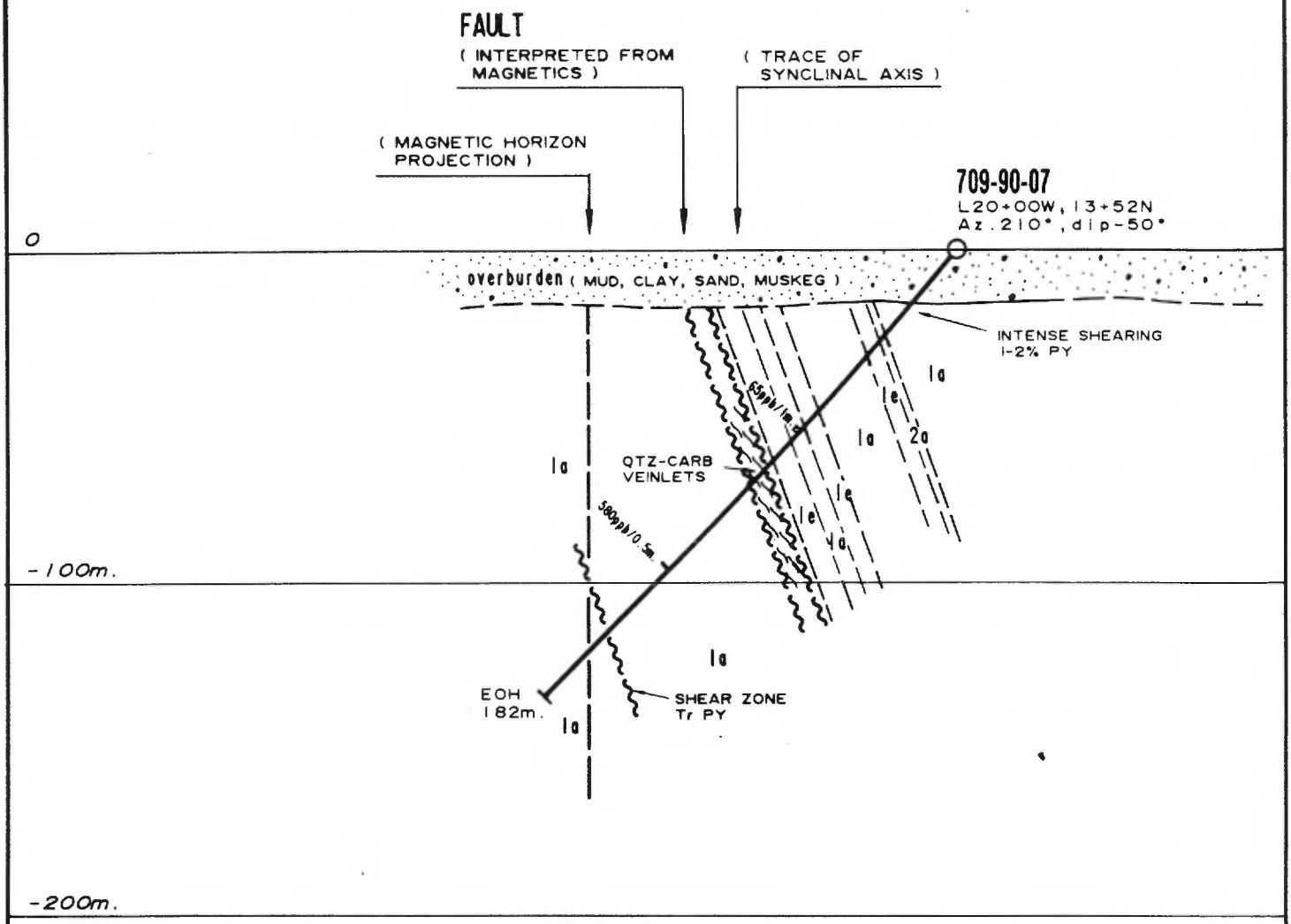
Figure 6

The section drilled consisted of a series of mafic flows and tuffs cut by a number of narrow felsic and intermediate dykes up to 1.0 m in width. Both the flow and tuffaceous units displayed a well developed sometimes very intense foliation as well as numerous quartz, carbonate and epidote veins/veinlets. The I.P. anomaly can be correlated with several narrow pyritic dykes (up to 10%) enclosed within a section of silicification, brecciation and intense shearing as encountered between 135.0 - 150.0 m. Fault/shear zones interpreted from VLF-EM data correlated well with sections of broken, sheared and altered core. (See Appendices I and II)

A second hole drilled D.D.H. 709-90-06 was collared at L2400W/1051N to complete the section of drill holes bordered by Gracefield Exploration's holes 87-3 and 87-4. (See Figure 6) A series of mafic-intermediate flows cut by a number of narrow felsic dykes and a 7.0 meter wide diorite intrusion were encountered prior to hole shutdown at a depth of 125.0 m (410.1 FT.). As was the case in holes 87-3, 87-4 and 90-5 the I.P. responses were attributable a shear bounded section of felsic dykes, silicification, brecciation and alteration.

Hole D.D.H. 709-90-07 was collared at L2000W/1352N to test a structural-geophysical target recommended by J.B. Boniwell. (See Attachment "A") The target was the interpreted intersection of the axial plane of a regional fold structure and later northwest trending shear/fault zones as interpreted from VLF-EM data. The casing depth was 22.0 metres. (See Figure 7)

The hole was drilled to a depth of 182 m (597.1 FT.) and the section consisted of fine to medium grained, massive mafic flows, several amygdaloidal mafic flows and a number of narrow intrusive dykes or sills. Two significant shear zones were encountered, the first between 22.0 m and 24.5 m just below the bedrock/overburden interface and a second zone from 59.7 m to 63.4 m. Both shears were characterized by intense



Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1e MAFIC FLOW (Amygdaloidal)
- 2a DIORITE (Dyke/Sill)

Scale 1:2000

0 10 50 100
METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-07

(Section Looking N 60° W)

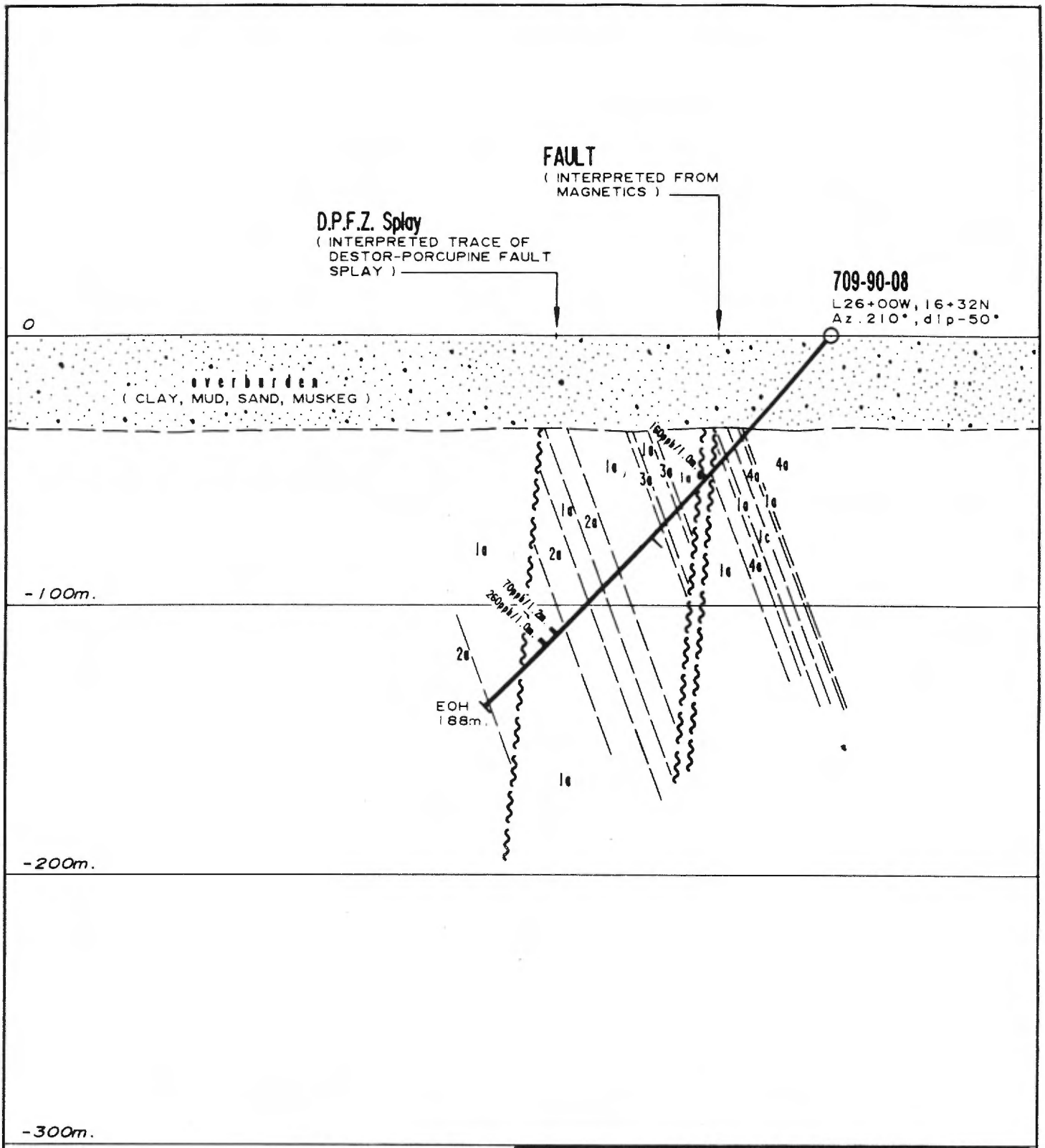
DRAWN BY: RODEL E. ORTIZ Nov.'90

Figure 7

silicification, some carbonization and numerous quartz-carbonate veinlets.

D.D.H. 709-90-08 was another "wildcat" reconnaissance hole collared at L2600W/1632N to test the intersection of a northwest and northeast trending cross-structures with an east-west trending structural lineament interpreted by Boniwell to be a splay fault related to the Porcupine Destor Fault Zone. (See Figure 8) After penetrating 46.0 m of overburden, the bedrock section drilled consisted of mafic flows intruded by a number of diorite dykes/sills, several narrow felsic dykes and three narrow magnetic diabase dykes. The interpreted faults and shear zones were interpreted from 66.4 m to 85.1 m and 168.1 m to 168.7 m. Both shear zones were characterized by silicification, carbonization and quartz-carbonate-epidote veinlets. The hole was drilled to a depth of 188.0 m (616.8 FT.) and shutdown in a diorite dyke.

The final hole D.D.H. 709-90-09 was collared at L2500W/1037N to test the strike extent of the structural elements drilled on the adjacent line to the east and to investigate an untested Gracefield I.P. anomaly. (See Figure 9) As was the case of the adjacent drill section, the section encountered consisted of mafic flows cut by intermediate-mafic and several narrow pyritic felsic dykes. The two fault/shear zones interpreted from the VLM-EM appear to coalesce into a wide zone of shearing from 211. m to 244.9 m. The I.P. response is attributable to several narrow felsic dykes with up to 10% disseminated pyrite. The hole was shutdown in a fine grained mafic flow at a depth of 260 m (853 FT.).



Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1c MAFIC FLOW (Trachytic Texture)
- 2a DIORITE (Dyke/Sill)
- 3a FELSIC DYKE (Pyritic)
- 4a DIABASE (Magnetic)

Scale 1:2000

0 10 50 100
METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

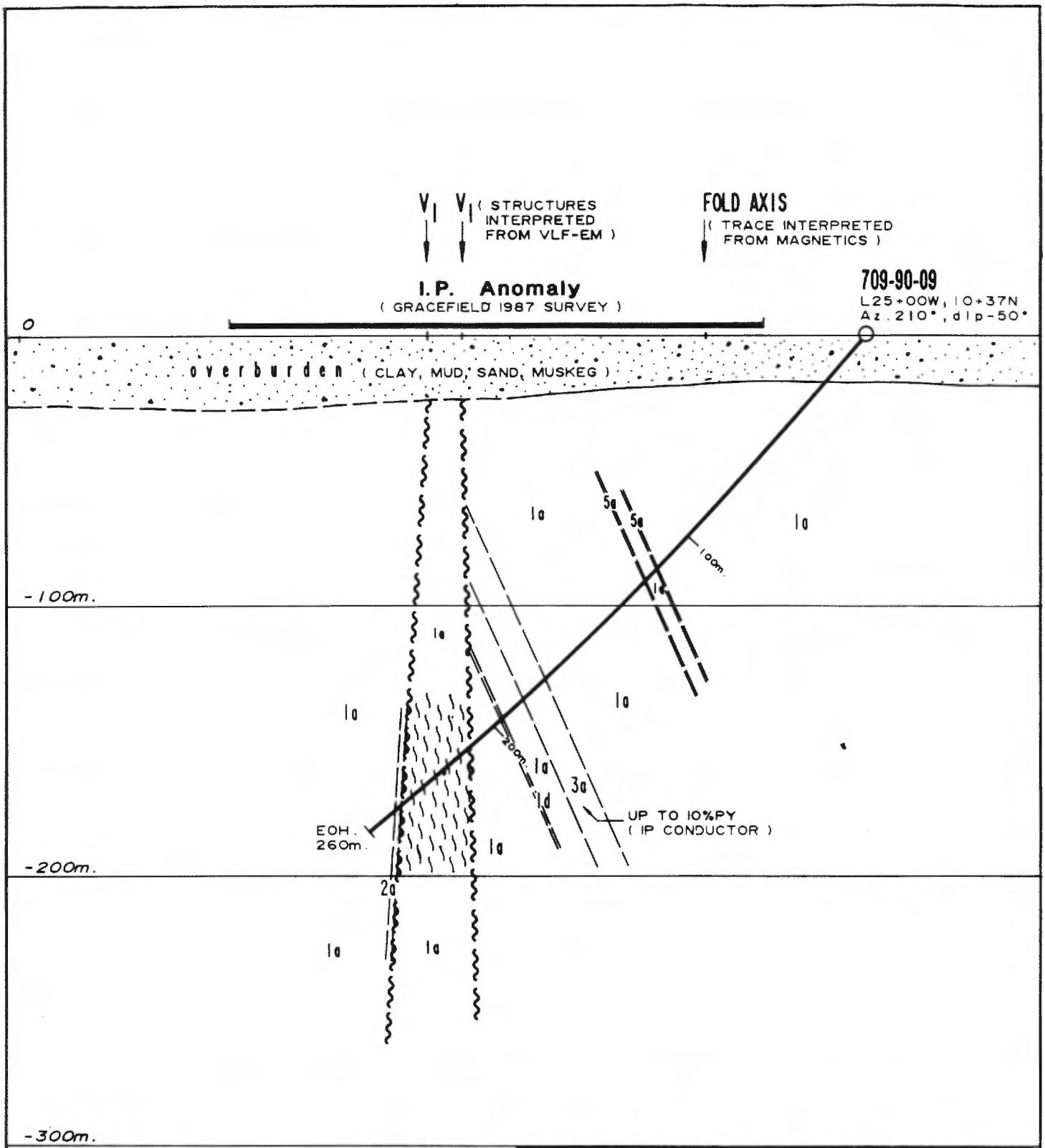
DRILL HOLE SECTION

Ddh 709-90-08

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

Figure 8



Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1d MAFIC FLOW (Feldsparphyric)
- 3a FELSIC DYKE (Pyritic)
- 5a INTERMEDIATE-MAFIC (Dyke)

Scale 1:2000

0 10 50 100

METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-09

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

Figure 9

VIII (C). Lithogeochemistry

During the 1990 drill program 376 core samples and four rock grab samples were submitted to Technical Services Laboratories in Timmins for gold geochemical analysis. Twenty-six of the core samples and all four of the rock grab sample also underwent whole rock geochemical analysis. In addition, the reconnaissance grab samples were analyzed for copper, zinc, lead and silver. The reconnaissance sampling results are discussed in the previous Section VII - Rock Grab Sampling and Prospecting.

Five of the 376 core samples submitted for gold analysis produced anomalous results in excess of 100 ppb Au with Au. The majority of the results (89.4%) were less than or equal to the 5 ppb Au gold detection limit. Thirty- five of the gold results (9.3%) slightly anomalous ranging from 10 ppb Au up to 70 ppb were Au. (See Appendix IV(A))

In general, the gold values resulting from drill core sampling of holes D.D.H. 709-90-05, 06 and 09 collared in the vicinity of two of the 1987 Gracefield drill holes were significantly higher than the 1987 sample results. The highest gold values resulting from D.D.H. GL-87-03 and 04 was 10 ppb Au.

Whole rock analysis confirmed that the volcanics drilled were predominantly tholeiitic ranging from basalt to dacite. Eighty-one percent (21 of 26) samples submitted produced tholeiitic basalt determinations. Noteworthy variations from field rock type identifications included sample 7150 logged as a diorite produced a tholeiitic basalt geochemical result, sample 7332 identified as a felsic dyke in hole 709-90-08 resulted in a tholeiitic basalt result and sample 7485 logged as a feldsparphyric flow produced a tholeiitic basalt result. Samples 7305 and 7446 produced calc-alkaline andesite and dacite determinations. (See Appendix IV(B))

IX. CONCLUSION

The 1990 geophysical and diamond drill program on the Landrienne Township property failed to define significant structurally controlled gold mineralization. Drill core gold analysis produced only spotty erratic slightly anomalous gold values up to 580 ppb Au over width ranging from 0.5 m to 1.0 m. The regional re-interpretation of geophysical geological and assessment data enhanced the potential for the discovery of structurally controlled precious metals mineralization by defining a number of target area outside the area where the 1987 and 1990 ground work was concentrated.

X. RECOMMENDATION

Phase 1 — Ground reconnaissance scale geophysical coverage should be expanded to cover the entire property as a preliminary investigation of the potential precious metal and base metal targets proposed by Boniwell in his October 3, 1990 report.

Phase 2 — Completion of systematic prospecting, geological mapping and lithogeochemical sampling over the entire grid.

Phase 3 — A follow-up I.P. survey focussed over selected prospective geological/geophysical outlined during phase 1 and 2 could further define drill targets.

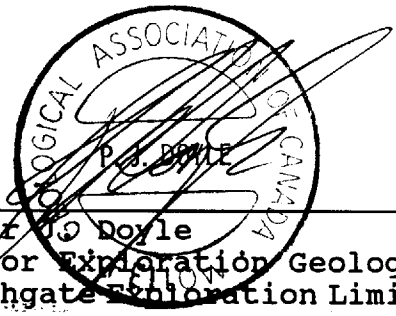
XI. STATEMENT OF QUALIFICATIONS

NAME:	Peter J. Doyle
PROFESSION:	Exploration Geologist
EDUCATION:	H.B.Sc. Geology Laurentian University, Sudbury, Ontario

EXPERIENCE:

1980-1983	Union Carbide Exploration Worked within Canadian Precambrian and Cordilleran geological provinces U)
1983-1987	Manitoba Department of Energy and Mines, Mines Branch Special Projects Geologist Precambrian Drill Core Libraries Project
1987-1989	Westfield Minerals Limited Senior Geologist
1989 - Present	Northgate Exploration Limited Senior Exploration Geologist

I Peter J. Doyle of Suite 2701, 1-First Canadian Place, Toronto, Ontario have been practicing as a professional geologist since graduation from Laurentian University in 1980.

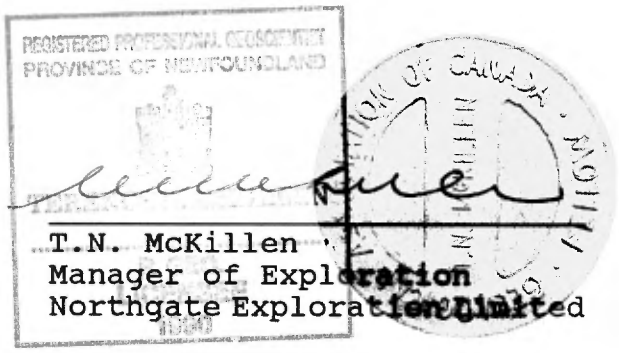


Peter J. Doyle
Senior Exploration Geologist
Northgate Exploration Limited

STATEMENT OF QUALIFICATIONS (CONT'D.)

I, Terence McKillen of Suite 2701, 1-First Canadian Place in the City of Toronto, Ontario have been practicing as a professional geologist since 1968.

I personally supervised the preparation, execution and interpretation of the field program.



T.N. McKillen
Manager of Exploration
Northgate Exploration Limited

XII. ACKNOWLEDGEMENT

This report could not have been compiled if not for the conscientious labour of the field crew in particular Mr. P. Tschipper and Mr. K. Cook. The assistance of Mr. J.B. Boniwell of Excalibur International Consultants during both data compilation and the program planning must be acknowledged. The authors also wish to thank R. Ortiz and A. Evans for their technical assistance in preparation of the report text and figures.

XIII. TIME DISTRIBUTION

LANDRIENNE TOWNSHIP PROJECT 709

NORTHGATE EXPLORATION LIMITED PERSONNEL

NAME	POSITION	FIELD DAYS	OFFICE DAYS	TIME PERIOD
T.N. McKillen	Manager of Exploration	0	8	Aug.22 - Dec.1,1990
P.J. Doyle	Senior Exploration Geologist	5	20	Aug.22 - Dec.1, 1990
P. Tschipper	Contract Geologist	34	10	Sept. 1 - Dec.1,1990
K. Cook	Contract Geologist	31	3	Sept.1 - Oct.31,1990
R. Ortiz	Technical Draughtsman	-	5	Oct.15 - Dec.1,1990
A. Evans	Secretary	-	5	Nov. 15 - Dec.1,1990
	TOTAL:	**70 Field Days**	**51 Office Days**	

XIV. STATEMENT OF EXPENDITURES

PROJECT 709 - LANDRIENNE TOWNSHIP
ABITIBI OUEST, QUEBEC
N.T.S. 32C 05/12
EXPENDITURES AUGUST-DECEMBER 1990

GEOLOGY:

Salaries:	NGX Personnel	$14,428.00	
Analysis:	Grab Samples	113.00	
			$14,541.00

LINE-CUTTING:

Contract:	Excalibur Consultants	$33,975.00	$33,975.00

GEOPHYSICAL/GEOLOGICAL:
(INTERPRETATION/COMPILATION)

Salaries:	NGX Personnel	$4,800.00	
Contract:	Excalibur Consultants/	$ 9,920.00	
	Tesla-10	2,340.00	$17,060.00

GEOCHEMISTRY:

Gold Analysis: (376 samples)	$ 4,196.00	
Whole Rock Analysis: (26 samples)	$ 4.846.00	
	650.00	$ 4,846.00

DRILLING:

Contract:	Bradley Bros. Limited	$49,888.00	
	Consultant (G. Lacroix)	600.00	$50,488.00

STATEMENT OF EXPENDITURES (CONT'.D)

CAMP:

Supplies/Rentals:	$ 1,146.00 ✓	
Hotel/Food:	$ 2,504.00	$ 3,650.00

TRANSPORT:

Supplies: (Gas, Maintenance)	$ 654.00	
Rentals: (Vehicles, ATV)	2,609.00	
Commercial Air Travel:	456.00	
Freight/Communications:	609.00	$ 4,328.00

OFFICE:

Supervision:	$ 3,000.00	
Drafting:	1,875.00	
Secretarial:	1,000.00	
Supplies:	450.00	$ 6,325.00

EXPENDITURE TOTAL **$135,213.00**

XV. REFERENCES

Boniwell, J.B. (1985a)

Results of Geophysical Surveying on the Landrienne Township Claims, Quebec. Private Report for Gracefield Explorations Inc.

Boniwell, J.B. (1985b)

The Geology and Exploration History, Landrienne Township Property. Private Report for Gracefield Explorations Inc.

Boniwell, J.B. (1986a)

Results of Extended Geophysical Surveying on the Landrienne Township Claims, Abitibi Ouest, Quebec. Private Report for Gracefield Explorations Inc.

Boniwell, J.B. (1986b)

Induced Polarization Results on the Landrienne Township Claims, Abitibi Ouest, Quebec. Private Report for Gracefield Explorations Inc.

Boniwell, J.B. (1986c)

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A study of Landrienne Township and Environs, Abitibi-Ouest, P.Q. Private Report for Northgate Exploration Limited.

Gow, N.N. (1987)

Spring 1987 Diamond Drill Programme - Landrienne Township Property. Abitibi, Ouest, Quebec. Private report for Gracefield Explorations Inc.

Patterson, J.M. (1985)

Landrienne Township Property, Quebec. Private report for Gracefield Explorations Inc.

APPENDIX I

SUMMARY DIAMOND DRILL LOGS

AND CROSS-SECTIONS

(D.D.H. 709-90-05 to 09)

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE DATE: Oct 17/90

SUMMARY DIAMOND DRILL LOG

PROPERTY: LANDRIENNE HOLE NO: 709-90-05 SHEET 1 of 2

PURPOSE: CLAIM:

COLLAR LOCATION 2400W 0976N AZIMUTH (A+COLLAR) 210°

CORE SIZE: BQ AZIMUTH (A+EOH) ~~210°~~ 223°

CONTRACTOR Bradly Brothers. DIP (A+COLLAR) -50°

DIP (A+EOH) -47

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION		
			Pyrite.		
0.0	15.88	CASING			
5.88	84.1	Unit 1a: Mafic Flow.	<1%		
		- Quartz, Carbonate, epidote, veins and veinlets throughout.			
		- Mild to strong foliations throughout the length.			
84.1	86.1	Unit 2a: Diorite dyke. moderately Carbonatized.			
86.1	110.0	Unit 1b: Mafic Tuff.			
		87.5-101.8m - Intense qtz, carb, epidote veining.			
		Mild to strong foliation throughout.			
10.0	110.3	Unit 2a - Diorite dyke.			
110.3	129.8	Unit 1a: Mafic flow.			
		Qtz, carb veins with			
		mild to strong foliation throughout.			
129.8	131.6	Unit 1b: Mafic Tuff.			
131.6	138.5	Unit 1a: Mafic Flow			
		136.0-136.3 pyrite	3-4%		
		foliated throughout.			
128.5	139.5	Unit 3a: Felsic Dyke	2%		
140.1	141.0	Unit 3a: Felsic Dyke	2%		

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE

SUMMARY DIAMOND DRILL LOG

DATE: Oct 17/90

PROPERTY: HOLE NO: SHEET 2 of 2

PURPOSE: CLAIM:

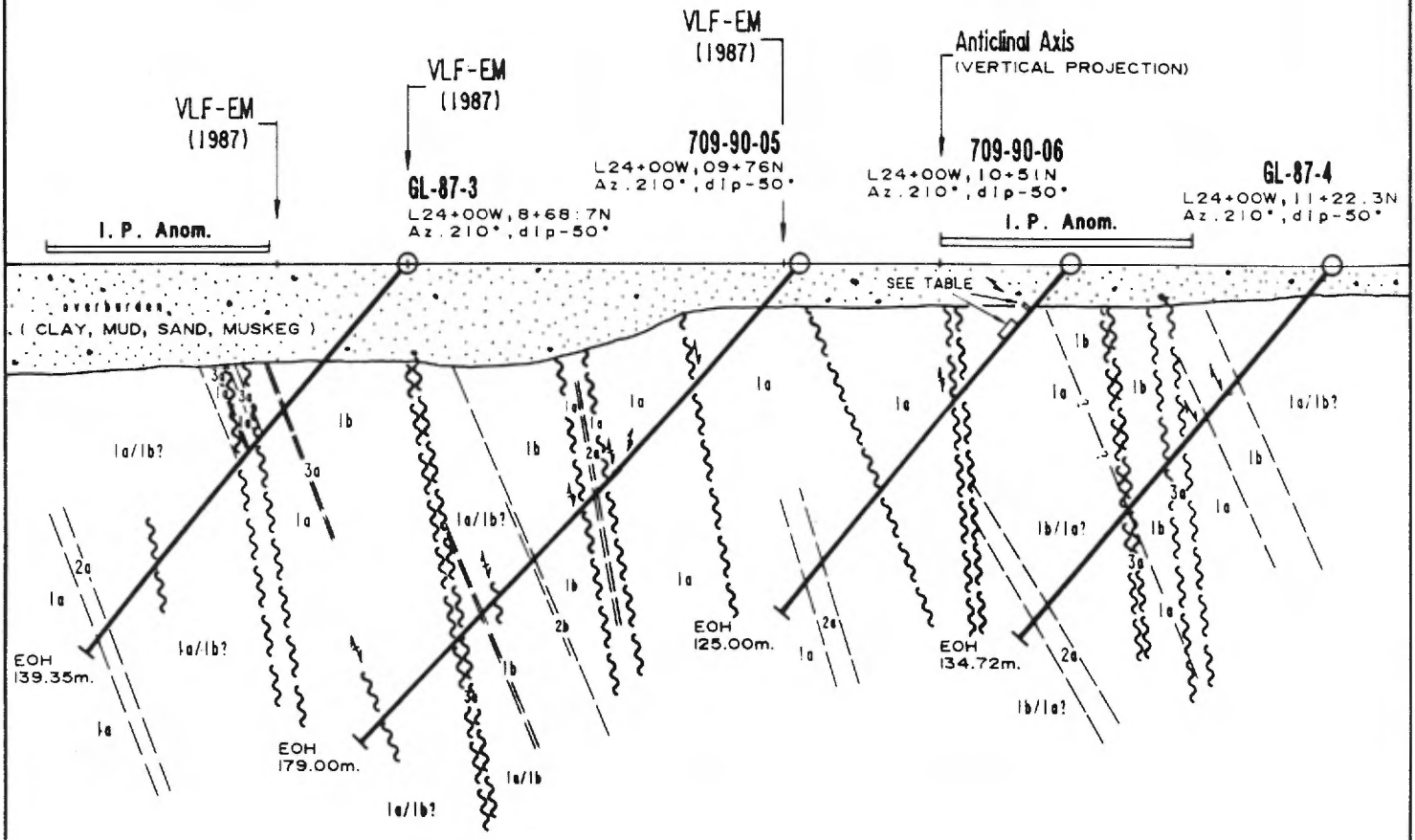
COLLAR LOCATION AZIMUTH (A+COLLAR)

CORE SIZE: (A+EOH)

(A+COLLAR)

CONTRACTOR (A+EOH)

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION		
141.0	179.0	Unit 1a: Mafic Flow. qtz-carb veins throughout weak to strong foliation throughout. Alteration and foliation become very weak in the last 10 meters of the hole.			
	179.0	E.O.H.			
		Note. (1) 100 samples split for Au-analysis. Assay tag Numbers 7101 - 7200			
		(2) 709-90-05. consists of 28: BQ 6 meter trays numbered 1-28 inclusive.			



Ddh 709-90-06			
FOOTAGE From	To	m	Au (ppb)
16.50	17.50	1.0	20
20.80	21.80	1.0	20
21.80	22.80	1.0	15
22.80	23.80	1.0	45
23.80	24.80	1.0	20
24.80	25.80	1.0	10
25.80	26.80	1.0	20
26.80	27.80	1.0	125
27.80	28.80	1.0	15

Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1b MAFIC TUFF
- 2a DIORITE (Dyke/Sill)
- 2b INTERMEDIATE INTRUSIVE
- 3a FELSIC DYKE (Pyritic)
- FAULT/SHEAR ZONE

Scale 1:2000

0 10 50 100

METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-05/06, GL-87-3/4

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE DATE: Oct 18/19

SUMMARY DIAMOND DRILL LOG

PROPERTY: LANDRIEVINE HOLE NO: 709-90-06 SHEET 1 of 1

PURPOSE: CLAIM:

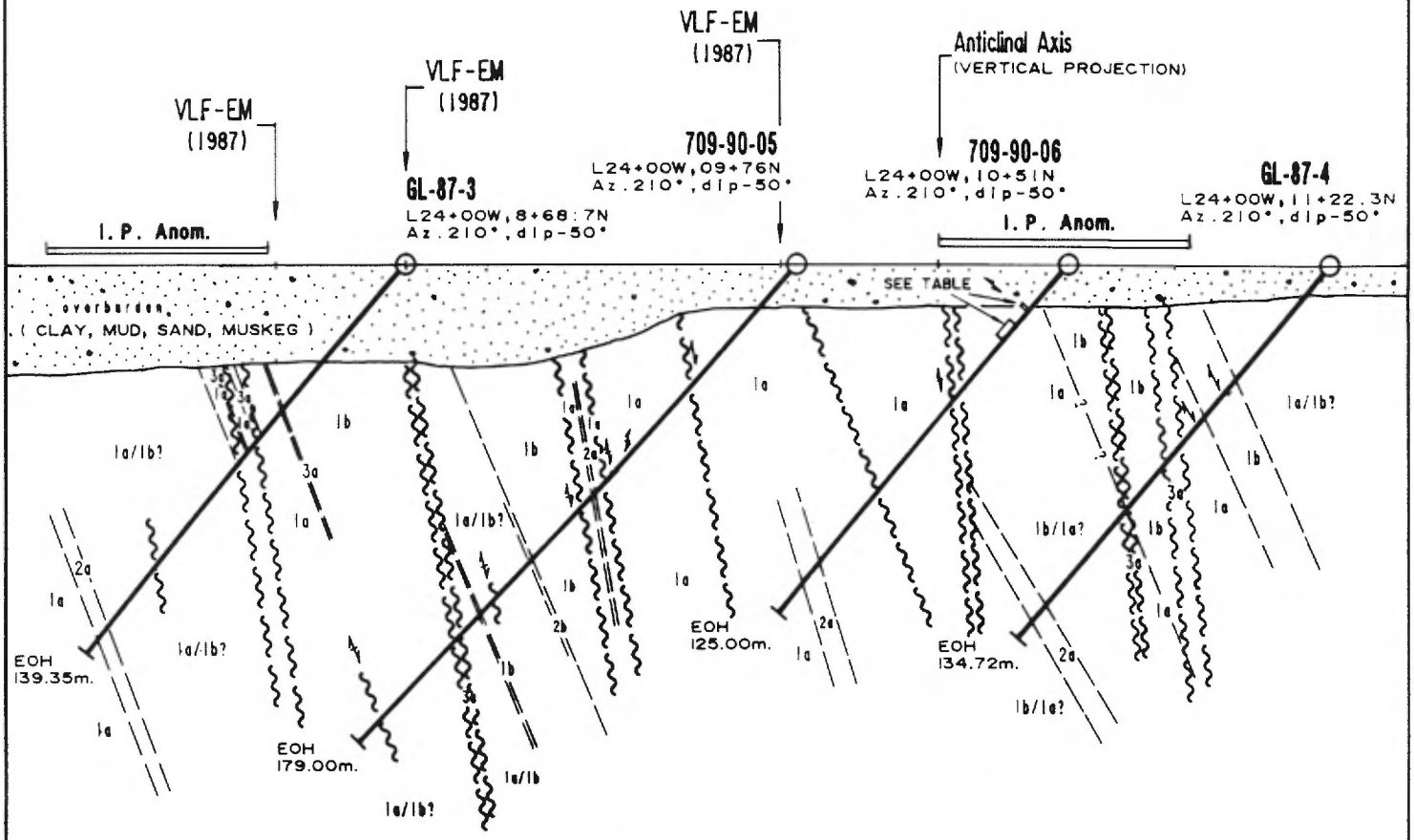
COLLAR LOCATION 24+00W 10+51N AZIMUTH (A+COLLAR) 210°

CORE SIZE: BQ AZIMUTH (A+EOH) 230°

CONTRACTOR Bradly Brothers. DIP (A+COLLAR) -50°

DIP (A+EOH) -52°

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION		
			Pyrite		
0.0	16.0	Casing			
16.0	107.0	Unit 1a - Fine grained mafic flow			
		qtz-carb veinlets pervasive.			
		20.8-21.1 - moderate to intense foliation @ 80°	1-2%		
		22.3-24.8 - intense silicification (Felsic dyke?)	5-10%		
		25.7-28.5 - intense silicification (Felsic dyke)	5-10%		
		46.1-50.1 - moderate to intense foliation @ 55°			
		82.4-82.8 - intense shearing, qtz carb veins @ 58°			
107.0	114.5	Unit 2a Diorite dyke.			
114.5	125.0	Unit 1a - Fine grained mafic flow			
		qtz-carb veinlets pervasive			
	125.0	E.O.H. CASING PULLED.			
		Note (1) 57 samples sent for			
		Au - analysis, Tag numbers			
		7001 - 7057			
		(2) 709-90-06 consists of			
		18 : BQ 6 metre trays.			
		Total meterage after			
		two holes is (304m)			



Ddh 709-90-06			
FOOTAGE From	To	m	Au (ppb)
16.50	17.50	1.0	20
20.80	21.80	1.0	20
21.80	22.80	1.0	15
22.80	23.80	1.0	45
23.80	24.80	1.0	20
24.80	25.80	1.0	10
25.80	26.80	1.0	20
26.80	27.80	1.0	125
27.80	28.80	1.0	15

Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1b MAFIC TUFF
- 2a DIORITE (Dyke/Sill)
- 2b INTERMEDIATE INTRUSIVE
- 3a FELSIC DYKE (Pyritic)
- FAULT/SHEAR ZONE

Scale 1:2000

0 10 50 100

METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-05/06, GL-87-3/4

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE DATE: Oct 22/9

SUMMARY DIAMOND DRILL LOG

PROPERTY: LANDRIENNE HOLE NO: 709-90-07 SHEET 1 of 2

PURPOSE: CLAIM:

COLLAR LOCATION 2000W 1352N AZIMUTH (A+COLLAR) 210°

CORE SIZE: BQ AZIMUTH (A+EOH) 225°

CONTRACTOR Bradly Brothers DIP (A+COLLAR) -50°

DIP (A+EOH) -45.5°

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION pyrite		
0.0	22.0	CASING			
22.0	34.5	Unit 1a - Fine-medium grained mafic flow.			
		22.0 - 23.4 - intense shearing, silicified, Carbonatized	1-2%		
34.5	36.2	Unit 2a - Medium grained diorite dyke.			
36.2	42.3	Unit 1b - Fine-medium grained mafic amygdaloidal flow.			
42.3	64.7	Unit 1a - Fine grained mafic flow.			
		42.3 - 43.7 - sheared with qtz-carb veins.	None		
		47.5 - 48.0 - very sheared qtz-carb veins.	Trace		
		60.5 - 61.8 - very sheared qtz-carb veins	Trace		
64.7	71.8	Unit 1b - Fine grained mafic qtz, amygdaloidal flow			
71.8	75.7	Unit 1a - Fine grained mafic flow.			
75.7	83.7	Unit 1b - Fine grained mafic amygdaloidal flow.			
83.7	182.0	Unit 1a - fine grained mafic flow			
		86.0 - 94.0 - Intense shearing qtz-carb veins.			
		156.8 - 157.2 - Brittle ductile shear zone	Trace.		
	182.0	EOH. CASING PULLED			

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE

SUMMARY DIAMOND DRILL LOG

DATE: Oct 22/9

PROPERTY:

HOLE NO: 709-90-07 SHEET 2 of 2

PURPOSE:

CLAIM:

COLLAR LOCATION 2000W 1352N

AZIMUTH (A+COLLAR)

CORE SIZE:

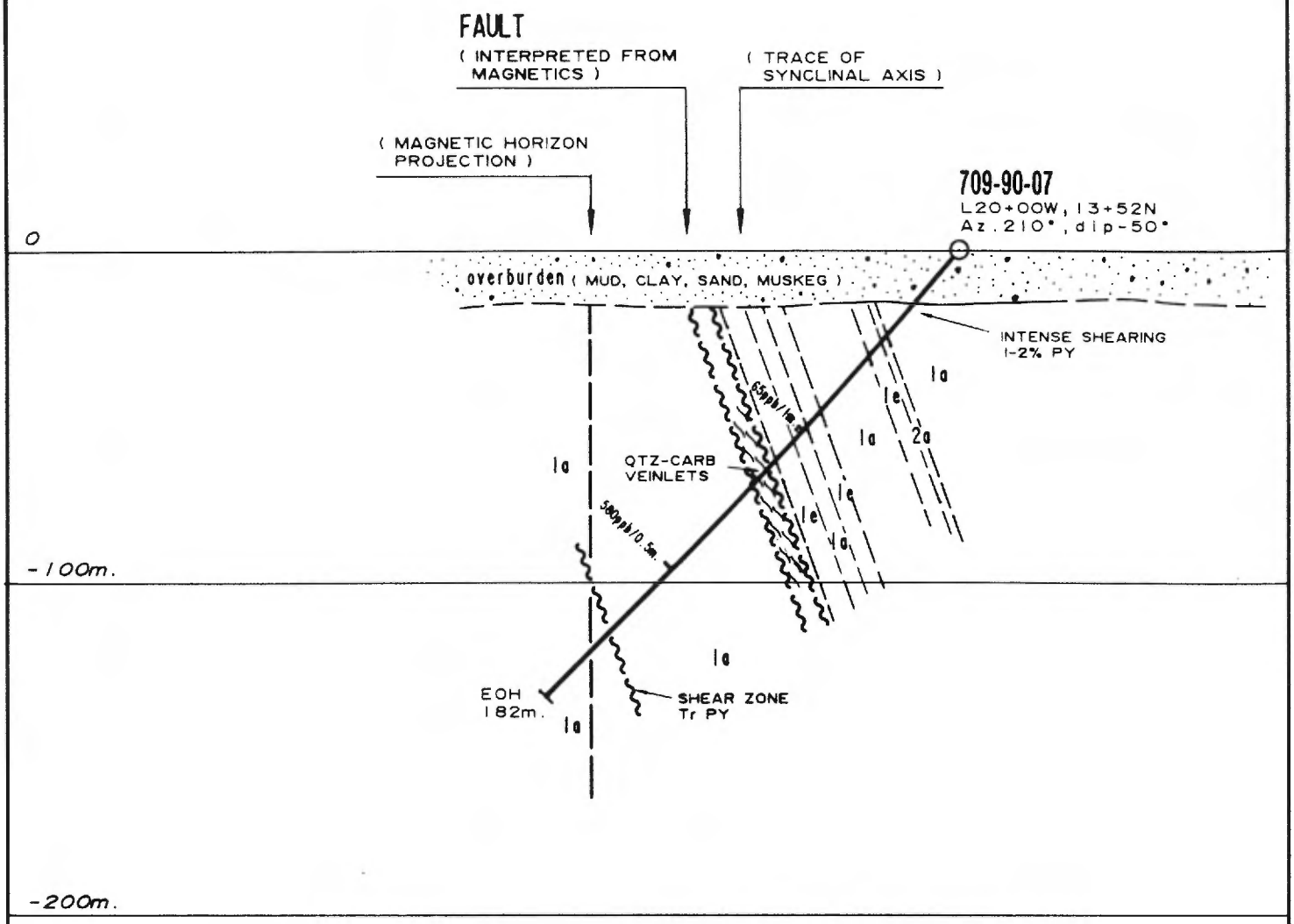
(A+EOH)

(A+COLLAR)

CONTRACTOR

(A+EOH)

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION		
		Note:			
		① 74 samples sent for Au-analysis. Tag numbers 7201-7274			
		② 709-90-07 consists of 28: BQ 6 metre trays			
		Total Meterage after 3 holes (486 m)			



Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1e MAFIC FLOW (Amygdaloidal)
- 2a DIORITE (Dyke/Sill)

Scale 1:2000

0 10 50 100

METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-07

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE DATE: Oct 22/90

SUMMARY DIAMOND DRILL LOG

PROPERTY: LANDRIENNE HOLE NO: 709-90-08 SHEET 1 of 2

PURPOSE: CLAIM:

COLLAR LOCATION 26+00N 16+32N AZIMUTH (A+COLLAR) 210°

CORE SIZE: BQ AZIMUTH (A+EOH) 227°

CONTRACTOR Bradly Brothers DIP (A+COLLAR) -50°

DIP (A+EOH) -45.5°

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION	
			Pyrite.	pyrrhotite
0.0	46.0	Casing.		
46.0	48.7	Unit 4a - medium grained magnetic diabase.		
48.7	50.0	Unit 1a - fine grained mafic flow.		
50.0	53.7	Unit 4a - medium grained magnetic diabase.		
53.7	56.5	Unit 1c - trachytic textured mafic flow.		
56.5	57.8	Unit 4a - Non-magnetic diabase.		
57.8	60.8	Unit 1a - fine grained mafic flow		
60.8	66.4	Unit 4a - medium grained magnetic diabase.		
66.4	85.1	Unit 1a - fine grained mafic flow.		
		66.4-72.8 - extremely silicified and sheared	5-10%	
85.1	86.9	Unit 3a - Grey felsic dyke	5-10%	
86.9	92.8	Unit 1a - fine grained mafic flow		
		89.1-89.5 - strong shearing.		
92.8	94.7	Unit 3a - Grey felsic dyke	5%	1-2%
94.7	117.9	Unit 1a - fine grained mafic flow		
117.9	126.4	Unit 2a - Diorite dyke.		
126.4	134.0	Unit 1a - fine grained mafic flow		
134.0	147.0	Unit 2a - Diorite Dyke.	Trace	

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE DATE:

SUMMARY DIAMOND DRILL LOG

PROPERTY: HOLE NO: 709-90-08 SHEET 2 of 2

PURPOSE: CLAIM:

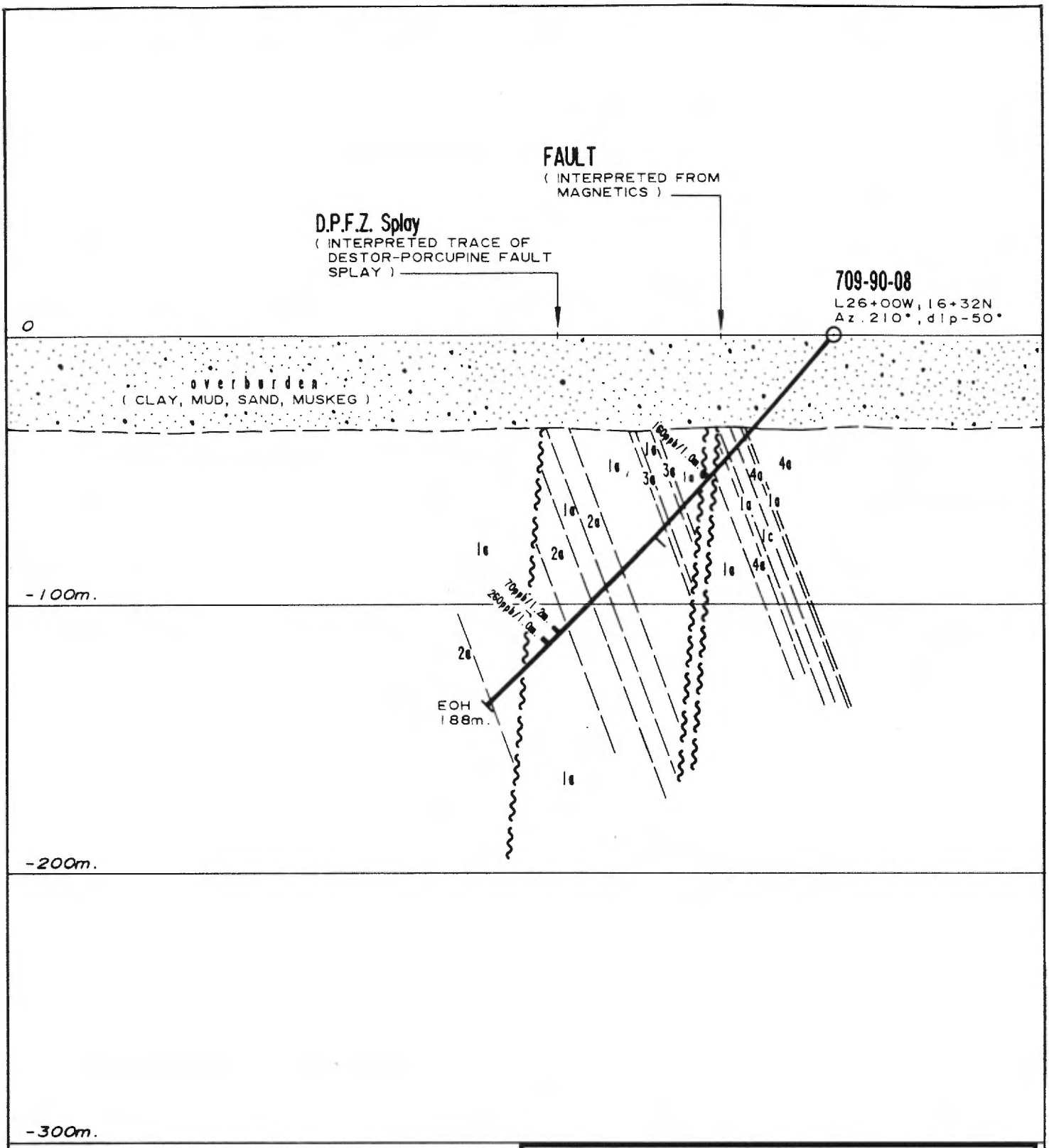
COLLAR LOCATION 26+00W 16+32N AZIMUTH (A+COLLAR) 210°

CORE SIZE: AZIMUTH (A+EOH) 227°

DIP (A+COLLAR) -50°

CONTRACTOR DIP (A+EOH) -45.5°

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION		
			Pyrite.		
147.0	186.5	Unit 1a - fine grained mafic flow			
		169.1-168.7 intense shearing intense chloritization qtz-carb veins	Trace		
186.5	188	Unit 2a Diorite Dyke.			
	188.0	EOH · CASING PULLED			
		Note			
		① 59 samples sent for Au-analysis.			
		Tag numbers 7301-7359			
		② 709-90-08 consists of 25: BQ 6 metre trays.			
		Total meterage after 4 holes is (674 m)			



Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1c MAFIC FLOW (Trachytic Texture)
- 2a DIORITE (Dyke/Sill)
- 3a FELSIC DYKE (Pyritic)
- 4a DIABASE (Magnetic)

Scale 1:2000

0 10 50 100
METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-08

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE

SUMMARY DIAMOND DRILL LOG

DATE: Oct 22/90

PROPERTY: LANDRIENNE HOLE NO: 709-90-09 SHEET 1 of 2

PURPOSE: CLAIM:

COLLAR LOCATION 2.5 ROOW 10+37 N AZIMUTH (A+COLLAR) 210°

CORE SIZE: BQ AZIMUTH (A+EOH) 221°

CONTRACTOR Bradly Brothers DIP (A+COLLAR) -50°

DIP (A+EOH) -40.5

FROM (Metres)	TO	DESCRIPTION	MINERALIZATION pyrite.		
0.0	22.0	CASING			
22.0	116.6	Unit 1a - fine grained mafic flow.			
		26.6 - 27.2 - Intense shearing.			
		46.5 - 47.0 - Intense chlorite alteration	1%		
		67.4 - 67.7 - Intense shearing.			
116.6	117.0	Mafic Dyke. Unit 5a			
117.0	123.8	Unit 1a - fine grained mafic flow.			
123.8	124.0	Unit 5a - Mafic Dyke.			
124.0	175.5	Unit 1a - fine grained mafic flow			
175.5	186.2	Unit 3a - Felsic Dyke.	0-10%		
186.2	194.6	Unit 1a - fine grained mafic flow.			
194.6	197.0	Unit 1d - medium grained feldspar phyric flow			
197.0	244.9	Unit 1a - fine grained mafic flow.			
		211.2 - 244.9 - major shear zone. very little pyrite except at lower contact. moderate to strong carbonatization throughout.			
244.9	247.4	Unit 2a Diorite Dyke.			
247.4	260	Unit 1a - fine grained mafic flow.			
		moderate to strong shearing throughout. shearing dies out towards the end.			

NORTHGATE EXPLORATION LIMITED

PRELIMINARY DRILL SITE

SUMMARY DIAMOND DRILL LOG

DATE: Oct 22/90

PROPERTY:

HOLE NO: 709·90·09 SHEET 2 of 2

PURPOSE:

CLAIM:

COLLAR LOCATION 2500N 10+37N

AZIMUTH (A+COLLAR)

ORE SIZE:

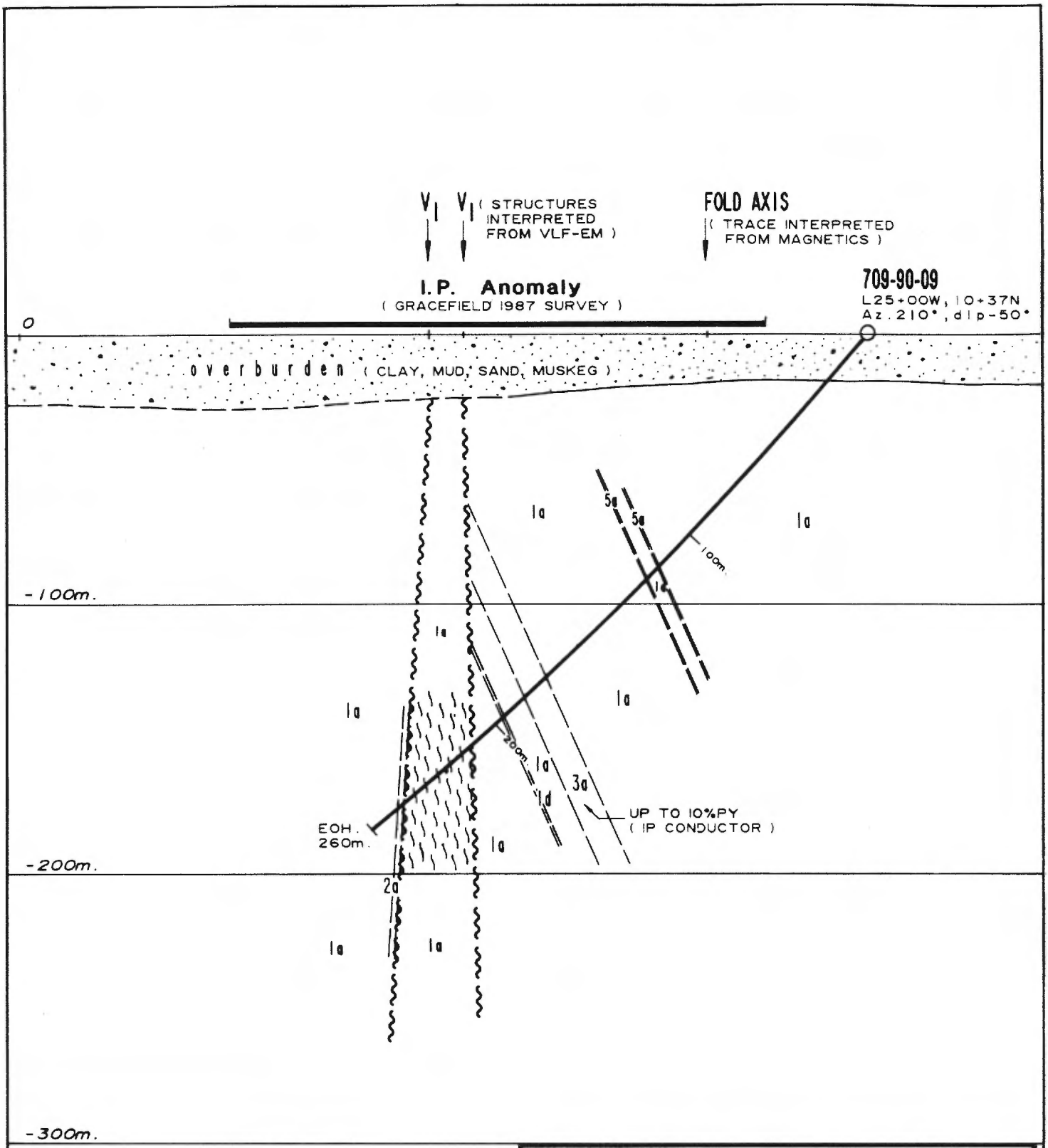
(A+EOH)

CONTRACTOR

(A+COLLAR)

(A+EOH)

ROM (Metres)	TO	DESCRIPTION	MINERALIZATION		
	EOH	260m Casing Pulled.			
		Note			
		① 84 samples sent			
		for Au-analysis.			
		Tag numbers 7401 - 7484			
		② 709·90·09 consists of			
		41: BQ 6 metre trays.			
		After 5 holes total			
		meterage is (934m)			



Legend:

- 1a MAFIC FLOWS (Fine grained, massive)
- 1d MAFIC FLOW (Feldsparphyric)
- 3a FELSIC DYKE (Pyritic)
- 5a INTERMEDIATE-MAFIC (Dyke)

Scale 1:2000

0 10 50 100

METRES

Northgate Exploration Limited

LANDRIENNE TWP. PROPERTY - Proj. 709

LANDRIENNE TWP., ABITIBI-OUEST, QUE. N.T.S.32 C/12

DRILL HOLE SECTION

Ddh 709-90-09

(Section Looking N 60° W)

DRAWN BY: RODEL E. ORTIZ Nov.'90

APPENDIX II

DETAILED DIAMOND DRILL LOGS

D.D.H. 709-90-05 to 09

NORTHGATE EXPLORATION LIMITED DIAMOND DRILL HOLE REPORT Hole #: 709-90-05 Page # 1 of 7

						Depth	Dip	Azimuth	Test	Depth	Dip	A	
Property	Landrienne Twp., Quebec			NTS	32 C/05	19.0	- 52	210	T	179.0	- 47	223	T
Location	Barraute, PQ	Claim	440636-2	Bearing	210*								
Logged By	P. T., K. Cook	Easting	24+00W	Dip-Collar	-50*								
Started	Oct 11, 1990	Northing	9+76N	Length	179m								
Completed	Oct 13,1990	Elevation		Core	BQ								

Drill Contractor Bradly Brothers Co., Rouyn-Noranda, Quebec
Comments To test the margin of an I.P. conductor

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
0.00	15.88	**CASING**					
15.88	84.10	**MAFIC FLOW** Fine to medium grained, medium green to grey colour, equigranular, homogenious, massive, mafic to intermediate volocanic flow. Pervasive quartz-sericite vein and veinlets infilling the fractures. <1mm feldspar phenocrysts predominate at 5 to 10cm away from major quartz veining. 16.07 sericite infilled fractures at 43 degrees. Specks of disseminated pyrite, 3 to 4mm wide. 17.02-17.12 Intense sericite alteration with minor siliceous veinlets. Upper contact at 30 degrees; lower contact at 61 degrees. 18.88-19.08 Quartz-sericite veining. Upper and lower contacts at 51 degrees. 21.14-21.30 Quartz-sericite veining with minor, 2mm wide, chlorite veinlets. Upper and lower contacts at 58 degrees. 22.85-23.10 Quartz-sericite veining with irregular blotches of sericite	7101	15.9	16.9	1.0	<5
			7102	16.9	17.9	1.0	<5
			7103	18.9	19.9	1.0	<5
			7104	20.8	21.8	1.0	<5
			7105	22.7	23.7	1.0	<5
			7106	23.7	24.7	1.0	<5
			7107	25.1	26.1	1.0	<5
			7108	26.1	26.6	0.5	<5
			7109	26.6	27.6	1.0	<5
			7110	27.7	28.7	1.0	<5
			7111	29.1	30.1	1.0	<5
			7112	30.8	31.8	1.0	<5
			7113	31.8	32.8	1.0	<5
			7114	32.8	33.8	1.0	<5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		alteration. Veins at 52 degrees.	7115	33.8	34.8	1.0	<5
23.20	23.30	Quartz-sericite veining infilling fractures. Moderate	7116	34.8	35.8	1.0	<5
		foliation at 60 degrees. Upper and lower contacts at 62 degrees.	7117	37.2	38.2	1.0	<5
23.78	23.81	Quartz-sericite vein. Upper and lower contacts at 48 degrees	7118	38.2	39.2	1.0	<5
24.34	24.37	Quartz-sericite vein. Upper and lower contacts at 65 degrees	7119	39.2	39.7	0.5	<5
24.59	24.63	Quartz-sericite vein. Upper and lower contacts at 40 degrees	7120	42.0	43.0	1.0	<5
25.62	25.65	Quartz vein(yellow brown in colour) with minor sericite	7121	43.0	44.0	1.0	<5
		veinlets at 45 degrees. Minor black chlorite alteration.	7122	44.0	45.0	1.0	<5
26.18	26.23	Quartz-sericite vein at 50 degrees.	7123	45.0	46.0	1.0	<5
27.00	27.13	White bull quartz vein with minor sericite and green chlorite	7124	46.0	47.0	1.0	<5
		Upper contact 40 degrees, lower contact 27 degrees.	7125	49.6	50.6	1.0	<5
28.20		Quartz vein, 3cm wide, lies within shear plane at 45 degrees.	7126	53.0	54.0	1.0	<5
29.20	29.30	Epidote veining at 40 degrees, with minor quartz and sericite	7127	54.0	55.0	1.0	<5
31.50		Quartz vein, 2cm wide, at 47 degrees.	7128	55.0	56.0	1.0	<5
32.70	33.10	Slightly sheared mafic volcanic at 83 degrees.	7129	57.0	58.0	1.0	<5
33.90	34.00	Disseminated, anhedral pyrite grains, 1-2mm wide.	7130	58.0	59.0	1.0	5
37.70	38.00	Quartz-epidote veining at 80 degrees. Epidote veining shows	7131	59.0	60.0	1.0	<5
		some brecciation with subsequent quartz infilling.	7132	61.7	62.7	1.0	<5
38.20	38.60	Disseminated euhedral to anhedral grains of pyrite, 2-3mm	7133	63.0	64.0	1.0	<5
		wide.	7134	64.0	65.0	1.0	<5
39.30		Quartz-epidote vein at 48 degrees, 4cm wide. The epidote is	7135	65.0	66.0	1.0	5
		brecciated with quartz infilling the fractures.	7136	66.0	67.0	1.0	5
42.20		Quartz-epidote vein at 70 degrees, 3cm wide. The epidote is	7137	67.0	68.0	1.0	5
		brecciated with quartz infilling the fractures.	7138	68.0	69.0	1.0	5
43.00	43.20	Quartz veining at 42 degrees. Veining lies along plane of	7139	72.7	73.7	1.0	5
		shearing.	7140	73.7	74.7	1.0	<5
44.00	45.00	Slight shearing at 50 degrees with an increase in	7141	74.7	75.2	0.5	<5
		silicification.	7142	75.2	76.2	1.0	5
45.00	45.50	Silicification becoming more intense.	7143	77.6	78.6	1.0	<5
45.50	45.60	Broken core: very silicified.	7144	78.6	79.6	1.0	<5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
45.60	46.50	Very silicified with 1% euhedral pyrite, 1-2mm in width.	7145	79.6	80.6	1.0	<5
50.70	50.80	Bull quartz vein at 25 degrees.	7146	80.6	81.6	1.0	5
53.20		Small quartz-epidote vein,3cm wide, at 30 degrees.	7147	81.6	82.6	1.0	<5
55.10	55.80	Bull quartz veining.	7148	82.6	83.6	1.0	<5
55.80	55.90	Grey, brecciated quartz veining at 55 degrees; possibly some tourmaline present.	7149	83.6	84.1	0.5	<5
57.30	57.50	Grey,white quartz veining, no sulphides, but there is a thin veinlet,1-2mm, of a black mineralat 24 degrees : possibly tourmaline.					
58.20	58.30	White quartz vein at 24 degrees. Small euhedral grains of pyrite, 1-2mm, are found along the contact.					
59.10	59.50	Bull quartz vein. Upper and lower contacts at 30 degrees.					
61.80	62.30	Disseminated euhedral pyrite grains, 1-5mm.					
63.00	69.00	Moderately silicified. Quartz vein between 65.6-65.7 at 60 degrees. Small quartz-epidote veinlets at: 67.9m at 26 degrees; 68.2m at degrees; 68.5m at 30 degrees. <1% euhedral pyrite, 1-2mm, found between 66.0-67.0.					
70.10	70.20	Bull quartz vein at 52 degrees.					
73.40	73.70	Moderate shearing at 30 degrees with quartz stringers aligned with shearing as well a pyrite up to 5mm wide.					
74.20	74.60	Moderate shearing at 52 degrees with quartz stringers as well as subhedral pyrite, 1-2mm wide.					
74.70	74.90	Quartz veining at 50 degrees with pyrite along contact.					
76.20		A few grains of euhedral pyrite 5mm wide.					
77.70		Broken core: minor quartz veining.					
80.00		Numerous quartz veinlets at 50 degrees with a few small pyrite grains <1mm wide.					
80.50	80.70	Shearing at 45 degrees with many quartz-carbonate stringers. No sulphides.					
81.00	81.10	Broken core: Quartz-epidote vein.					
82.70	84.10	Shearing at 40 degrees; very silicified. Minor carbonate					

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		with quartz stringers and very fine pyrite grains (<1mm) within the quartz stringers and along shear planes.					
84.10	86.10	**DIORITE DYKE** Medium grained, pale green, moderately carbonatized throughout. Upper contact at 55 degrees; lower contact at 50 degrees.	7150	84.9	85.9	1.0	<5
86.10	110.10	**MAFIC TUFF** Fine grained, light green. Fragments are small: 1mm. 86.10-86.60 Sheared at 70 degrees. Quartz stringers,sericite, with some pyrite grains but very little carbonatization. 87.50-87.90 Moderate shear at 65 degrees. Quartz-carbonate veiening present. 89.60-89.90 Quartz-carbonate-epidote vein. Epidote is brecciated with quartz-carbonate veins infilling the fractures. Numerous smaller veins of a similar type at 87.0, 87.3, 88.7, 89.1, 90.6. 92.20-92.60 A few euhedral grains of pyrite up to 5mm wide. 92.60-93.00 Sheared at 50 degrees. Quartz- carbonate-epidote veins. 93.90-94.10 Quartz-carbonate-epidote vein. 98.30-98.50 Euhedral pyrite, 5mm cubes. 100.10-100.30 Quartz-carbonate-epidote shear at 42 degrees. 101.30-101.80 Quartz-carbonate vein oriented along the core axis, 1cm wide. 102.70 A marked absence of epidote veining from this point downwards. Pervasive quartz-carbonate veinlets.	7151 7152 7153 7154 7155 7156 7157 7158 7159 7160 7161 7162 7163 7164	86.0 87.0 88.6 89.6 91.7 92.2 93.2 94.2 95.2 98.1 99.1 100.1 101.1 102.1	87.0 88.0 89.6 90.6 92.2 93.2 94.2 95.2 96.2 99.1 100.1 101.1 102.1 103.1	1.0 1.0 1.0 1.0 0.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	<5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5
110.10	110.30	**DIORITE DYKE** Intermediate intrusive rock. Light grey, fine to medium grained, porphyritic, inequigranular, weak to moderate foliation, intensely altered. Upper and lower contacts both at 90 degrees.					

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
110.30	129.80	**MAFIC TO INTERMEDIATE FLOW (TUFF?)** Fine grained, dark green, equigranular, moderately to strongly foliated, moderately aletered. 111.80 113.20 Zone of intense silicification, sulphidation and shearing. Numerous quartz-chlorite-carbonate veinlets along shear planes. Pyrite concentrated along shear planes at 112.3, 112.4, 112.6-112.9. 114.90-115.50 Zone of intense silicification and shearing at 65 degrees. Minor quartz-chlorite-carbonate veinlets along shear planes. 118.50-119.50 A new unit of the same composition. Both contacts gradational. Upper contact at 90 degrees; lower at 28 degrees. 119.60 End of zone of intense silicification with small chloritic veinlets (<2mm) Pyrite is up to 2% disseminated. 121.40-127.00 Pervasive quartz-carbonate veinlets. Rock is very carbonatized at 121.40, decreasing in intensity along length, becoming on slightly carbonatized at 127.00. 121.40-122.00 very silicified with many euhedral grains of pyrite (1-2mm) foliation at 60 degrees. 124.20- 124. very silicified, some small pyrite grains (1-2mm) foliation at 50 degrees 124.60-124.70 extremely carbonatized, slightly sheared at 60 degrees. 128.40-128.80 Very carbonatized with quartz veining, minor epidote and sericite.	7165	111.8	112.8	1.0	<5
			7166	112.8	113.3	0.5	<5
			7167	114.1	114.6	0.5	<5
			7168	114.6	115.6	1.0	<5
			7169	118.9	119.9	1.0	<5
			7170	119.9	120.9	1.0	<5
			7171	120.9	121.4	0.5	<5
			7172	121.4	122.4	1.0	<5
			7173	122.4	123.4	1.0	<5
			7174	123.4	124.4	1.0	<5
			7175	124.4	125.4	1.0	<5
			7176	128.4	128.9	0.5	<5
129.80	131.60	**MAFIC TUFF** Fine grained, light green, fragments up to 1mm. Contacts are sharp and are both at 55 degrees. Weakly carbonatized throughout.	7177	131.0	131.5	0.5	5
131.60	138.50	**MAFIC FLOW (TUFF?)** Fine grained 135.00-136.50 An increase in silicification, weakly carbonatized.	7178	135.0	136.0	1.0	<5
			7179	136.0	136.5	0.5	5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		135.10-136.00 numerous pyrite grains up to 5mm wide. 136.00-136.3 pyrite increases in concentration to 3 or 4%, with foliation at 50 degrees. Pyrite is concentrated along the foliation.					
138.50	139.50	**FELSIC DYKE?** or extremely silicified mafic. Aphanitic. Contacts are both 40 degrees. 1-2% pyrite up to 5mm wide present.	7180	138.5	139.5	1.0	5
139.50	140.10	**MAFIC FLOW (TUFF?)** Fine grained					
140.10	141.00	**FELSIC DYKE?** or extremely silicified mafic. Aphanitic. Both contacts at 55 degrees. 1-2% pyrite present (1mm wide).					
141.00	179.00	**MAFIC FLOW (TUFF?)**	7181	140.1	141.1	1.0	<5
		Fine grained	7182	142.0	143.0	1.0	<5
		142.50-142.60 Broken core	7183	143.0	144.0	1.0	<5
		142.80 Small quartz-carbonate vein.	7184	144.0	145.0	1.0	<5
		146.00-147.00 Numerous quartz-carbonate veins and veinlets at 45-50 degrees.	7185	146.0	147.0	1.0	<5
			7186	147.5	148.5	1.0	<5
		147.60-148.10 A moderate to strongly silicified zone with quartz-carbonate veins along foliation at 53 degrees.	7187	149.0	150.0	1.0	<5
			7188	153.0	154.0	1.0	<5
		148.10-149.00 Numerous quartz-carbonate veins along foliation at 55 degrees.	7189	154.0	155.0	1.0	5
			7190	155.0	156.0	1.0	<5
		149.00-150.00 Zone of intense silicification with minor chloritic veinlets. 1-2% disseminated pyrite.	7191	156.0	157.0	1.0	<5
			7192	157.0	158.0	1.0	<5
		151.20 Sharp contact at 90 degrees marking division between two similar units.	7193	158.0	159.0	1.0	<5
			7194	159.0	160.0	1.0	<5
		153.00-160.00 Zone of intense silicification with numerous	7195	160.0	161.0	1.0	5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		quartz-chlorite-carbonate veinlets at 50-65 degrees.	7196	163.0	164.0	1.0	<5
		158.40-158.50 Zone of pyrite mineralization concentrated along foliation	7197	165.0	166.0	1.0	<5
		at 50-60 degrees.	7198	166.0	167.0	1.0	<5
		160.30-161.80 Intense silicification.	7199	167.0	167.5	0.5	<5
		163.00-163.70 Moderate silicification with quartz-carbonate veinlets	7200	170.8	171.3	0.5	<5
		along foliation at 50-60 degrees.					
		165.30-167.10 Intense silicification with quartz-carbonate veins and					
		quartz-sericite veins parallel to a 50-60 degree foliation.					
		170.90-171.20 Moderately sheared. Silicified with weak carbonatization.					
		Pyrite found along shear planes. Foliation at 65 degrees. Pyrite cubes					
		up to 5mm (1-2%)					
		END OF HOLE					

NORTHGATE EXPLORATION LIMITED DIAMOND DRILL HOLE REPORT Hole #: 709-90-06 Page # 1 of 4

							Depth	Dip	Azimuth	Test	Depth	Dip	A	
Property	Landrienne Twp., Quebec			NTS	32 C/05		19.0	- 49	218	T	125.0	- 52	230	T
Location	Barraute, PQ	Claim	440636-2	Bearing	210*									
Logged By	P. T., K. Cook	Easting	24+00W	Dip-Collar	-50*									
Started	Oct 13,1990	Northing	10+52N	Length	125m									
Completed	Oct 15,1990	Elevation		Core	BQ									

Drill Contractor Bradly Brothers Co., Rouyn-Noranda, Quebec
Comments To test the margin of an I.P. conductor

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
0.00	16.00	**CASING**					
16.00	22.30	**MAFIC TO INTERMEDIATE FLOW** Dark green, fine grained, feldspar phyric (<1mm anhedral) massive, equigranular, homogeneous, weakly to strongly sheared. Locally intensely altered. 16.0-17.5 Lost core. 20.80-21.10 Moderate to intense foliation at 80 degrees with 1-2% pyrite cubes. 21.30-21.40 Quartz-carbonate vein. 21.60-21.80 Quartz-carbonate vein.	7001 7002	16.5 20.8	17.5 21.8	1.0 1.0	20 20
22.30	24.80	**FELSIC DYKE?** Or zone of intense silicification and sericite, with 5-10% pyrite. upper contact at 32 degrees. Lower contact at 51 degrees.	7003 7004 7005	21.8 22.8 23.8	22.8 23.8 24.8	1.0 1.0 1.0	15 45 20

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
24.80	25.70	**MAFIC TO INTERMEDIATE FLOW** Same as between 16.00-22.30					
25.70	28.50	**FELSIC DYKE?** Or zone of intense silicification and sericite, with 5-10% pyrite. Upper contact at 70 degrees. Lower contact at 90 degrees.	7006 7007 7008	24.8 25.8 26.8	25.8 26.8 27.8	1.0 1.0 1.0	20 20 125
28.50	107.00	**MAFIC TO INTERMEDIATE FLOW** Same as between 16.00-22.30 30.40-30.60 White to yellow-brown bull quartz vein at 14 degrees. 33.00-33.10 Quartz-carbonate vein at 32 degrees. 34.00-34.10 Quartz-carbonate veins 34.80-35.00 Broken core 35.00-35.30 Broken core and quartz-carbonate veining. 40.00-40.30 Quartz-carbonate veining at 60 degrees. 42.20-42.50 Moderate to intense foliation at 50-60 degrees. Quartz-carbonate veins along foliaition. 43.00-45.20 Moderate epidote-sericite alteration with quartz-carbonate veins infilling the fractures. 46.10-50.80 Moderate to intense foliation at 45-60 degrees with moderate to intense epidote-sericite alteration and quartz-carbonate veins along the foliation. 53.30-53.50 Quartz-carbonate vein at 48 degrees. 54.00-54.20 Quartz-carbonate veining at 53 degrees. 59.20-59.60 Quartz vein at 8 degrees with minor carbonate and chlorite. 62.20 3cm wide quartz-epidote vein at 63 degrees. 62.60 2cm wide quartz-carbonate vein at 88 degrees. 63.90-64.90 White bull quartz vein with minor black-green chloritic veinlets. Upper and lower contacts at 16 and 18 degrees respectively. 66.40 1cm wide quartz-carbonate vein at 35 degrees.	7009 7010 7011 7012 7013 7014 7015 7016 7017 7018 7019 7020 7021 7022 7023 7024 7025 7026 7027 7028 7029 7030 7031	27.8 30.3 32.8 34.0 34.8 39.8 42.0 43.0 44.0 46.0 47.0 48.0 49.0 50.0 53.0 53.8 54.3 59.1 62.0 63.9 66.1 67.5 68.4	28.8 30.8 33.3 34.5 35.3 40.3 42.5 44.0 45.0 47.0 48.0 49.0 50.0 50.5 53.5 54.3 55.3 59.6 63.0 64.9 67.1 68.0 68.9	1.0 0.5 0.5 0.5 0.5 0.5 0.5 1.0 1.0 1.0 1.0 1.0 1.0 0.5 0.5 0.5 1.0 0.5 1.0 1.0 1.0 0.5 0.5	15 5 5 5 <5 20 230 10 5 5 5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5 <5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		68.10 1cm wide quartz-carbonate-epidote vein	7032	70.5	71.0	0.5	5
		68.80-68.90 Quartz-carbonate veins.	7033	73.5	74.0	0.5	<5
		70.20-70.80 Quartz-carbonate-epidote veins at 34 degrees.	7034	75.0	76.0	1.0	<5
		73.70-74.00 Quartz-carbonate veins at 90 degrees.	7035	76.0	76.5	0.5	10
		75.10 Bull quartz vein at 63 degrees.	7036	77.1	77.6	0.5	<5
		75.40-75.60 Epidote veining at 30 degrees.	7037	78.5	79.5	1.0	<5
		76.30 White bull quartz-carbonate vein with minor green chlorite at	7038	79.5	80.5	1.0	<5
		37 degrees.	7039	81.5	82.0	0.5	<5
		77.40-77.50 Epidote vein with minor quartz at 80 degrees.	7040	82.0	83.0	1.0	<5
		78.20 3cm wide bull quartz vein with minor chlorite and calcite.	7041	83.0	83.5	0.5	5
		78.70-80.50 Quartz-carbonate veins at 70 degrees.	7042	84.6	85.1	0.5	5
		81.90-82.20 Quartz veins at 50 degrees.	7043	85.7	86.7	1.0	5
		82.40-82.80 Intense shearing at 58 degrees with quartz-carbonate veinlets	7044	89.7	90.7	1.0	<5
		along foliation.	7045	90.7	91.7	1.0	<5
		83.10-83.70 Numerous quartz-carbonate veins trending 40-50 degrees.	7046	92.8	93.3	0.5	<5
		84.60-85.20 Intense epidote alteration	7047	94.5	95.0	0.5	5
		85.70-86.70 Quartz-carbonate veins as well as epidote veins at 70 degrees	7048	95.8	96.8	1.0	5
		89.70-91.70 Foliation at 65-75 degrees. Quartz-carbonate veinlets along	7049	96.9	97.9	1.0	<5
		foliation.	7050	97.9	98.4	0.5	5
		92.80-93.30 Quartz-carbonate-epidote veins at 27-37 degrees.	7051	98.8	99.8	1.0	<5
		97.00-97.10 Intense epidote alteration at 50 degrees.	7052	104.5	105.5	1.0	<5
		106.00-107.00 Moderate to intense epidote alteration with	7053	106.0	107.0	1.0	<5
		quartz-carbonate veining.					
107.00	114.50	**DIORITE DYKE**	7054	108.8	109.3	0.5	<5
		Fine to medium grained, massive, porphyritic, inequigranular,homogeneous.					
		Upper contact at 90 degrees. Lower contact at 20 degrees.					
		108.90 3cm wide quartz-carbonate vein at 16 degrees.					
		109.10-109.30 Bull quartz vein at 16 degrees.					

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
114.50	125.00	**MAFIC TO INTERMEDIATE FLOW**	7055	119.0	120.0	1.0	<5
		Same as between 16.00-22.30	7056	120.0	121.0	1.0	<5
		116.40 Flow contact at 30 degrees.	7057	121.5	122.0	0.5	<5
		118.60-118.70 Quartz-carbonate veins at 40 degrees.	7058	124.5	125.0	0.5	5
		119.10-119.50 Quartz-carbonate-epidote veins, 1cm wide.					
		119.90-120.70 Quartz-carbonate-epidote veins, 1cm wide.					
		120.80-121.00 Quartz-epidote veinlets at 90 degrees.					
		121.60-121.80 Two 1cm wide bull quartz veins at 27 degrees.					
		122.50 5cm wide epidote alteration.					
		END OF HOLE					

NORTHGATE EXPLORATION LIMITED DIAMOND DRILL HOLE REPORT Hole #: 709-90-07 Page # 1 of 5

							Depth	Dip	Azimuth	Test	Depth	Dip	A	
Property	Landrienne Twp., Quebec			NTS	32 C/05		22.0	- 47	217.	T	182.0	- 46	225	T
Location	Barraute, PQ	Claim	440635-2	Bearing	210*									
Logged By	P. T., K. Cook	Easting	20+00W	Dip-Collar	-50*									
Started	Oct 15, 1990	Northing	13+52N	Length	182m									
Completed	Oct 17, 1990	Elevation		Core	BQ									

Drill Contractor Bradly Brothers Co., Rouyn-Noranda, Quebec
Comments To test the magnetic low as well as V.L.F. anomaly

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
0.00	22.00	**CASING**					
22.00	29.00	**MAFIC FLOW** Fine to medium grained, dark green. Diabasic texture found in some parts Moderately carbonatized throughout as well as silicification occuring as quartz veinlets along shear planes as well as in the matrix. Chloritization is mainly a regional effect. 22.0-23.4 Intensely sheared rock at 37 degrees. Quartz-carbonate veins with 1-2% pyrite cubes found concentrated along the foliation. 23.4-23.7 Clusters of pyrite grains	7201 7202 7203 7204 7205	22.1 23.1 24.1 25.1 26.1	23.1 24.1 25.1 26.1 26.6	1.0 1.0 1.0 1.0 0.5	45 5 <5 <5 <5
29.00	30.00	**FELSIC DYKE?** Either a felsic dyke or intensely silicified mafic. Upper contact at 90 degrees. Lower contact at 60 degrees. Euhedral pyrite, 2-3%.	7206	29.0	30.0	1.0	<5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
30.00	34.50	**MAFIC FLOW** Same as between 22.00-29.00					
34.50	36.20	**DIORITE DYKE** Medium grained, chilled margins, non- mineralized. Both contacts at 65 degrees.					
36.20	42.30	**AMYGDALOIDAL ANDESITE FLOW** Grey, fine to medium grained, quartz amygdaloidal. Weakly carbonatized throughout. 40.00-41.00 Moderate shearing at 45 degrees. Quartz-carbonate veins.	7207	40.1	41.6	1.5	<5
42.30	64.70	**MAFIC FLOW** Fine grained, weakly carbonatized and moderately foliated throughout. 42.30-43.70 Shearing at 45 degrees. Quartz- carbonate veinlets along foliation. Becoming intensely sheared between 43.80-43.90. No pyrite. 45.10 Quartz vein with pyrite in vein (1cm wide) 45.80-45.90 Intense shearing at 40 degrees. Quartz-carbonate veins. No pyrite. 47.50-48.00 Very sheared at 55 degrees. At lower end of shear, pyrite is clustered along foliation. 50.00-50.20 Quartz-carbonate-epidote vein with 2% pyrite cubes (1-2mm wide) Epidote appears brecciated with Quartz-carbonate veins infilling fractures. 59.70-59.80 Intense shearing at 50 degrees. Quartz-carbonate-epidote vein as well as pyrite are found along the foliation. 60.50-61.80 Very sheared and silicified pyrite cubes found at 60.9 within a very silicified section of rock. Silicification is in veins as well as matrix. 63.20-63.40 Very sheared at 45 degrees. Quartz-carbonate veins along the	7208 7209 7210 7211 7212 7213 7214 7215	42.3 45.5 47.0 49.4 59.0 60.0 61.0 63.0	43.8 46.0 48.0 50.4 60.0 61.0 62.0 64.0	1.5 0.5 1.0 1.0 1.0 1.0 1.0 1.0	5 <5 <5 <5 <5 <5 5 <5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		foliation with some euhedral pyrite.					
64.70	71.80	**MAFIC TO INTERMEDIATE AMYGDALOIDAL FLOW** Fine grained, quartz-amygdaloidal. Amygdules are up to 5mm diameter. Stronly carbonatized throughout, within both veins and matrix.	7216	64.5	65.5	1.0	<5
71.80	75.70	**MAFIC FLOW** Fine grained, no amygdules, pervasive carbonatization. 71.80-73.50 Pervasively silicified with euhedral pyrite (2-4%) and sheared at 40 degrees. 73.50-74.70 1-2% pyrite grains throughout.	7217 7218 7219 7220	71.7 72.7 73.7 74.7	72.7 73.7 74.7 75.7	1.0 1.0 1.0 1.0	65 <5 <5 <5
75.70	182.00	**MAFIC AMYGDALOIDAL FLOW** Fine grained with moderate to strong pervasive carbonatization. <2% ,2-4mm oval quartz-carbonate filled amygdules. 83.80-83.90 Broken core: extremely carbonatized. 85.90-86.40 Moderately sheared at 60 degrees. Quartz-carbonate veining along foliation. 86.80-88.30 Moderate to intense foliation at 65 degrees with quartz-carbonate stringers along foliation. 89.30-89.60 Intense foliation at 60 degrees with quartz-carbonate stringers along the foliation. 94.30-94.50 Intense foliation at 70 degrees with quartz-carbonate veins along the foliation. 94.80-98.70 Weak to moderate foliation at 40 degrees with minor quartz-carbonate stringers. 104.00-111.40 Grain size increases to 2-4mm. Moderate silicification, which is botchy giving the appearance of being intrusive, but is not. 113.50-116.60 Moderate to intense shearing at 40-70 degrees with minor	7221 7222 7223 7224 7225 7226 7227 7228 7229 7230 7231 7232 7233 7234 7235 7236 7237 7238	83.7 85.9 86.8 87.8 89.3 94.2 98.3 104.0 108.5 113.5 114.5 115.5 118.0 119.0 120.0 121.6 122.6 127.3	84.2 86.4 87.8 88.3 89.8 94.7 98.8 104.5 109.0 114.5 115.5 116.5 119.0 119.5 121.0 122.6 123.6 127.8	0.5 0.5 1.0 0.5 0.5 0.5 0.5 0.5 0.5 1.0 1.0 1.0 1.0 0.5 1.0 1.0 1.0 0.5	<5 15 <5 <5 <5 <5 <5 <5 <5 <5 5 <5 <5 <5 <5 <5 <5 <5 <5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		areas of broken core. Pervasive chlorite alteration with numerous quartz-carbonate veinlets along foliation. At 114.90 there is a 3cm wide white quartz- carbonate vein at 90 degrees.	7239	128.8	129.3	0.5	580
			7240	129.6	130.6	1.0	<5
			7241	139.2	139.7	0.5	<5
		118.10-119.50 Moderate to intense shearing at 46-48 degrees. Pervasive chlorite alteration with numerous quartz-carbonate stringers along foliation.	7242	140.2	140.7	0.5	<5
			7243	141.1	142.1	1.0	<5
			7244	142.1	143.1	1.0	10
		120.10 2-3cm wide white quartz-carbonate vein at 63 degrees.	7245	143.5	144.5	1.0	5
		120.70-121.00 Moderate foliation at 50 degrees with numerous quartz-carbonate-chlorite veinlets.	7246	144.6	145.6	1.0	<5
			7274	145.6	146.6	1.0	<5
		121.60-123.10 Moderate foliation at 60-70 degrees with quartz-carbonate veinlets. Chlorite alteration is pervasive.	7247	146.6	147.6	1.0	<5
			7248	151.1	151.6	0.5	<5
		127.30-127.40 A 2cm wide quartz-carbonate vein at 10 degrees with green chlorite veins.	7249	152.3	153.3	1.0	<5
			7250	153.6	154.6	1.0	<5
		128.80-129.20 White bull quartz vein with minor carbonate. Black and green chloritic blotches and veinlets throughout. Possible tourmaline veinlets. Upper contact at 60 degrees; lower contact at 20 degrees. Pods of disseminated pyrite between 129.10-129.20.	7251	154.6	155.6	1.0	<5
			7252	155.8	156.3	0.5	<5
			7253	156.4	157.4	1.0	<5
			7254	158.3	158.8	0.5	<5
		137.30 2-3cm wide quartz vein with minor chlorite and epidote. <1% pyrite.	7255	161.0	162.0	1.0	10
			7256	162.0	163.0	1.0	5
		139.40-139.70 Broken core. Moderate shearing with quartz-carbonate veinlets. Foliation at 40-50 degrees.	7257	163.0	164.0	1.0	<5
			7258	164.0	165.0	1.0	<5
		152.30-152.40 Brittle-ductile shear zone. Tectonic breccia fragments rimmed by black chlorite: trending 25 degrees.	7259	165.0	166.0	1.0	10
			7260	166.0	167.0	1.0	<5
		153.60-154.20 Brittle-ductile shear zone, same as above, trending 10 degrees.	7261	167.0	168.0	1.0	10
			7262	168.0	169.0	1.0	<5
		154.20-156.30 Quartz-carbonate stringers and veinlets in addition to chloritic stringers along foliation at 70 degrees.	7263	169.0	170.0	1.0	<5
			7264	170.0	171.0	1.0	<5
		156.40-156.60 Silicification with minor chloritic blebs.	7265	171.0	172.0	1.0	<5
		156.80-157.20 Brittle-ductile shear zone with intense silicification and chloritic veinlets in all directions. <1% pyrite in blebs 3-7mm wide.	7266	172.5	173.5	1.0	5
			7267	173.9	174.4	0.5	<5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		158.60 Quartz-chlorite veining at 50-60 degrees.	7268	175.4	176.4	1.0	<5
		162.30-162.80 Ductile shear zone with quartz- epidote and quartz-carbonate veins and veinlets along foliation.	7269	176.6	177.6	1.0	<5
			7270	177.6	178.6	1.0	<5
		163.00-163.30 Moderate to intense shearing at 50-55 degrees with quartz-carbonate veining.	7271	179.5	180.0	0.5	<5
			7272	180.0	181.0	1.0	5
		172.60-173.20 Moderate to intense shearing at 60 degrees and quartz-carbonate veinlets along the foliation.	7273	181.0	182.0	1.0	5
		173.90-175.10 Moderate foliation at 50-55 degrees with minor quartz-carbonate-chlorite stringers.					
		175.40-176.40 Quartz-chlorite veining along a 50-60 degree foliation.					
		178.20-182.00 Moderate foliation at 55-65 degrees with pervasive quartz-carbonate-chlorite veinlets.					
		END OF HOLE					

NORTHGATE EXPLORATION LIMITED DIAMOND DRILL HOLE REPORT Hole #: 709-90-08 Page # 1 of 5

Property	Landrienne Twp., Quebec			NTS	32 C/05	Depth	Dip	Azimuth	Test	Depth	Dip	A		
Location	Barraute, PQ	Claim	440636-1	Bearing	210*	49.0	- 51	220	T	188.0	- 46	227	T	
Logged By	P. T., K. Cook	Easting	26+00W	Dip-Collar	-50*									
Started	Oct 17,1990	Northing	16+32N	Length	188m									
Completed	Oct 18,1990	Elevation		Core	BQ									

Drill Contractor Bradly Brothers Co., Rouyn-Noranda, Quebec
Comments To test the Destor-Porcupine splay

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
0.00	46.00	**CASING**					
46.00	48.70	**DIABASE** Medium grained, magnetic, dyke. No upper contact. Lower contact at 45 degrees. 1-2% pyrite in the 50cm preceding the lower contact.					
48.70	50.00	**MAFIC FLOW** Aphanitic to fine grained mafic flow. Upper contact sheared at 45 degrees. Quartz-carbonate veinlets along foliation between 48.70-49.20. Lower contact at 45 degrees contains 1-2% pyrite in the 20cm preceeding the contact.	7301	48.3	49.3	1.0	<5
50.00	53.70	**DIABASE** Medium grained, dark green, magnetic dyke. Upper contact at 45 degrees. Lower contact at 55 degrees. 1- 2% pyrite in the 30cm preceeding the upper contact.	7302 7303	49.8 50.8	50.3 51.3	0.5 0.5	<5 <5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
53.70	56.50	**MAFIC TRACHYTE** Light grey flow with a trachytic texture (randomly oriented amphibole needles). Carbonatization is very weak to non-existent. A few quartz-carbonate-chlorite veinlets. 53.70-53.80 Shearing at 55 degrees.	7304	53.7	54.3	0.6	<5
			7305	55.2	55.7	0.5	<5
56.50	57.80	**DIABASE** Non-magnetic, medium grained, dark green, 1% pyrite grains throughout. Lower contact blurred. 57.30-57.60 Quartz-epidote veining at 19 degrees.					
57.80	60.80	**MAFIC FLOW** Fine grained, dark green flow. A few quartz- carbonate veinlets but generally weak to non-existent carbonatization. A few pyrite grains clustered along quartz veinlets. Upper contact blurred. Lower contact sheared at 18 degrees with quartz, carbonate, chlorite and pyrite.	7306	59.0	60.0	1.0	<5
60.80	66.40	**DIABASE** Magnetic, medium grained, dark green. Some quartz-carbonate-epidote and minor sericite veinlets throughout, but alteration generally weak. Lower contact at 75 degrees.	7307	60.6	61.1	0.5	<5
66.40	85.10	**MAFIC FLOW** Fine grained, dark green flow. Quartz- carbonate-epidote-chlorite veinlets throughout. 66.40-72.80 Extremely silicified and sheared with 5-10% pyrite. At 68.40-sheared at 55 degrees, at 72.40- sheared at 70 degrees. 73.80 Flow contact at 70 degrees between two mafic fine grained flows.	7308	66.3	67.3	1.0	<5
			7309	67.3	68.3	1.0	<5
			7310	68.3	69.3	1.0	10
			7311	69.3	70.3	1.0	5
			7312	70.3	71.3	1.0	<5
			7313	71.3	72.3	1.0	160
			7314	72.3	73.3	1.0	20

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		75.90-76.00 Sheared at 47 degrees with quartz- carbonate veinlets along foliation. Intensely chloritized throughout length. Trace pyrite.	7315	75.7	76.2	0.5	5
			7316	77.0	77.5	0.5	<5
		77.10 Quartz-carbonate-chlorite shear at 47 degrees (only 5cm wide					
85.10	86.90	**FELSIC DYKE**	7317	85.0	86.0	1.0	<5
		Grey, felsic dyke. Upper contact at 50 degrees, lower contact at 38 degrees. 5% pyrite throughout with an increase to 10% near the contacts. Weak to non- existent carbonatization.					
86.90	92.80	**MAFIC FLOW**	7318	86.0	87.0	1.0	<5
		Fine to medium grained, dark green, weakly carbonatized flow.	7319	89.0	89.5	0.5	10
		89.10-89.50 Strong shearing, strong carbonatization.	7320	89.9	90.4	0.5	<5
		Quartz-carbonate-chlorite veins along foliation at 50 degrees.					
		90.10-90.20 Quartz-carbonate-chlorite shear at 50 degrees. Trace pyrite.					
		92.80 Contact at 50 degrees. Pyrite clustered along foliation of sheared contact.					
92.80	94.70	**FELSIC DYKE?**	7321	92.3	93.3	1.0	15
		or intensely silicified unit. Upper contact at 50 degrees. Lower contact at 45 degrees. 5% pyrite.	7322	93.3	94.3	1.0	10
		92.80-93.10 Quartz-carbonate-chlorite veining with 5% pyrite and 1-2% pyrrhotite.					
94.70	117.90	**MAFIC FLOW**	7323	94.3	94.8	0.5	<5
		Fine to medium grained mafic flow.	7324	95.0	95.5	0.5	<5
		96.80-96.90 Small pyritiferous shear at 60 degrees.	7325	96.8	97.8	1.0	<5
		97.50-97.60 Quartz-carbonate-chlorite shear at 50 degrees. 2-3% pyrite.	7326	99.3	99.8	0.5	10
		99.30-99.40 Quartz-epidote vein at 70 degrees.	7327	103.1	104.6	1.5	5
		103.00-104.00 Moderate shearing at 60 degrees with	7328	106.6	107.1	0.5	<5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		quartz-carbonate-chlorite veins and 1-2% pyrite.	7329	109.5	110.0	0.5	<5
		109.60-109.70 Slight shearing at 60 degrees. Quartz-carbonate veins with 1-2% pyrite.	7330	115.7	116.7	1.0	<5
		113.00-117.90 Moderately foliated. Weak carbonatization. At 116.00 there is a quartz-carbonate- chlorite vein. Between 117.4 and 117.9 the pyrite content increases and is clustered along the foliation.					
117.90	123.90	**DIORITE**	7331	117.4	118.4	1.0	<5
		Medium grained and magnetic. Upper contact at 47 degrees.	7332	122.0	122.5	0.5	<5
123.90	124.60	**FELSIC DYKE?**	7333	123.8	124.3	0.5	<5
		or intensely silicified zone. Both contacts at 60 degrees.					
124.60	126.40	**DIORITE**	7334	125.0	125.5	0.5	<5
		Same as between 117.90 and 123.90. Lower contact at 38 degrees.					
126.40	134.00	**MAFIC FLOW**	7335	127.5	128.0	0.5	<5
		Fine to medium grained mafic flow	7336	133.5	134.0	0.5	<5
134.00	147.00	**DIORITE**	7337	144.0	145.0	1.0	<5
		Medium grained, dark green, dyke with trace pyrite.					
		144.10-144.50 Sheared and intensely silicified. No core angle possible.					
147.00	186.50	**MAFIC FLOW**	7338	147.2	148.2	1.0	<5
		Fine grained	7339	148.2	149.2	1.0	<5
		147.40-153.00 Extremely silicified, moderately carbonatized with trace pyrite. Sheared at 45 degrees.	7340	149.2	150.2	1.0	<5
			7341	150.2	151.2	1.0	70
		155.30-157.40 Extremely silicified, moderately carbonatized with trace pyrite and some epidote veins. Sheared at 45 degrees.	7342	151.2	152.2	1.0	10
			7343	152.2	153.2	1.0	<5
		160.40-160.70 Extremely silicified, weakly carbonatized. Sheared at 50	7344	155.1	156.1	1.0	260

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		degrees.	7345	156.1	157.1	1.0	15
		161.40-162.70 Extremely silicified, weakly carbonatized and sheared at 37	7346	157.1	157.6	0.5	10
		degrees.	7347	160.4	160.9	0.5	<5
		164.30-164.40 Quartz-epidote vein, sheared at 20 degrees.	7348	161.4	162.4	1.0	<5
		164.60-164.80 Intense silicification, weak carbonatization with trace	7349	162.4	162.9	0.5	<5
		pyrite. Sheared at 40 degrees.	7350	164.5	165.0	0.5	<5
		168.10-168.70 Intense shearing at 60 degrees. Quartz-carbonate veining as	7351	166.0	166.5	0.5	<5
		well as chlorite occuring as veins. Trace pyrite.	7352	167.6	168.6	1.0	5
		168.90-169.70 Quartz-carbonate veining with trace pyrite.	7353	168.6	169.6	1.0	<5
		171.80-172.00 Quartz-carbonate-chlorite veining sheared at 45 degrees.	7354	170.3	171.3	1.0	<5
		1% pyrite.	7355	171.7	172.2	0.5	<5
		179.30-179.70 Quartz-carbonate-epidote veining with 1% pyrite.	7356	173.3	173.8	0.5	<5
			7357	174.3	174.8	0.5	<5
			7358	179.3	179.8	0.5	<5
186.50	188.00	**DIORITE**	7359	186.4	187.4	1.0	<5
		Silicified, dyke, sheared at 50 degrees. Contact is sharp, also 50 degrees. No carbonate, no pyrite. Igneous diabasic texture evident.					
		END OF HOLE					

NORTHGATE EXPLORATION LIMITED DIAMOND DRILL HOLE REPORT Hole #: 709-90-09 Page # 1 of 5

Property	Landrienne Twp., Quebec			NTS	32 C/05	Depth	Dip	Azimuth	Test	Depth	Dip	A		
Location	Barraute, PQ	Claim	440636-2	Bearing	210*	30.0	- 50	212	T	164.0	- 45	231	T	
Logged By	P. T., K. Cook	Easting	25+00W	Dip-Collar	-50*	260.0	- 41	221	T					
Started	Oct 19, 1990	Northing	10+37N	Length	260m									
Completed	Oct 21, 1990	Elevation		Core	BQ									

Drill Contractor Bradly Brothers Co., Rouyn-Noranda, Quebec
Comments To test the intersection of two faults coincident

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
0.00	22.00	**CASING**					
22.00	116.60	**MAFIC TO INTERMEDIATE FLOW**	7401	22.0	23.0	1.0	<5
		Aphanitic to fine grained, felspar	7402	24.5	26.0	1.5	<5
		phyric(<1mm) amygdaloidal (quartz-carbonate filled,2-3mm in size, oval	7403	26.5	27.5	1.0	<5
		shaped) equigranular with pervasive chloritic alteration.	7404	32.4	32.9	0.5	<5
		22.00-22.70 Broken core: moderate to intense shearing with	7405	33.1	33.6	0.5	<5
		quartz-carbonate veinlets and stringers. Foliation at 40 degrees.	7406	33.6	35.0	1.4	<5
		24.60-25.80 Same as 22.00-22.70 except a higher percentage of quartz	7407	43.0	44.0	1.0	<5
		filled amygdules(1-3%). Foliation at 50 degrees.	7408	44.0	45.0	1.0	<5
		26.60-27.20 Intense shear zone with silica alteration and quartz veining.	7409	45.5	46.5	1.0	<5
		Foliation at 30 degrees.	7410	46.5	47.0	0.5	<5
		32.40-32.60 Quartz-carbonate veining.	7411	52.0	53.5	1.5	5
		33.10-33.50 Moderate to intense shear zone with quartz-carbonate veinlets	7412	54.5	55.0	0.5	30
		and stringers. Foliation at 60 degrees.	7413	58.7	59.7	1.0	<5
		33.80-35.30 Moderate shearing with quartz- carbonate veining. Foliation	7414	60.5	61.0	0.5	<5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		at 50-55 degrees.	7415	62.0	62.5	0.5	<5
		43.20-43.80 Broken core	7416	65.6	66.1	0.5	<5
		43.80-46.50 Zones of moderate silicification throughout.	7417	67.4	68.4	1.0	10
		46.50-47.00 Intense chloritic (black to dark green) alteration with 1%	7418	80.0	80.5	0.5	5
		disseminated pyrite.	7419	83.9	84.6	0.7	<5
		52.70-53.30 Intense chloritic alteration (black to dark green) with local	7420	88.2	88.7	0.5	<5
		bands of disseminated pyrite along the 60-65 degree foliation.	7421	89.7	90.2	0.5	<5
		67.40-67.70 Intense shear zone with moderate silica alteration.	7422	95.5	96.0	0.5	<5
		83.90-84.60 Quartz-carbonate veining and black chloritic alteration.	7423	101.7	102.7	1.0	<5
		89.90 A 7cm wide 50-55 degree trending band of pyritic blebs.	7424	104.3	105.3	1.0	<5
		93.60-97.50 An increase in grain size to medium grained.	7425	110.8	111.3	0.5	<5
		108.20-108.50 Black chloritic alteration.	7426	113.0	114.0	1.0	<5
			7427	114.0	115.0	1.0	<5
			7428	115.0	116.0	1.0	<5
116.60	117.00	**MAFIC INTRUSIVE**	7429	116.6	117.0	0.4	<5
		Fine grained, dark green, equigranular, massive, weakly foliated, homogeneous. Upper and lower contacts are both 43 degrees.					
117.00	123.80	**MAFIC TO INTERMEDIATE FLOW**	7430	117.0	118.0	1.0	<5
		Same as between 22.00 and 116.60	7431	118.0	119.0	1.0	<5
		117.00-119.60 Moderately to strongly foliated at 55-60 degrees with	7432	119.0	119.6	0.6	5
		moderate to intense chlorite and silica alteration.	7433	120.5	121.5	1.0	<5
		120.50-123.80 same as 117.00-119.60					
123.80	124.00	**MAFIC INTRUSIVE**					
		same as between 116.60 and 117.00. Upper and lower contacts both at 80 degrees.					
		124.00 175.50 MAFIC TO INTERMEDIATE FLOW					
		same as between 22.00 and 116.60. Moderately foliated throughout with					

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		only minor quartz-carbonate veining. No pyrite. Foliations are generally in the 50-60 degree range.					
			7434	123.8	124.4	0.6	<5
			7435	124.9	125.9	1.0	<5
			7436	129.3	130.3	1.0	<5
			7437	130.3	131.3	1.0	<5
			7438	132.3	133.3	1.0	<5
			7442	144.5	145.5	1.0	<5
			7439	147.0	148.5	1.5	<5
			7440	149.6	151.1	1.5	<5
			7441	152.8	153.3	0.5	10
			7443	167.4	168.4	1.0	<5
			7444	171.1	171.6	0.5	<5
			7445	174.0	175.5	1.5	<5
175.50	186.20	**FELSIC DYKE (QFP?)** Medium to dark grey, aphanitic, massive, weakly foliated, porphyritic, locally altered , felsic intrusive. Feldspar phenocrysts are <2mm, anhedral and make up <5% of the rock. Quartz eyes are 1-2mm in size, circular and make up 10- 15% of the rock. Foliation is weak at 40-50 degrees. <1% pyrite overall. Upper contact gradational at 38 degrees. 178.40-179.10 Silica rich bands 3-4mm wide at 35 degrees. 179.70-185.00 same as above 182.90-184.20 white bull quartz vein. Upper and lower contacts are 90 and 37 degrees respectively. 184.20-185.00 Intense silica alteration with up to 10% pyrite.	7446	177.9	178.4	0.5	<5
			7447	178.4	179.4	1.0	<5
			7448	179.4	180.9	1.5	<5
			7449	180.9	181.9	1.0	5
			7450	182.9	184.2	1.3	<5
			7451	184.2	185.2	1.0	<5
186.20	194.60	**MAFIC TO INTERMEDIATE FLOW** Same as between 124.0 and 175.5 , except a higher degree of	7452	191.1	191.6	0.5	5

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
		silicification throughout. 191.50 A 6cm wide zone of epidote and silica alteration.					
194.60	197.00	**MAFIC FELDSPAR PHYRIC FLOW** Medium grained, feldspar phyric flow. Feldspars are <3mm diameter. Upper and lower contacts both at 65 degrees.	7485	196.5	197.0	0.5	5
197.00	244.90	**MAFIC FLOW** Fine grained, light green flow. 199.00-199.10 Small shear at 55 degrees. 201.70-202.40 Sheared at 70 degrees. Quartz veins along foliation. 1% pyrite, trace pyrrhotite both found along the foliation. 203.00-211.20 Becoming moderately to strongly carbonatized approaching the shear zone which begins around 211.00. The shear zone itself is also moderate to strongly carbonatized. 211.20-244.90 Moderate to strongly carbonatized, quartz veined shear zone. This is a very wide shear with very little pyrite. There are a few small quartz- carbonate-sericite veinlets with pyrite present. 212.70 at 60 degrees 217.20 at 60 degrees 221.00 at 40 degrees 233.80 at 40 degrees 236.60 at 42 degrees 241.20 at 52 degrees 243.90-244.90 There is an increase in pyrite (5%) as well as epidote and sericite veining.	7453	198.8	199.3	0.5	<5
			7454	201.4	202.4	1.0	<5
			7455	211.2	212.7	1.5	10
			7456	212.7	214.2	1.5	5
			7457	214.2	215.7	1.5	<5
			7458	215.7	217.2	1.5	<5
			7459	217.2	218.7	1.5	<5
			7460	218.7	220.2	1.5	<5
			7461	220.2	221.7	1.5	5
			7462	221.7	223.2	1.5	<5
			7463	223.2	224.7	1.5	<5
			7464	224.7	226.2	1.5	<5
			7465	226.2	227.7	1.5	10
			7466	227.7	229.2	1.5	<5
			7467	229.2	230.7	1.5	<5
			7468	230.7	232.2	1.5	<5
			7469	232.2	233.7	1.5	<5
			7470	233.7	235.2	1.5	<5
			7471	235.2	236.7	1.5	<5
			7472	236.7	238.2	1.5	<5
			7473	238.2	239.7	1.5	<5
			7474	239.7	241.2	1.5	<5
			7475	241.2	242.7	1.5	<5

HOLE #: 709-90-09

FROM	TO	DESCRIPTION	SAMPLE	FROM	TO	WIDTH	Au ppb
			7476	242.7	244.2	1.5	<5
244.90	247.40	**DIORITE** Medium grained dyke. Upper contact at 62 degrees. Lower contact at 37 degrees.	7477	244.2	245.2	1.0	<5
247.40	260.00	**MAFIC FLOW** Moderate to strongly sheared mafic flow. Moderate to strong carbonatization. Quartz veinlets throughout. 247.40-248.00 Silicified and sericitized, trace pyrite, possibly a contact effect. 256.20-256.40 3-5% pyrite associated with quartz-carbonate veinlets. 256.40-260.00 Shearing becomes less intense.	7478	247.3	248.8	1.5	<5
			7479	248.8	250.3	1.5	<5
			7480	250.3	251.8	1.5	<5
			7481	251.8	253.3	1.5	10
			7482	253.3	254.8	1.5	<5
			7483	254.8	255.8	1.0	<5
			7484	255.8	256.8	1.0	10
		END OF HOLE					

APPENDIX III

LABORATORY SAMPLE PREPARATION

AND ANALYTICAL PROCEDURES

GEOCHEMICAL SAMPLE PREPARATION

Samples were prepared in the following manner:

1. Crushed with a Jaw Crusher to 1/4 inch.
2. Reduced in a Core Crusher to -10 mesh.
3. Riffled up to 3 passes. If more passes needed, additional reduction and mixing was done before further splitting.
4. Pulverized with a ring pulverizer to -150 mesh producing a uniform pulp (i.e. homogeneous mix). The pulp was then processed by traditional Fire Assay and the bead analyzed for gold by Atomic Absorption Spectroscopy.

Sample Preparation - Core/Rock

- Samples are received, sorted and assigned a group number.
- The entire sample is then jaw crushed to 6 mm
- The sample is further crushed by a cone crusher (-10 mesh approximately 1.5 mm), riffled and split for pulverizing.
- The split is pulverized in a ring pulverizer to produce a homogeneous pulp (approximately -150 mesh). The time used to pulverize the samples depends on the size of the split and the type of sample.

Crushers are blown out with compressed air between each sample. The pulverizer heads are brushed clean between samples and if required, cleaned with sand.

Fire Assay

- Samples are fused for approximately 45 minutes at approximately 1,070 degrees celsius.
- The melt is poured into cast iron molds and cooled.
- After approximately 15 minutes the lead button is separated from the slag using a hammer.

Cupelling

- The lead buttons are placed into the cupels and put into an electric furnace at approximately 900 degrees celsius. Once the samples have opened, air is introduced and the lead is driven off (approximately one hour).
- Once cupellation is completed, the cupels are taken out of the furnace and cooled.

Geochemistry Procedure (AA finish)

- The Au-Pd dore beads are placed into small test tubes.
- Dissolved with aqua rega
- Diluted with DI H20
- Analyzed on the atomic absorption and reported to 1000 ppb.

Assay procedure (gravimetric finish)

- The Au-Ag dore bead is flattened and placed into a parting cup.
- Three to five mils of 1:6 HN03 is added and the samples placed on a hot plate.
- Once gas bubbles cease, a couple of drops of concentration HN03 is added to ensure all of the Ag has dissolved.
- The samples are then rinsed three times with DI H20.
- Samples are dried and annealed.
- The gold is then weighed on a micro-balance and reported in oz/ton.

This is a general procedure for fire assay-gold. Each sample varies depending upon its composition. In some cases, more or less of a particular reagent would be required.

APPENDIX IV

ROCK GEOCHEMISTRY

a) Gold Analytical Results

b) Whole Rock Analytical Results

APPENDIX IV (A)

GOLD ANALYTICAL RESULTS

T S L LABORATORIES
DIVISION OF SURGENER TECHNICAL ENTERPRISES LIMITED
2031 RIVERSIDE DRIVE, UNIT #2
TIMMINS, ONTARIO
P4N 7C3
(705) 268-4441 FAX: (705) 268-4420

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Northgate Exploration
Suite 2701, P.O. Box 143
1 First Canadian Place
Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4855

INVOICE #: 4813
P.O.: 709-90-05

SAMPLE(S) OF rocks

Peter Tschipper

REMARKS: All samples have the prefix " 7099005 ".

	Au ppb
7161099101001010	<5
7162100101011010	<5
7163101101021010	<5
7164102101031010	<5
7165111801128010	<5
7166112801133005	<5
7167114101146005	<5
7168114601156010	<5
7169118901199010	<5, <5
7170119901209010	<5
7171120901214005	<5
7172121401224010	<5
7173122401234010	5, <5
7174123401244010	<5
7175124401254010	<5
7176128401289005	<5
7177131001315005	5
7178135001360010	<5
7179136001365005	5
7180138501395010	5

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P4N 7C3
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CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Northgate Exploration
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1 First Canadian Place
Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4856

INVOICE #: 4814
P.O.: 709-90-05

SAMPLE(S) OF rocks

Peter Tschipper

REMARKS: All samples have the prefix " 7099005 ".

	Au ppb
7121043000440010	<5
7122044000450010	<5
7123045000460010	<5, <5
7124046000470010	<5
7125049600506010	<5
71260530005540010	<5
7127054000550010	<5
7128055000560010	<5
7129057000580010	<5
7130058000590010	5
7131059000600010	<5
7132061700627010	<5
7133063001640010	<5
7134064000650010	<5
7135065000660010	5
7136066000670010	5
7137067000680010	5, 5
7138068000690010	5
7139072700737010	5
7140073700747010	<5

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P4N 7C3
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Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4857

SAMPLE(S) OF rock

INVOICE #: 4815
P.O.: 709-90-05

Peter Tschipper

REMARKS: All samples have the prefix " 7099005 ".

	Au ppb
7101015900169010	<5, <5
7102016900179010	<5
7103018900199010	<5
7104020800218010	<5
7105022700237010	<5
7106023700247010	<5
7107025100261010	<5
7108026100266005	<5
7109026600276010	<5
7110027700287010	<5
7111029100301010	<5
7112030800318010	<5
7113031800328 10	<5
7114032800338010	<5
7115033800348010	<5, <5
7116034800358010	<5
7117037200382010	<5
7118038200392010	<5
7119039200397005	<5
7120042000430010	<5

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P4N 7C3
(705) 268-4441 FAX: (705) 268-4420

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Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4858

INVOICE #: 4816
P.O.: 709-90-05

SAMPLE(S) OF rocks

Peter Tschipper

REMARKS: All samples have the prefix " 7099005 ".

	Au ppb
7181140101411010	<5
7182142001430010	<5
7183143001440010	<5
7184144001450010	<5, <5
7185146001470010	<5
7186147501485010	<5
7187149001500010	<5
7188153001540010	<5
7189154001550010	5
7190155001560010	<5
7191156001570010	<5
7192157001580010	<5
7193158001590010	<5
7194159501600005	<5
7195160001610010	5
7196163001640010	<5
7197165001660010	<5
7198166001670010	<5
7199167001675005	<5, <5
7200170801713005	<5

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2031 RIVERSIDE DRIVE, UNIT #2
TIMMINS, ONTARIO
P4N 7C3
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Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4860

INVOICE #: 4817
P.O.: 709-90-05

SAMPLE(S) OF rock

Peter Tschipper

REMARKS: All samples have the prefix "7099005 ".

	Au ppb
7141074700752005	<5
7142075200762010	5
7143077600786010	<5, <5
7144078600796010	<5
7145079600806010	<5
7146080600816010	5
7147081600826010	<5
7148082600836010	<5
7149083600841005	<5
7150084900859010	<5
7151086000870010	<5
7152087000880010	<5
7153088600896010	<5
7154089600906010	<5
7155091700922005	<5
7156092200932010	<5
7157093200942010	<5, <5
7158094200952010	<5
7159095200962010	<5
7160098100991010	<5

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2031 RIVERSIDE DRIVE, UNIT #2
TIMMINS, ONTARIO
P4N 7C3
(705) 268-4441 FAX: (705) 268-4420

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Northgate Exploration
Suite 2701, P.O. Box 143
1 First Canadian Place
Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No
W4863

INVOICE #: 4834
P.O.: [redacted]-90-06

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099006.

	Au ppb
7001016500175010	20
7002020800218010	20
7003021800228010	15
7004022800238010	45
7005023800248010	20
700602480025810	10, 20
7007025800268010	20
7008026800278010	125, 120
7009027800288010	15
7010030300308005	5
7011032800333005	5
7012034000345005	5
7013034800353005	<5
7014039800403005	20
7015042000425005	230, 230
7016043000440010	10, 10
7017044000450010	5
7018046000470010	5
7019047000480010	5
7020048000490010	<5

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TIMMINS, ONTARIO
P4N 7C3
(705) 268-4441 FAX: (705) 268-4420

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Northgate Exploration
Suite 2701, P.O. Box 143
1 First Canadian Place
Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4864

INVOICE #: 4828
P.O.: 709-90-06

SAMPLE(S) OF Rock

P. Tschipper

REMARKS: All samples have the prefix 7099006.

	Au ppb
7021049000500010	<5
7022050000505005	<5
7023053000535005	<5, <5
7024053800543003	<5
7025054300553010	<5
7026059100596005	<5
7027062000630010	<5
7028063900649010	<5
7029066100671010	<5
7030067500680005	<5
7031068400689005	<5
7032070500710005	5
7033073500740005	<5
7034075000760010	<5
7035076000765005	10
7036077100776005	<5
7037078500795010	<5, <5
7038079500805010	<5
7039081500820005	<5
7040082000830010	<5

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2031 RIVERSIDE DRIVE, UNIT #2
TIMMINS, ONTARIO
P4N 7C3
(705) 268-4441 FAX: (705) 268-4420

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Northgate Exploration
Suite 2701, P.O. Box 143
1 First Canadian Place
Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No.
W4865

INVOICE #: 4829
P.O.: 709-90-06

SAMPLE(S) OF rocks

P. Tschipper

REMARKS: All samples have the prefix 7099006.

	Au ppb
7041083000835003	5
7042084600851005	5
7043085700867010	5
7044089700907010	<5
7045090700917010	<5
7046092800933005	<5
7047194500950005	5
7048095800968010	5
7049096900979010	<5
7050097900984005	5, 5
7051098800998010	<5
705210450105510	<5
7053106001070010	<5
7054108801093005	<5
7055119001200010	<5, <5
7056120001210010	<5
7057121501220005	<5

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P4N 7C3
(705) 268-4441 FAX: (705) 268-4420

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM Northgate Exploration
Suite 2701, P.O. Box 143
1 First Canadian Place
Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4879

INVOICE #: 4838
P.O.: 709-90-07

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099007.

	Au ppb
7201022100231010	45
7202023100241010	5
7203024100251010	<5
7204025100261010	<5
7205026100266005	<5
7206029000300010	<5
7207040100416015	<5
7208042300438015	5
7209045500460005	<5
7210047000480010	<5
7211049400504010	<5
7212058000600010	<5
7213060000610010	<5
7214061000620010	5
7215063000640010	<5
7216164500655010	<5
7217071700727010	65
7218072700737010	<5
7219073700747010	<5
7220074700757010	<5

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REPORT No. W4881

INVOICE #: 4840
P.O.: 709-90-07

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099007.

	Au ppb
7261167001680010	10
7262168001690010	<5
7263169001700010	<5
7264170001710010	<5
7265171001720010	<5, <5
7266172501735010	5
7267173901744005	<5
7268175401764010	<5
7269176601776010	<5
7270177601786010	<5
7271179501800005	<5
7272180001810010	5
7273181001820010	5
7274145601466010	<5, <5

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REPORT No.
W4880

INVOICE #: 4839
P.O.: 709-90-07

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099007.

	Au ppb
7241139201397005	<5
7242140201407005	<5
7243141001421010	<5
7244142101431010	10, 10
7245143501445010	5
7246144601456010	<5
7247146601476010	<5
7248151101516005	<5
7249152301533010	<5
7250153601546010	<5
7251154601556010	<5
7252155801563005	<5
7253156401574010	<5
7254158301588005	<5
7255161001620010	10
7256162001630010	5
7257163001640010	<5, <5
7258164001650010	<5
7259165001660010	10
7260166001670010	<5

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REPORT No. W4892

INVOICE #: 4854
P.O.: 709-90-08

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099008.

	Au ppb
7321092300933010	15
7322093300943010	10
7323094300948005	<5
7324095000955005	<5
7325096800978010	<5
7326099300998005	10, 5
7327103101046015	5
7328106601071005	<5
7329109501100005	<5
7330115701167010	<5
7331117401184010	<5
7332122001225005	<5
7333123801243005	<5
7334125001255005	<5
7335127501280005	<5, <5
7336133501340005	<5
7337144001450010	<5
7338147201482010	<5
7339148201492010	<5
7340149201502010	<5

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REPORT No. W4893

SAMPLE(S) OF rock

INVOICE #: 4853
P.O.: 709-90-08

P. Tschipper

REMARKS: All samples have the prefix 7099008.

	Au ppb
7341150201512010	70
7342151201522010	10
7343152201532010	<5
7344155101561010	260
7345156101571010	15
7346157101570005	10
7347160401609005	<5, <5
7348161401624010	<5
7349162401629005	<5
7350164501650010	<5
7351166001665005	<5
7352167601686010	5
7353168601696010	<5
7354170301713010	<5
7355171701722005	<5
7356173301738005	<5, <5
7357174301748005	<5
7358179301798005	<5
7359186401874010	<5

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REPORT No. W4891

INVOICE #: 4852
P.O.: 709-90-08

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099008.

	Au ppb
7301048300493010	<5
7302049800503005	<5
7303050800513005	<5
7304053700542005	<5
7305055200557005	<5, <5
7306059000600010	<5
7307060600616005	<5
7308066300673010	<5
7309067300683010	<5
7310068300693010	10
7311069300703010	5
7312070300713010	<5
7313071300723010	160
7314072300733010	20
7315075700762005	5, 5
7316077000775005	<5
7317085000860010	<5
7318086000870010	<5
7319089000895005	10
7320089900904005	<5

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REPORT No. W4890

INVOICE #: 4851
P.O.: 709-90-09

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099009.

	Au ppb
7461220202217015	5
7462221702232015	<5
7463223202247015	<5
7464224702262015	<5
7465226202277015	10
7466227702292015	<5
7467229202307015	<5, <5
7468230702322015	<5
7469232202337015	<5
7470233702352015	<5
7471235202367015	<5
7472236702382015	<5
7473238202397015	<5
7474239702412015	<5, <5
7475241202427015	<5
7476242702442015	<5
7477244202452010	<5
747824730248815	<5
7479248802503015	<5
7480250302518015	<5

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REPORT No. W4890

INVOICE #: 4851
P.O.: 709-90-09

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099009.

	Au ppb
7481251802533015	10
7482253302548015	<5, <5
7483254802558010	<5
7484255802568010	10

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REPORT No. W4882

INVOICE #: 4850
P.O.: 709-90-07

SAMPLE(S) OF rock

P. Tschipper

REMARKS: All samples have the prefix 7099007.

	Au ppb
72210837008420 05	<5
72220859008640 05	15
72230868008780 10	<5
72240878008830 05	<5
72250893008980 05	<5
72260942009470 05	<5
72270983009880 05	<5
72281040010450 05	<5
72291085010900 05	<5
72301135011450 10	<5
72311145011550 10	5
72321155011650 10	<5
72331180011900 10	<5
72341190011950 05	<5
72351200012100 10	<5
72361216012260 10	<5
72371226012360 10	<5
72381273012780 05	<5
72391288012930 05	580
72401296013060 10	<5

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Attention: Terrence McKillen

REPORT No. W4894

INVOICE #: 4859
P.O.: 709-90-09

SAMPLE(S) OF rocks

P. Tschipper

REMARKS: All samples have the prefix 7099009.

	Au ppb
7401022000230010	<5
7402024500260015	<5
7403026500275010	<5
7404032400329005	<5
7405033100336005	<5,<5
7406033600350015	<5
7407043000440010	<5
7408044000450010	<5
7409043500465010	<5
7410046500470005	<5
7411052000535015	5
7412054500550005	30
7413058700597010	<5
7414060500610005	<5
7415062000625005	<5,<5
7416065600661005	<5
7417067400684010	10
7418080000805005	5
7419083900846005	<5
7420088200887005	<5

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REPORT No. W4895

INVOICE #: 4858
P.O.: 709-90-09

SAMPLE(S) OF rocks

P. Tschipper

REMARKS: All samples have the prefix 7099009.

	Au ppb
7421089700902005	<5
7422095500960005	<5
7423101701027010	<5
7424104301053010	<5
7425110801113005	<5
7426113001140010	<5
7427114001150010	<5,<5
7428115001160010	<5
7429116601170005	<5
7430117001180010	<5
7431118001190010	<5
7432119001196005	5
7433120501215010	<5
7434123801244005	<5
7435124901259010	<5
7436129301303010	<5
7437130301313010	<5
7438132301333010	<5
7439147001485015	<5,<5
7440149601511015	<5

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REPORT No. W4896

INVOICE #: 4857
P.O.: 709-90-09

SAMPLE(S) OF rock

P. Tchipper

REMARKS: All samples have the prefix 7099009.

	Au ppb
7441152801533005	10
7442144501455010	<5
7443167401684010	<5
7444171101716005	<5
7445174001735015	<5,<5
7446177901784005	<5
7447178401794010	<5
7448179401809015	<5
7449180901819010	5
7450182901842013	<5
7451184201852010	<5
7452191101916005	5
7453198801993005	<5
7454201402024010	<5
7455211202127015	10
7456212702142015	5
7457214202157015	<5,<5
7458215702172015	<5
7459217202187015	<5
7460218702202015	<5

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REPORT No. W4901

INVOICE #: 4860
P.O.:

SAMPLE(S) OF rocks

P. Tschipper
project 709

REMARKS: First 2 samples have prefix 70990.

	Au ppb	Cu ppm	Pb ppm
067058124501250005	5, 5		
097485196501970005	5, 5		
7500 Claim418372-2	5, 5	82, 85	<2, <2

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REPORT No. W4901

INVOICE #: 4860
P.O.:

SAMPLE(S) OF rocks

P. Tschipper
project 709

REMARKS: First 2 samples have prefix 70990.

	Zn ppm
067058124501250005	
097485196501970005	
7500 Claim418372-2	87, 94

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Attention: Terrence McKillen

REPORT No. W4972

INVOICE #: 4939
P.O.: 709

SAMPLE(S) OF rock

Peter Tschipper
project Landrienne

REMARKS: RUSH

	Au ppb	Ag ppm	Cu ppm	Zn ppm
7497	<5	<.2	42	87
7498	10	1.8	1555	101
7499	<5	<.2	61	85

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Toronto, Ontario M5X 1C7
Attention: Terrence McKillen

REPORT No. W4901

INVOICE #: 4860
P.O.:

SAMPLE(S) OF rocks

P. Tschipper
project 709

REMARKS: First 2 samples have prefix 70990.

	Au ppb	Cu ppm	Pb ppm
067058124501250005	5, 5		
097485196501970005	5, 5		
7500 Claim418372-2	5, 5	82, 85	<2, <2

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REPORT No. W4901

INVOICE #: 4860
P.O.:

SAMPLE(S) OF rocks

P. Tschipper
project 709

REMARKS: First 2 samples have prefix 70990.

	Zn ppm
067058124501250005	
097485196501970005	
7500 Claim418372-2	87, 94

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APPENDIX IV (B)

WHOLE ROCK ANALYTICAL RESULTS

MW1EG

T S L LABORATORIES WOFHP
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TELEPHONE #: 05) 268 - 4441
FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK ANALYSISWOFHP
Lithium MetaBorate Fusion

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4866
T.S.L. File No. : M8355
T.S.L. Invoice No. : 4887

YOUR REFERENCE - Prefix 7099006 - P.O.#709-90-06

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
052104501055010	48.66	13.79	11.69	11.08	3.72	1.35	0.32	1.38	0.17	0.20	5.51	97.36
018046000470010	50.08	15.98	10.50	9.68	4.32	2.52	0.26	0.95	0.16	0.12	5.19	97.86

DATE : Nov-02-1990

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FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Noranda Exploration

T.S.L. REPORT No. : #4866
T.S.L. File No. : M8355
T.S.L. Invoice No. : 4887

YOUR REFERENCE - Prefix 7099006 - P.O.#709-90-06

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
052104501055010	77	509	118	29	26
018046000470010	75	338	114	25	23

DATE : Nov-02-1990

SIGNED : _____

1 of 1

MW1EG

T S L LABORATORIES W0FHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: 05) 268 - 4441
FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK ANALYSISW0FHP
Lithium MetaBorate Fusion

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4859
T.S.L. File No. : M8343
T.S.L. Invoice No. : 4898

YOUR REFERENCE - P.O.#709-90-05 - Samples have prefix of 70990057.

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
189154001550010	70.14	12.11	7.44	2.54	1.37	2.14	1.46	0.35	0.09	0.04	1.68	99.35
195160001610010	76.67	11.53	3.46	1.86	0.56	4.06	0.82	0.24	0.04	<0.01	0.36	100.11
198166001670010	52.95	13.32	10.36	8.17	4.38	2.81	0.02	0.82	0.17	0.16	4.63	97.81
150084900859010	49.06	14.37	9.16	8.51	5.39	2.63	1.00	0.91	0.15	0.32	6.72	98.21

DATE : NOV-02-1990

SIGNED : _____

MW1EG

T S L LABORATORIES WOFWP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: (05) 268 - 4441
FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCKWOFWP

LITHIUM METABORATE FUSION

Northgate Exploration

T.S.L. REPORT No. : W4859
T.S.L. File No. : M8343
T.S.L. Invoice No. : 4898

YOUR REFERENCE - P.O.#709-90-05 - Samples have prefix 70990057. ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
189154001550010	360	60	381	72	8
195160001610010	257	67	352	57	6
198166001670010	11	165	106	28	27
150084900859010	286	189	96	21	23

DATE : NOV-02-1990 SIGNED : _____

MW1EG

T S L LABORATORIES W0FHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: (705) 268 - 4441
FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK ANALYSISW0FHP
Lithium MetaBorate Fusion

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4883
T.S.L. File No. : M8370
T.S.L. Invoice No. : 4920

YOUR REFERENCE - P.O.#709-90-07 - Samples have prefix 70990077.

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
228104001045005	46.59	13.01	12.91	8.66	5.01	1.59	0.08	1.66	0.19	0.32	9.11	99.13

DATE : NOV-07-1990

SIGNED : _____

MW1EB

T S L LABORATORIES WOFHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #:(705) 268 - 4441
FAX #: (705) 268 - 4420

MW1EB

I.C.A.P. WHOLE ROCK WOFHP
LITHIUM METABORATE FUSION

Northgate Exploration

T.S.L. REPORT No. : W4882
T.S.L. File No. : M8379
T.S.L. Invoice No. : 4929

YOUR REFERENCE - P.O.#709-90-07 - Samples have the prefix 70990077. ALL RESULTS ppm

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
228104001045005	91	213	124	29	32

DATE : NOV-07-1990

SIGNED : _____

MW1EG

T S L LABORATORIES WOFHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: 05) 268 - 4441
FAX #: (705) 268 - 4420

MW1EG

I.C.A.P. WHOLE ROCK ANALYSISWOFHP
Lithium MetaBorate Fusion

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4900
T.S.L. File No. : MB389
T.S.L. Invoice No. : 4959

YOUR REFERENCE - project 799 - All samples have the prefix 7.

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
305055200557005	59.33	15.43	5.86	4.97	4.10	6.41	0.34	0.62	0.11	0.18	2.63	99.97
324095000955005	52.57	13.27	12.18	6.87	3.19	3.78	0.24	1.06	0.18	0.16	6.78	100.24
332122001225005	53.67	14.12	12.87	7.73	3.52	2.35	0.10	1.18	0.19	0.16	3.60	99.49
336133501340005	52.56	13.47	11.35	6.60	3.44	3.74	0.54	1.29	0.15	0.16	6.93	100.17
337174301748005	50.33	13.47	12.12	7.05	3.48	3.74	0.16	1.17	0.17	0.16	7.03	98.88
412054500550005	52.06	14.99	8.04	8.92	3.93	2.76	0.82	0.84	0.14	0.12	7.43	100.06
414060500610005	51.72	14.95	9.37	8.33	4.47	2.27	0.54	0.82	0.16	0.14	6.79	99.55
422095500960005	49.39	15.68	10.34	8.53	5.52	2.76	0.06	1.03	0.16	0.44	5.98	99.63
429116601170005	49.81	12.85	14.17	10.12	4.06	0.25	0.10	2.12	0.19	0.48	6.33	100.49
434123801244005	52.17	13.44	7.28	10.58	4.15	2.74	0.28	0.82	0.13	0.22	8.50	100.31
441152801533005	52.18	14.37	9.31	8.66	6.66	2.83	0.12	0.66	0.14	0.10	4.86	100.08
446177901784005	74.13	11.48	2.67	3.31	0.68	4.39	0.96	0.25	0.05	<0.02	2.45	100.29

DATE : NOV-16-1990

SIGNED : Diane Michaud
for Evelyn White

MNIEB

T S L LABORATORIES NOFHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7E3
TELEPHONE #: 051 268 - 4441
FAX #: (705) 268 - 4420

MNIEB

I.C.A.P. WHOLE ROCK WOFHP

LITHIUM METABORATE FUSION

Northgate Exploration

T.S.L. REPORT No. : W4900
T.S.L. File No. : M8387
T.S.L. Invoice No. : 4959

YOUR REFERENCE - project 709 - All samples have the prefix 7. ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
305055200557005	133	268	99	12	10
324095000955005	104	99	125	31	27
332122001225005	39	214	120	33	30
336133501340005	362	86	119	29	30
357174301748005	88	188	118	33	28
412054300550005	203	196	94	24	26
414060500610005	112	233	90	24	26
422095500960005	25	528	91	24	24
429116601170005	19	209	151	38	32
434123801244005	62	267	98	15	16
441152801533005	9	190	45	17	30
446177901784005	275	52	304	63	8

DATE : NOV-16-1990

SIGNED : Diane Blackard
for Evelyn White

NW1EB

T S L LABORATORIES WOFHP

2071 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (705) 268 - 4441

FAX #: (705) 268 - 4420

NW1EB

I.C.A.P. WHOLE ROCK ANALYSISWOFHP

Lithium MetaBorate Fusion

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4902
T.S.L. File No. : M8390
T.S.L. Invoice No. : 4960

YOUR REFERENCE - project 709 - 1st two samples have the prefix 70990.

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
0670531245012500O5	52.86	15.19	10.76	8.85	4.66	2.73	0.34	1.05	0.17	0.10	3.78	100.51
0974851965019700O5	52.62	15.45	8.58	8.60	3.12	2.02	1.68	0.92	0.14	0.10	7.24	100.49
7500 Claim418372-2	50.98	17.42	8.86	9.48	4.44	3.60	1.56	0.72	0.16	0.08	2.97	100.27

DATE : NOV-16-1990

SIGNED : Diane Rucland
for Evelyn White

NWIEG

T S L LABORATORIES NOFHP

2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: (05) 268 - 4441
FAX #: (705) 268 - 4420

NWIEG

I.C.A.P. WHOLE ROCKNOFHP

LITHIUM METABORATE FUSION

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4902
T.S.L. File No. : M8390
T.S.L. Invoice No. : 4960

YOUR REFERENCE - project 709 - Samples have the prefix 70990. ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
067053124501250005	93	296	83	27	26
097485196501970005	366	154	90	29	23
7500 Claim418372-2	701	225	65	17	26

DATE : NOV-16-1990

SIGNED : Diane MacDonald
for Evelyn White

MM1EB

T S L LABORATORIES WOFHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: 051 268 - 4441
FAX #: (705) 268 - 4420

MM1EB

I.C.A.P. WHOLE-ROCK ANALYSISWOFHP

Lithium MetaBorate Fusion

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4993
T.S.L. File No. : M8391
T.S.L. Invoice No. : 4961

YOUR REFERENCE - project 709 - Samples have the prefix 70990.

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
057106023700247010	52.51	15.42	11.01	9.50	4.68	2.20	0.26	1.04	0.16	0.10	3.48	100.37
057107025100241010	50.18	14.59	10.73	9.76	4.73	2.48	0.22	0.95	0.16	0.12	6.11	100.32
067038079500805010	48.18	14.34	10.46	8.43	4.60	0.59	2.56	1.00	0.17	0.12	9.11	99.56
077201022100231010	55.76	14.14	9.55	6.87	3.88	3.24	0.14	0.86	0.14	0.14	3.67	98.40
077272180001810010	52.75	12.96	7.87	8.56	4.58	2.65	0.50	0.65	0.19	<0.02	9.46	100.19

DATE : NOV-16-1990

SIGNED : Diane Weekland
for Evelyn White

MW1E6

T S L LABORATORIES WOFMP

2031 RIVERSIDE DRIVE, UNIT 3, TIMMINS, ONTARIO P4N 7C3

TELEPHONE #: (05) 268 - 4441

FAX #: (705) 268 - 4429

MW1E6

I.C.A.P. WHOLE ROCKWOFMP

LITHIUM METABORATE FUSION

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4903
T.S.L. File No. : MB391
T.S.L. Invoice No. : 4961

YOUR REFERENCE - project 709 - Samples have the prefix 70990. ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
057106023700247010	75	433	92	25	26
057107025100261010	59	338	89	25	24
067038079500805010	790	69	88	24	24
077201022100231010	24	227	152	39	20
077272180001810010	124	111	79	22	24

DATE : NOV-16-1990

SIGNED : Diane Muchand
for Evelyn White

MW1E6

T S L LABORATORIES WOFHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: (705) 268 - 4441
FAX #: (705) 268 - 4420

MW1E6

I.C.A.P. WHOLE ROCK ANALYSISWOFHP
Lithium MetaBorate Fusion

Northgate Exploration
P.O. Box 143
Toronto, Ontario

T.S.L. REPORT No. : W4973
T.S.L. File No. : M8481
T.S.L. Invoice No. : 4980

YOUR REFERENCE - project Landrienne

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	LOI %	TOTAL %
7497	54.67	15.93	10.84	7.07	3.42	2.79	0.56	1.17	0.17	0.22	3.84	100.69
7498	62.37	13.56	6.20	7.80	0.93	3.74	0.24	1.07	0.10	0.22	2.47	98.70
7499	59.95	14.27	8.89	5.19	2.28	3.47	0.64	1.13	0.14	0.28	3.24	99.49

DATE : NOV-21-1990

SIGNED : Diane Rochard
for Evelyn White

MW1E6

T S L LABORATORIES WOFHP
2031 RIVERSIDE DRIVE, UNIT 2, TIMMINS, ONTARIO P4N 7C3
TELEPHONE #: (705) 268 - 4441
FAX #: (705) 268 - 4420

MW1E6

I.C.A.P. WHOLE ROCKWOFHP

LITHIUM METABORATE FUSION

Northgate Exploration

T.S.L. REPORT No. : W4973
T.S.L. File No. : M8481
T.S.L. Invoice No. : 4980

YOUR REFERENCE - project Landrienne

ALL RESULTS PPM

SAMPLE #	Ba ppm	Sr ppm	Zr ppm	Y ppm	Sc ppm
7497	138	217	169	40	22
7498	27	246	179	42	17
7499	273	142	181	41	19

DATE : NOV-21-1990

SIGNED : Diane Richard for Evelyn White

C.I.P.W. NORMATIVE MINERAL COMPOSITION
and ROCK NAMES

IN ACCORDANCE WITH THE CLASSIFICATION DEFINED BY
[illegible] IRVINE & W.R.A. BARAGAR, Can. [illegible] of Earth Sciences 8, 52[illegible]

FOR THESE NORMATIVE MINERAL CALCULATIONS, THE [illegible] APPLIES:

[illegible] FeO = [illegible], [illegible] assumed [illegible] analysed [illegible]
[illegible] that Fe2O3 [illegible] = TiO2 + 1.5 [illegible] and [illegible] Fe [illegible]

[illegible] total of the major oxides + the LOI is normalized to [illegible] 100 [illegible]

[illegible] total of the Normative Minerals always equals 100 % unless [illegible]

[illegible] samples with a Mineral total [illegible] 100 % have more SiO2 assigned than [illegible]

[illegible] FOLLOWING ABREVIATIONS ARE USED:

QZ	Quartz	SiO_2
COR	Corundum	Al_2O_3
CaO	Calcium Oxide	CaO
P2O5	Phosphate	P_2O_5
Fe-Mn	Excess FeO or MnO	FeO, MnO
RU	Rutile	TiO_2
IL	Ilmenite	$FeO.TiO_2$
HM	Haematite	Fe_2O_3
MT	Magnetite	$FeO.Fe_2O_3$
Na-Si	Sodium Silicate	$Na_2O.SiO_2$
K-Si	Potassium Silicate	$K_2O.SiO_2$
AP	Apatite	$3CaO.P_2O_5.1/3CaF_2$
AN	Anorthite	$CaO.Al_2O_3.6SiO_2$
AB	Albite	$Na_2O.Al_2O_3.6SiO_2$
OR	Orthoclase	$K_2O.Al_2O_3.6SiO_2$
LC	Leucite	$K_2O.Al_2O_3.4SiO_2$
KP	Kaliophilite	$K_2O.Al_2O_3.2SiO_2$
DI	Diopside	$CaO.MgO.2SiO_2$
HE	Hedenbergite	$CaO.FeO.2SiO_2$
AC	Acmite	$Na_2O.Fe_2O_3.4SiO_2$
FO	Fosterite	$2MgO.SiO_2$
FA	Faylite	$2FeO.SiO_2$
WO	Wollastonite	$CaO.SiO_2$
NE	Nepheline	$Na_2O.Al_2O_3.2SiO_2$
EN	Enstite	$MgO.SiO_2$
FS	Ferrosilate	$FeO.SiO_2$
LA	Larnite	$2CaO.SiO_2$
PL	Plagioclase	= AN + AB
AG	Augite	= DI + HE
OL	Olivine	= FO + FA
HY	Hypersthene	= EN + FS

AVIS

La mauvaise qualité du présent document est due à la mauvaise qualité de l'original qui a été fourni au Ministère.

NORMATIVE MINERAL COMPOSITION (Weight Percent)

[illegible]

SAMPLE : T105

SiO2	[illegible]	Fe2O3	FeO	CaO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible] THOLEIITIC BASALT, [illegible] POTASSIUM LOW [illegible]

SAMPLE : [illegible]

SiO2	[illegible]	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

SAMPLE : T150

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	[illegible]
50.30	14.78	2.47	6.06	9.72	5.53	2.70	1.03	0.97	0.18	0.12	[illegible]

QZ	[illegible]	MT	AP	AN	AB	OR	DI	HE	EN	FS
6.40	1.77	3.53	0.76	25.07	22.81	6.04	8.60	4.48	5.78	5.35

SL	AB	WO
47.88	13.18	15.62

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM AVERAGE SERIES

SAMPLE : T166

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	[illegible]
54.04	12.26	1.88	5.11	2.57	1.39	2.17	1.43	0.38	0.09	0.04	[illegible]

QZ	[illegible]	[illegible]	MT	AP	AN	AB	DI	EN	FS
21.91	3.82	0.67	2.69	0.09	12.50	18.34	6.72	3.45	7.44

WO
10.83	10.89

ROCK TYPE : THOLEIITIC ANDESITE, POTASSIUM AVERAGE SERIES

NORMATIVE MINERAL COMPOSITION (Weight Percent)

T.N. IRVINE & W.R.A. BARAGAR, Can. Journal of Earth Sciences 8: 523-548

SAMPLE : T19E

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
[illegible]	[illegible]	1.74	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

QZ	OR	AB	MT	AP	AN	DI	HY	EN	FS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PL	HY
[illegible]	[illegible]

ROCK TYPE : THOLEIITIC DACITE, POTASSIUM POOR SERIES

SAMPLE : T19B

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

QZ	OR	AB	MT	AP	AN	DI	HY	EN	FS
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PL	HY
[illegible]	[illegible]

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

SAMPLE : T01B

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
51.60	15.54	2.48	7.50	8.94	4.45	2.60	0.27	0.98	0.16	[illegible]

QZ	OR	AB	MT	AP	AN	DI	HY	EN	FS
8.21	1.86	7.59	0.29	29.95	21.97	1.58	6.18	5.04	8.22	7.77

PL	AB	HY
51.92	11.24	15.95

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM AVERAGE SERIES

SAMPLE : T03B

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
48.76	14.82	2.51	7.27	8.54	4.66	0.60	2.59	1.01	0.17	0.12

QZ	OR	AB	MT	AP	AN	AB	DI	HE	EN	FS
8.62	1.92	3.64	0.28	29.28	5.05	15.33	5.79	4.32	8.91	7.62

PL	AB	HY
34.33	10.11	16.54

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM RICH SERIES

NORMATIVE MINERAL COMPOSITION (Weight Percent)

T.N. IRVINE & W.R.A. BARAGAR, Can. Journal of Earth Sciences [illegible]

[illegible]

SAMPLE : 7052

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	[illegible]
[illegible]	[illegible]	3.92	8.33	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
[illegible]	[illegible]	[illegible]	1.48	31.78	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PL	AB	HY
[illegible]	[illegible]	[illegible]

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM RICH SERIES

SAMPLE : [illegible]59

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	[illegible]
[illegible]	15.[illegible]	2.57	7.45	8.94	4.68	2.74	0.34	1.05	0.[illegible]	0.[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
8.75	3.00	3.[illegible]	0.23	28.29	23.17	2.02	7.0[illegible]	5.35	8.75	7.24

PL	AB	HY
51.46	11.44	15.60

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM AVERAGE SERIES

SAMPLE : 7101

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	[illegible]
57.09	14.48	3.32	6.66	7.03	3.97	3.32	0.14	0.88	0.14	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
14.64	1.67	3.45	0.33	24.19	22.07	0.85	4.48	3.58	7.82	[illegible]

PL	AB	HY
52.16	8.06	14.93

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

SAMPLE : 7228

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	[illegible]
47.4[illegible]	13.76	3.19	8.96	8.82	5.10	1.62	0.08	1.69	0.19	0.37	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
9.76	3.21	4.63	0.76	28.66	13.71	0.45	6.01	4.69	9.93	8.84

PL	AB	HY
41.36	0.70	18.82

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM AVERAGE SERIES

NORMATIVE MINERAL COMPOSITION (Weight Percent)

T.N. IRVINE & W.R.A. BARAGAR, Can. Journal of Earth Sciences [illegible]

SAMPLE : 7272

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
[illegible]	13.[illegible]	[illegible].15	3.17	6.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
[illegible]	[illegible]	3.12	0.07	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PL	AB	HY
[illegible]	[illegible]	10.37

ROCK TYPE : [illegible], POTASSIUM [illegible] SERIES

SAMPLE : 7305

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
59.57	15.49	2.12	3.38	4.99	[illegible]	6.44	0.34	[illegible]	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
5.27	1.18	3.08	0.42	12.33	54.[illegible]	2.02	4.96	2.12	7.07	[illegible]

PL	AB	HY
66.33	3.99	9.58

ROCK TYPE : CALC-ALKINE (HIGH ALUMINA) ANDESITE, POTASSIUM POOR SERIES

SAMPLE : 7324

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
52.93	13.36	2.57	8.73	6.92	3.21	3.91	0.24	1.07	0.18	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
8.19	2.03	3.72	0.37	18.66	32.20	1.43	5.20	7.07	5.59	[illegible]

PL	AB	HY
50.87	12.26	14.31

ROCK TYPE : THOLEIITIC ANDESITE, POTASSIUM POOR SERIES

SAMPLE : 7332

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5
54.51	14.34	2.70	9.33	7.85	3.57	2.39	0.10	1.20	0.19	0.16

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
14.60	2.28	3.91	0.38	28.12	20.19	0.60	3.56	4.63	7.25	[illegible]

PL	AB	HY
48.31	8.19	13.08

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

NORMATIVE MINERAL COMPOSITION (Weight Percent)

T.N. IRVINE & W.R.A. BARAGAR, Can. Journal of Earth Sciences 8, [illegible]

[illegible]

SAMPLE : 7336

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
[illegible]	17.[illegible]	0.71	[illegible]	6.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
[illegible]	[illegible]	[illegible]	[illegible]	18.51	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PL	AG	HY
[illegible]	[illegible]	[illegible]

ROCK TYPE : THOLEIITIC ANDESITE, POTASSIUM [illegible] SERIES

SAMPLE : [illegible]

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
51.39	[illegible]	2.69	8.71	7.2[illegible]	3.55	[illegible].92	0.[illegible]	1.17	0.17	0.16	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
5.96	2.27	3.91	0.38	19.91	32.31	0.97	[illegible]	6.71	[illegible]	[illegible]

PL	AG	HY
51.22	[illegible]	14.80

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

SAMPLE : 7412

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
52.33	15.07	2.34	5.16	9.97	[illegible].95	2.77	[illegible].82	0.84	0.14	0.12	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
9.13	1.60	3.40	0.28	26.23	23.47	4.88	9.09	5.16	5.62	3.66

PL	AG	HY
49.70	14.25	9.29

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM AVERAGE SERIES

SAMPLE : 7414

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
[illegible]1.32	13.12	2.33	6.43	8.43	4.52	2.30	0.55	0.83	0.16	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
10.95	1.59	3.38	0.33	29.35	19.47	3.[illegible]	5.63	[illegible].24	[illegible]	[illegible]

PL	AG	HY
[illegible]	7.47	15.[illegible]

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM AVERAGE SERIES

NORMATIVE MINERAL COMPOSITION (Weight Percent)

T.N. IRVINE & W.R.A. BARAGAR, Can. Journal of Earth Sciences 8, 523 1971

[illegible]

SAMPLE : 7402

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
48.34	17.93	2.74	7.16	8.61	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
[illegible]	[illegible]	1.48	1.07	30.19	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PL	AG	HY
[illegible]	[illegible]	[illegible]

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

SAMPLE : 7409

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
[illegible]	12.92	[illegible]	9.56	[illegible]	4.08	[illegible]	[illegible]	2.17	0.19	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
19.45	4.05	[illegible]	1.12	33.84	2.13	0.59	5.68	5.34	7.74	[illegible]

PL	AG	HY
35.97	[illegible]	[illegible]

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM RICH SERIES

SAMPLE : 7434

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
52.27	13.47	5.32	4.47	10.60	4.16	2.75	0.28	0.87	0.13	[illegible]	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
10.53	1.56	5.37	0.51	23.59	23.23	1.66	15.53	6.78	3.15	1.58

PL	AG	HY
46.82	22.31	4.73

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

SAMPLE : 7441

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
52.51	14.46	7.16	6.48	8.92	6.70	2.65	0.12	0.66	0.14	0.10	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
6.17	1.26	3.14	0.23	26.32	24.10	0.71	9.44	4.58	[illegible]	[illegible]

PL	AG	HY
50.42	14.01	19.16

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM POOR SERIES

NORMATIVE MINERAL COMPOSITION (weight Percent)
T.N. IRVINE & W.R.A. BARAGAR, Can. Journal of Earth Sciences 8, 523, 197[illegible]

atlanchim[illegible]

SAMPLE : [illegible]

SIO2	AL2O3	FE2O3	FEO	CAO	MGO	NA2O	K2O	TIO2	MNO	P2O5	LOI
[illegible]	[illegible]	[illegible]75	2.92	3.[illegible]	0.68	4.38	[illegible]94	[illegible]	[illegible]	0.0[illegible]	[illegible]

QZ	IL	[illegible]	[illegible]	AP	AN	AB	OR	[illegible]	[illegible]
38.38	0.[illegible]	[illegible]	[illegible]	0.05	5.74	37.0[illegible]	5.[illegible]	3.5[illegible]	[illegible]

PL	AB
42.7[illegible]	[illegible]

ROCK TYPE : CALC-ALKALINE DACITE, POTASSIUM POOR SERIES

SAMPLE : [illegible]495

SIO2	AL2O3	FE2O3	FEO	CAO	MGO	NA2O	K2O	TIO2	MNO	P2O5	LOI
[illegible]2.70	15.47	[illegible].40	5.55	8.61	3.12	2.02	1.68	0.92	0.14	0.10	[illegible]

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
11.50	1.75	3.51	0.23	28.17	17.12	9.95	6.45	5.01	4.79	4.27

PL	AB	HY
45.28	11.[illegible]	9.06

ROCK TYPE : THOLEIITIC BASALT, POTASSIUM RICH SERIES

NORMATIVE MINERAL COMPOSITION (Weight Percent)

T.N. IRVINE & W.R.A. BARAGAR. Cdn. Journal of Earth Sciences 8. 523. 1971

Northgate Exploration Ltd. a:landrien.wqs

SAMPLE : 7497

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
54.75	15.95	2.67	7.36	7.08	3.42	2.79	0.56	1.17	0.17	0.22	3.85

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
13.22	2.22	3.87	0.51	29.33	23.64	3.32	1.82	1.80	7.69	8.74

PL	AG	HY
52.97	3.62	16.42

ROCK TYPE : THOLEIITIC BASALT. POTASSIUM AVERAGE SERIES

SAMPLE : 7498

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
63.43	13.79	2.59	3.34	7.93	0.95	3.80	0.24	1.09	0.10	0.22	2.51

QZ	IL	MT	AP	AN	AB	OR	DI	HE	WO
25.40	2.07	3.75	0.52	19.84	32.18	1.44	5.08	4.51	2.70

PL	AG
52.02	9.58

ROCK TYPE : THOLEIITIC ANDESITE. POTASSIUM POOR SERIES

SAMPLE : 7499

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
60.65	14.44	2.64	5.71	5.25	2.31	3.51	0.65	1.14	0.14	0.28	3.28

QZ	IL	MT	AP	AN	AB	OR	DI	HE	EN	FS
21.35	2.17	3.83	0.66	21.72	29.70	3.83	1.02	1.04	5.27	6.13

PL	AG	HY
51.42	2.06	11.40

ROCK TYPE : THOLEIITIC ANDESITE. POTASSIUM POOR SERIES

SAMPLE : 7500

SiO2	Al2O3	Fe2O3	FeO	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	LOI
51.26	17.36	2.22	6.01	9.53	4.46	3.62	1.57	0.72	0.16	0.08	2.99

IL	MT	AP	AN	AB	OR	DI	HE	FO	FA	EN	FS
1.37	3.22	0.19	26.50	30.63	9.28	10.05	6.55	3.08	2.54	2.06	1.54

PL	AG	OL	HY
57.13	16.61	5.62	3.60

ROCK TYPE : HAWAIITE, SODIC SERIES

APPENDIX V

GEOLOGICAL MAPPING, ROCK SMAPLING AND PROSPECTING SUMMARY

P. Tschipper October 31, 1990

GEOLOGICAL MAPPING, ROCK SAMPLING

AND PROSPECTING SUMMARY

SEPTEMBER - OCTOBER 1990

LANDRIENNE TOWNSHIP PROPERTY

By: P. Tschipper

The geological mapping program on the Landrienne Township Property was conducted in two stages.

The first part involved the restoration (line-cutting, flagging, chaining) of the 1985-1986 base lines L00+00N, L10+00N and L18+00N to provide a frame work for systematic line-cutting, geological mapping and prospecting of bedrock exposures on the property. Work was completed during period of September 10 - October 31st, 1990 by Ken Cook, Peter Doyle and the writer. A total of 30 person-days were utilized for the prospecting program.

The second part of the program involved the systematic search for outcrops not visible from the aerial photography. The mapping and sampling program was completed prior to and during drilling operation. The writer made traverses from the period of October 1 - 15, then October 16-25 (25 days), while Mr. K. Cook supervised the drilling program. From October 26-30, (5 days), K. Cook continued the prospecting program while the writer completed the drilling and core logging.

The geological mapping program resulted in the discovery of two new bedrock exposures on claim 440640-2 and claim 418378-2. (See Attached Figure)

Prospecting in and along the esker which dominates the property's eastern margin resulted in the discovery of a single outcrop.

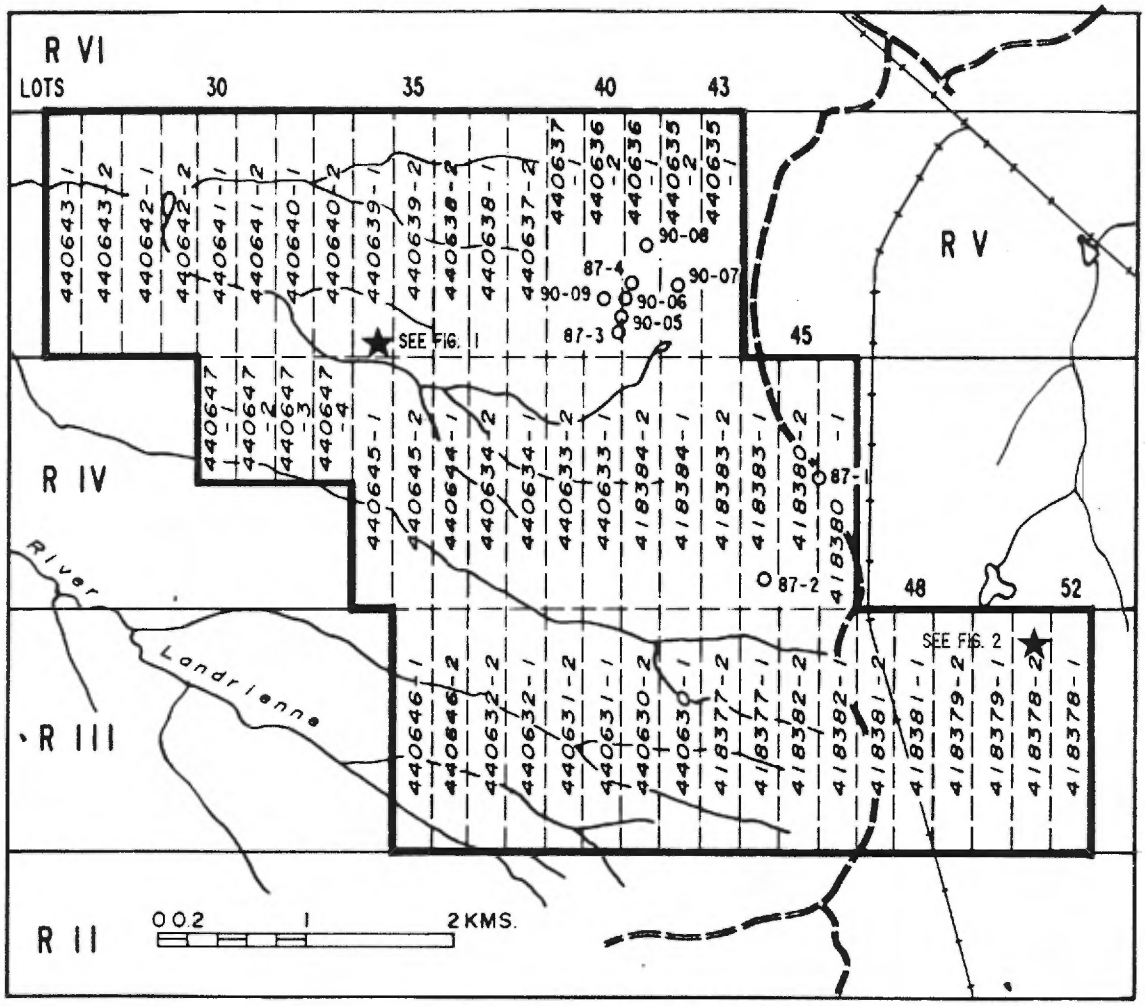
Four samples numbered 7497, 7498, 7499 and 7500 were collected and submitted to Technical Services Laboratories in Timmins, Ontario

for Gold, Silver, Copper, Zinc and Whole Rock analysis. (See Appendix IV for results)

Assay tag numbers were 7497, 7498, 7499 and 7500. The samples collected on the claim 440640-2 outcrop are sheared, silicified andesite with 5% pyrite and 0.5% chacopyrite.
(See Figure 1)

The sample collected from claim 418378-2 was field identified as either a silicified intermediate or a rhyolite with trace disseminated pyrite. A well developed foliation trending 280° was noted with a 47° dip to the north.

None of the other exposures noted by previous mappers were located partly due to intermittent snow cover. Once the western grid cutting operation is completed, prospecting along the cut lines should be completed if snow conditions allows.



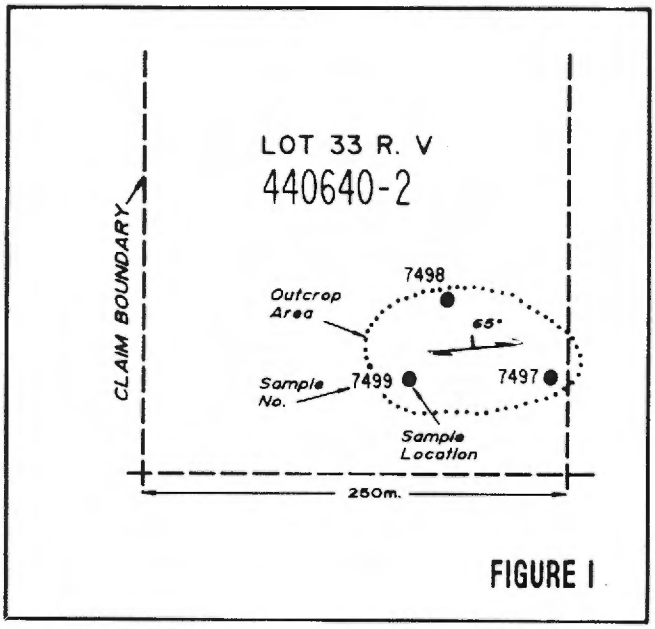


FIGURE I

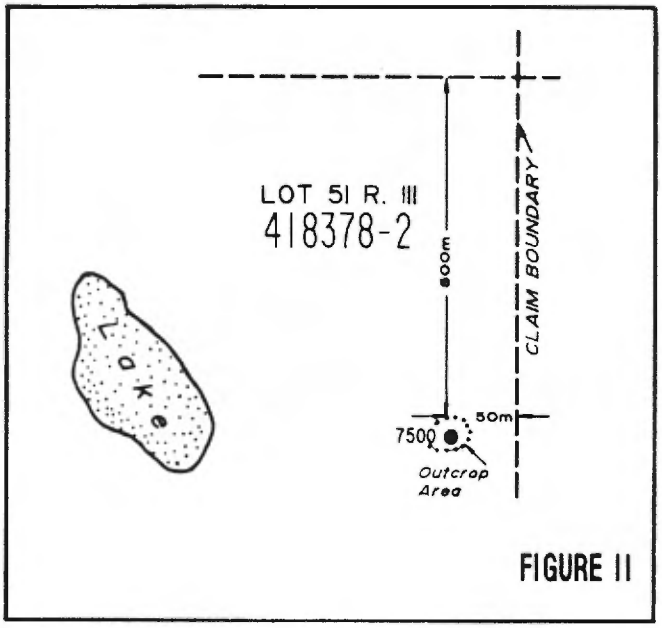


FIGURE II

PROSPECTING RESULTS / BEDROCK OUTCROP LOCATIONS