

84-1180-13140

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**13,140**

12/85

GEOPHYSICAL & GEOCHEMICAL REPORT  
ON NCL 1, 4 & 5 CLAIMS (8 UNITS)  
FAIRVIEW GOLD CAMP, OLIVER SECTOR  
49°13'N, 119° 35'W: NTS 82E/4E  
(1.5 mi.) 2.4Km NW OF OLIVER)  
OSOYOOS MINING DIV., BRITISH COLUMBIA

by

N.C.Lenard, P.Geol., P.Eng., Cons.Geol.  
Box 863, Westbank, B.C. VOH 2A0  
Nov. 12, 1984

Field Work Done: October 19,20,22, 1984  
Owner: B.A. Resources Ltd.  
402, 1755 West Broadway  
Vancouver, B.C.

V6J 4S5



Province of  
British Columbia

Ministry of  
Energy, Mines and  
Petroleum Resources

ASSESSMENT REPORT  
TITLE PAGE AND SUMMARY

TYPE OF REPORT/SURVEY(S) <i>GEOPHYSICAL &amp; GEOCHEMICAL</i>	TOTAL COST <i>\$ 2,621.95</i>
--	----------------------------------

AUTHOR(S) *Neill Curtis LEONARD* SIGNATURE(S) *N. C. Leonard*

DATE STATEMENT OF EXPLORATION AND DEVELOPMENT FILED *Dec. 10, 1984* YEAR OF WORK *1984*

PROPERTY NAME(S) *NCL 1 NCL 4 NCL 5*

COMMODITIES PRESENT *Gold Silver*

B.C. MINERAL INVENTORY NUMBER(S), IF KNOWN

MINING DIVISION *0504005* NTS *82E/4E*

LATITUDE *49° 13' N* LONGITUDE *119° 35' W*

NAMES and NUMBERS of all mineral tenures in good standing (when work was done) that form the property [Examples: TAX 1-4, FIRE 2 (12 units); PHOENIX (Lot 1706); Mineral Lease M 123; Mining or Certified Mining Lease ML 12 (claims involved)]:

OWNER(S)  
(1) *B.A. Resources Ltd.* (2)

MAILING ADDRESS  
*402, 1755 W. Broadway  
Vancouver B.C. V6J 4S5*

OPERATOR(S) (that is, Company paying for the work)  
(1) *B.A. Resources Ltd.* (2)

MAILING ADDRESS  
*as above*

SUMMARY GEOLOGY (lithology, age, structure, alteration, mineralization, size, and attitude):

*Oliver plutonic complex & quartz monzonite;  
Cretaceous; sericite, garnet; one km square; vertical*

REFERENCES TO PREVIOUS WORK *Assessment Reports: 6949 Braty & Culver 1978  
& N.C. Leonard 1981*

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS			COST APPORTIONED
GEOLOGICAL (scale, area)					
Ground	2 cm = 100 m x 1500 m x 1500 m				
Photo					
GEOPHYSICAL (line-kilometres)					
Ground					
Magnetic					
Electromagnetic					
Induced Polarization					
Radiometric					
Seismic					
Other	VLF - EM = 0.9 line km	NCL 1	NCL 4	NCL 5	\$2,445.80
Airborne					
GEOCHEMICAL (number of samples analysed for ....)					
Soil					
Silt					
Rock	14				\$175.25 (includes assays below)
Other					
DRILLING (total metres; number of holes, size)					
Core					
Non-core					
RELATED TECHNICAL					
Sampling/assaying	3				
Petrographic					
Mineralogic					
Metallurgic					
PROSPECTING (scale, area)					
PREPARATORY/PHYSICAL					
Legal surveys (scale, area)					
Topographic (scale, area)					
Photogrammetric (scale, area)					
Line/grid (kilometres)					
Road, local access (kilometres)					
Trench (metres)					
Underground (metres)					
				TOTAL COST	\$2,621.05

FOR MINISTRY USE ONLY	NAME OF PAC ACCOUNT	DEBIT	CREDIT	REMARKS:
Value work done (from report)				
Value of work approved				
Value claimed (from statement)				
Value credited to PAC account				
Value debited to PAC account				
Accepted Date	Rept. No.			Information Class





INTRODUCTION:

At the request of the property owner, B.A. Resources Ltd., a VLF-EM geophysical reconnaissance survey was done on claims 1, 4 and 5 of the 14-unit NCL group situated in the Oliver granitic sector of Fairview gold camp in the southern Okanagan Valley. The property adjoins two old single-claim gold mines, the Standard (Snowflake claim) and the Empire (Empire claim). Both of these are north to northeasterly oriented quartz vein structures that trend onto the NCL property.

Also, limited reconnaissance was done over north and south portions of NCL 1 claim, in part to sample bedrock for locating gold halos around precious metal deposits.

SUMMARY & CONCLUSIONS:

1. This work established several prospective gold-bearing structures on the subject claims from outcrop and geophysical evidence.
- 2.(a) The strongest, inferred VLF-EM conductor is a 45m-wide anomaly on lines LA and LB, south of South Wow Lake (Fig. 3,5). It parallels the west side of a fault trace mapped by Beaty et al (1978), that trends south through the Standard mine. The surveyed site marks a structural intersection that could be an important locus for ore deposition. The subject anomaly appears to support this idea.
- 2.(b) Weaker potential VLF-EM conductors that occur on the LC-LF traverses north of the Empire vein appear to mark faults hosting quartz veins:
  - a 3m-wide mineralized quartz stockwork at R6 site;
  - a possible 300m extension of the Empire vein at 240m east on LC traverse;
  - another similar extension on LE near a soil lead anomaly from previous work (Lenard, 1981).
- 2.(c) A linear draw northeast of R5 site (an old prospect pit) parallels the strike of the 3m quartz vein at R6, and it may mark a shear zone, - a prospective gold-bearing structure.
3. A strong, 2m-wide mineralized quartz vein was located on the old Quartz Queen lapsed crown grant claim in the southwest part of NCL 1

claim. It is exposed in a 5m-deep shaft, bears oxides of iron and copper, and hosts sporadic galena. Turn of the century reports describe a 50-foot tunnel on this prospect, but no shipping record. The shaft appears to be on the border of NCL 1 and the Snowflake claim.

A single VLF-EM orientation line, LQ, was run across this structure just above the shaft. A weak, definite response to the vein structure was recorded in dips and field strength (Fig. 6). Brief traverses of outcrops suggested continuance of structure northeast and southwest of the shaft. This vein appears to parallel the Standard vein, some 400m to the north, and to have similar economic potential. One grab sample of copper-stained, galena-bearing quartz yielded values of economic interest: 0.161 oz. gold and 2.14 oz. silver per short ton.

4. A 0.8m vertical quartz vein, bearing native gold and galena, trends north under soil cover onto NCL 1 from the east side of Snowflake claim. Its strike projects into the major structural intersection south of South Wow Lake. It warrants exploration.

5. Multiple trends of fault-controlled quartz veins occur in the Oliver monzonite complex, related to intrusive contacts and cross-cutting structures: north to northeast, and east-west. Only the mineralized, conductive parts of such structures, shallow enough to be detected, and if aligned with the signal source used, may be detected by the VLF-EM method, barring interference by terrain factors. Consequently, any apparent positive results obtained by this preliminary survey need follow-up confirmation by soil-rock geochemistry and pitting or stripping to bedrock. Discrete, isolated conductors may represent pods of galena in this area.

6. Litho-geochemical analyses of outcrop and water well samples indicate:

(a) a possible 200m (656 ft.) northward extension of the Empire vein onto LD traverse, NCL 4 claim;

(b) a potential 200m extension of the Quartz Queen vein across the Snowflake claim, suggesting similar continuity southwestward from the shaft across the NCL 1 claim;

(c) a prospective gold quartz vein trend from an auriferous roadside

quartz vein outcrop on NCL 1 (site Y) (1983 assay) 260m northeast to R3 sample site, and potentially beyond to the 3m-wide quartz vein at R6 roadside.

RECOMMENDATIONS:

An overall survey grid is needed for the property, centered on NCL 1 claim, and is recommended for efficient mapping of all data. Specific proposals for further work are listed here in order of economic potential:

1. Quartz Queen Vein:

Explore the old Quartz Queen 2m-wide vein to the southwest on NCL 1 claim by combined soil-rock geochem and VLF-EM methods. Chip sample the shaft outcrop.

2. NCL 1 - NCL 4:

Strip, resample and map the gold-silver bearing quartz vein, now covered, at road site Y, and explore NE & SW by soil-rock geochem. Especially, examine the altered monzonite area R3, which tested anomalous gold in rock sampling.

Strip the 3m-wide quartz vein at site R6 for detailing its size trend, and mineralization.

Prospect the linear draw on NE corner of NCL 4, and sample soils.

3. Empire Vein Trend:

Detail VLF-EM and rock geochem anomalies on LD 75E, LE 60W, and LC by soil-rock geochemistry and by stripping, if warranted by the follow-up work. Sample outcrops for gold halos at VLF-EM anomalies.

4. South Wow Lake:

Evaluate the VLF-EM anomaly by soil sampling for Pb, Ag, Au, Cu and do same north of the lake along the mapped geologic contact on NCL 2/8 borders. Schedule reconnaissance VLF-EM along this northern trend also, covering the east third of NCL 8.

5. Snowflake Claim, Vein Extension:

Prospect a gold-bearing 0.8m quartz vein on the NE edge of Snowflake claim onto NCL1 claim by sampling soils, B & C zones, and include VLF-EM if planned for other parts of the property. Analyze for Au, Ag, Pb, and Cu.



PROPERTY AND ACCESS:

Access is by auto from the White Lake paved road, about  $\frac{1}{2}$  Km west of the upper adit on Snowflake claim, or by the subdivision road reached from an east turnoff 0.8 Km further north.

The property was optioned by B.A. Resources Ltd. in 1983 and subsequently purchased September, 1984 from the stakers, N.C. Lenard of Westbank, B.C. and M.S. Evick of Calgary, Alberta.

The claims expire March 2, 1985, except the NCL 1 six-unit claim, which expires Dec. 19, 1984. The fractional NCL 9 claim expires March 15, 1985.

WORK HISTORY:

Exploration for gold here dates back to the 1930's. The last recorded shipment was made in 1961-1962, - a reported 405 tons grading 1.43 oz. gold per ton.

Vermilion Resources recently diamond-drilled the Standard Vein from the surface, with undisclosed results.

The present VLF-EM survey follows one in 1981 (Lenard) the first geophysical work known to the writer to be done on these NCL claims.

GEOLOGY:

General

The property is underlain by a three-phase, composite, mid-Jurassic plutonic complex of quartz monzonite composition, previously called the 'Oliver granite-syenite.' It is well described in prior reports by Beaty and Culver, 1978 and Lenard, 1981. The property covers the young core of the complex and its contacts with the biotite mica phase.

Economic

(a) Quartz veins traverse structures in the core and beyond: the Empire vein is interior; the Standard, Quartz Queen, and Gypo Silica mine are in the bordering biotite mica phase.

The recently rediscovered Quartz Queen vein, which gave a grab sample assay of 0.161 oz. gold and 2.14 oz. silver per ton, occurs in a shaft near the border of the Snowflake claim in the southwest part

of NCL 1. Last recorded work on this prospect was at the turn of the century. It is a strong vein, comparable to the Standard structure.

(b) Twelve fresh outcrop samples were collected for detection of possible gold halo indicators of auriferous structures on NCL 1, 4 and 5. They included sample cuttings from three recently drilled water wells in the northeast part of NCL 1 claim. Results are plotted on Fig.3 map.

The method seems viable here, as the values appear to relate to known gold-bearing structures. Threshold, background gold content for such granitic rock is 0.8 ppb (parts per billion). The anomaly on LD (R8) is a particularly striking sign for extension of the Empire vein.

#### GEOPHYSICS:

A brief VLF-EM geophysical survey was run over selected structures with gold potential to detect any associated conductors for extensions and for discovery of new deposits. A similar survey was done by Lenard in 1981.

A Phoenix VLF-2 receiver, Ser. No. L1048, was used, employing the Seattle, Washington station for signal source. All data were filtered by the Fraser method. Fifteen metre (50-foot) stations were used on the lines, which are sub-perpendicular to the northerly structural grain in the area.

The geophysical data are plotted with field notes and inferred conductors, and presented after the property map, Fig.3.

#### RESULTS:

A moderately strong conductor recorded on the two lines south of South Wow Lake warrants follow up work as recommended herein. The topographic low there makes interpretation uncertain.

Weaker conductors inferred on remaining lines suggest that they are relatable to faults controlling quartz veins that host or could bear precious metals. The clearest such evidence was on the single LQ line over the mineralized Quartz Queen vein. Conclusions were less firm over the Empire vein and across the 3m quartz stockwork on LC (R6 site).

-REFERENCES-

British Columbia Ministry of Energy, Mines, Petr. Res.:

Assessment Reports -

- (a) No. 6949 R.J. Beaty & R.J. Culver, 1978: Geological, Geophys.  
Report on the Oliver Property, Oliver, B.C.
- (b) N.C.Lenard, 1981: Geophysical, Geochemical Report on the NCL 1-8  
Claims, Oliver, B.C.

Arnott, E.L., 1963: University of B.C. Thesis (B.A.Sc.)  
The Mineralogy and Petrology of Standard Mine,  
Oliver, B.C.

Northwest Mining Association, Spokane, WA. 1980: Practical Geophysics

Northern Miner, May 19, 1983, P.B5: Gold Halos Article

-CERTIFICATION-

I, Neall Curtis Lenard, of the settlement of Westbank, in the Province of British Columbia do hereby certify:

1. that I am a consulting geologist with an office mailing address of Box 863, Westbank, British Columbia VOH 2A0.
2. that I am a graduate of the University of British Columbia, (BA) Honors Geology 1949,
3. that I have practised my profession continuously for 33 years,
4. that I have an indirect interest in the subject property through prior ownership of shares of B.A. Resources Ltd.
5. that the statements made in this report are based on personal examination of the claims and on a study of published and unpublished reports on the property area,
6. that I am a member of the Associations of Professional Engineers of British Columbia and Alberta,
7. that no legal survey has been conducted over the subject mining claims, and, therefor, in accordance with the mining laws of the appropriate jurisdiction in which such properties are situate, the existence of and the area of such properties could be in doubt; and,
8. that I attended short courses on Exploration Geochemistry at the University of Calgary in 1970 and in mining at Spokane, Washington sponsored by the Northwest Mining Association in April, 1981.

DATED AT: The Settlement of Westbank, in the Province of British Columbia, this twelfth day of November, 1984.

Neall C. Lenard, P.Eng.  
Neall Curtis Lenard, P.Eng., P.Geol.



-EXPENDITURES-

Personnel:

N.C.Lenard, P.Geol.	
October 19, 20, 22, 1984 : 3 days @ \$400.	\$1,200.00

Transportation:

Auto, 3 days @ \$30	90.00
Gas: 355 Km @ 15¢	53.25

Motel, Meals

187.93

Geophysical Equipment: Rent, Air Cargo, Insurance

160.72

Assays:

175.25

Express:

8.90

Report Preparation:

N.C.Lenard, P.Geol. : 1½ days @ \$400.	600.00
Office costs	100.00
Drafting: 3 hr. @ \$15	45.00

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\$2,621.05

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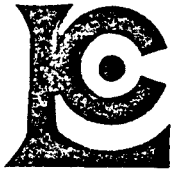
I certify that the above statement accurately represents expenditures made for the survey of the NCL 1, 4 and 5 claims conducted on October 19, 20, and 22, 1984.

*N. C. Lenard*

N.C.Lenard, P.Geol., P.Eng.



Exp. Date: 1984-10-22



# Chemex Labs Ltd.

212 Brooksbank Ave.  
North Vancouver, B.C.  
Canada V7J 2C1

Analytical Chemists • Geochemists • Registered Assayers

Telephone: (604) 984-0221  
Telex: 043-52597

## CERTIFICATE OF ANALYSIS

TO : B.A. RESOURCES LTD.

\*\* CERT. # : A8417456-001-A

402 - 1755 W. BROADWAY  
VANCOUVER, B.C.  
V6J 4S5

Box 863  
Westbank, BC  
V0H 2A0

INVOICE # : I8417456  
DATE : 5-NOV-84  
P.O. # : NONE

ATTN: N. CHAMBERLIST *VCC*: N. C. LENARD

Sample description	Prep code	Au NAA ppb						
N 84 R01	205	2	--	--	--	--	--	--
N 84 R02	205	6	--	--	--	--	--	--
N 84 R03	205	6	--	--	--	--	--	--
N 84 R04	205	1	--	--	--	--	--	--
N 84 R05	205	<1	--	--	--	--	--	--
N 84 R07	205	<1	--	--	--	--	--	--
N 84 R08	205	12	--	--	--	--	--	--
N 84 R09	205	<1	--	--	--	--	--	--
N 84 R10	205	<1	--	--	--	--	--	--
N 84 R11	205	8	--	--	--	--	--	--
N 84 R12	205	5	--	--	--	--	--	--
N 84 R13	205	3	--	--	--	--	--	--
N 84 R14	205	3	--	--	--	--	--	--
N 84 R15	205	<1	--	--	--	--	--	--

APPENDICES: p.9 Lithogeochem analyses



Certified by *H. Bichler*



# Chemex Labs Ltd.

Analytical Chemists • Geochemists • Registered Assayers

212 Brooksbank Ave.  
North Vancouver, B.C.  
Canada V7J 2C1  
Telephone: (604) 984-0221  
Telex: 043-52597

## CERTIFICATE OF ASSAY

TO : B.A. RESOURCES LTD.

402 - 1755 W. BROADWAY  
VANCOUVER, B.C.  
V6J 4S5

Box 363  
Westbank, BC  
VOH 2A0

\*\* CERT. # : A8417455-001-A  
INVOICE # : 18417455  
DATE : 5-NOV-84  
P.O. # : NONE

ATTN: N. CHAMBERLIST *LEC*: N. C. LENARD

Sample description	Prep code	Ag FA oz/T	Au FA oz/T				
N 84 Q	207	2.14	0.161	--	--	--	--
N 84 6A	207	0.12	0.003	--	--	--	--
N 84 6B	207	0.06	0.003	--	--	--	--

APPENDICES:      p.10 (grab samples)



.....  
Registered Assayer, Province of British Columbia

# General Testing Laboratories

A Division of SGS Supervision Services Inc.

1001 EAST PENDER ST., VANCOUVER, B.C., CANADA, V6A 1W2  
 PHONE (604) 254-1647 TELEX 04-507514 CABLE: SUPERVISE



TO:  
**MR. N. C. LEMARU**  
**Box 863**  
**Westbank B.C.**  
**VOH 2A0**

## CERTIFICATE OF ASSAY

No.: **8304-1856**      DATE: **Apr. 20/83**

We hereby certify that the following are the results of assays on: **Ore**

MARKED	GOLD	SILVER	XXX	XXX	XXX	XXX	XXX	XXX
	oz/at	oz/at						
	0.130	2.71						

NOTE: REJECTS RETAINED ONE MONTH. PULPS RETAINED THREE MONTHS. ON REQUEST PULPS AND REJECTS WILL BE STORE FOR A MAXIMUM OF ONE YEAR.

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*L. Wong*  
 L. Wong

PROVINCIAL ASSAYER

**Analytical and Consulting Chemists, Bulk Cargo Specialists, Surveyors, Inspectors, Samplers, Weighers**

MEMBER: American Society For Testing Materials • The American Oil Chemists Society • Canadian Testing Association  
 REFEREE AND OR OFFICIAL CHEMISTS FOR: National Institute of Oilseed Products • The American Oil Chemists' Society  
 OFFICIAL WEIGHMASTERS FOR: Vancouver Board Of Trade



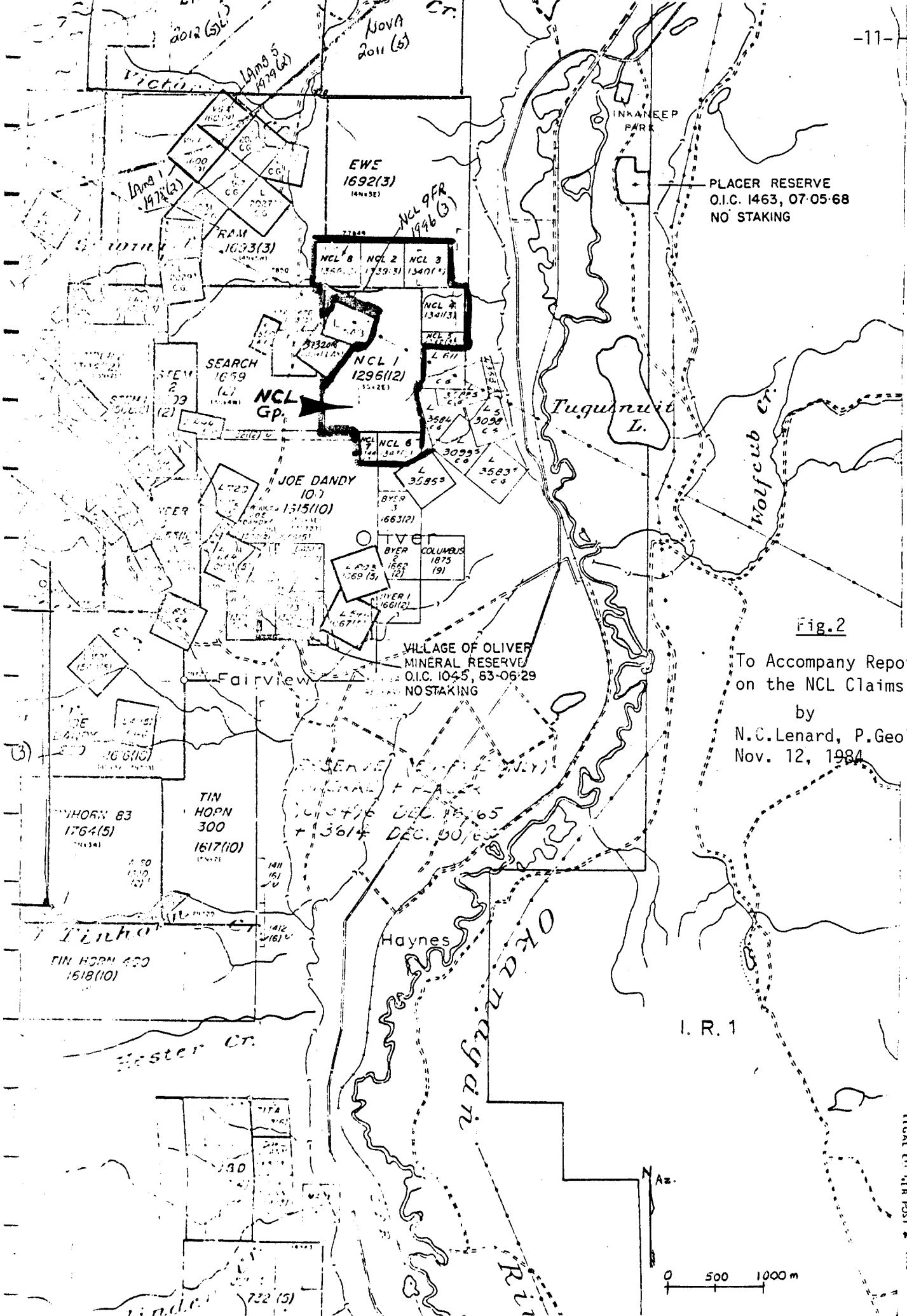


Fig.2

To Accompany Report  
 on the NCL Claims  
 by  
 N.C. Lenard, P. Geol.  
 Nov. 12, 1984

LEGEND  
 CLAIMS  
 REVISIONS  
 FOUNDATION  
 VERIFIED  
 LEGAL CO. POST & TAG NUMBER

Fig.4

VLF-EM Raw & Filtered Data

LOCATION	Measured Dip °	Filtered Value	Horizontal Fld. Strength %	Measured Dip °	Filtered Value	Horizontal Fld. Strength %	
<u>Line A (LA) : (S. WOW LK)</u>				<u>Line D (LD) : (NCL 4)</u>			
0+00 m East	-2 (S)		100	0+00 m East	+19(N)	100	
15	0	-2	112	15	+16	+35	
30	-3	-3	+4	127	+13	+28	-9
45	+5(N)	+2	+16	117	+13	+26	-3
60	+8	+13	+14	107	+13	+26	0
75	+8	+16	+1	97	+13	+26	-2
90	+6	+14	-1	99	0+90 m E	+11	+24
105	+9	+15	0	112			
0+120 m E	+5	+14	117				
<u>Line B (LB) (S. WOW LK.)</u>				<u>Line E (LE) : (NCL 5 : EMPIRE VEIN)</u>			
0+135 m West	0		99	0+105 m West	+13(N)	90	
120	0	0	99	90	+14	+27	90
105	0	0	0	75	+12	+26	-1
90	0	0	+16	60	+14	+26	0
75	+16	+16	+33	45	+12	+26	-5
60	+17	+33	+19	30	+9	+21	-9
45	+18	+35	+7	15	+8	+17	-6
30	+8	+26	-22	0+00 m W	+7	+15	87
15	+5	+13	-25				
0+00 m W	-4	+1	127				
<u>Line C (LC) : (NCL 1 - NCL 4)</u>				<u>Line F (LF) : (NCL 5 : EMPIRE VEIN)</u>			
0+00 m East	-4 (S)		100	0+00 m East	+11(N)	100	
15	0	-4	102	15	+11	+22	100
30	0	0	+6	30	+11	+22	+2
45	+2(N)	+2	0	45	+13	+24	+5
60	-1	+1	-3	60	+14	+27	95
75	0	-1	-1				
90	0	0	+3				
105	+2	+2	+6				
120	+4	+6	+7				
135	+5	+9	+4				
150	+5	+10	0				
165	+4	+9	+4				
180	+10	+14	+10				
195	+9	+19	+1				
210	+6	+15	-6				
225	+7	+13	-1				
240	+7	+14	+4				
255	+10	+17	+5				
270	+9	+19	-1				
0+285 m E	+7	+16	108				
			99				
<u>Line G (LQ) : (SW NCL 1 : QUARTZ QUEEN)</u>							
				0+00 m East	-4	-10	100
				15	-6	-10	102
				30	-4	-10	+6
				45	0	-4	+14
				60	+4	+4	+12
				75	+4	+8	+4
				90	+4	+8	-4
				0+105 m E	0	+4	88

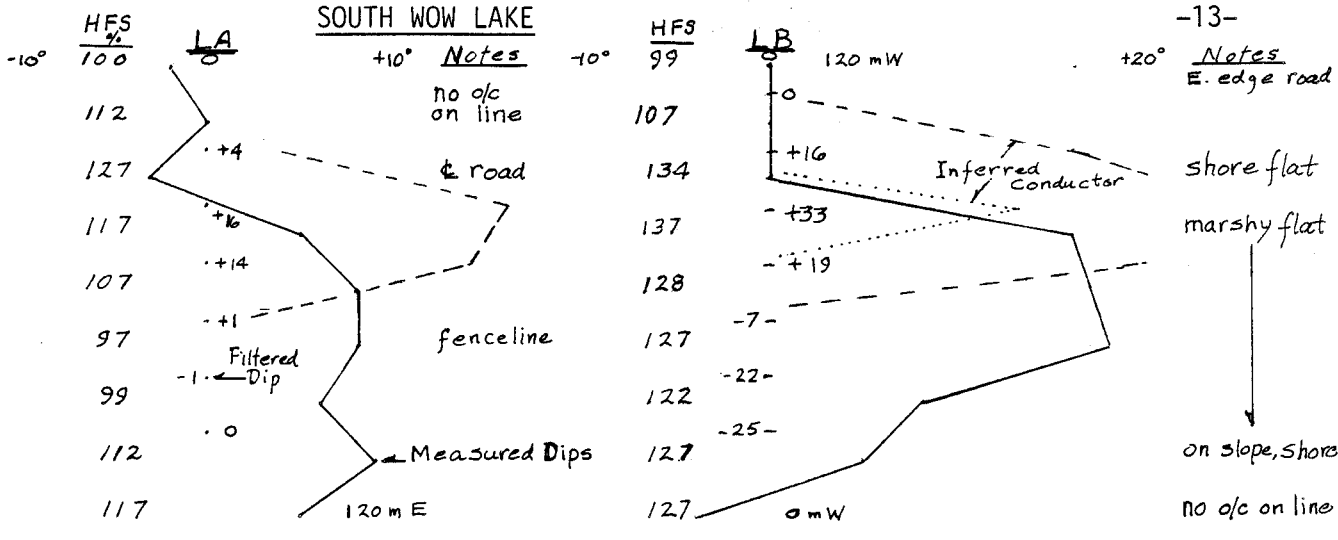
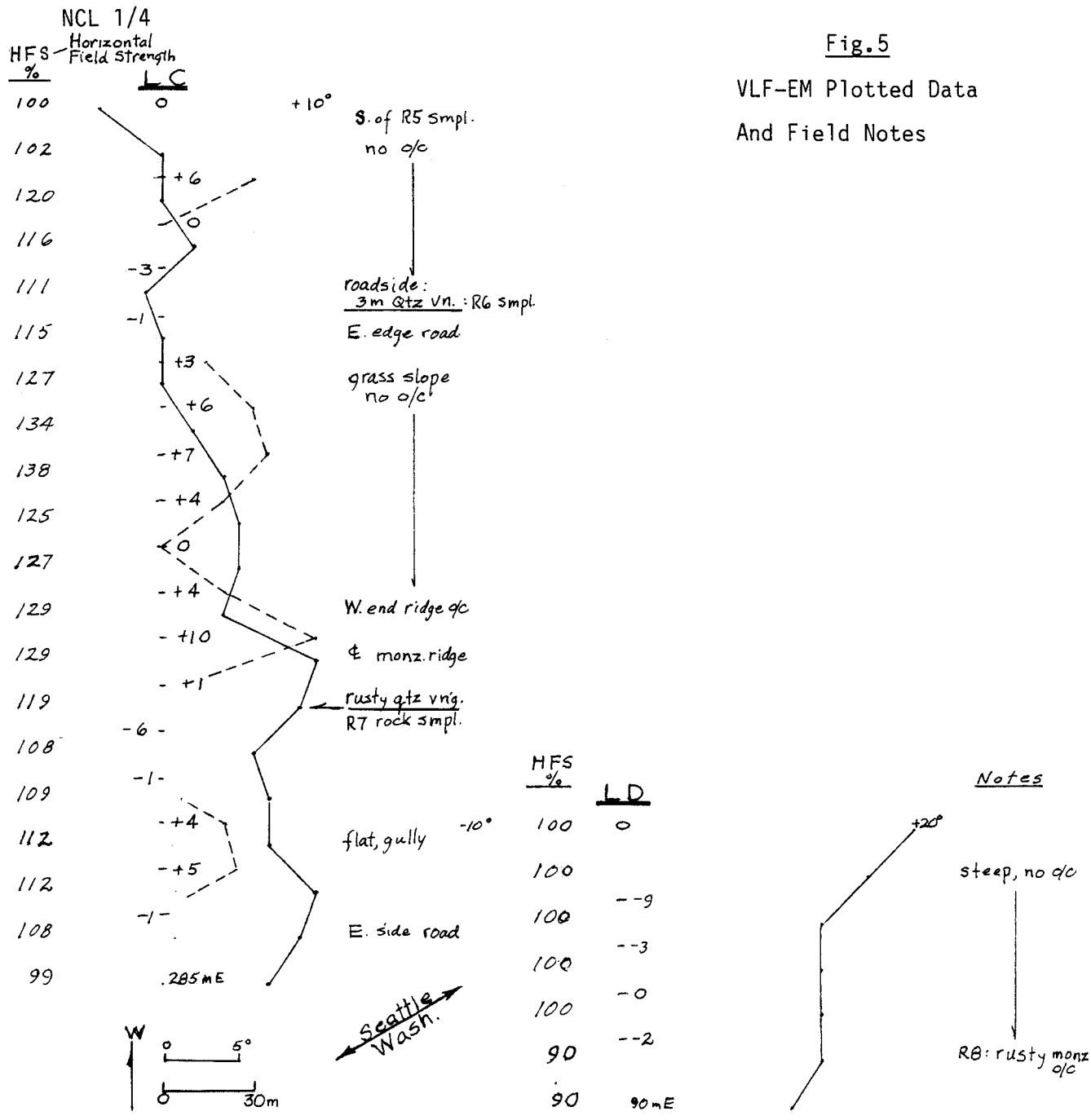
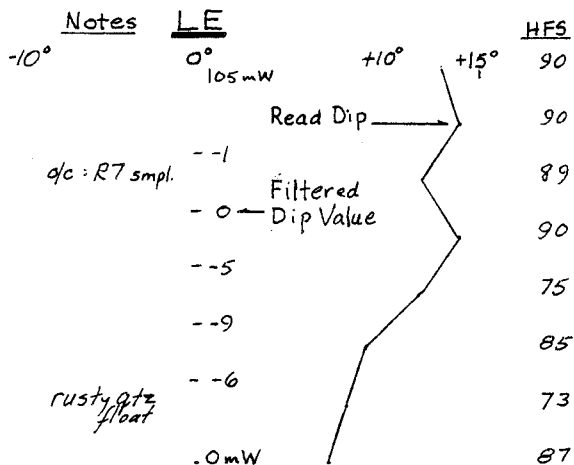


Fig.5

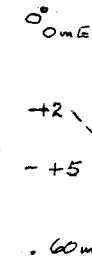
VLF-EM Plotted Data  
And Field Notes



EMPIRE VEIN TREND



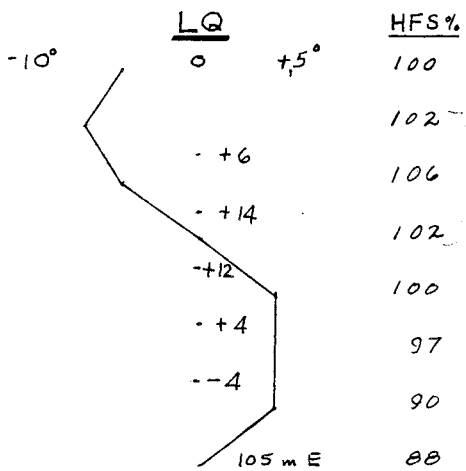
LF



HFS%	Notes
100	slope above Empire Vn.
100	
92	⊥ Empire Vein
95	o/c R11 sample
95	o/c R10 smpl.

Fig.6  
VLF Plotted Data and Field Notes

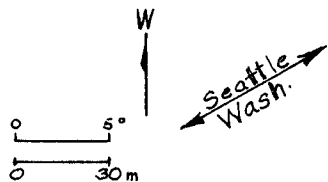
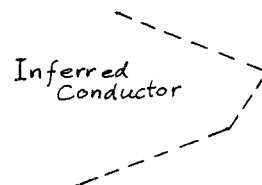
QUARTZ QUEEN



Notes

No o/c  
↓  
Qtz. Queen shaft  
R2 smpl.  
base of hill  
covered flat  
  
180° Az from U. adit,  
(R1 smpl) Standard vn.

Filtered Dips  
0 +5 +10 +15



# Gold halos fine prospecting tool

By Guy Perrault and Pierre Trudel, REM/MERI, Ecole Polytechnique, and Paul Bedard,

## Compagnie minière Lamaque

All rocks contain gold though not all rocks are gold ore. The barren rocks of Archean greenstone belts so widespread in the Precambrian Shield of Canada contain gold: the gneisses contain roughly 0.8 ppb (parts per billion) gold, the basalts 0.2 to 1.7 ppb gold, the granites 0.6 ppb gold.

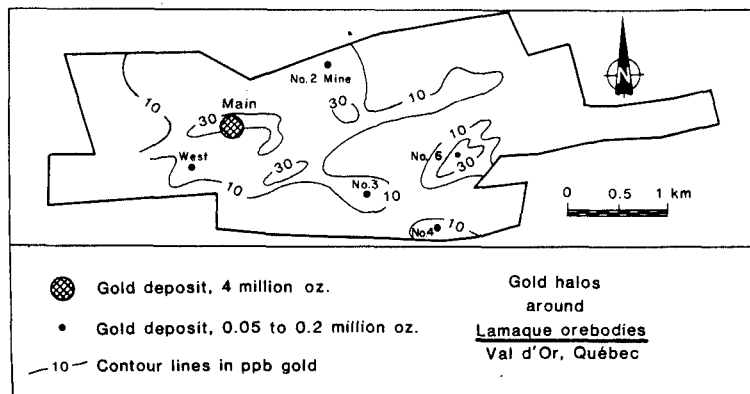
At these concentrations, gold analyses are tricky. Great care must be exercised in the preparation of samples to avoid contamination. For instance, it would not be a good idea to grind such low gold concentration rocks with the same instruments and in the same environment as that used to grind ore specimens. Ore specimens frequently contain 0.1 oz. gold per ton; that is equivalent to 3.4 ppm or 3,400 ppb gold. The very dust in the atmosphere of the crushing or grinding room in an assay office may be enough to contaminate samples.

The analytical techniques used to determine gold in such low concentrations have now been tried and

well tested; many of them are quite reliable. One of the most commonly used techniques is that of neutron activation. In this technique, small specimens of rock powders (1 or 2 g) are inserted near the heart of a nuclear reactor and immersed in a field of neutrons: the neutrons impacting on the sample render many of its atoms radioactive. All elements are subject to this radioactivation in the nuclear reactor although the technique is not applied with equal ease to the analysis for all elements.

### Sensitive technique

Gold is generally found in nature in the form of its stable isotope,  $^{197}\text{Au}$ ; when irradiated with neutrons, it transforms into its radioactive isotope  $^{198}\text{Au}$ ; with a half-life of 64.70 hours. Spectrometric intensity measurements can be made after some suitable "cooling" period (decay time, 7 to 10 days) and gold concentrations are calculated from intensities. The technique is very sensitive (down to 0.05 ppb gold) and reasonably precise (frequently around 20% of contained gold). Sample preparation varies from lab to lab. Similarly, very low gold con-



centrations are generally measured by a radiochemical method: concentration of radioactive gold onto a resin followed by spectrometric measurements.

Gold analyses in the ppb range has been applied to the host-rocks on the Lamaque gold property in the Val d'Or area. Results are shown in the accompanying figure. The orebodies already mined or currently being mined are outlined on this map. Essentially, the principal ore area in that centred on the main plug; the ore is composed veins or

stockworks of quartz stringers in faults with little displacement cutting the intrusive plugs (granite and diorite). This area has yielded approximately 75% of the gold produced at Lamaque, that is 4 million oz. Other ore areas are the west plug orebody (0.23 million oz. gold), the No. 2 mine area (0.18 million oz. gold), the No. 3 pluton orebody (0.06 million oz.) and the No. 4 pluton orebody (0.05 million oz.)

Gold halos envelop each of these ore areas. The critical gold value seems to be 10 ppb. All ore areas are enveloped by the 10 ppb contour line. The halo around the main ore area is large; it is approximately 2 km diameter and likely extends to envelop the orebodies at the adjacent Sigma mine to the north. The smaller orebodies are enveloped by smaller halos or irregularities in the main halo; these smaller halos are approximately 0.5 km diameter (see No. 3 and No. 4 ore areas on map). One medium size halo (No. 6 area on map) was unexplored until recently but is currently being drilled.

### Cost effective

Mapping of gold in low concentrations in mining camps can be a very cost-effective method of prospecting. Samples collected on a grid of one kilometre along strike and approximately 0.5 km across strike should allow the detection of gold halos in potential ore-bearing areas. More detailed sampling 100 m x 200 m may be necessary once an anomalous value has been found. The critical values to watch in the Val d'Or area are the 10-ppb gold contour line. While gold halos do not constitute exact drilling targets, they can help focus additional work (geophysical, trenching, stripping, etc.)

In the application of this technique in Canada, some caution should be exercised. Our work has indicated the manner of its use in the Val d'Or area. Gold distribution patterns may be different in other areas (Hemlo, Noranda or other). Nevertheless, it does promise to be useful in these other areas.

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Fig. 7



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ASSESSMENT REPORT

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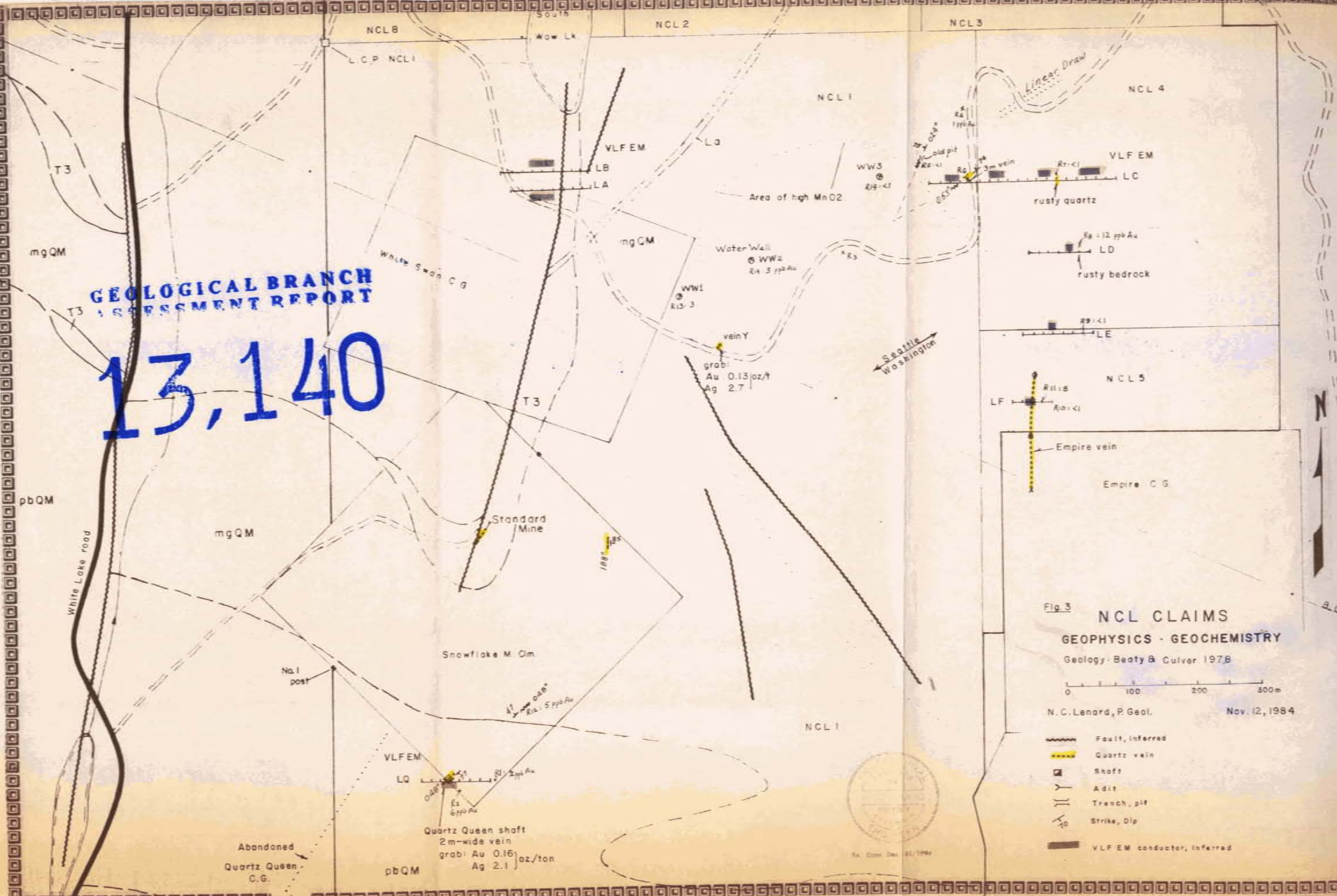


Fig 3  
NCL CLAIMS  
GEOPHYSICS - GEOCHEMISTRY  
Geology: Beatty & Culver 1978



N.C. Lenard, P. Geol. Nov. 12, 1984

- Fault, Inferred
- Quartz vein
- Shaft
- Y Adit
- == Trench, pit
- ↘ Strike, Dip
- ▬ VLF EM conductor, Inferred

