84-#815 - 12927
9/85

ASSESSMENT REPORT

ON THE

SELF-POTENTIAL SURVEY

OF THE

LOMOND GROUP

NELWAY AREA

NELSON MINING DIVISION, BRITISH COLUMBIA

Latitude: 49°0'

Longitude: 117°19'

NTS 82F/3W

for

J. W. Macleod

CARMAC RESOURCES LTD.

Prepared by:

P. J. Santos, P. Eng.
ANGINEL RESOURCES LTD.
626 - 9th Avenue
Castlegar, British Columbia
V1N 1M4

September 24, 1984

Copy No. 1

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SCHEDULE OF ACCOMPANYING MAPS AND ILLUSTRATIONS

1. SUMMARY AND CONCLUSION

Four (4) line kilometers of S.P. (Self Potential) survey was conducted on a portion of the Lomond Property. This geopysical survey detected one (1) strong S.P. anomaly, one (1) weak S.P. anomaly, and two (2) very weak S.P. anomalies. The significance of thse anomalies are discussed in this report.

2. INTRODUCTION

At the request of J. W. Macleod, P. Eng., a self-potential (S.P.) survey was conducted on the Lomond property owned by Carmac Resources Ltd. of Vancouver, British Columbia. The geophysical survey was conducted during the period September 15-23, 1984.

3. LOCATION AND ACCESS

The Lomond Property is located two point seven (2.7) kilometers west of Nelway, British Columbia, in the Nelson Mining Division. It is at the international border at longitude 117°19' and latitude 49°00'. The claims are plotted on N.T.S. 82F/3W (see Plate 2).

Access is by way of the Nelway-Waneta road (Highway 22A) that joins Highway 6 at Nelway which in turn connects with Highway 3. Several old logging roads provide access to most of the claim group.

4. PROPERTY DESCRIPTION AND HISTORY

The Lomond Property consists of fourteen (14) reverted crown-granted claims. Originally, there were fifteen (15)

crown-granted claims but two (2) small fractional claims were combined as one (1) claim. Details of these claims are as follows:

Claim Name	Lot No.	Record No.	Acreage	Due Date
Hastings	6598	306	51.65	October 1, 1984
Glasgow	6599	307	38.09	October 1, 1984
Salmo	6600	308	51.65	October 1, 1984
Pioneer	6601	309	51.65	October 1, 1984
Lake View	6602	310	40.12	October 1, 1984
Medoc	6603	311	49.91	October 1, 1984
Renfrew	6604	312	51.65	October 1, 1984
Golden Rod }	6605	313	31.36	October 1, 1984
Pioneer #1 Fr.}	6608			
International	6606	314	11.84	October 1, 1984
Golden Fleece	6607	315	23.73	October 1, 1984
Renfrew #1	6609	316	40.24	October 1, 1984
International #1	6610	317	36.99	October 1, 1984
Glasgow #1 Fr.	6611	318	12.05	October 1, 1984
Salmo #1 Fr.	6612	319	15.71	October 1, 1984

The claims were crown-granted in 1913 but no work was recorded until 1946 when Sheep Creek Gold Mines Limited carried out a diamond drilling program on the property.

Between 1948 and 1950, leasees shipped seven thousand two hundred and ninety-two (7292) tons of iron oxide to the Lehigh Cement Company at Metaline Falls, Washington. In addition nineteen (19) tons of lead ore that graded 2.0 oz/ton Ag, 25.5% Pb, and 2.5% Zn were shipped to the smelter in Trail.

The property was acquired by International Lead and Zinc Mines Ltd. who held it until 1976 and the claims reverted to the crown. The property was acquired by Carmac Resources Ltd. which conducted geochemical, geological, and trenching programs in 1977 and 1978. In 1983, Anginel Resources Ltd. conducted for Carmac Resources Ltd. geophysical testing (VLF-EM and S.P.) on the property. In 1984, an S.P. survey was carried out on a portion of the property.

5. REGIONAL GEOLOGY

The area in which the Lomond Property is located is in the Kootenay Arc, an arcuate belt of highly deformed rocks that stretches from east-central Washington State to north of Revelstoke, British Columbia. These rocks are comprised of mainly Proterozoic to Mid-Paleozoic miogeosynclinal facies and Upper Paleozoic and Mesozoic eugeosynclinal units.

Within the Kootenay Arc are formational rock units known to host silver-lead-zinc deposits. The most notable of these are the Slocan Group, the Nelway (Metaline) Formation, and the Reeves and Badshot members of the Laib Formation.

The Nelway Formation is a thick sequence of calcareous rocks of Middle Cambrian age sub-divided into Upper, Middle, and Lower members. In Washington, this formation is known as the Metalline Formation. The Upper Member is a fine-grained, grey, massive linestone; the Middle Member is a massive or banded, light and dark gray, fine-grained dolomite; and the Lower Member is a dark gray, fine-grained limestone and argillaceous limestone.

Overlying unconformably the Nelway (Metaline) Formation are black argillites and carbonaceous slates of the Active (Ledbetter Slate) Formation.

On Table 1 the stratigraphic sections of the Salmo-Metaline areas are shown with examples of lead-zinc deposits.

6. LOCAL GEOLOGY

It is generally considered that the Lomond Property is underlain by a dolomitic sequence belonging to the Middle Member of the Nelway Formation that contains the Yellowhead Horizon which is a productive host rock of lead-zinc deposits in Washington. There are, however, indications that the property may in part occur within the Upper Member of the Nelway (Maitlen) Formation that include the Josephine Horizon which is also a productive unit south of the border (see Table 1).

At the property, the rocks consist of blue-grey, fine- to medium-grained and black carbonaceous dolomites and dense, fine-grained light gray limestone. This rock sequence strikes east-west and dips 30° to 40° to the south.

There are several occurrences of limonite in the property. This limonite occurs as pods and fracture fillings as well as in layers in the dolomite. Some of the limonite occurs as botryoidal and stalactitic forms which are evidence of transportation and deposition. The limonite contains lead and zinc in significant quantities, and may indicate the presence of sulfide mineralization at depth. In this part of the Kootenay Arc, the lead-zinc sulfide deposits are quite often oxidized to a considerable depth which further complicates the exploration for these deposits. Geochemical anomalies, therefore, may be far removed from the sulfide bodies.

The classical theory for the deposition of lead-zinc sulfides in carbonates is the replacement theory in which the limestone or dolomite is replaced volume for volume by the lead-zinc sulfides. The problem with this theory is that it has no practical use in exploration.

From this author's experience in Pine Point and the Kootenay Arc, there is another theory of deposition which

has practical application in exploration. The Mississippi-Valley-type of lead zinc deposits are actually sulfide deposition in breccia zones mainly caused by solution collapse initiated by faulting and/or jointing. The movement of groundwater through these collapse zones is the plumbing system that brought about the deposition of the sulfides. That fact that solution collapse is prevalent in carbonate rocks such as linestones and dolomites tends to confine these deposits to such rock strata and are hence strata bound.

7. SELF-POTENTIAL SURVEY

In 1983, two (2) geophysical survey methods, VLF-EM and S.P. (Self Potential) were tested over some of the Lomond showings to determine their usefulness in future exploration programs. The VLF-EM survey indicated weak anomalies which were attributed to shallow, near surface conductors, although the filtered data indicated a trend approximately parallel to the underlying dolomites and coincides with a zone of limonitic rocks.

The Self-Potential tests in 1983 showed readings that are considered definitely anomalous. Although the anomalies trend in a direction different to the geology, this is

considered not significant. In fact, if J. W. Macleod's theory of a breccia pipe is correct, the anomaly trend should not follow the bedding. In this theory, a breccia pipe provided the plumbing for ascending solution from a strata-bound source bed at depth.

The self-potential method is an electrical exploration technique based upon natural direct currents flowing in the ground. There are several causes of these currents, one of which is the potentials arising from the chemical reactions in oxidizing massive sulfides. Zones of massive sulfide mineralization that extend into the oxidizing zone are usually marked by definite voltage lows.

In the 1984 self-potential survey, the readings were taken along lines one hundred (100) meters apart on stations twenty-five (25) meters apart (see Plate 4).

The Base Station is on Line 19+00E, 13+00N and the results (in millivolts) are plotted and contoured on Plate 5. Anomalies in the order of -100 millivolts and less are considered definitely anomalous, -75 to -100 millivolts is considered weakly anomalous, and -25 to -50 millivolts very weakly anomalous.

The self-potential data (Plate 5) show a strong, large anomaly on the northeast corner of the Salmo claim on the bottom of Lines 21+00E, 21+50E, and 22+00E. The map of Fyles & Hewlett (Plate 3) shows some old workings in this area.

A weak self-potential anomaly was detected on Line 20+00E, 16+00N which is located topographically higher than a lead geochemical anomaly that was trenched before (Trench #6, seep Plate 5).

A very weak "anomaly" was detected on Line 19+00E, 14+00N below Trench #6. It is roughly coincidental with a weak lead soil anomaly.

A very weak "anomaly" was also detected on Line 16+00E, 14+50N which is coincidental with a lead anomaly that was trenched previously (Trench #8).

A geochemical anomaly on Line 16+00E, 12+00N that was trenched previously (Trench #9) did not have a self-potential response indicating that this geochemical anomaly was probably transported.

8. RECOMMENDATIONS

The following recommendations are being made:

1. The remainder of the property should be surveyed by the S.P. (Self Potential) method.

2. The ground east of the Salmo claim (about two units) should be staked.

9. STATEMENT OF COSTS

Dates of Work

Mitchel Quaedvlieg (Line cutting, S.P. Helper)
September 15, 17, 18, 19, 21, 23, 1984.

Ken Bonde (S.P. Operator)
September 15, 17, 18, 19, 21, 23, 1984

P. J. Santos (Geologist, supervision)
September 15, 20, 24, 1984

Wages

P. J. Santos - 3 days @ $210/day	$ 630.00
Ken Bonde - 6 days @ $210/day	1,260.00
M. Quaedvlieg - 6 days @ $90/day	540.00
Vehicle - 6 days @ $40/day	240.00
Equipment Rental	80.00
Reproduction, typing, printing	170.00
	$ 2,920.00

P. J. Santos, P. Eng.

10. BIBLIOGRAPHY

Dings, M. G. and Whitehead, D. H. 1965 - Geology and ore deposits of the Metalline zinc-lead district, Pend Oreille county, Washington; USGS Professional Paper No. 489.

Fyles, J. T. and Hewlett, C. G. 1959 - Stratigraphy and structure of the Salmo lead-zinc area; British Columbia Department of Mines Bulletin No. 41.

Little, H. W. 1960 - Nelson map-area, west half, British Columbia (82F/2); Geological Survey of Canada Memoir 308, 25 pp.

Macleod, J. W. 1978 - Geological and geochemical report on the Lomond claim group for Carmac Resources Ltd.

Ministry of Mines, British Columbia - Annual reports, 1948, 1950.

Potter, R. G. 1977 - Geological and geochemical report on the Lomond claim group for Carmac Resources Ltd.

Rennie, D. W. 1983 - Assessment report on the VLF-EM and self potential programs on the Lomond Group for Carmac Resources Ltd., 15 pp.

Santos, P. J. 1978 - Report of investigation on the La Sota-Jones property, Metaline District, Washington State, U.S.A., 32 pp.

Van Blaricon, R. 1980 - Editor; Practical geophysics for the exploration geologist; Northwest Mining Association, 303 pp.

Weissenborn, A. E. 1970 - Editor; Lead-zinc deposits in the Kootenay arc; State of Washington Department of Natural Resources Bulletin No. 61.

11. STATEMENT OF QUALIFICATIONS

I, Perfecto J. Santos, of 626 - 9th Avenue, of the City of Castlegar, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geological Engineer with the firm of Anginel Resources Ltd, whose offices are located at 626 - 9th Avenue, Castlegar, British Columbia, Canada;

That I am a registered Professional Engineer in the Province of British Columbia, Canada;

That I am a graduate of the College of Engineering, University of the Philippines with a Bachelor of Science degree in Mining Engineering (Geology Option);

That I have been practicing my profession continuously for the past twenty-three years;

That I have prepared this report based on personal work on the property and I personally supervised the work done as described in this report on the Lomond Group of Claims owned by Carmac Resources Ltd. of Vancouver, British Columbia, Canada;

That in addition, pertinent available literature and maps were studied prior to the preparation of this report;

That I have not received directly or indirectly, nor do I expect to receive any interest direct or indirect, in the property and/or shares of Carmac Resources Ltd.

DATED at Castlegar, British Columbia, this 24th day of September, A. D. 1984.

P. J. Santos, P. Eng.

12. Appendix

    (a) Table 1 - Columnar Sections

    (b) Self-Potential Survey Data

    (c) Maps and Illustrations

TABLE 1 - COLUMNAR SECTIONS OF STRATIGRAPHIC HOSTS OF OREBODIES IN SALMO-METALINE AREAS

	SALMO AREA			METALINE AREA			SALMO-METALINE AREAS
	FORMATION	LITHOLOGY	APPROX. THICKNESS (feet)	FORMATION	LITHOLOGY	APPROX. THICKNESS (feet)	LEAD-ZINC DEPOSITS
ORDOVICIAN	ACTIVE	Black argillite, slate and argillaceous limestone.	?	LEDBETTER	Black carbonaceous argillite and slate.	2200 to 2500	
CAMBRIAN	NELWAY			METALINE LIMESTONE		4500 to 6500	
	Upper Member: * ?	Fine grained grey massive lst. locally dolomitic	?	*Josephine Horizon: Grey lst Unit:	Black and grey dolomite Massive grey lst.	0 to 200	La Sota-Jones Lomond
	Middle Member:	Fine grained grey dolomite with discontinuous layers of spotted black dolomite.	?	Bedded Dolomite Unit (Yellowhead Horizon)	Light grey dolomite with beds and lenses of spotted black dolomite.	3500	Van Stone, Calhoun Lomond
	Lower Member:	Fine grained, bedded dark grey limestone.		Bedded Limestone Unit	Thin to medium bedded dark grey limestone.	1000 to 1200	
	LAIB			MAITLEN PHYLLITE			
	Upper Laib:	Grey and green phyllite			Green phyllite with limestone near top	5000	
	Emerald Member:	Black argillite	200-500				Remac, H. B.
	*Reeves Member:	Grey limestone locally dolomitized.	130-450	* Lead-zinc mineralization			
	Truman Member:	Brown and green argillite	60-350				

Modified from R. G. Potter

SELF-POTENTIAL SURVEY DATA

LOMOND PROPERTY, NELSON MINING DIVISION, BRITISH COLUMBIA

September 17-24, 1984

Line 19+00E

Station	Observation Pot	Base Shift	Final Pot	Comments
13+00N	0	0	0	Main Base Station
13+25N	+26	0	+26	
13+50N	+ 7	0	+ 7	
13+75N	-43	0	-43	
14+00N	-49	0	-49	
14+25N	-41	0	-41	
14+50N	+64	0	+64	
14+75N	+43	0	+43	
15+00N	+88	0	+88	
15+25N	+85	0	+85	
15+50N	+26	0	+26	
15+75N	+36	0	+36	
16+00N	+50	0	+50	
16+25N	+104	0	+104	
16+50N	+70	0	+70	
16+75N	+15	0	+15	
17+00N	+36	0	+36	
17+25N	+70	0	+70	
17+50N	+19	0	+19	
17+75N	-30	0	-30	
18+00N	-13	0	-13	

SELF-POTENTIAL SURVEY DATA

LOMOND PROPERTY, NELSON MINING DIVISION, BRITISH COLUMBIA

September 17-24, 1984

Line 20+00E

Station	Observation Pot	Base Shift	Final Pot	Comments
13 N	+5	0	+5	1st New Base Station
13+25N	+27	+5	+32	
13+50N	+35	+5	+40	
13+75N	+36	+5	+41	
14+00N	+57	+5	+62	
14+25N	+78	+5	+83	
14+50N	+61	+5	+66	
14+75N	+83	+5	+88	
15+00N	+85	+5	+90	
15+25N	+90	+5	+95	
15+50N	+56	+5	+61	
15+75N	+45	+5	+50	
16+00N	-13	+5	-8	
16+25N	-33	+5	-28	
16+50N	+45	+5	+50	
16+75N	+17	+5	+22	
17+00N	+81	+5	+86	
17+25N	+51	+5	+56	
17+50N	+72	+5	+77	
17+75N	+61	+5	+66	
18+00N	+85	+5	+90	

16+00N	+109	-35	+74
16+25N	+138	-35	+103
16+50N	+125	-35	+90

SELF-POTENTIAL SURVEY DATA

LOMOND PROPERTY, NELSON MINING DIVISION, BRITISH COLUMBIA

September 17-24, 1984

Line 21+50E

Station	Observation Pot	Base Shift	Final Pot	Comments
13+00N	-83	-35	-118	3rd New Base Station
13+25N	-5	-118	-123	
13+50N	-1	-118	-119	
13+75N	+65	-118	-53	
14+00N	+39	-118	-79	
14+25N	+143	-118	+25	
14+50N	+165	-118	+47	
14+75N	+166	-118	+48	
15+00N	+122	-118	+4	
15+25N	+174	-118	+56	
15+50N	+163	-118	+45	
15+75N	+191	-118	+73	
16+00N	+152	-118	+34	
16+25N	+185	-118	+67	
16+50N	+238	-118	+120	
16+75N	+206	-118	+88	
17+00N	+203	-118	+85	
17+25N	+105	-118	-13	
17+50N	+163	-118	+45	
17+75N	+195	-118	+77	
18+00N	+195	-118	+77	

SELF-POTENTIAL SURVEY DATA

LOMOND PROPERTY, NELSON MINING DIVISION, BRITISH COLUMBIA

September 17-24, 1984

Line 22+00E

Station	Observation Pot	Base Shift	Final Pot	Comments
13+00N	+6	-118	-112	4th New Base Station
13+25N	-6	-112	-118	
13+50N	+23	-112	-89	
13+75N	+61	-112	-51	
14+00N	-17	-112	-129	
14+25N	-160	-112	-272	
14+50N	+135	-112	+23	
14+75N	+102	-112	-10	
15+00N	+106	-112	-8	
15+25N	+116	-112	+4	
15+50N	+166	-112	+54	
15+75N	+112	-112	0	
16+00N	+187	-112	+75	
16+25N	+180	-112	+68	
16+50N	+176	-112	+64	
16+75N	+183	-112	+71	
17+00N	+156	-112	+44	
17+25N	+94	-112	-18	
17+50N	+163	-112	+51	
17+75N	+155	-112	+43	
18+00N	+83	-112	-29	

SELF-POTENTIAL SURVEY DATA

LOMOND PROPERTY, NELSON MINING DIVISION, BRITISH COLUMBIA

September 17-24, 1984

Line 18+00E

Station	Observation Pot	Base Shift	Final Pot	Comments
13+00N	+30	0	+30	
13+25N	+5	+30	+35	
13+50N	+8	+30	+38	
13+75N	+18	+30	+48	
14+00N	+3	+30	+33	
14+25N	0	+30	+30	
14+50N	+11	+30	+41	
14+75N	-4	+30	+26	
15+00N	+5	+30	+35	
15+25N	+7	+30	+37	
15+50N	-4	+30	+26	
15+75N	+19	+30	+49	
16+00N	+16	+30	+46	
16+25N	+7	+30	+37	
16+50N	-18	+30	+12	
16+75N	-50	+30	-20	
17+00N	-32	+30	-2	
17+25N	-65	+30	-35	
17+50N	-64	+30	-34	
17+75N	-55	+30	-25	
18+00N	-75	+30	-45	

SELF-POTENTIAL SURVEY DATA

LOMOND PROPERTY, NELSON MINING DIVISION, BRITISH COLUMBIA

September 17-24, 1984

Line 17+00E

Station	Observation Pot	Base Shift	Final Pot	Comments
13+00N	+10	+30	+40	
13+25N	-3	+40	+37	
13+50N	-5	+40	+35	
13+75N	-17	+40	+23	
14+00N	-7	+40	+33	
14+25N	-27	+40	+13	
14+50N	-35	+40	+5	
14+75N	-28	+40	+12	
15+00N	-27	+40	+13	
15+25N	-37	+40	+3	
15+50N	-70	+40	-30	
15+75N	-33	+40	+7	
16+00N	-60	+40	-20	
16+25N	-60	+40	-20	
16+50N	-69	+40	-29	
16+75N	-83	+40	-43	
17+00N	-100	+40	-60	
17+25N	-85	+40	-45	
17+50N	-92	+40	-52	
17+75N	-100	+40	-60	
18+00N	-105	+40	-65	

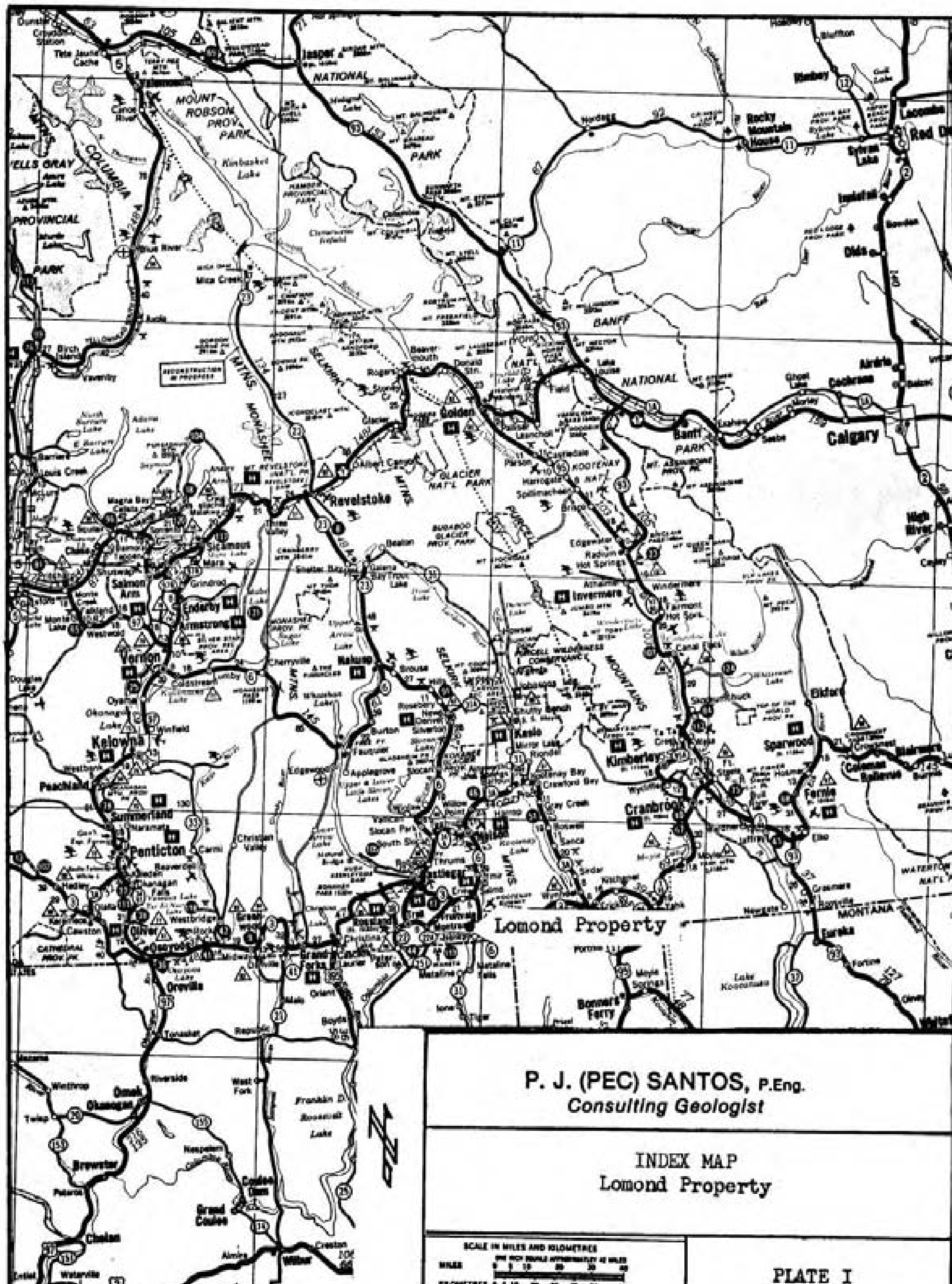
SELF-POTENTIAL SURVEY DATA

LOMOND PROPERTY, NELSON MINING DIVISION, BRITISH COLUMBIA

September 17-24, 1984

Line 16+00N

Station	Observation Pot	Base Shift	Final Pot	Comments
13+00N	+6	+40	+46	
12+75N	-20	+46	+26	
12+50N	-33	+46	+13	
12+25N	-31	+46	+15	
12+00N	-37	+46	+9	
13+25N	-14	+46	+32	
13+50N	-22	+46	+24	
13+75N	-38	+46	+8	
14+00N	-42	+46	+4	
14+25N	-93	+46	-47	
14+50N	-90	+46	-44	
14+75N	-60	+46	-14	
15+00N	-78	+46	-32	
15+25N	-80	+46	-34	
15+50N	-58	+46	-12	
15+75N	-90	+46	-44	
16+00N	-87	+46	-41	
16+25N	-100	+46	-54	
16+50N	-110	+46	-64	
16+75N	-101	+46	-55	
17+00N	-105	+46	-59	
17+25N	-100	+46	-54	
17+50N	-140	+46	-94	
17+75N	-110	+46	-64	
18+00N	-122	+46	-76	



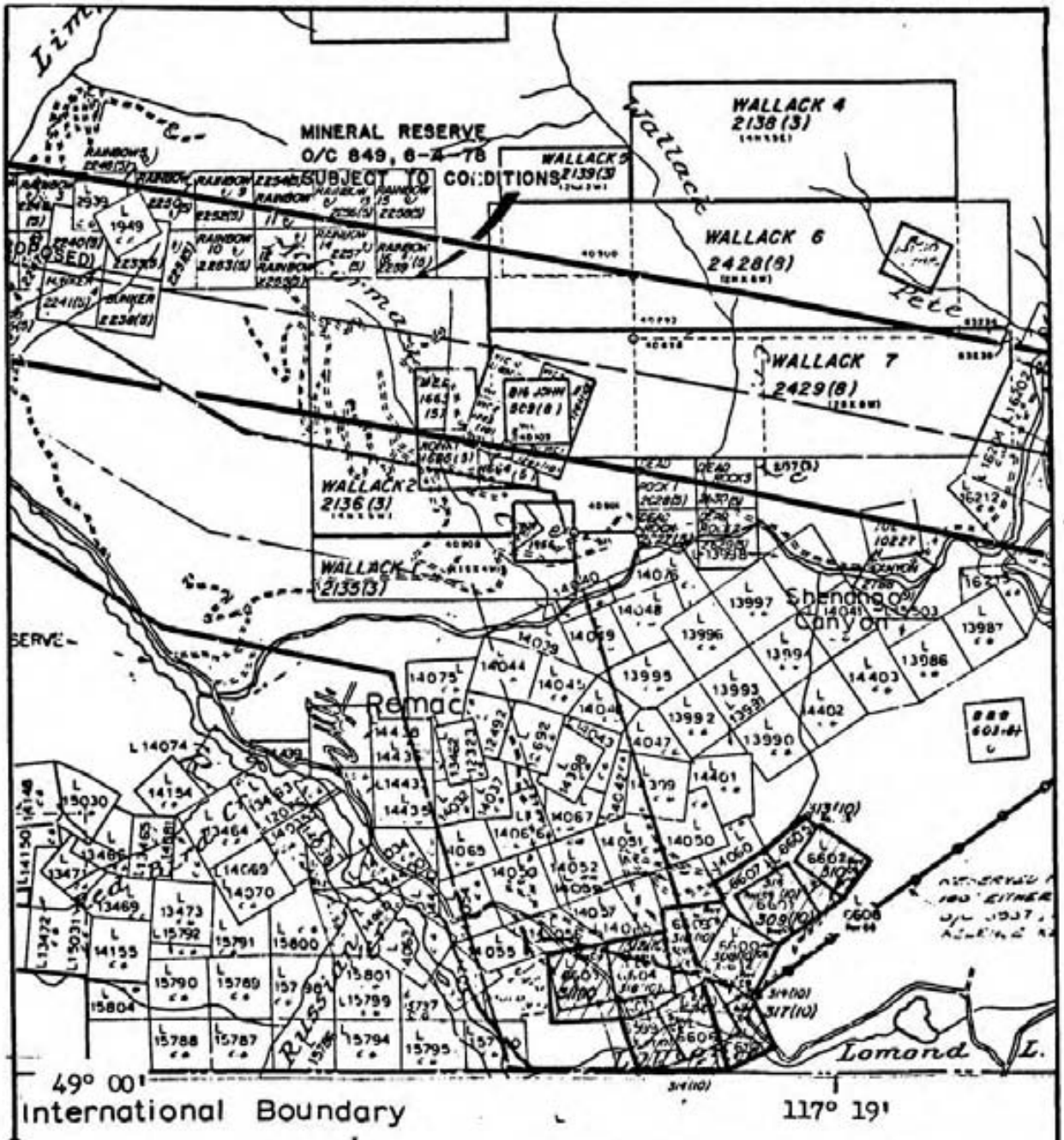
P. J. (PEC) SANTOS, P.Eng.
Consulting Geologist

INDEX MAP
Lomond Property

SCALE IN MILES AND KILOMETRES

PLATE I

NTS 82F/3W



LEGEND and SYMBOLS

Lomond Property

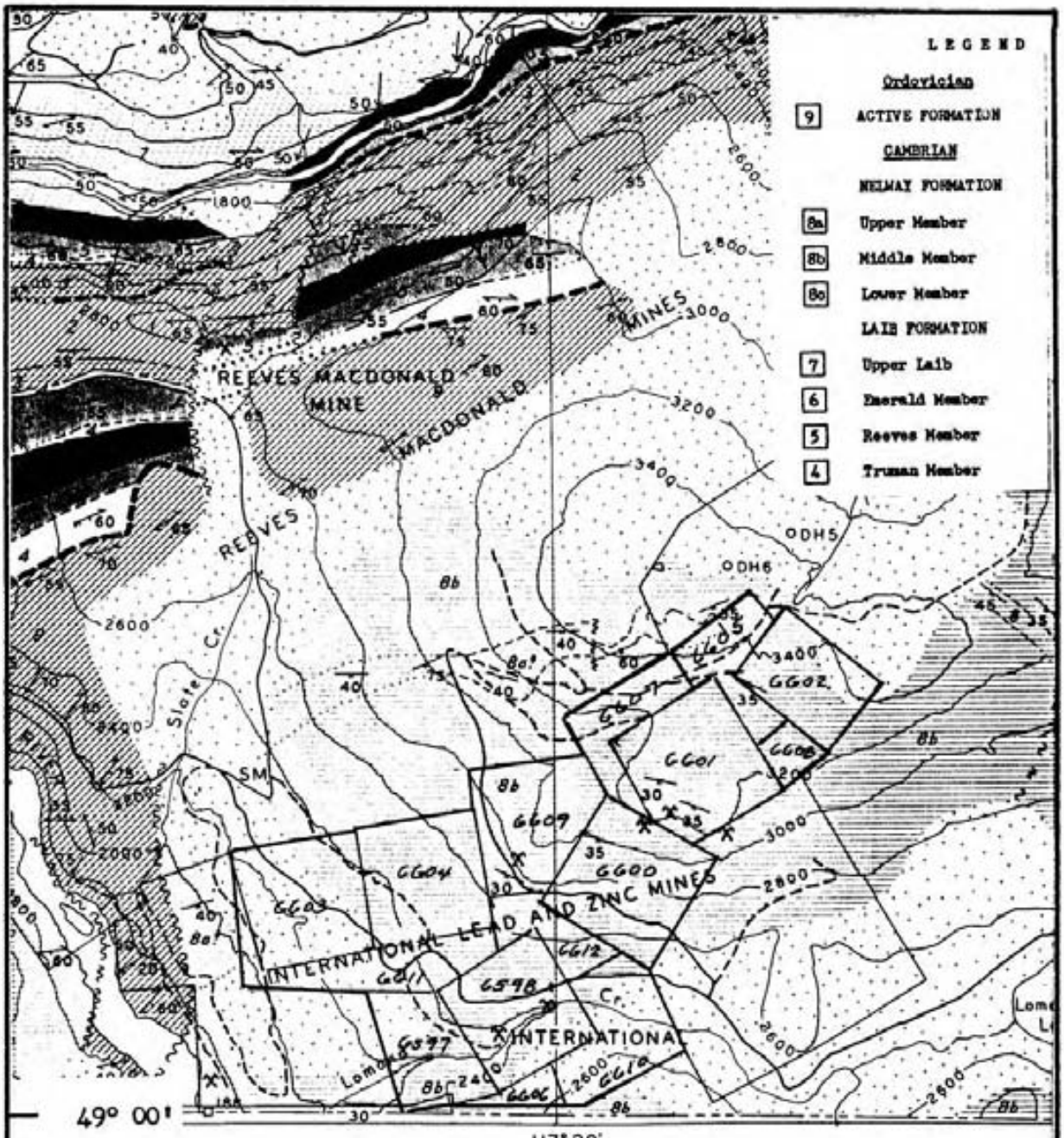
N

P. J. (PEC) SANTOS P. ENG.
Consulting Geologist

Project Title

Lomond Property
CARNAC RESOURCES LTD.

DATE: Sept. 24, 1984	SCALE: 1:50 000
DRAWN BY: P. J. SANTOS	PLATE NO. 2



P. J. (PEC) SANTOS P. ENG.
Consulting Geologist

Project Title

Geologic Map

Lomond Lake Area
B.C.

DATE: Sept. 24, 1984	SCALE: 1"=2000'
DRAWN BY: P. J. SANTOS	PLATE NO. 3

After Hewlett & Fyles, Bull. 41

ASSESSMENT REPORT

ON THE

SELF-POTENTIAL SURVEY

OF THE

LOMOND GROUP

NELWAY AREA

NELSON MINING DIVISION, BRITISH COLUMBIA

GOLDEN FLEECE

PIONEER

RENFREW NO.1

SALMO NO.1 FR.

HASTINGS

SALMO

INTERNATIONAL NO.1

POWER LINE

To Nelway

16+00E 16+50E 17+00E 17+50E 18+00E 18+50E 19+00E 19+50E 20+00E 20+50E 21+00E 21+50E 22+00E 22+50E

18+00N

13+00N

12+00N

Trench 8

Trench 9

Trench C

MAIN BASE STATION

0 50 100 Meters

Note: Readings in millivolts

CARMAC RESOURCES LTD.

LOMOND GROUP

SELF POTENTIAL MAP

ANGINEL RESOURCES LTD.

Drawn by:	Date:	
P. J. Santos, P. Eng.	Sept. 1984	PLATE NO. 5

GOLDEN FLEECE

PIONEER

RENFREW NO.1

SALMO NO.1 FR

HASTINGS

INTERNATIONAL No. 1

POWER LINE

16+00E
16+50E
17+00E
17+50E
18+00E
18+50E
19+00E
19+50E
20+00E
20+50E
21+00E
21+50E
22+00E
22+50E

18+00N
13+00N
12+00N

0 50 100 Meters

GEOLOGICAL BRANCH
ASSESSMENT REPORT

12,927

N

CARMAC RESOURCES LTD.

LOMOND GROUP

EXPLORATION GRID LINES

ANGINEL RESOURCES LTD.

Drawn by:	Date	
P.J. Santos, P.Eng.	Sept. 1984	PLATE NO 4