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PART I : GEOLOGICAL REPORT ON THE WIGWAM PROPERTY

by Dr. P. Levin

PART II : REPORT ON GEOPHYSICAL SURVEYS IN THE WIGWAM AREA

by J. W. Kieley

(NTS 82 K/13 W)

REVELSTOKE MINING DIVISION

GEOLOGICAL REPORT

ON THE

WIGWAM PROPERTY

32 KM SE OF REVELSTOKE, B.C.

NTS 82 K / 13 W

REVELSTOKE MINING DIVISION

CLAIMS: PARMAC, BIG R, BIG M,
MEL (FR.)

by: Dr. Peter Levin
Metallgesellschaft Canada Ltd.
Vancouver, B.C.

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LIST OF ILLUSTRATIONS

1. INTRODUCTION

During the period of June 6 to July 11, 1977, Metallgesellschaft Canada Ltd. performed a geological study of 1.6 square kilometers north of Akolkolex River, approximately 32 km south-east of Revelstoke, B.C. (Fig. 2).

Access to the property is by all weather road leading south from Revelstoke on the east side of the Columbia River for 19.2 kilometers then east along the Akolkolex River logging road for 15.7 kilometers to a bridge crossing a tributary of the Akolkolex. At this point a 4-wheel drive road leads north for some 1000 meters into the south-east portions of the property.

Work for which assessment credit is requested on the Parmac 1, Big R 1-4, Big M 1-6, Mel 1-2 Fr., Big M 7-12 mineral claims was undertaken on behalf of Metallgesellschaft Canada Ltd. (Vancouver) which, together with its partners, holds the above listed claims owned by Mr. Mel Pardek and Parmac Mines Ltd.

The purpose of the investigation was to better understand the geological controls, the tectonic deformation and the mode of occurrence of the sulfide mineralization found in the Akolkolex River area. On the north flank of the Akolkolex Valley the Wigwam property is located.

References have been made to the Wigwam property in the Minister of Mines Reports since 1915. The first formal exploration was undertaken by the Wigwam Mining Co. in 1925 and consisted of 5,833 feet of diamond drilling in 39 holes, 1,963 feet of underground development and several open cuts. Most of the information compiled during these years has been lost.

The Schlumberger Electrical Prospecting Co. surveyed the property in 1928 but their results are not available either.

Northwestern Explorations Ltd. (Kennco) optioned the property in 1953 and surveyed, mapped and sampled it. In 1961 Cominco Explorations Ltd. took up the property and completed a program of detailed mapping, sampling and trenching.

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1967 most of the present claims were staked by M. Pardek & Associates, Vancouver and then sold to Parmac Mines Ltd. In 1968 Parmac Mines Ltd. carried out a·limited exploration program which consisted of 2,300 feet of road building, five diamond drill holes for a total of 1,249 feet, minor mapping and check sampling.

In 1969 Canex Aerial Exploration Ltd. undertook a program of geological mapping, a structural study, road building, check sampling and surface diamond drilling.

In 1971 T.R. Tough undertook for Parmac Mines Ltd. (N.P.L.) a compilation from information obtained of trips to the property and all available reports of the Minister of Mines of British Columbia.

2. GENERAL GEOLOGY OF THE WIGWAM AREA

The Akolkolex River area "forms the northwestern limit of the Kootenay Arc, a narrow arcuate belt of severely deformed sedimentary and volcanic rocks, and is part of the structural-metamorphic transition between the 'Shuswap Metamorphic Complex' to the west and the 'Selkirk Mountain Fold and Thrust Belt' to the east." (Thompson 1972)

"Two structural levels can be outlined in the Akolkolex River area separated by the Standfast Creek Fault ("Standfast Slide"), a low-angle fault which cuts obliquely upward through the stratigraphic succession from southwest to northeast. The upper structural level contains quartzite, calcareous phyllite, limestone, and carbonaceous phyllite and argillite of Lower Paleozoic age which can be regionally correlated with the Hamill Group, Mohican Formation, Badshot Formation, and Index Formation of the Lardeau Group respectively. This succession has been deformed into a pair of large recumbent folds: the Akolkolex anticline and the Drimmie Creek syncline.

The lower structural level contains quartzite and pelitic schist which appears to be part of the Hamill Group and possibly part of the Horsethief Creek Group of Hadrynian age ." (Thompson 1972)

2.1 Lithology of the Wigwam Area NW of Akolkolex River

2.1.1 Hamill Group

The Hamill quartzite which forms the core of the Akolkolex anticline is non-calcareous, whereas the Mohican Formation, which forms an envelope around it, contains calcareous phyllite and limestone bands.

The Hamill quartzite is fine grained with siliceous cement. The colour is generally white to grey. Some stratabound parts, which form a topographic cliff, are rhythmically white and black banded or dark grey to black; the last type seems to contain carbonaceous material. Some very isolated bands are bearing muscovite.

The true thickness is about 30 m.

2.1.2 Mohican Formation

The rocks of the Mohican Formation are ranging from micaceous quartzite to gneiss; the quartzite is light grey with muscovite rich layers and several limestone/marble bands of mostly dark colour (carbonaceous ?). Certain layers contain rosettes of a prismatic light green mineral, probably tremolite.

The footwall of the Mohican Formation is formed by a layer of biotite- (muscovite-) gneiss with boudinlike quartz bands. The hanging wall rocks are biotite schist, locally biotite-gneiss, quartzose green phyllite, greenish brown calcareous phyllite and grey phyllite.

The maximum thickness is about 12 m.

2.1.3 Badshot Formation

The Badshot Formation is a sequence of pure and impure marble and limestone of 70 m maximum thickness. The footwall is formed by a white coarse grained marble with few bands of similar looking coarse grained white quartzite with calcite cement; sometimes both are forming a rhythmical sequence with a thickness of 1 - 5 mm each band. Towards the hanging wall the marble is grey to dark grey and brown, sometimes black and the muscovite content is increasing; then an argillitic sequence is forming the transition to a calcareous biotite gneiss with micaceous marble bands.

2.1.4 Index Formation

The basal part is a light grey non-calcareous phyllite which overlies the calcareous biotite gneiss of the Badshot Formation and grades upward into dark grey and black phyllites. Especially the basal part is rich in pyrite crystals (100); the oxidation of this pyrite is producing a typical rusty surface on the rocks of the Index Formation.

2.1.5 Summary of General Geology

In the Wigwam area different quartzites, limestones and pelite units occur; they can be correlated with the established stratigraphic units of the Kootenay Arc and the Western Selkirk Mountains.

The correlation of rocks below the Standfast-Creek Fault is uncertain; lithologically they could be part of the Hamill Group, Mohican and Badshot Formations.

Generally, the petrologic sequence is as follows:

pure quartzite
impure quartzite
quartzite with gneiss and calcareous material
pure marble
impure marble
calcareous gneiss
phyllite.

2.2 Tectonic Structure

"The Akolkolex River area is situated in the transition zone between two contrasting tectonic regions: the Shuswap Metamorphic Complex to the west, and the Selkirk Mountain Fold and Thrust Belt to the east. The Shuswap Complex is characterized by large recumbent isoclinal folds, many of which trend east-west and are refolded about northwest-southeast axes. Structures in the fold and thrust belt of the Western Selkirks are dominated by northwest-southeast trending folds with steep east dipping axial planes." (Thompson 197).

The main tectonic structure on the north side of the Akolkolex River is a pair of large recumbent folds: the Akolkolex anticline and the Drimmie Creek syncline; they are outlining a nappe several kilometers long.

The Wigwam property is located on the apex of the Drimmie Creek syncline. The apex is composed of five or more co-axial isoclinal folds of smaller size; the axes are dipping between 20 SE and 8 NW. Lithologic layering (So) is well developed; a more or less strong schistosity (S1) is mostly parallel to So. In some rocks a crenulation cleavage (S2) is developed.

2.3 Lead-Zinc Bearing Horizons

In the steep terrain of the Wigwam area a great number of sulfide outcrops is known. Most of the occurrences are well exposed.

2.3.1 Mineralization

The sulfides are: pyrrhotite, pyrite, sphalerite, galena, very little chalcopyrite.

The following ore types are distinguishable:

Type 1 : massive sulfides
Type 2 : disseminated sulfides.

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Type 1 a : fine grained massive pyrrhotite intergrown with pyrite and different amounts of sphalerite and galena and inclusions of quartz grains of about 1 or 2 mm diameter; mostly the percentage of quartz grains is $\pm$ 40% ; in some cases the sulfides represent only the cement of a quartzite; colour light brown - black;

Type 1 b : fine grained pyrrhotite with pyrite, sphalerite, and galena with inclusions of more or less rounded fragments of white quartz, siliceous marble or gneiss. The size of the fragments ranges between 1 cm and 65 cm; colour light brown - black (Unit G).

Type 2 a : light brown medium grained (0.5 - 2 mm) sphalerite and pyrite in coarse grained marble;

Type 2 b : light brown - black sphalerite, pyrite and pyrrhotite in argillite;

Type 2 c : yellow - brown coarse grained sphalerite and galena in quartzite;

Type 2 d : galena as cement in quartzite, sometimes forming massive masses.

In the core of diamond drill hole DDH-SI (Fig. 4, Section 2) and in outcrops in and around the Ice Adit violet coarse grained fluorspar, graphite and magnetite were found.

Smithsonite, gypsum, cerussite and native sulfur are common. Some layers are bearing diopside, andalusite and sericite.

2.3.2 Stratigraphic position

The sulfide bearing horizons are stratigraphically related to eight positions in rocks of the Hamill Group, Mohican Formation and Badshot Formation.

Unit A	:	Pyrite and pyrrhotite in banded, black and white quartzite (Unit 10)
Unit B	:	Pyrrhotite and light brown sphalerite in white quartzite (Unit 11)
Unit C	:	Pyrite, pyrrhotite, brown sphalerite, galena in quartzite between white quartzite (Unit 11) and biotite- (muscovite) gneiss with quartz bands (Unit 12)
Unit D	:	Pyrite, pyrrhotite, galena, little sphalerite in micaceous quartzite with limestone bands (Unit 13)
Unit E	:	Galena and dark brown sphalerite in biotite schist (Unit 14)
Unit F	:	Pyrrhotite, pyrite, light brown sphalerite and galena in white marble (Unit 15)
Unit G	:	Pyrrhotite, sphalerite, pyrite, galena with rock fragments between white marble (Unit 15) and marble with argillose and mica (Unit 16)
Unit H	:	Pyrite, sphalerite, pyrrhotite, galena in impure marble (Unit 16).

2.3.3 Geometry of ore bodies

All sulfide bearing horizons are lenselike. The thickness is varying from 1 mm to 3.4 m; the longest sulfide lens could be traced for 700 m in length. This lens is composed by numerous smaller lenses of different sizes connected by a few centimeter wide band of sulfides. Mostly the dimensions are between 10 and 60 m length and a thickness of 1 to 100 cm. Often a thick part (for example Unit G) is decreasing from 2 m to 10 cm in thickness within a distance of 20 m or less. The greatest change in thickness is in parts of Unit G with large fragments.

The extension and geometry to the NE can be partly reconstructed with the help of diamond drill hole information into a palinspastic model.

2.3.4 Grade of the mineralization

In the report of Parmac Mines Ltd. (1971) grades for drill hole intersections and channel samples are given. Because of the extremely lensy character of the mineralization no further channel sampling was undertaken. Only at the NW end of the horizon a hitherto unsampled sphalerite showing was sampled which assayed 2.74% Zn, 0.92% Pb, 0.06 oz Ag over 1.7 m.

3. RESTORATION OF FOLDED METAL SULFIDE HORIZONS (Palinspastic Model)

The excellent outcrop conditions, the folding style and the drill cores give sufficient information for a restoration of folded metal sulfide horizons (palinspastic model) (Fig. 12).

The "baseline" is the south-west outcrop line of Unit 11 (quartzite) (Fig. 1 and 2).

Following are the results:

1. The sulfide layers are formed by several not directly connected lenses in the same stratigraphic position.

2. The sulfide bearing horizons (Units G, F/H, A-E) have not exactly the same extension.

3. Four maxima are visible:
   - around Ice Adit (Units A-E, Unit F/H)
   - between Trench 3 and Trench 5 (Units A-E, Unit F/H, Unit G)
   - around Galena Showing (Units A-E, Unit G)
   - around Gold Adit (Units A-E, Unit F/H, Unit G)

4. A weak elongation of the sulfide bearing lenses is visible in two directions: northeast and southeast.

5. The main sulfide concentration seems to be between Trench 7 and Galena Showing.

6. The equivalent of sulfide bearing horizons between the sulfide lenses is a thin weakly calcareous biotite gneiss with very little pyrite.

7. The area with lead-zinc sulfide lenses is about 1.6 km long and 680 m wide; the main area (Gold Adit, Galena Showing, No. 11 Adit, No. 13 Adit, Trench 5, Galena Adit, Crooked Adit) includes about 0.35 sq. km.

4. SUMMARY AND CONCLUSION

- The Wigwam property is a stratabound lead-zinc mineralization in quartzites (metachert) and carbonates of Lower Middle Cambrian age.

- The mineralization consists mainly of pyrrhotite, sphalerite and little galena and is pretectonic.

- The base metal deposition is beginning at the end of the Hamill Group (pure quartzite), continues in the Mohican Formation (impure quartzites), reaches the maximum in the Badshot limestone/marble and ends in argillites of the Badshot Formation.

- The tectonic structure is a complex series of smaller isoclinal folds in the apex of the "Drimmie Creek Syncline", a large recumbent isoclinal fold.

- The sulfides are forming several not directly connected lenses in the same stratigraphic position.

- Two centres of mineralization are distinguishable : around "No. 11 Adit" and "Trench 5" and "Ice Adit".

- The different sulfide lenses are composed of numerous small ore bodies of different thicknesses. This may be the result of tectonic mobilisation during intensive folding .

Vancouver, B.C.
October 17,1977

5. REFERENCES

BIRD G. & HEWETT F.G. (1969) : Report on the Wigwam Property, Revelstoke, B.C. 10 p. Canex Aerial Exploration Ltd.

MURARO T. W. (1966) : Metamorphism of Zinc-Lead Deposits in Southeastern British Columbia. pp. 239-247 In: Tectonic History and Mineral Deposits of the Western Cordillera. CIM Special Volume No. 8 1966, Montreal

PARMAC MINES LTD. (N.P.L.) (1971) : Geological Report on the Wigwam Property, Revelstoke Mining Division, B.C. T. R. Tough, Consulting Geologist. 28 p. , 30 sections

THOMPSON R. I. (1972) : Geology of the Akolkolex River Area near Revelstoke, B.C. Ph. D. Thesis, Queen's University 125 p., geological map

APPENDIX I

STATEMENT OF QUALIFICATION

STATEMENT OF QUALIFICATION

I, Dr. Peter Levin, with residence at 1230 Nelson Street, Vancouver, B.C., declare:

1. that I studied geology and mineralogy at the University of Heidelberg, West Germany, and graduated with a diploma in mineralogy from the University of Heidelberg in 1973.

2. that I obtained a Ph.D. degree in mineralogy and economic geology from the University of Heidelberg in 1975.

3. that I have worked in exploration since 1973 in Peru, Germany, Chile and Canada.

4. that I am presently employed as exploration geologist by Metallgesellschaft AG at 14 Reuterweg, Frankfurt, West Germany.

5. that I have no interest whatsoever in the mineral claims under consideration.

6. that I worked in the Wigwam Area from June 6 to July 11, 1977, and collected the geological data on which this report is based.

Peter Levin

Dr. Peter Levin

Vancouver, B.C.
October 17, 1977

APPENDIX II

STATEMENT OF COSTS

STATEMENT OF COSTS

a) ORGANISATION

Field work on the Wigwam property took place between June 6, 1977, and July 11, 1977. For the first part of the work camp was established at the No. 2 Adit at elevation 675 m. This camp was supplied by truck from Revelstoke. Camp was then moved to the Crooked Adit at elevation 990 m by helicopter and supplied by helicopter. All geophysical work was done from this camp. For the last stage of mapping the camp was moved again above the Sleeper's Adit at 1340 m.

b) COSTS

1. Personnel Costs

Dr. Peter Levin, Senior geologist 36 field days 10 days report writing and evaluation	
46 days @ 110 $/day	$ 5,060.00
Joel Posener, Student helper 36 field days @ 26 $/day	$ 936.00
John Kieley, Geophysical technician 18 field days 5 days report writing and drafting	
23 days @ 60 $/day	$ 1,380.00
V. Tanzini, Junior operator of Geophysical contractor P. Walcott & Assoc. 11 days @ 70 $/day	$ 770.00
Helgard Wellmer 3 days report typing and map colouring @ 37 $/day	$ 111.00
	$ 8,257.00

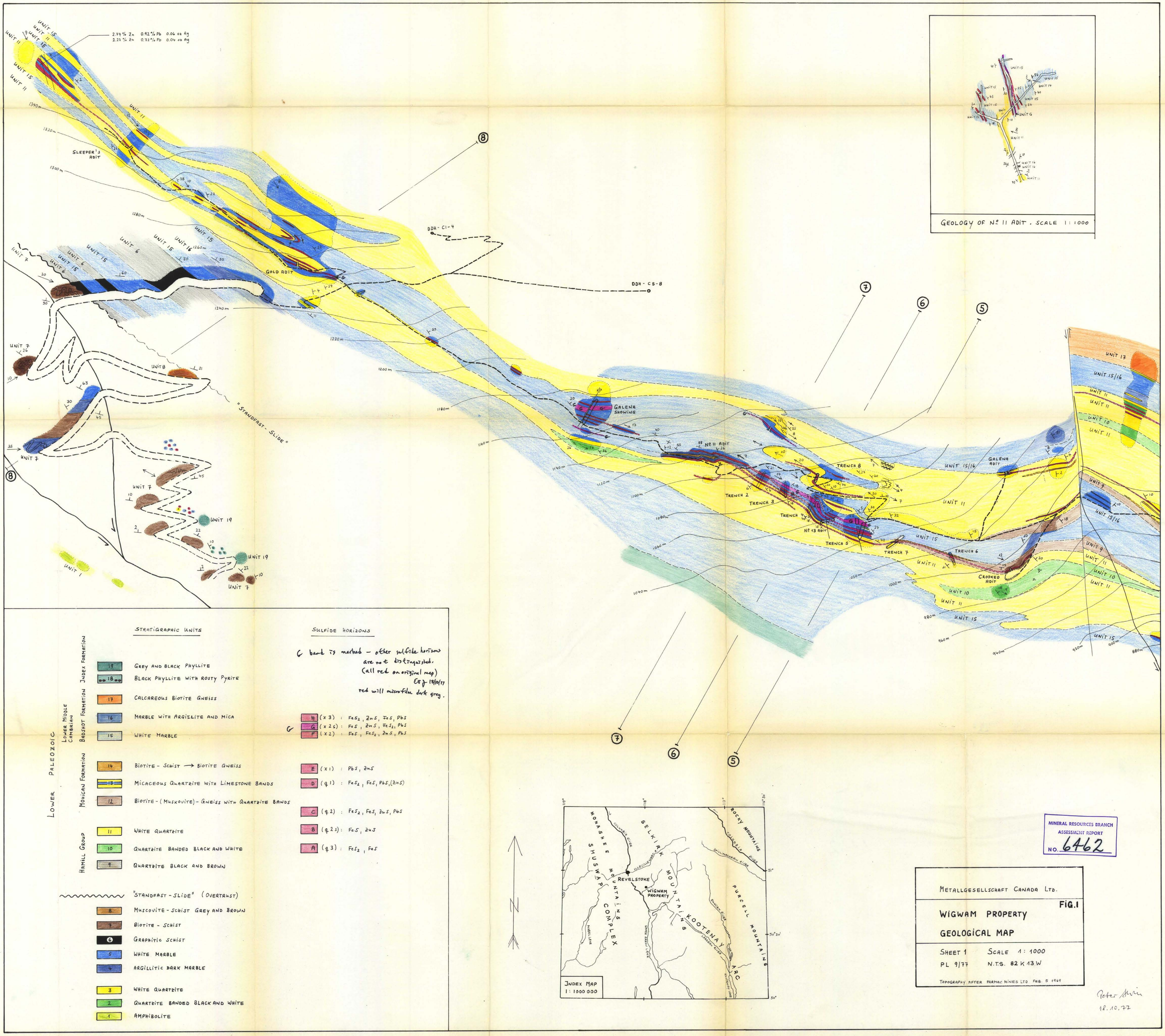
Statement of Costs (continued)

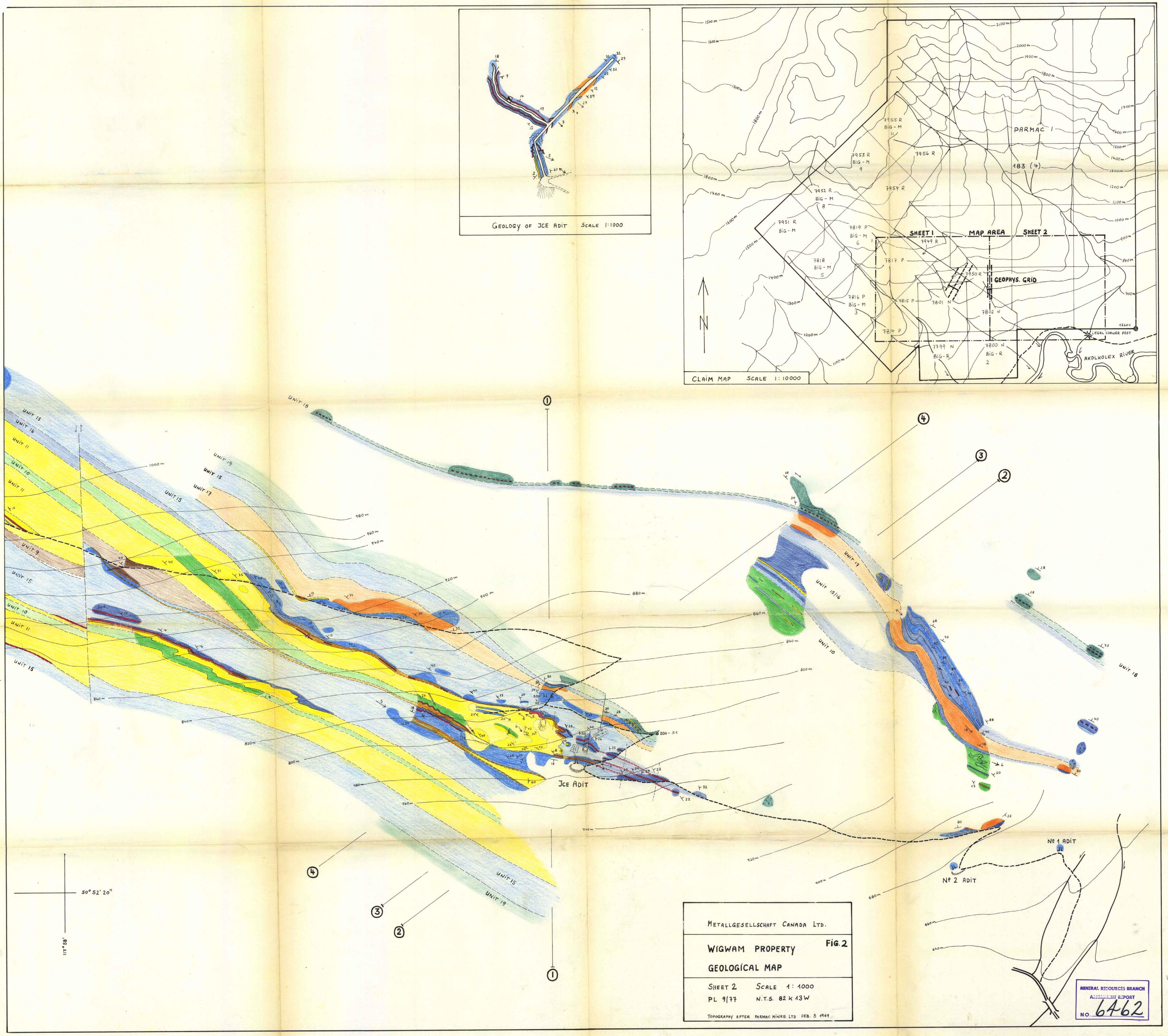
2. Other Costs

Camp equipment		$ 369.80
Geophysical equipment and equipment rental		$ 906.35
Maps, air photos, printing		$ 88.53
Assays		$ 32.00
Helicopter charter		$ 1,015.15
Transportation		
a) own truck 900 miles @ 20 ¢/mi =	$ 180.00	
b) truck rental	$ 862.09	
	$1042.09	$ 1,042.09
Living expenses		$ 807.48
		$ 4,261.40
Total costs :		$ 12,518.40

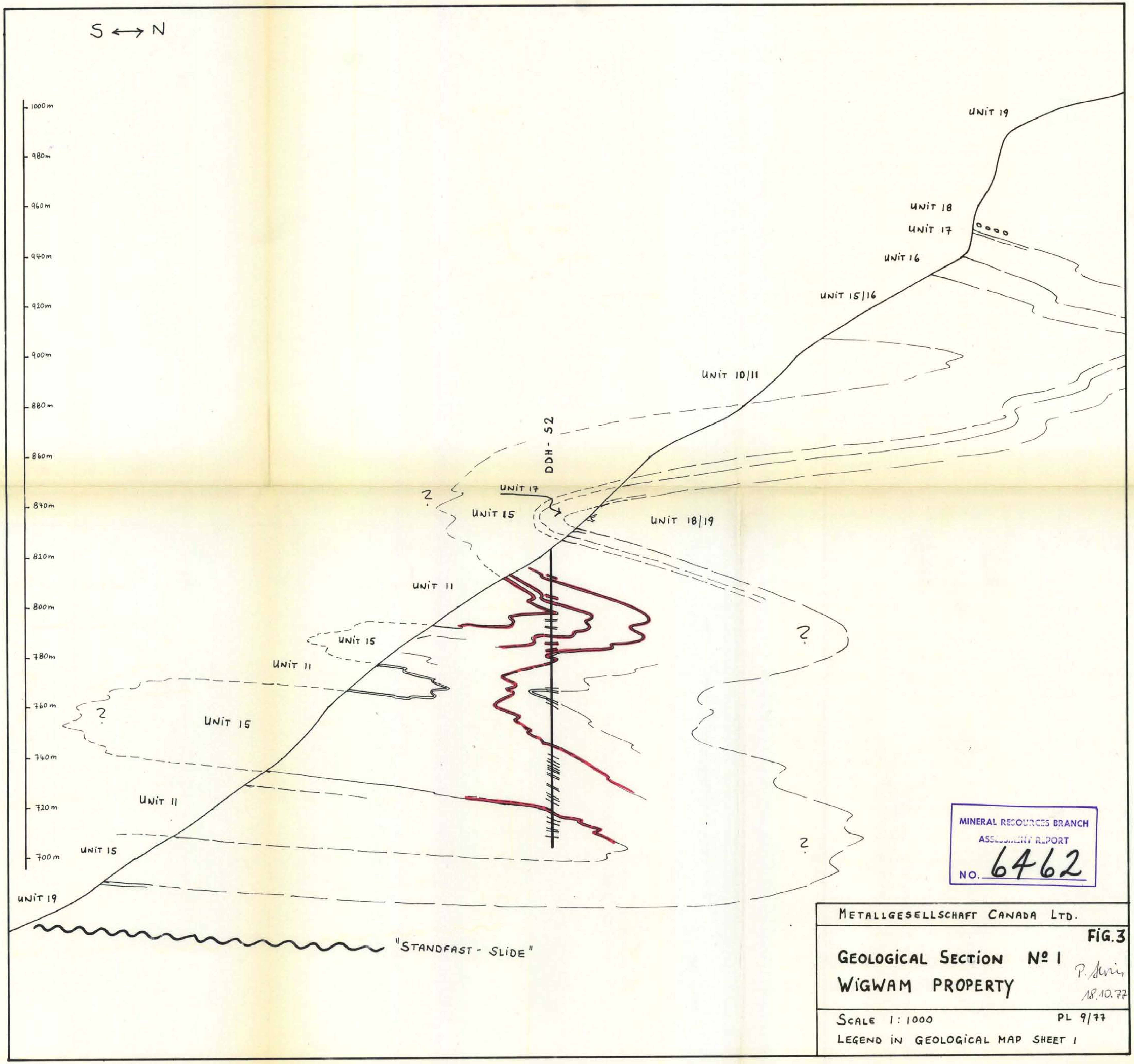
T.W. Wellmer

Dr. F.-W. Wellmer
Exploration Manager - Western Canada
Metallgesellschaft Canada Ltd.


UNIT 11
UNIT 15
2.74% Zn 0.92% Pb 0.06 oz Ag
2.23% Zn 0.72% Pb 0.04 oz Ag
SLEEPER'S ADIT
GOLD ADIT
DDH - C1-4
DDH - CS-8
UNIT 6
UNIT 7
UNIT 8
UNIT 19
UNIT 1
"STANDFAST - SLIDE"
GALENA SHOWING
Nº 11 ADIT
Nº 13 ADIT
TRENCH 2
TRENCH 3
TRENCH 4
TRENCH 5
TRENCH 6
TRENCH 7
TRENCH 8
GALENA ADIT
CROOKED ADIT
UNIT 15/16
UNIT 17
UNIT 10
UNIT 9
GEOLOGY OF Nº 11 ADIT . SCALE 1 : 1000
STRATIGRAPHIC UNITS
LOWER PALEOZOIC
LOWER MIDDLE CAMBRIAN
JNDEX FORMATION
19 GREY AND BLACK PHYLLITE
18 BLACK PHYLLITE WITH ROSTY PYRITE
BADSHOT FORMATION
17 CALCAREOUS BIOTITE GNEISS
16 MARBLE WITH ARGILLITE AND MICA
15 WHITE MARBLE
MOHICAN FORMATION
14 BIOTITE - SCHIST → BIOTITE GNEISS
13 MICACEOUS QUARTZITE WITH LIMESTONE BANDS
12 BIOTITE - (MUSKOVITE) - GNEISS WITH QUARTZITE BANDS
HAMILL GROUP
11 WHITE QUARTZITE
10 QUARTZITE BANDED BLACK AND WHITE
9 QUARTZITE BLACK AND BROWN
"STANDFAST - SLIDE" (OVERTRUST)
8 MUSCOVITE - SCHIST GREY AND BROWN
7 BIOTITE - SCHIST
6 GRAPHITIC SCHIST
5 WHITE MARBLE
4 ARGILLITIC DARK MARBLE
3 WHITE QUARTZITE
2 QUARTZITE BANDED BLACK AND WHITE
1 AMPHIBOLITE
SULFIDE HORIZONS
G band is marked - other sulfide horizons are not distinguished. (all red on original map)
EG 18/10/77
red will microfilm dark grey.
H (x 3) : FeS_2, ZnS, FeS, PbS
G G (x 2s) : FeS, ZnS, FeS_2, PbS
F (x 2) : FeS, FeS_2, ZnS, PbS
E (x 1) : PbS, ZnS
D (q 1) : FeS_2, FeS, PbS, (ZnS)
C (q 2) : FeS_2, FeS, ZnS, PbS
B (q 2s) : FeS, ZnS
A (q 3) : FeS_2, FeS
N
SELKIRK MOUNTAINS
MONASHEE MOUNTAINS
SHUSWAP COMPLEX
ROCKY MOUNTAINS
PURCELL MOUNTAINS
KOOTENAY ARC
REVELSTOKE
WIGWAM PROPERTY
JNDEX MAP 1 : 1 000 000
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6462
METALLGESELLSCHAFT CANADA LTD.
FIG.1
WIGWAM PROPERTY
GEOLOGICAL MAP
SHEET 1
SCALE 1 : 1000
PL 9/77
N.T.S. 82 K 13 W
TOPOGRAPHY AFTER PARMAC MINES LTD FEB. 5 1969
Peter Hvin
18.10.77



Geology of Jce Adit Scale 1:1000
Claim Map Scale 1:10000
PARMAC 1
183 (4)
7955 R BIG-M 11
7953 R BIG-M 9
7956 R
7954 R
7952 R BIG-M 8
7951 R BIG-M
7819 P BIG-M 6
7818 BIG-M 5
7817 P
7816 P BIG-M 3
7815 P
7814 P
7949 R
7950 R
7801 N
7802 N
7799 N BIG-R
7800 N BIG-R 2
SHEET 1
MAP AREA
SHEET 2
GEOPHYS. GRID
LEGAL CORNER POST
AKOLKOLEX RIVER
N
UNIT 18
UNIT 15
UNIT 16
UNIT 11
UNIT 10
UNIT 9
UNIT 19
UNIT 17
UNIT 15/16
Jce Adit
No 1 Adit
No 2 Adit
50° 52' 20"
117° 58'
Metallgesellschaft Canada Ltd.
Wigwam Property
Geological Map
Fig. 2
Sheet 2 Scale 1:1000
PL 9/77 N.T.S. 82 K 13 W
Topography after Parmac Mines Ltd Feb. 5 1969



METALLGESELLSCHAFT CANADA LTD.

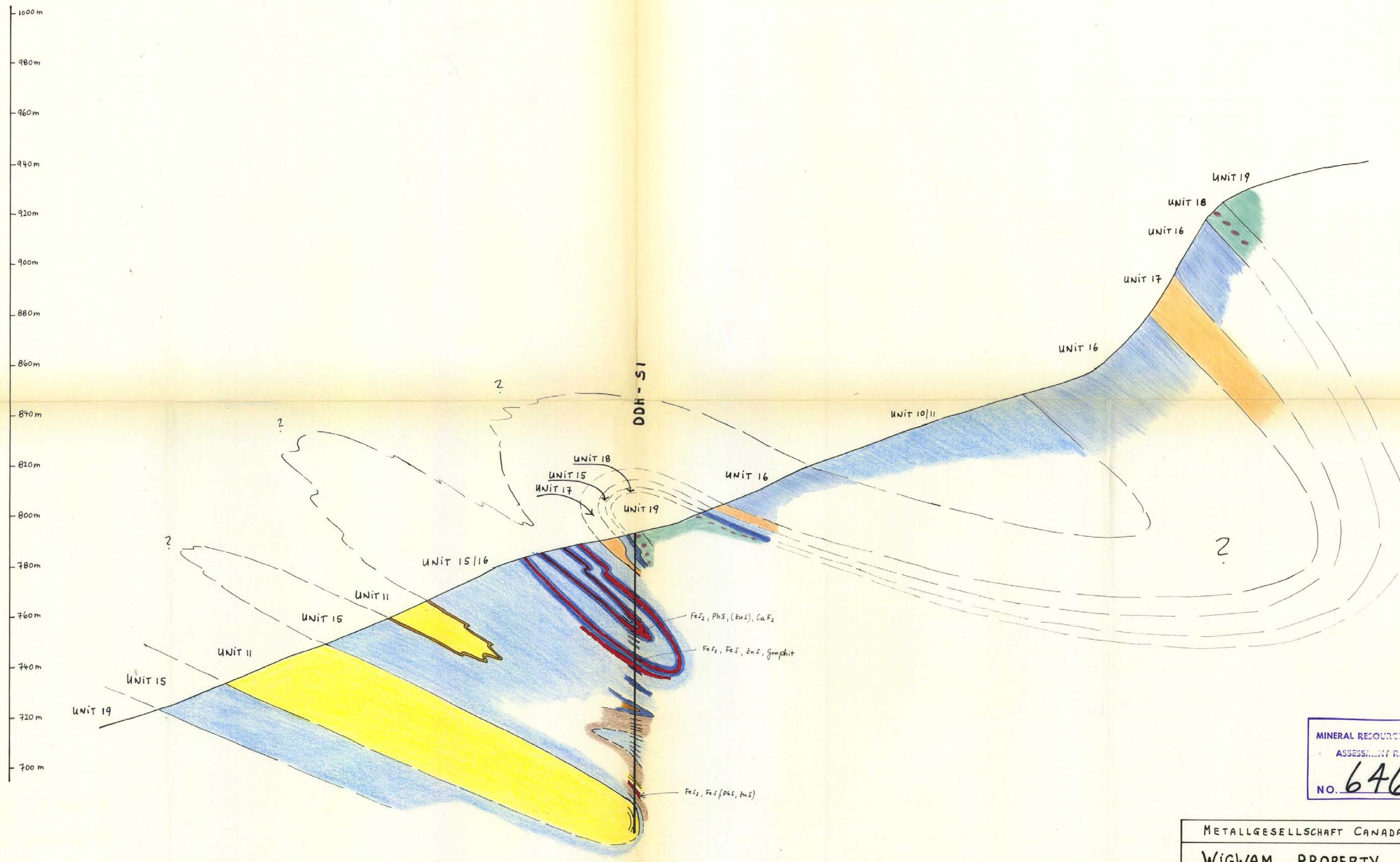
FIG.3

GEOLOGICAL SECTION No. 1
WIGWAM PROPERTY

P. Alvin
18.10.77

SCALE 1:1000 PL 9/77

LEGEND IN GEOLOGICAL MAP SHEET 1



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WIGWAM PROPERTY

FIG. 4

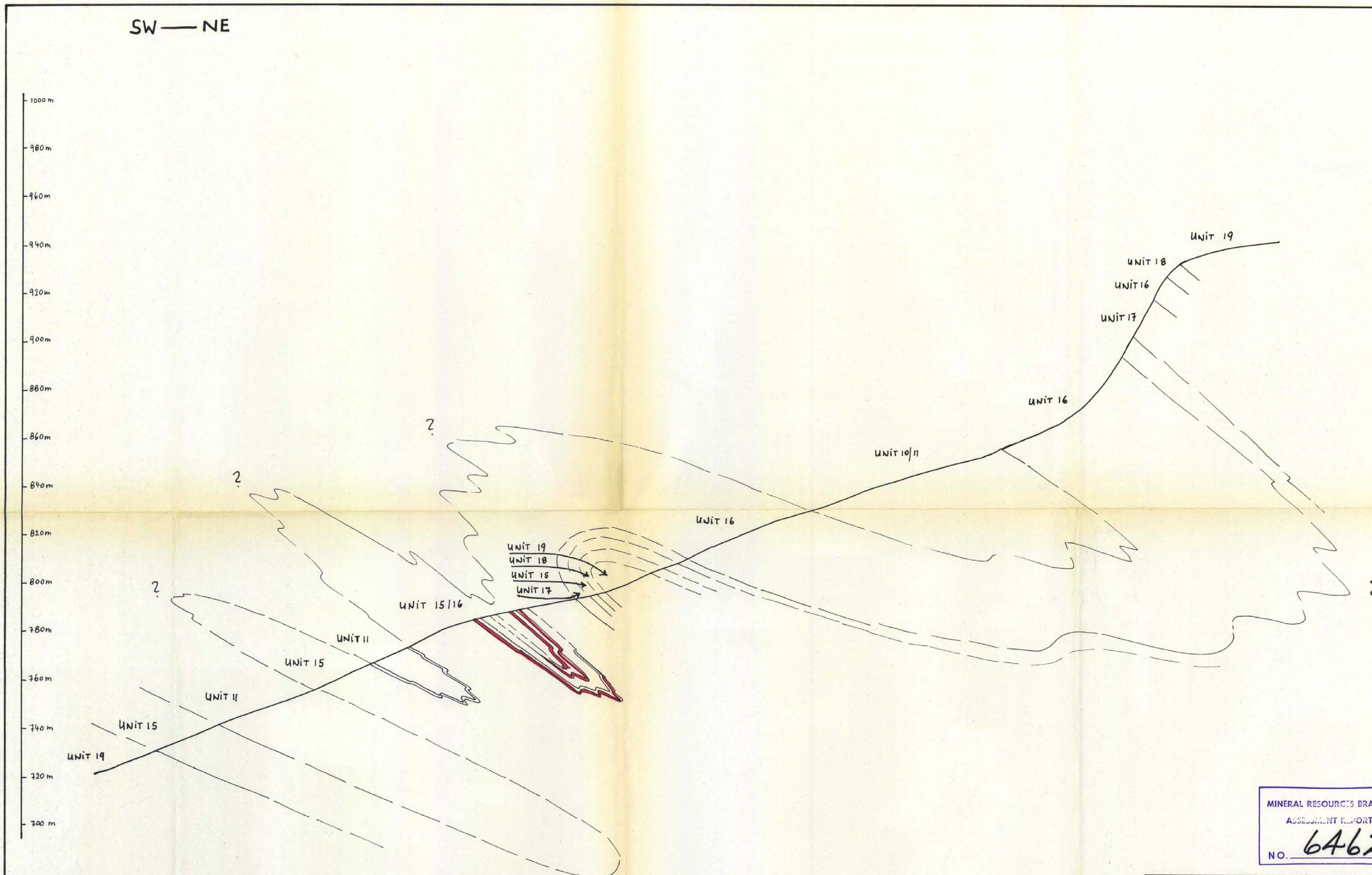
GEOLOGICAL SECCION Nº 2

P. [signature] 18.10.77

SCALE 1:1000

PL 9/77

LEGEND IN GEOLOGICAL MAP SHEET 1



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WIGWAM PROPERTY — FIG. 5

GEOLOGICAL SECTION Nº 3

SCALE 1 : 1000 — PL 9/77

LEGEND IN GEOLOGICAL MAP SHEET 1

18.10.77

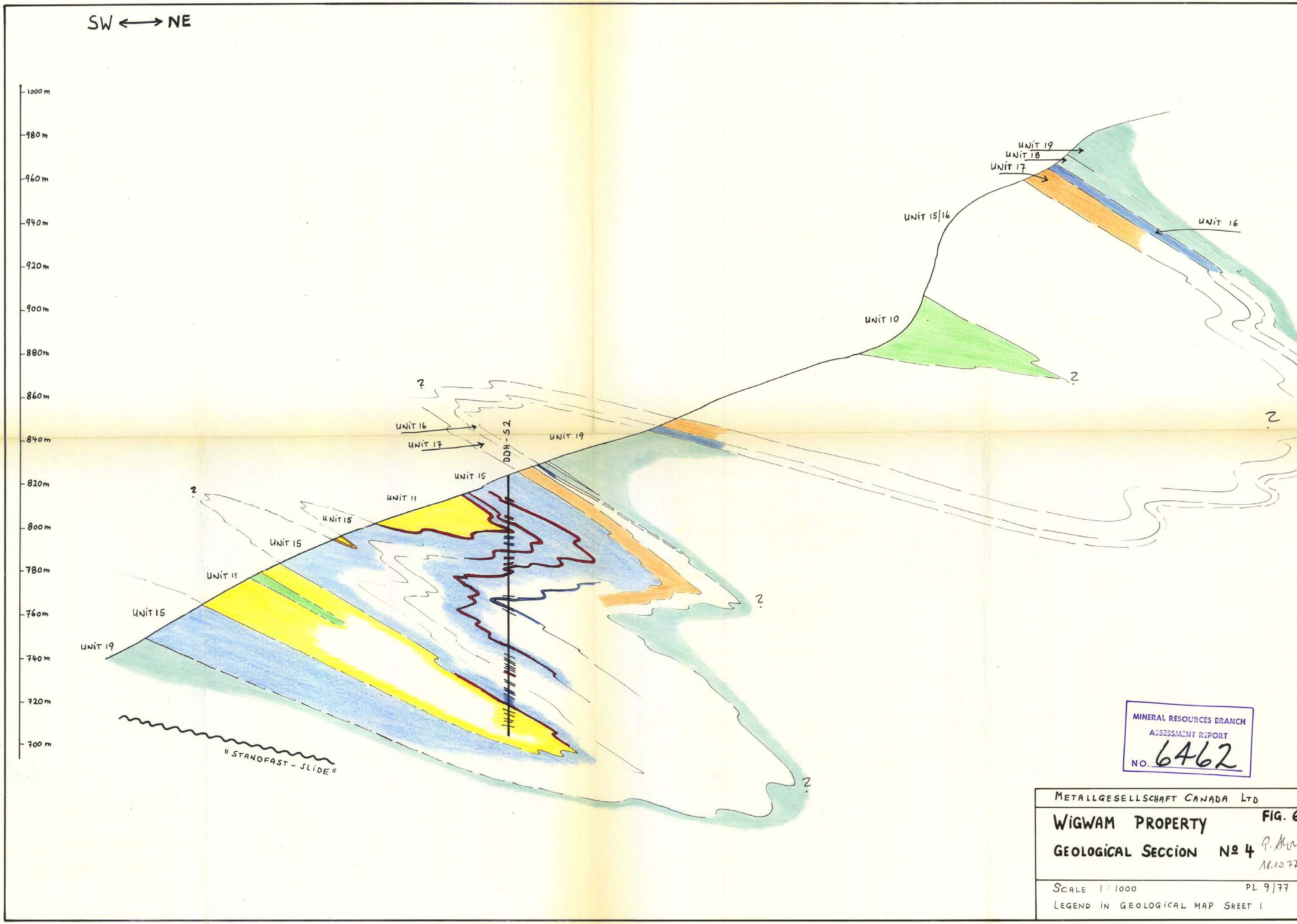

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FIG. 6

WIGWAM PROPERTY

GEOLOGICAL SECCION Nº 4

P. Alvi 18.10.77

SCALE 1 : 1000 PL 9/77

LEGEND IN GEOLOGICAL MAP SHEET 1

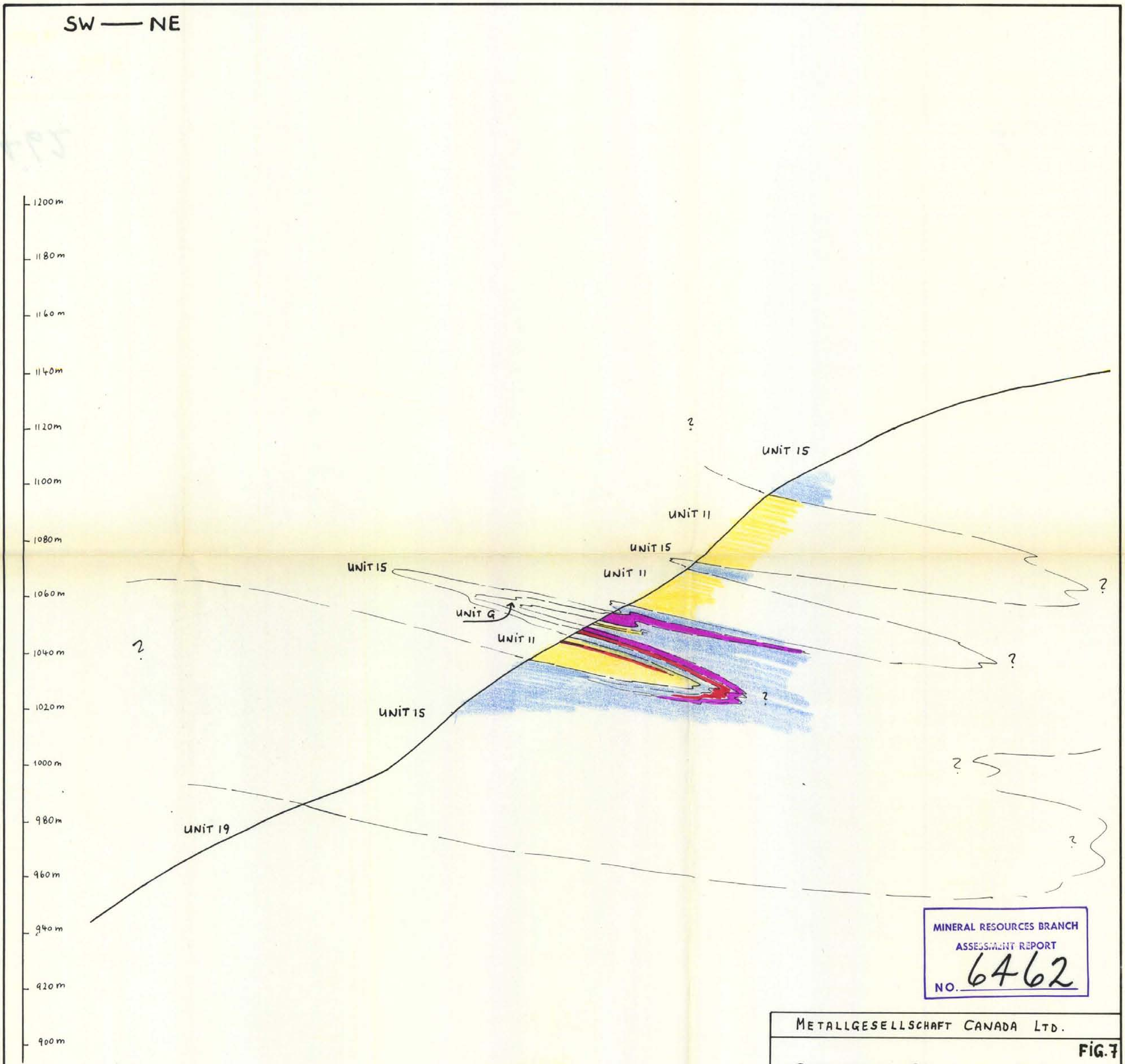

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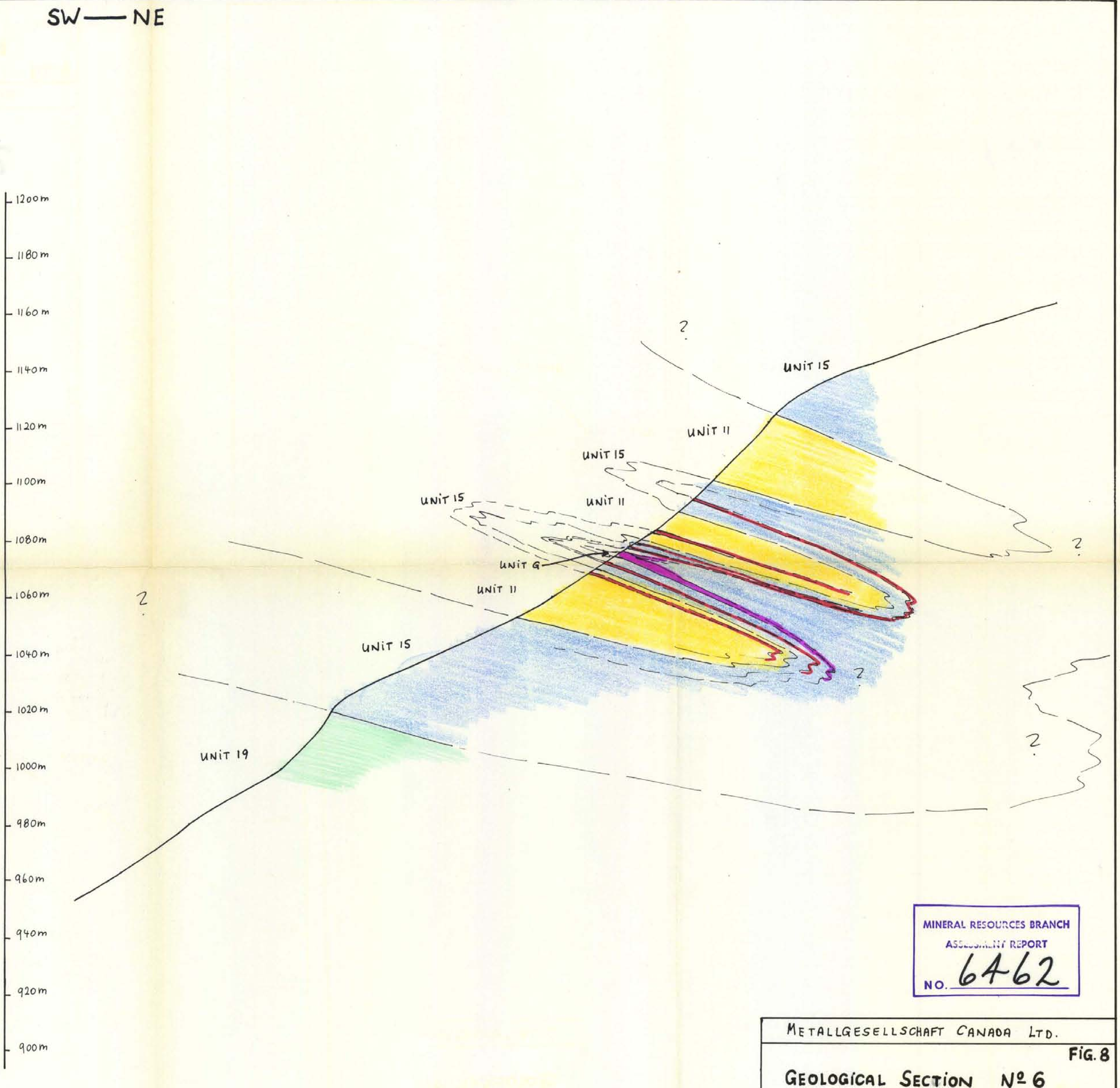
FIG. 7

GEOLOGICAL SECTION Nº 5
WIGWAM PROPERTY

SCALE 1:1000 PL 10/77

LEGEND IN GEOLOGICAL MAP SHEET 1

18.10.77



METALLGESELLSCHAFT CANADA LTD.

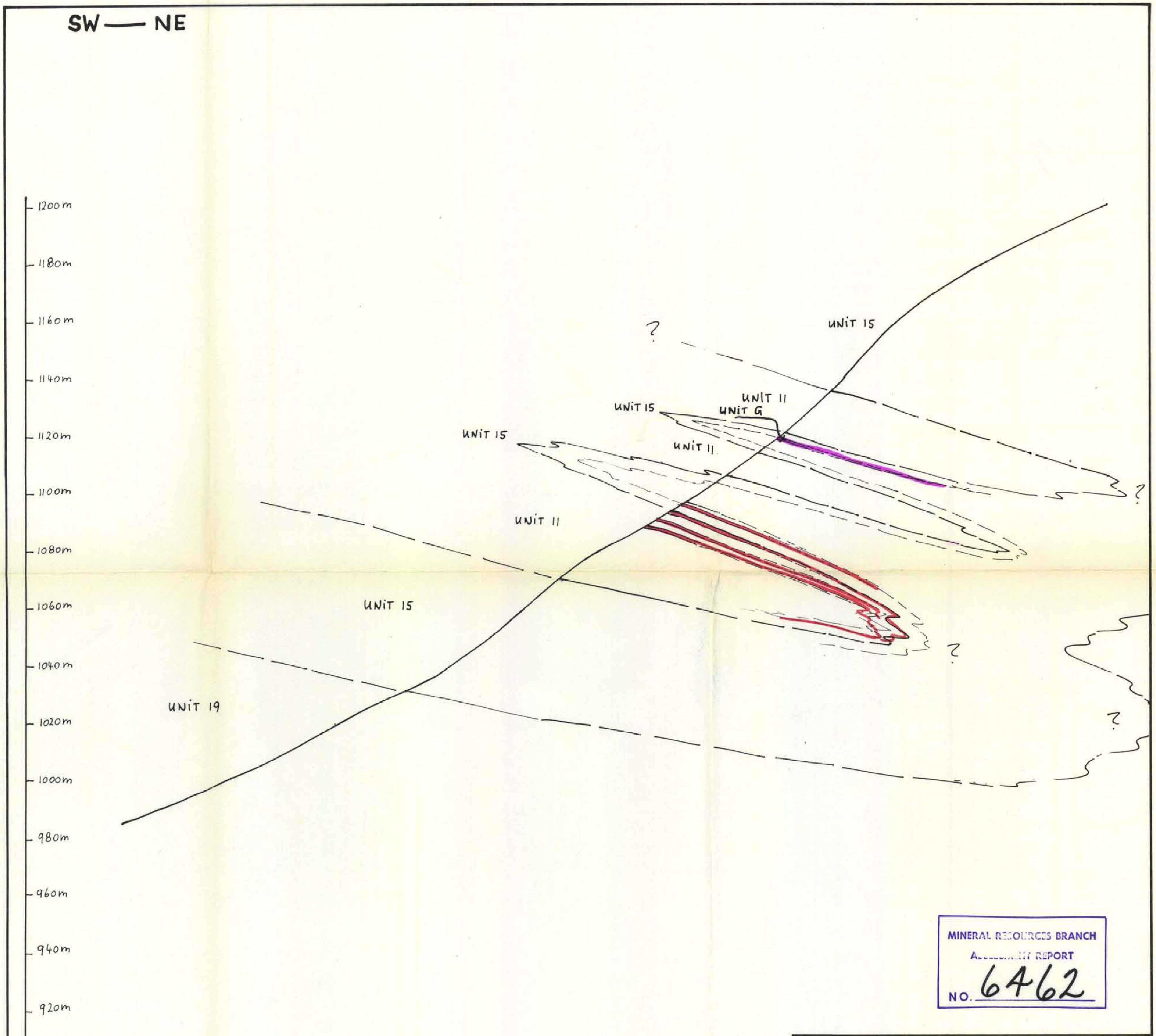
FIG. 8

GEOLOGICAL SECTION № 6
WIGWAM PROPERTY

P. Jevin 18.10.77

SCALE 1 : 1000 PL 10/77

LEGEND IN GEOLOGICAL MAP SHEET 1



METALLGESELLSCHAFT CANADA LTD.

FIG. 9

GEOLOGICAL SECTION Nº 7
WIGWAM PROPERTY

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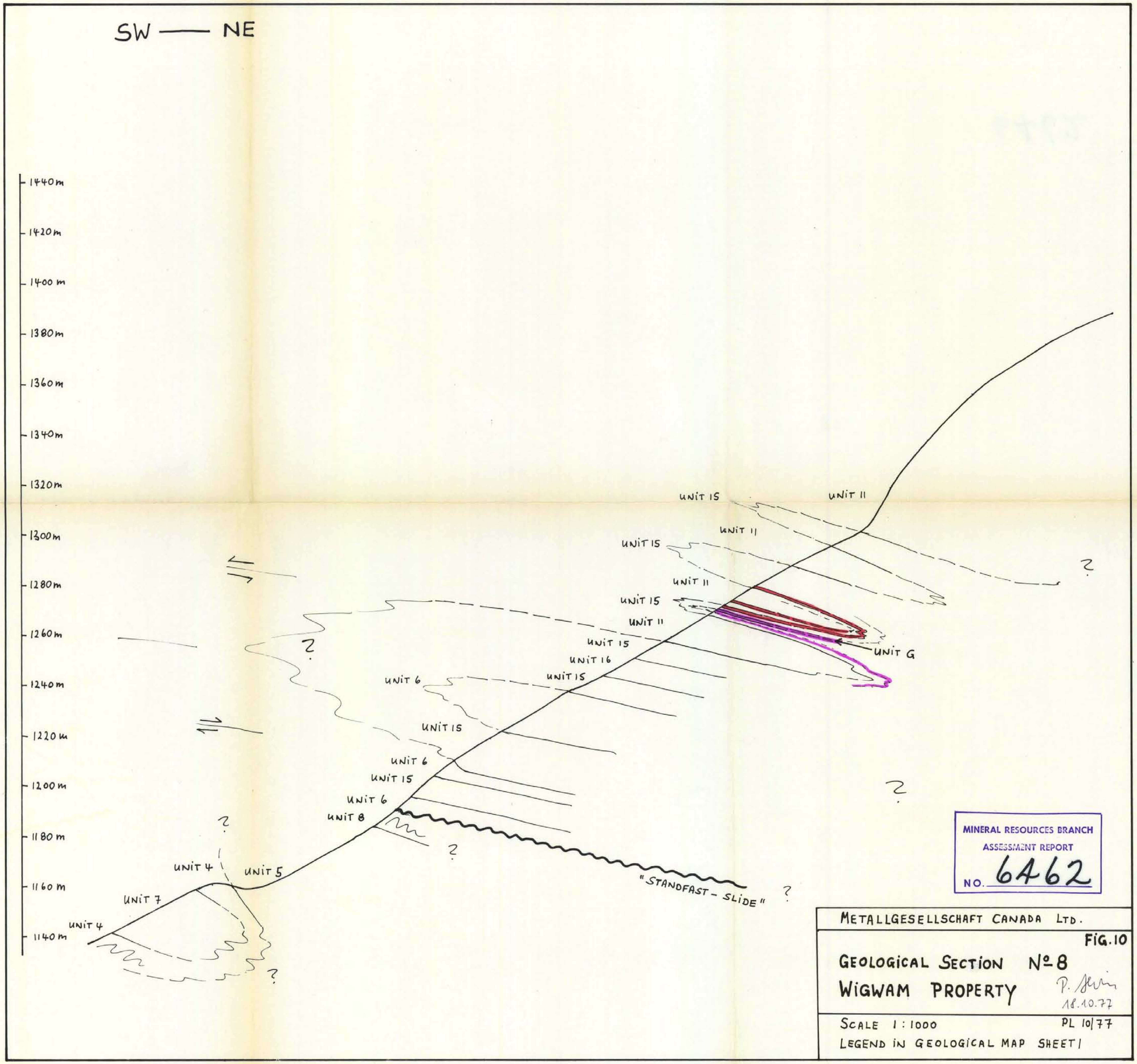
18.10.77

SCALE 1 : 1000 PL 10/77
LEGEND IN GEOLOGICAL MAP SHEET 1



METALLGESELLSCHAFT CANADA LTD.

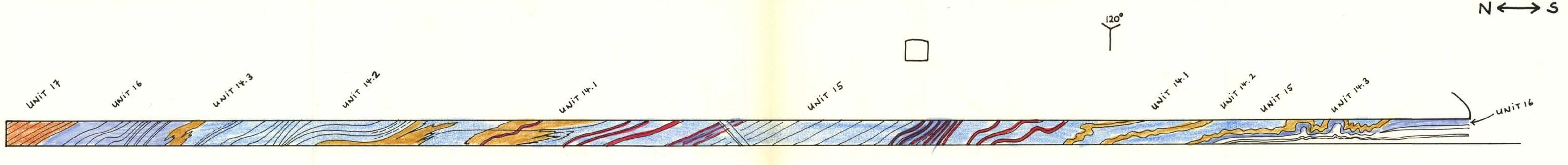
FIG. 10

GEOLOGICAL SECTION № 8
WIGWAM PROPERTY

P. [signature]
18.10.77

SCALE 1 : 1000 PL 10/77

LEGEND IN GEOLOGICAL MAP SHEET I



METALLGESELLSCHAFT CANADA LTD.

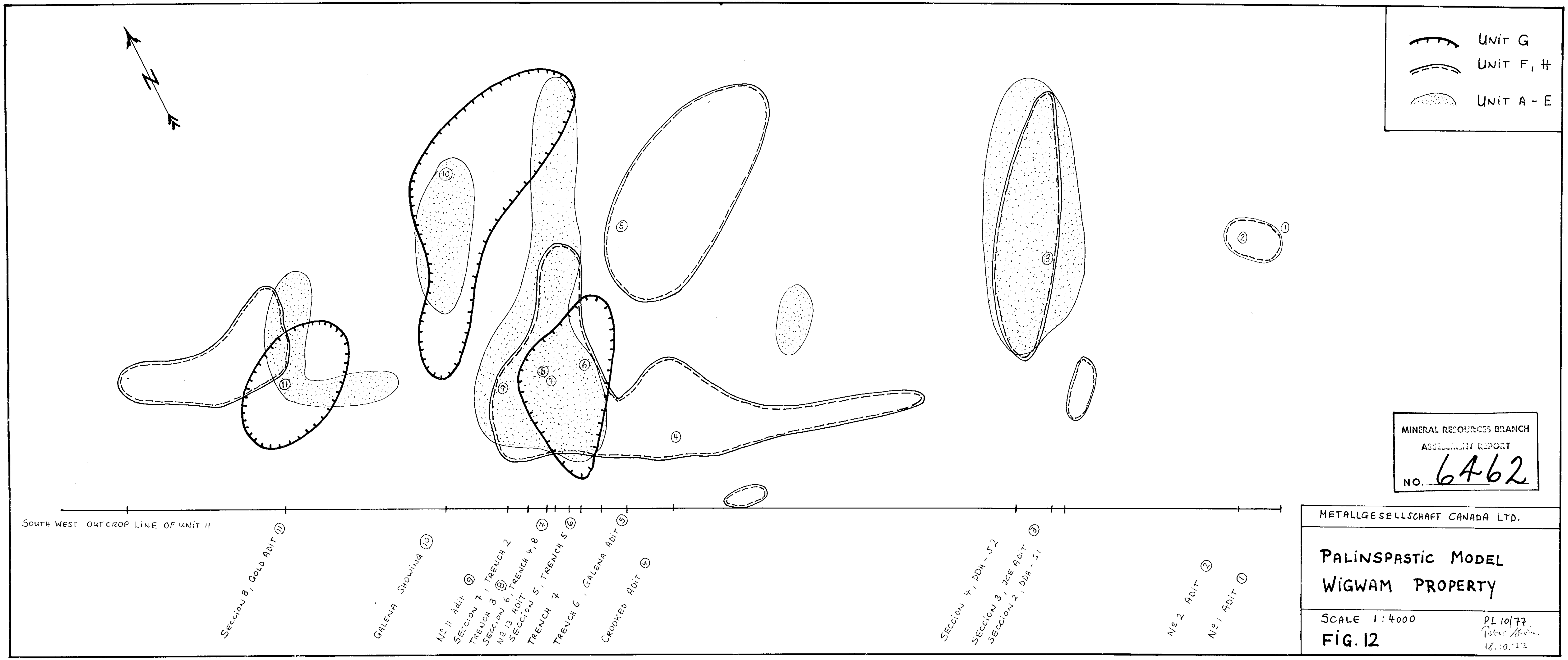
WIGWAM PROPERTY
GEOLOGICAL SECTION
ICE ADIT (EAST-WALL)

FIG. 11

P. Akin
18.10.77

SCALE 1:200

PL 9/77


N
UNIT G
UNIT F, H
UNIT A - E
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6462
SOUTH WEST OUTCROP LINE OF UNIT 11
SECCION 8, GOLD ADIT (11)
GALENA SHOWING (10)
No 11 ADIT (9)
SECCION 7, TRENCH 2
TRENCH 3 (8)
SECCION 6, TRENCH 4, 8 (7)
No 13 ADIT
SECCION 5, TRENCH 5 (6)
TRENCH 7
TRENCH 6, GALENA ADIT (5)
CROOKED ADIT (4)
SECCION 4, DDH-52
SECCION 3, ICE ADIT (3)
SECCION 2, DDH-51
No 2 ADIT (2)
No 1 ADIT (1)
METALLGESELLSCHAFT CANADA LTD.
PALINSPASTIC MODEL
WIGWAM PROPERTY
SCALE 1:4000
PL 10/77
18.10.77
FIG. 12

6462

REPORT ON

GEOPHYSICAL SURVEYS

IN THE WIGWAM AREA

32 KM SOUTH-EAST OF REVELSTOKE

NTS 82 K / 13 W

REVELSTOKE MINING DIVISION

CLAIMS : PARMAC, BIG R, BIG M,

MEL (FR.)

by: John W. Kieley
Metallgesellschaft Canada Ltd.
Vancouver, B.C.

TABLE OF CONTENTS

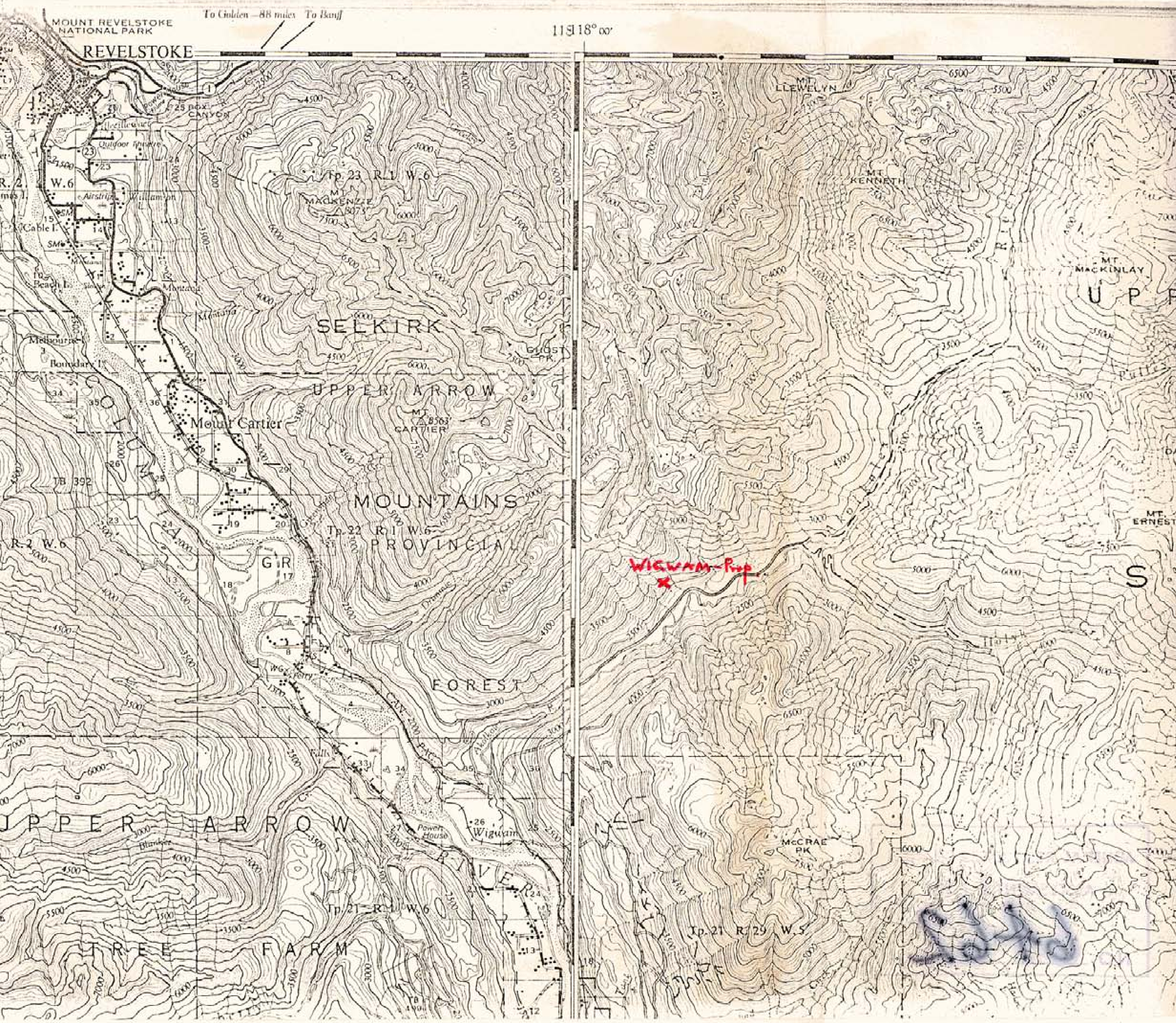
LIST OF ILLUSTRATIONS

1. INTRODUCTION

Work for which assessment credit is requested on the Parmac 1, Big R 1-4, Big M 1-6, Mel 1-2 Fr., Big M 7-12 mineral claims consisted of a program of geophysical surveys. These surveys were undertaken during the period June 26, 1977 through July 10, 1977 on behalf of Metallgesellschaft Canada Ltd. (Vancouver) which, together with its partners, holds the above listed claims owned by Mr. Mel Pardek and Parmac Mines Ltd.

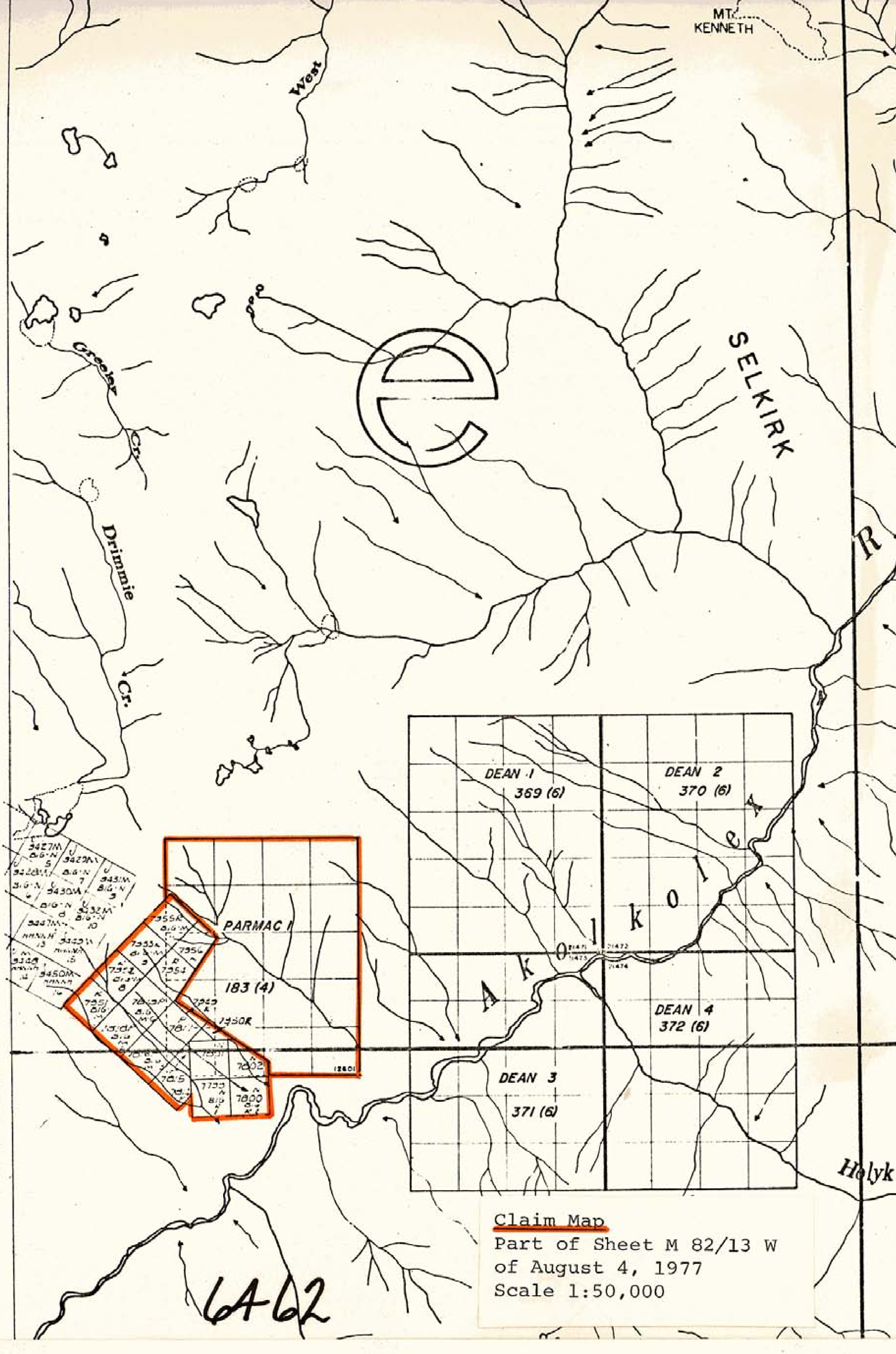
This report is a compilation of these surveys.

../2



GENERAL LOCATION MAP

Parts of Sheets 82 L / NE and 82 K/ NW
Scale 1 Inch to 2 Miles
of B.C. Lands, Forests and Water Resources



Claim Map
Part of Sheet M 82/13 W
of August 4, 1977
Scale 1:50,000

6462

TO WEST SEE MAP 92

2. LOCATION AND ACCESS

The Wigwam property is located approximately 32 kilometers south-east of Revelstoke in the Revelstoke Mining Division, NTS 82 K / 13 W.

Acces to the property is by all weather road leading south from Revelstoke on the east side of the Columbia River for 19.2 kilometers then east along the Akolkolex River logging road for 15.7 kilometers to a bridge crossing a tributary of the Akolkolex. At this point a 4-wheel drive road leads north for some 1000 meters into the south-east portions of the property.

../3

3. ABSTRACT

The principle of the mise-à-la masse method is to earth one current electrode, C_1, of a pair in a conducting mineral showing, the other electrode, C_2, being a great distance away effectively at infinity, and measure the resulting distribution of surface electric potentials on lines near and around C_1. The distribution will, to some extent, reflect the geometry of the ore mass of which the mineral showing forms a part, as shown in the accompanying figure by D. S. Parasnis from a report of 1967:"Three Dimensional Electric Mise-a-la-Masse Survey of an Irregular Lead-Zinc-Copper Deposit in Central Sweden". In the mise-a-la-masse survey of a lead-zinc deposit in the Wigwam Area, electric potentials were measured on surface from three successive earthings. The survey clearly outlines the strike of several conductive horizons.

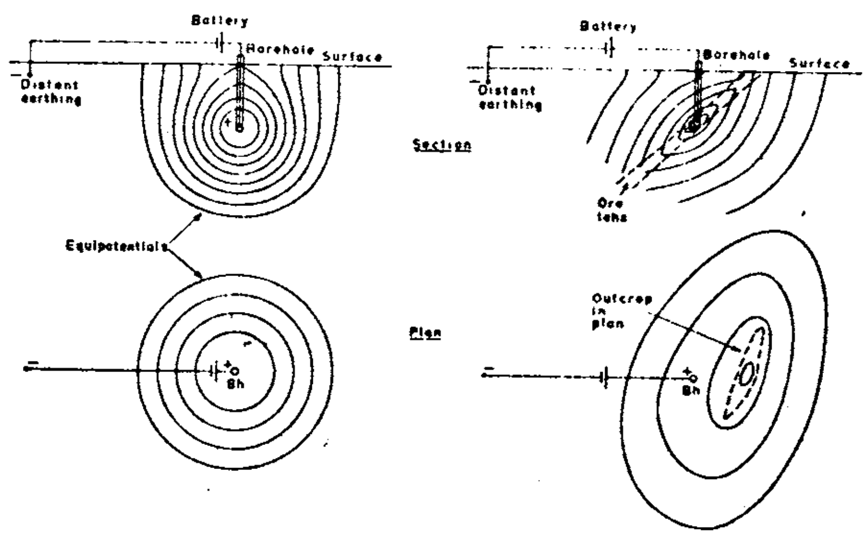


Fig. 1. Principle of the mise-à-la-masse method.

4. METHOD AND PROCEDURE

Mineral showings were prepared for electrode earthing by surface drilling with an Atlas Copco portable drill followed by subsequent blasting and trenching to obtain relatively fresh surfaces.

Electrodes consisted of copper screening, 50 cm x 50 cm, connected to the transmitter source via insulated copper wire. The primary current electrode, C_1, was connected to one pole of the transmitter unit. The "infinity" electrode, C_2, located some 2 kilometers distant in clays of the Akolkolex River, was connected to a second pole. Mudpacks of clay and saltwater were used to assure good electrical contact between electrode C_1 and the mineral showings.

A McPhar Induced Polarization transmitter unit, powered by a 2.5 Kw, 400 cycle generator, produced DC currents varying from 270 mA to 400 mA (Appendix 2). Variations in current were due to potential drops across the contact resistance at each showing.

The observed voltages across line potential electrodes , P_1 and P_2 , were measured with a high input impedance, no-drift voltmeter manufactured by Apex Parametrics of Markham, Ontario (Appendix 2).

The potential electrodes consisted of cylindrical porous porcelain pots containing saturated cupric sulfate solutions ($CuSO_4$).

Measurements of the equipotentials in millivolts were recorded at 10 metre intervals while maintaining a P_1-P_2 separation of 20 metres. A total of 1.55 km of survey was completed.

Radio contact between receiver and transmitter operators coordinated the power on and off periods.

5. DATA PRESENTATION

The survey results are presented in profiled form and illustrate the self potentials and mise-à-la-masse values both as potentials and gradients. Resistivity values have also been calculated from the raw data. These values are determined by the following formulae:

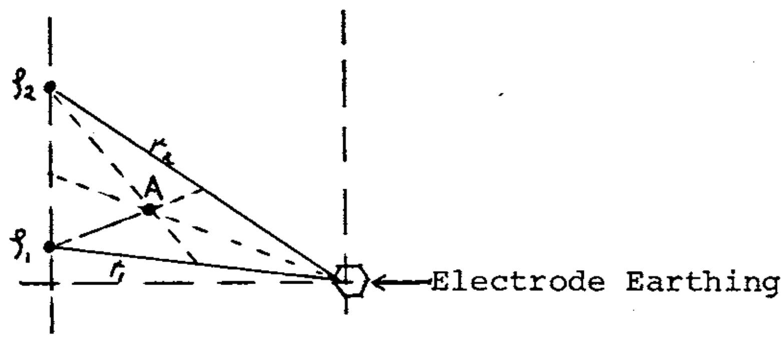
1. Self Potentials:

$$\frac{V_1 + |V_2|}{2}$$

2. Mise-à-la-Masse Values:

$$\frac{V_1 - |V_2|}{2}$$

3. Resistivity Values:



$$\rho_a = \frac{V_1 - V_2}{I\left(\frac{1}{r_1} - \frac{1}{r_2}\right)} \cdot 2\pi$$

where V_1 = signal in millivolts when current on +
V_2 = signal in millivolts when current on -
I = output current from transmitter in milliamperes
r_1 = scaled distance from C_1 to P_1
r_2 = scaled distance from C_1 to P_2
P_1 = location of potential electrode 1
P_2 = location of potential electrode 2
A = plotted value of ρ a

6. RESULTS

Mapping of the whole Wigwam property (see report by Dr. Peter Levin) showed that the sulfide horizons are generally lensy over short strike length. As indicated by previous sampling (Parmac Mines) and also by this year's mapping the most intensive mineralization occurs in the area of the Crooked Adit and between Trench 5 and Adit 11.

The purpose of the geophysical measurements was to

a) better delineate and correlate the sulfide horizons;
b) to see in detail the variable character of the sulfide horizons;
c) to find out whether sulfide horizons at depth can be picked up with mis-à-la masse measurements.

The lensy character over short distances becomes apparent when comparing on the self potential profiled gradient and profiled potential maps the anomalies of the main sulfide horizons along the baseline. The lines are 45 to 60 m apart. The amplitudes of the anomalies differ significantly.

On 120 N, on lines L 0 to L 2W , there is a mise-à-la masse anomaly without an equivalent expression in the self potential survey, indicating no source directly at the surface or close to the surface. This anomaly coincides with a sulfide horizon explored underground at the end of the drifts of Adit No. 11, 85 m below the surface at 110 N and 80 m to the east of L 2W.

APPENDIX I

SPECIFICATIONS OF THE APEX VOLTMETER

Unit of Measurement:	DC millivolts
Measurement Ranges :	0 to ± 10 mV, 0 to ± 30 mV, 0 to ± 100 mV 0 to ± 300 mV, 0 to ±1000 mV, 0 to ± 3000 mV
Resolution:	0.1 mV or 1% of full scale
Meter Damping:	Three switch positions, equal to 0.2, 1 and 10 second time constants on the more sensitive ranges
Operating Temperatures:	- 25° to 60° C
Power Supply:	2 - 9 V transistor batteries, life expectancy 250 hrs.
Console Dimensions:	21 x 12 x 9 cm^3
Console Weight:	1.5 Kg

SPECIFICATIONS OF THE McPHAR P 660 INDUCED POLARIZATION TRANSMITTER UNIT

Operating Voltage Range:	30 - 700 Volts
Maximum Current at Full Voltage:	5 amps
Current Regulation:	3 % maximum output current change for 10 % input voltage change
Operating Temperatures:	- 40° C to 60° C
Weight:	16 kilos

APPENDIX II

STATEMENT OF QUALIFICATION

I, John W. Kieley, with residence at 1279 Nicola Street, Vancouver, B.C., declare:

1. that I graduated from Cambrian Colloge of Applied Arts and Technology, Sudbury (Ontario) with a diploma in geology in 1974.

2. that since graduation I have been employed as exploration geophysical technician in Ontario, Quebec, Northwest Territories, British Columbia, Yukon and Nova Scotia.

3. that I am presently geophysical technician for Metallgesellschaft Canada Ltd. of 824-602 W. Hastings Street, Vancouver, B.C.

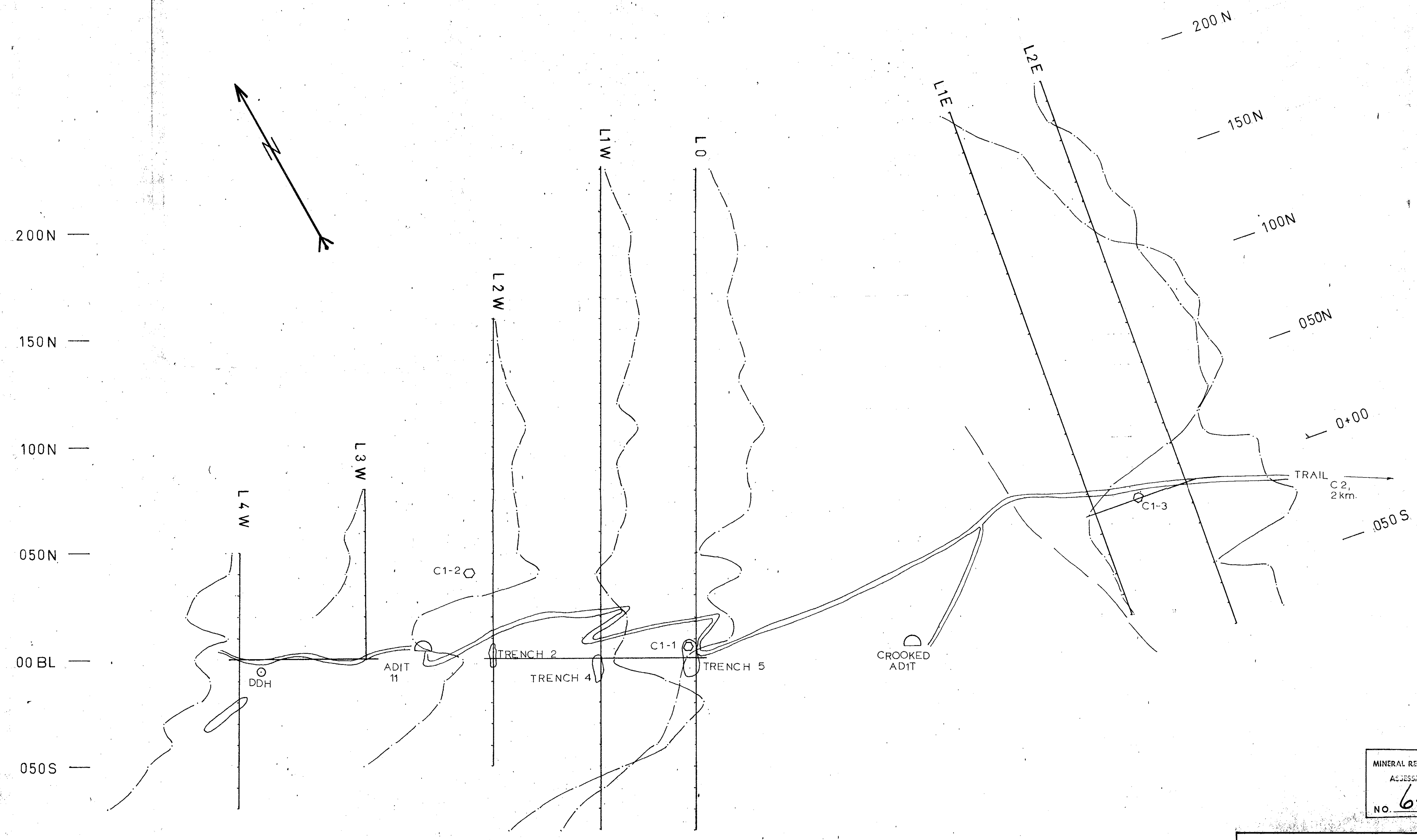
4. that I have no interest whatsoever in the mineral claims under consideration.

5. that I performed the geophysical surveys as part of a program of Cyprus Anvil Mining Corporation and Metallgesellschaft Canada Ltd. in the Wigwam Area in June and July 1977 and collected data on which this report is based.

John W. Kieley

John W. Kieley

Vancouver, B.C.
September 16, 1977



PROFILED DATA PLOTTED AS MILLIVOLTS

SCALE 1:50mV

C1-1,2,3 : LOCATION AND SEQUENCE OF ELECTRODE EARTHINGS

millivolts

-200 -100 0 +100 +200

100 50 0 50 100

metres

METALLGESELLSCHAFT CANADA LTD.

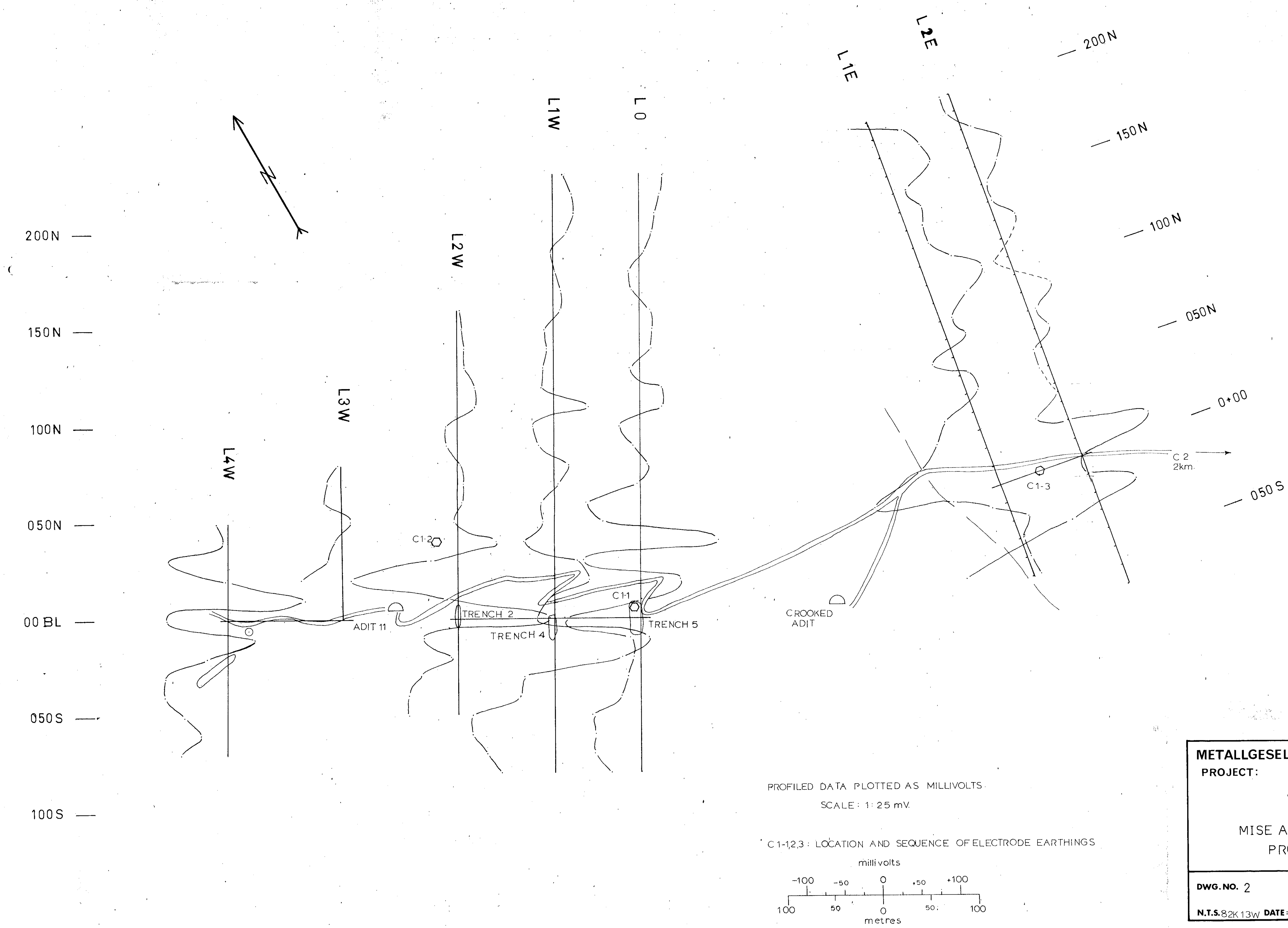
PROJECT:

WIGWAM

MISE A LA MASSE SURVEY

PROFILED POTENTIALS

DWG. NO. 1	**SCALE:** 1:1000	**DRAWN BY:** JWK
N.T.S. 82K 13W **DATE:** 7-77	**UPDATED:**	**AUTHOR:** JWK



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6462

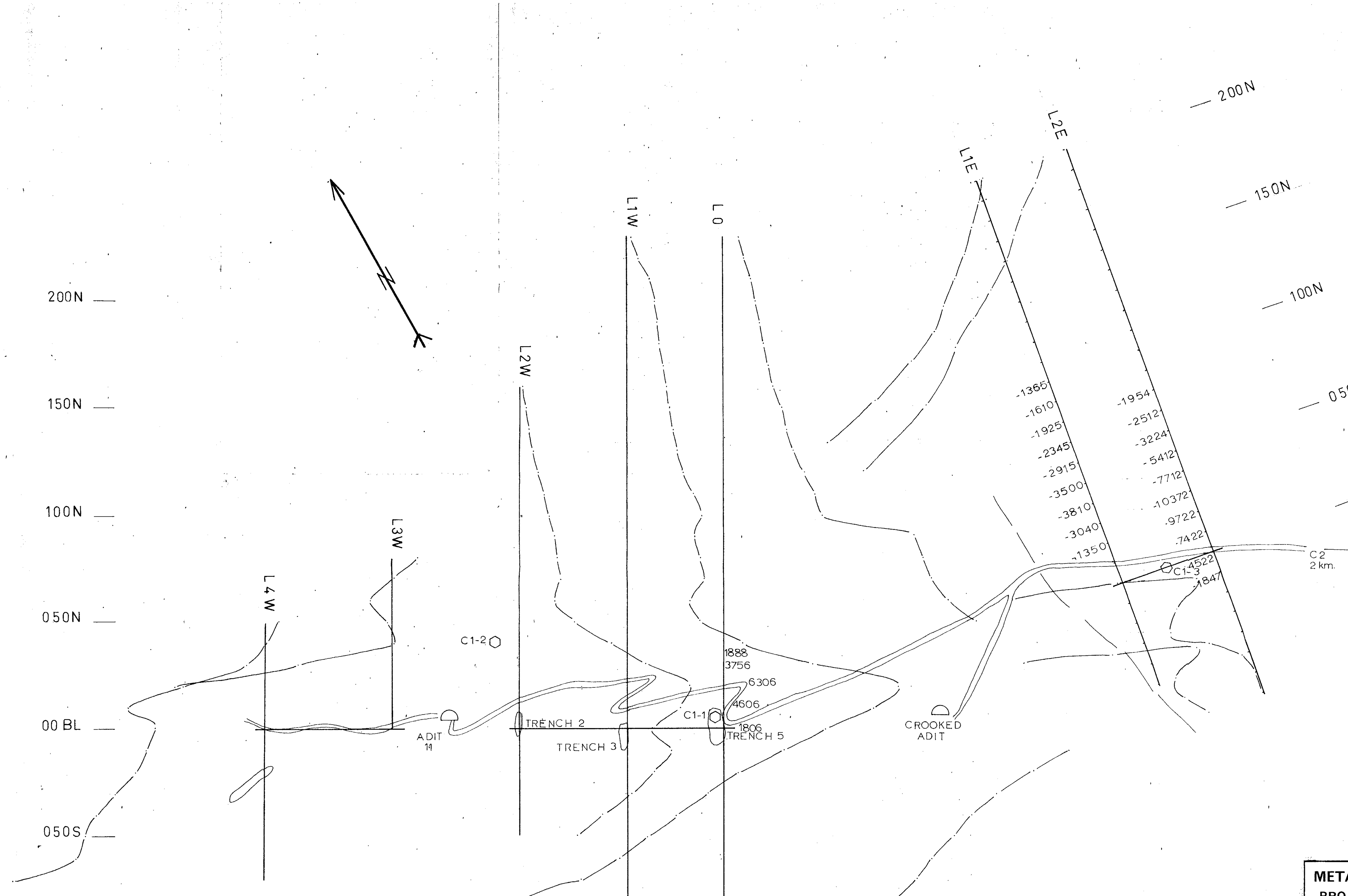
METALLGESELLSCHAFT CANADA LTD.

PROJECT:

WIGWAM

MISE A LA MASSE SURVEY
PROFILED GRADIENTS

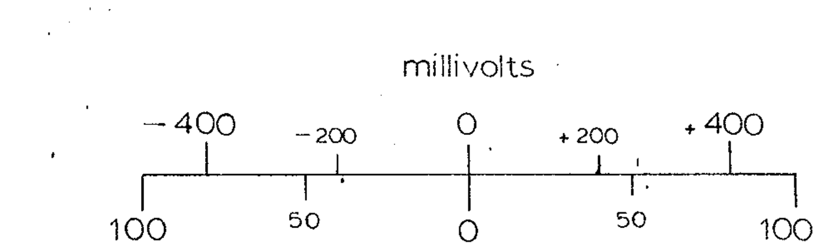
DWG. NO. 2	**SCALE:** 1:1000	**DRAWN BY:** JWK
N.T.S. 82K 13W **DATE:** 7 77	**UPDATED:**	**AUTHOR:** JWK



PROFILED DATA PLOTTED AS MILLIVOLTS.

SCALE : 1:100 mV.

C1-1,2,3 LOCATION AND SEQUENCE OF ELECTRODE EARTHINGS



MINERAL RESOURCES BRANCH
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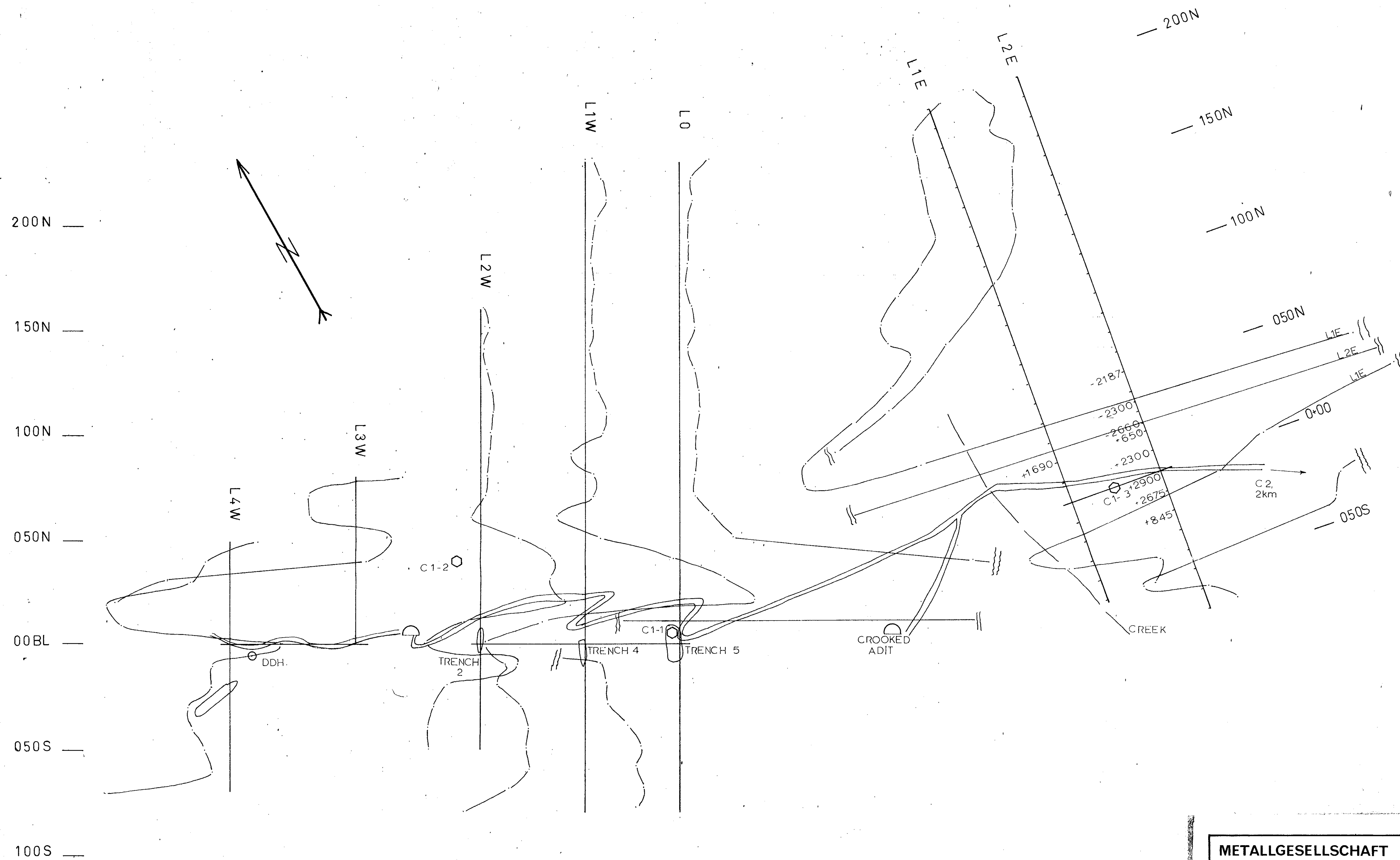
METALLGESELLSCHAFT CANADA LTD.

PROJECT: WIGWAM

SELF POTENTIAL SURVEY
PROFILED POTENTIALS

DWG. NO. 3	**SCALE:** 1:1000	**DRAWN BY:** JWK
N.T.S. 82K13W **DATE:** 7-77	**UPDATED:**	**AUTHOR:** JWK

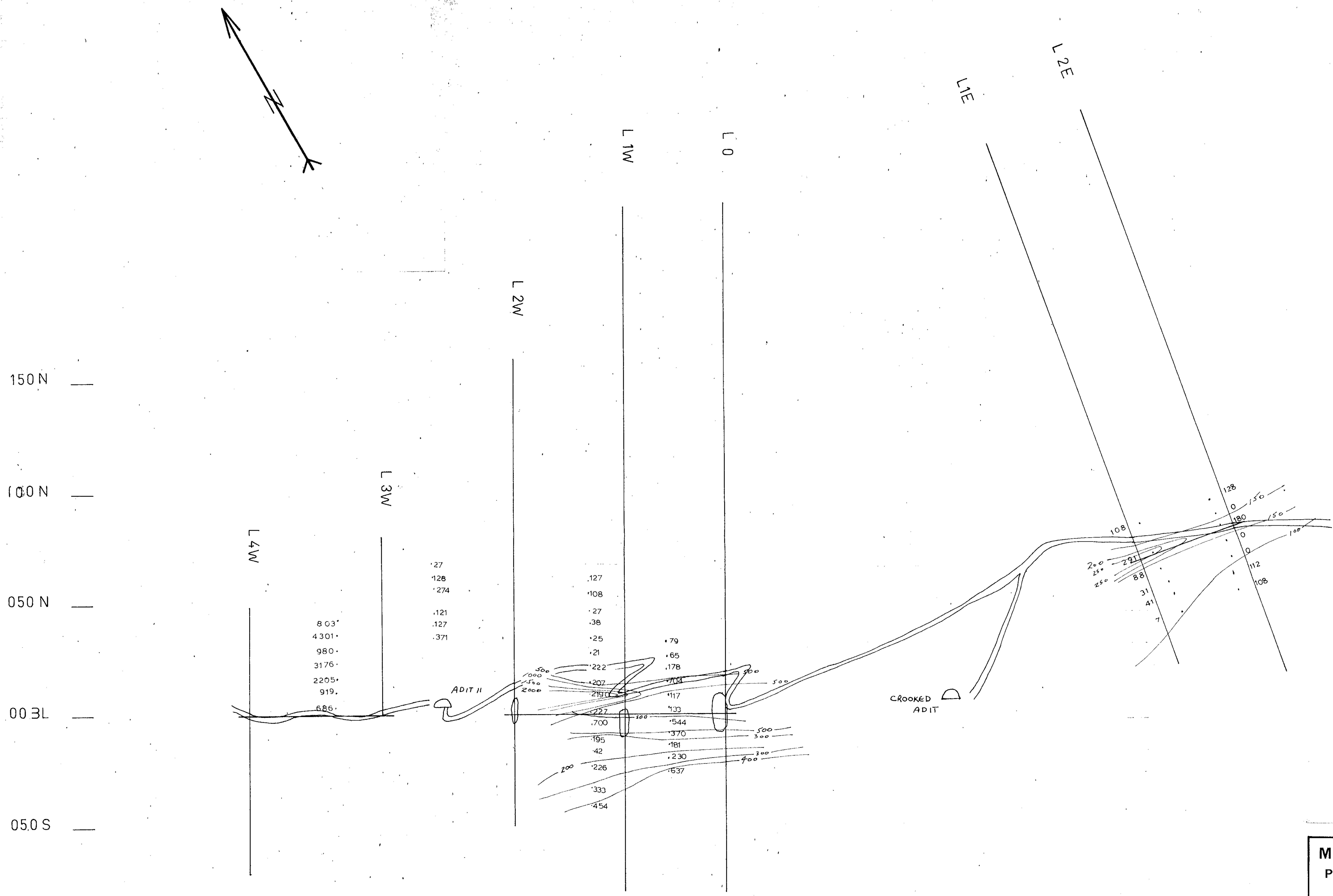


PROFILED DATA PLOTTED AS MILLIVOLTS.
SCALE: 1: 50 mV.

C1-1,2,3 : LOCATION AND SEQUENCE OF ELECTRODE EARTHINGS

millivolts: -200, -100, 0, +100, +200
metres: 100, 50, 0, 50, 100

METALLGESELLSCHAFT CANADA LTD.		
PROJECT: WIGWAM		
SELF POTENTIAL SURVEY. PROFILED GRADIENTS		
DWG. NO. 4	**SCALE:** 1:1000	**DRAWN BY:** JWK
N.T.S. 82K 13W **DATE:** 7-77	**UPDATED:**	**AUTHOR:** JWK



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 6462

METALLGESELLSCHAFT CANADA LTD.

PROJECT: WIGWAM

RESISTIVITY VALUES

DWG. NO. 5 **SCALE:** 1:1000 **DRAWN BY:** JWK

N.T.S. 82K13W **DATE:** 7-77 **UPDATED:** **AUTHOR:**