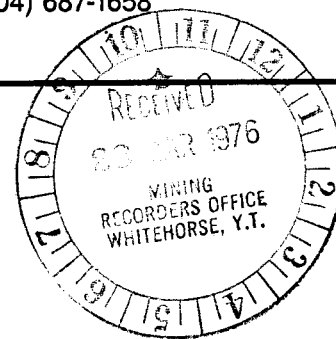




WELCOME NORTH MINES LTD. (N.P.L.)
1027-470 Granville St., Vancouver, B.C. V6C 1V5 Telephone (604) 687-1658



VANGORDA '75 PROJECT

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT

ON THE

IRENE 1-56 CLAIM GROUP

Latitude 62°28'N

Longitude 133°25'W

N.T.S. 105K-6

WHITEHORSE MINING DISTRICT
YUKON TERRITORY

During the Period July 11 - Sept. 15, 1975

by

F. Foster

and

J.S. Brock



January 28, 1976



This report has been examined by the Geological Exploration Unit and is recommended to the Commission to be considered as representation work in the amount of

\$ 16,800

W.D. Sinclair

at Resident Geologist or
~~Resident Mining Engineer~~

Considered as representation work under Section 63 of the Yukon Quartz Mining Act.

[Signature]

A.R. BAXTER
Supervising Mining Recorder

Commissioner of Yukon Territory

16,800

TABLE OF CONTENTS

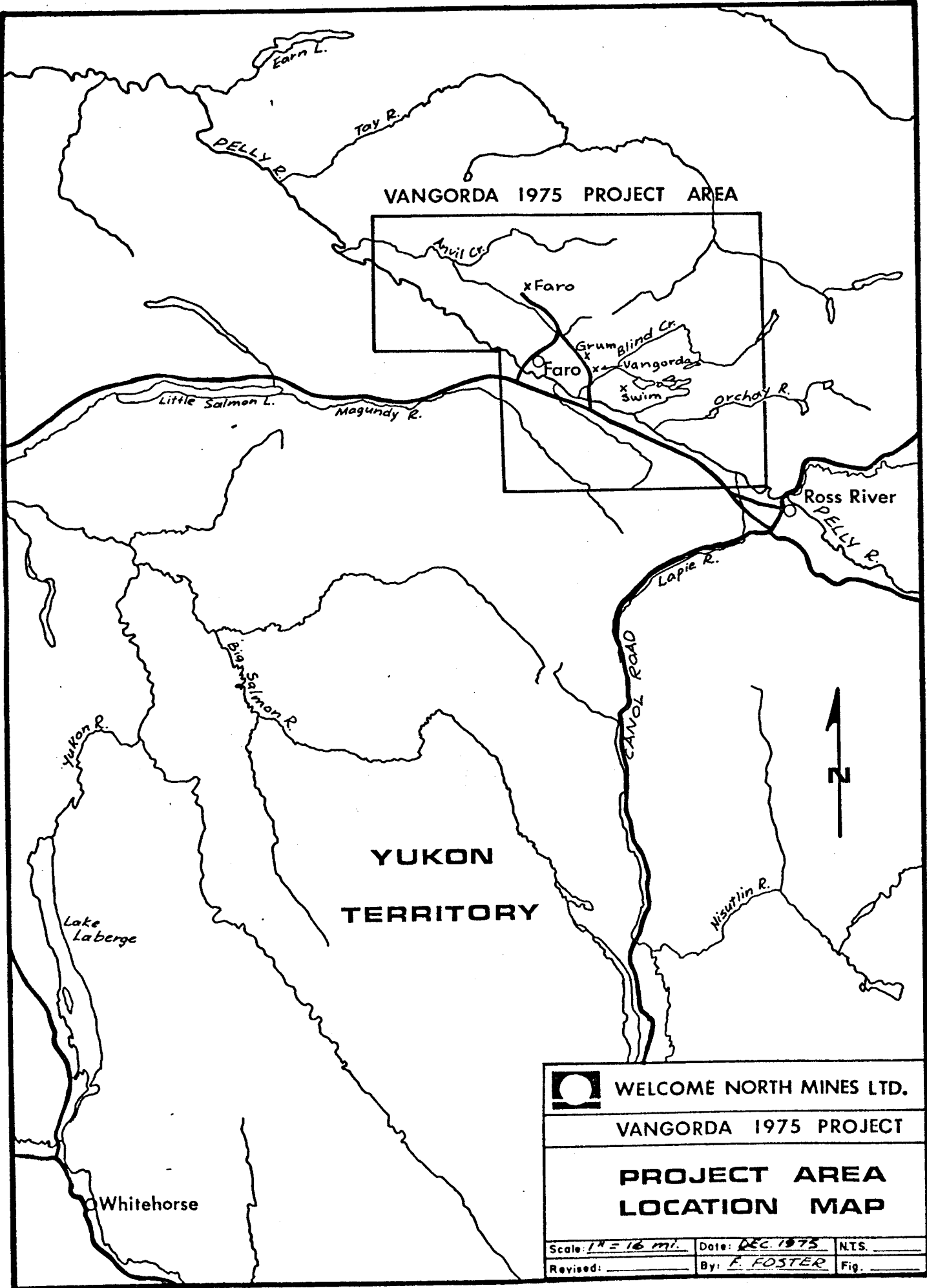
	<u>Page</u>
INTRODUCTION	1
MINERAL CLAIMS	2
SUMMARY AND CONCLUSIONS	4
LOCATION AND ACCESS	5
REGIONAL GEOLOGY	7
PREVIOUS WORK	11
GEOLOGY	12
Lithology	12
Structure	13
LINECUTTING	15
GEOCHEMICAL SURVEYS	17
1. Method of Survey	17
2. Method of Analysis	17
3. Treatment of Data	18
4. Interpretation of Results	19
GEOPHYSICAL SURVEYS	32
Instruments Used	32
Method of Survey	32
a) Magnetometer Survey	32
b) Electromagnetic Survey	33
Treatment of Data	33
a) Magnetic Results	33
b) Electromagnetic Results	34
Interpretation of Results	34
a) Magnetic Survey	34
b) Electromagnetic Survey	34
RECOMMENDATIONS	37
BIBLIOGRAPHY	38
TABLE I LITHOLOGIC SECTION, ANVIL DISTRICT	10

FIGURES

	<u>Page</u>
1. IRENE 1-56 claims	2
2. Property Location Map	6
3. Geology of the Anvil District	8
4. Grid Location Map	16
5. Logarithmic Probability Graph: Copper Geochemistry in soils of the Anvil District	20
6. Logarithmic Probability Graph: Copper Geochemistry in silts of the Anvil District	21
7. Logarithmic Probability Graph: Lead Geochemistry in soils of the Anvil District	22
8. Logarithmic Probability Graph: Lead Geochemistry in silts of the Anvil District	23
9. Logarithmic Probability Graph: Zinc Geochemistry in soils of the Anvil District	24
10. Logarithmic Probability Graph: Zinc Geochemistry in silts of the Anvil District	25
11. Logarithmic Probability Graph: Copper Geochemistry in rocks of the Anvil District	26
12. Logarithmic Probability Graph: Lead Geochemistry in rocks of the Anvil District	27
13. Logarithmic Probability Graph: Zinc Geochemistry in rocks of the Anvil District	28

MAPS - IN POCKETS

PLATE 1	GRID LOCATION MAP
PLATE 2	GEOCHEMISTRY - COPPER
PLATE 3	GEOCHEMISTRY - LEAD
PLATE 4	GEOCHEMISTRY - ZINC
PLATE 5	COMPILATION MAP
PLATE W-202-1	MAGNETOMETER SURVEY Gamma Values - Contoured
PLATE W-202-2	CRONE ELECTROMAGNETIC SURVEY Dip Angles - Contoured
PLATE W-202-3	CRONE ELECTROMAGNETIC SURVEY Dip Angles - Profiled



VANGORDA 1975 PROJECT AREA

**YUKON
TERRITORY**



WELCOME NORTH MINES LTD.

VANGORDA 1975 PROJECT

**PROJECT AREA
LOCATION MAP**

Scale: 1" = 16 mi.	Date: DEC. 1975	NTS.
Revised: _____	By: F. FOSTER	Fig. _____

INTRODUCTION

The IRENE 1-56 claims were staked by Welcome North Mines in February, 1975. The property was located over what was considered to be a favourable geologic environment for Anvil-Vangorda type massive sulphide deposits.

The IRENE claims were subsequently joint ventured to Getty Mining Pacific Ltd. in March, 1975 as part of the Vangorda 1975 Project. Under the joint venture agreement, Getty Mining Pacific currently holds a 60 percent working interest in the property, with Welcome North as partner with a 40 percent carried interest.

Welcome North, as operator, during the period July 11, 1975 to Sept. 15, 1975, carried out an exploration program consisting of geological mapping, soil and silt geochemistry surveys and electromagnetic and magnetic surveys.

MINERAL CLAIMS

The IRENE 1-56 claim group consists of the following 56 contiguous mineral claims located in the Whitehorse Mining District of the Yukon Territory (see Fig. 1).

<u>CLAIMS</u>	<u>GRANT NUMBERS</u>	<u>RECORDING DATE</u>
IRENE 1-56	Y92519-Y92574	Feb. 19, 1975

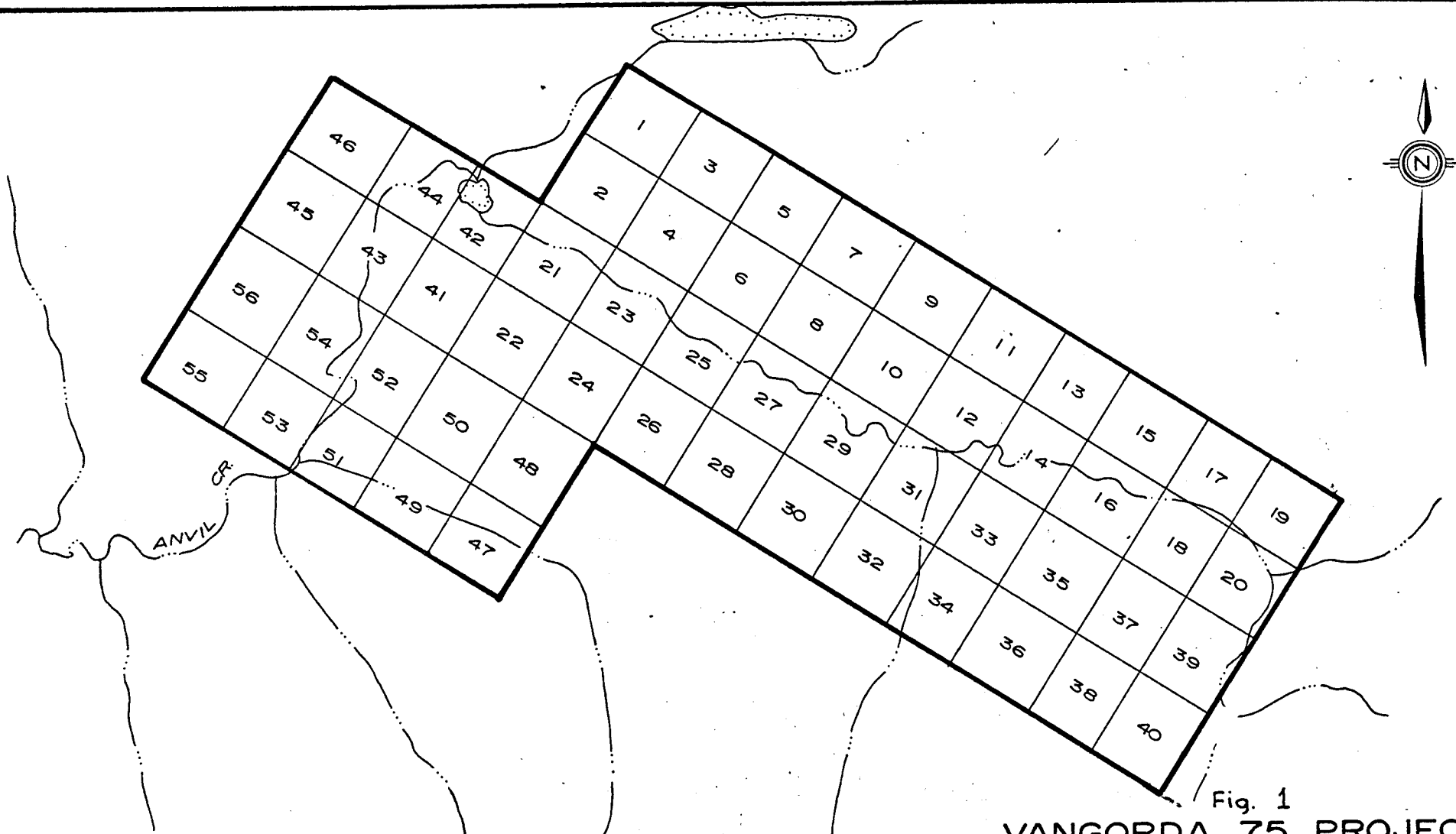


Fig. 1

VANGORDA 75 PROJECT
 WELCOME NORTH/
 GETTY MINING PACIFIC
 IRENE 1-56
 105-K-6



SUMMARY AND CONCLUSIONS

Lack of outcrop on the IRENE claims prohibits any detailed geological interpretation. However, through on-strike geological extrapolation coupled with examination of limited outcrop existing on the property, it appears that the IRENE claims are favourably located over rocks [Unit (1c) and Unit (3a)] that host both the Faro type and the Grum type massive sulphide deposits.

Of particular significance are four moderate east-west trending electromagnetic conductors and three coincident or partially coincident zones of weakly to moderately anomalous geochemical response in copper, lead, and zinc. The strongest electromagnetic conductor, which overlies Unit (1c) and is on strike with a second weaker conductor, is also on strike and lying adjacent to the east side of one of the zones of anomalous geochemical response in lead and zinc.

All the electromagnetic conductors, two of which are located within Unit (1c), the other two being within Unit (3a), are on strike with I.P. conductors situated to the east, their source being postulated through previous interpretation by others as graphitic horizons similar to those hosting the Faro, Grum, Vangorda, and Swim massive sulphide deposits.

As the presence of graphitic horizons within these rocks has been established outside the claim group, the next stage of exploration should consist of a gravity survey to delineate possible sulphide bodies within the conductive zones attributed to graphitic horizons. Diamond drilling would be contingent on the results of this survey.

LOCATION AND ACCESS

The IRENE 1-56 claims are located in the Whitehorse Mining District of the Yukon Territory (N.T.S. 105K-6) at latitude 62°28'N, and longitude 133°25'W, 125 miles northeast of Whitehorse, Yukon Territory and 17 miles north of the town of Faro, Yukon Territory (see Fig. 2).

Access to the property is gained by helicopter from Faro or the Anvil mine site situated 8 miles to the south of the property in Rose Creek valley.

The property is located at an elevation of 3,500 feet in a narrow valley of Upper Anvil Creek which opens out onto a broad flood plain on the north side of the Anvil Batholith. All the property is below treeline and covered by muskeg or buck brush. The slopes on either side of the valley are covered by terraced glacial moraines of 100 feet maximum thickness. Anvil Creek flows through the center of the property and can be bridged by fallen trees.

Outcrop is extremely limited, occurring at isolated localities on the eastern portion of the claims near the base of glacial moraines.



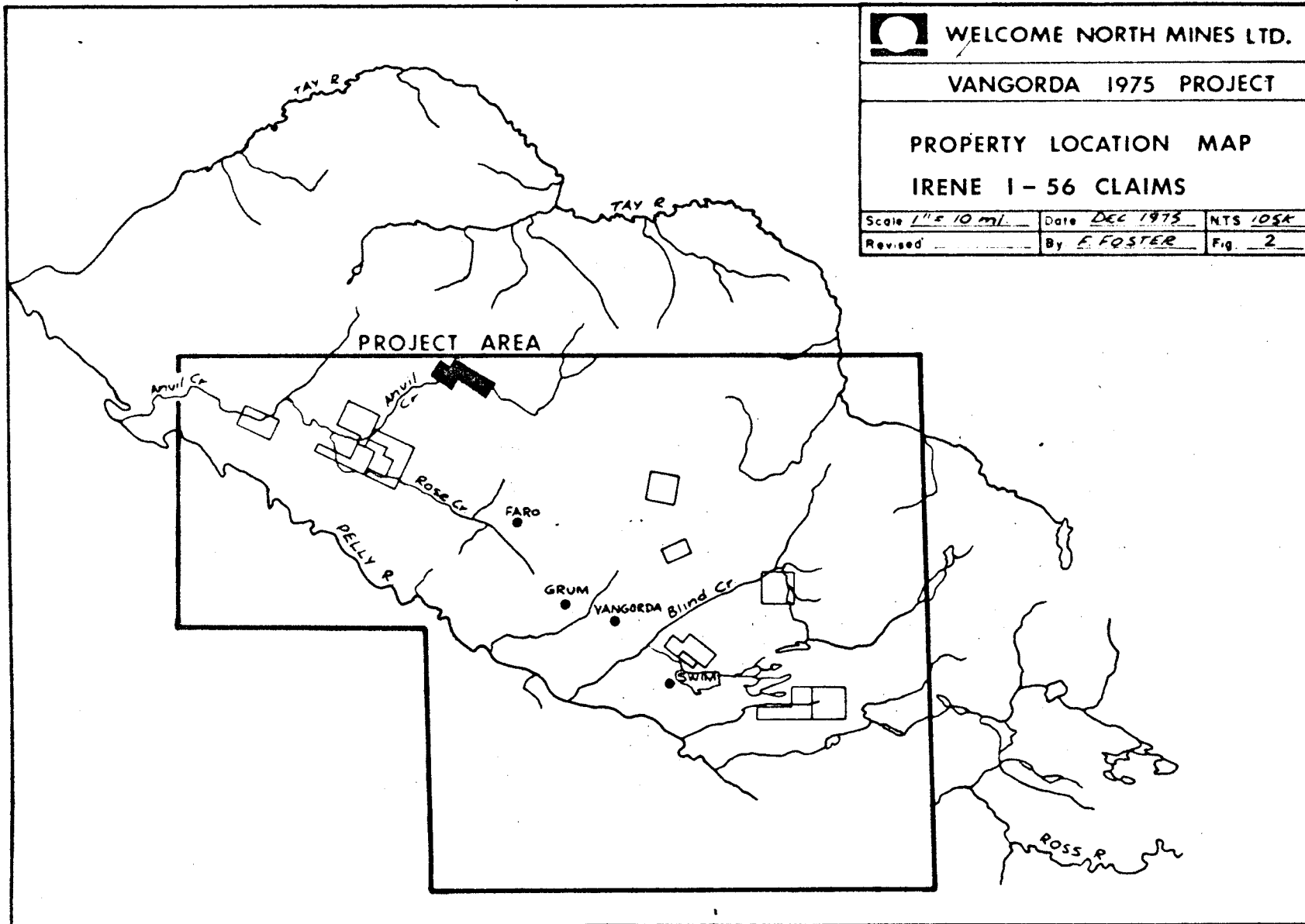
WELCOME NORTH MINES LTD.

VANGORDA 1975 PROJECT

PROPERTY LOCATION MAP

IRENE 1-56 CLAIMS

Scale 1" = 10 mi.	Date DEC 1975	NTS 105K
Revised	By F. FOSTER	Fig. 2



REGIONAL GEOLOGY

The Anvil District, as outlined in Fig. 3, lies immediately northeast of the Tintina Trench, the probable locus of a major zone of northwest-southeast transcurrent faulting.

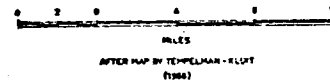
The central part of the district is formed by the Anvil Range, the dominating structure being a doubly plunging arch-like feature around the Anvil batholith. The core of the Anvil Range is underlain by granitic rocks for which potassium-argon age determinations suggest an age of 80 - 90 million years. The Anvil Arch is flanked on the southwest and northeast by phyllites, calc-silicate gneisses and schistose rocks thought to be of Cambrian (?) to Ordovician age; these metasediments which have undergone at least three phases of deformation are host to the known massive sulphide deposits of Faro, Vangorda, Grum and Swim.

The schistose quartz rich host rocks of the Faro sulphide deposits are confined to the lower part of a unit of muscovite-biotite schist whose lower sections are sometimes graphitic. Small greenstone lenses are often found in the upper part of this sequence. This section constitutes the lower member of a 6,000 foot thick sequence of biotite-muscovite schist, calc-silicate gneiss and skarn, phyllite, chloritic greenstone bodies, and tuffaceous phyllite.

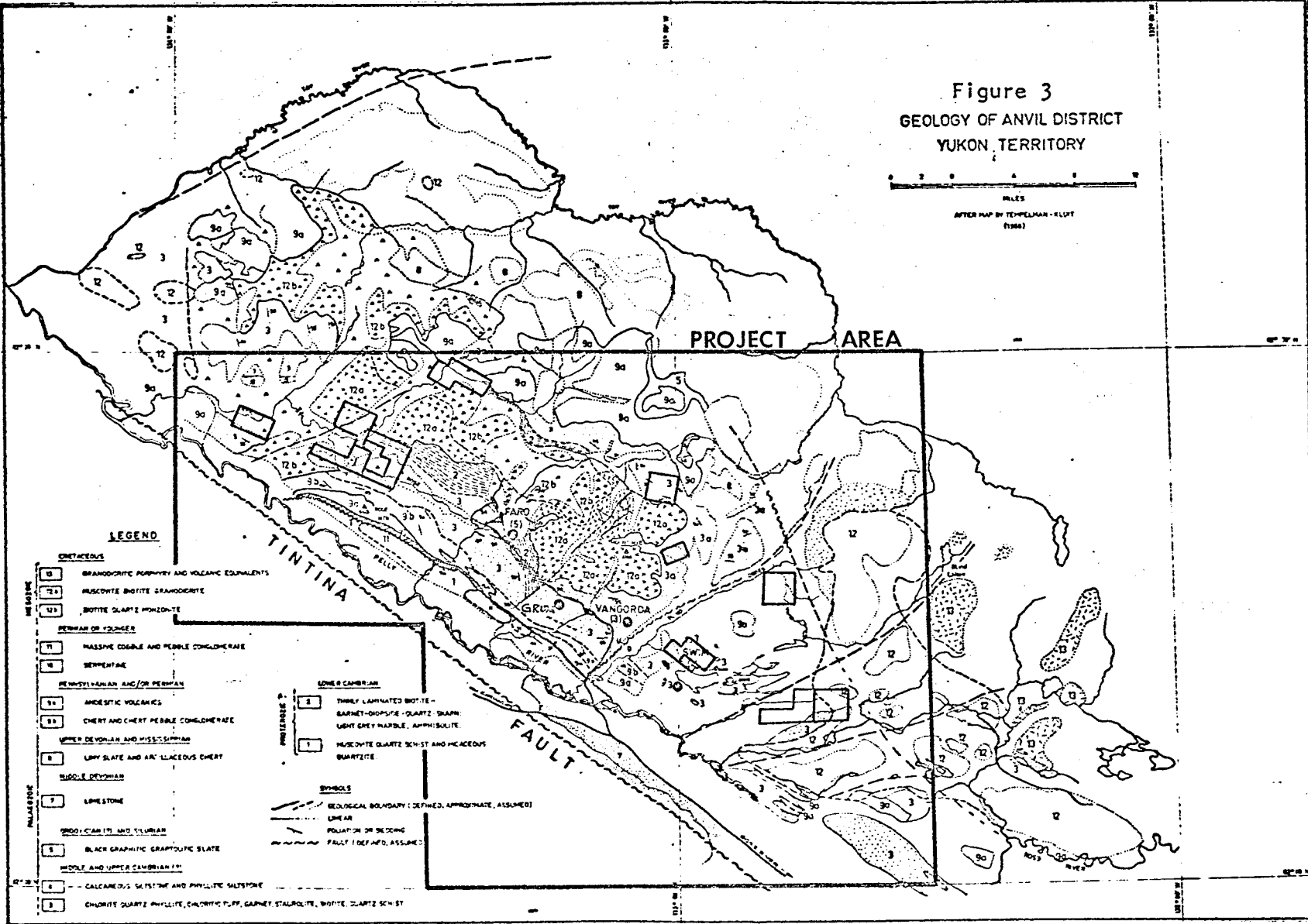
The phyllitic host rocks of the Grum, Vangorda and Swim sulphide deposits are confined to graphitic quartz-rich sections of phyllite situated close to relic volcanic complexes of greenstone, chloritic phyllite, limestone, and pyroxenite in the lower part of an estimated 3,000 foot thick unit of phyllite. The phyllite unit is separated from the lower schist unit in many areas by thick sections of calc-silicate gneiss.

The sulphide bodies of the Anvil district are tabular and lie in the plane of the crenulation foliation developed during the first phase of deformation. Their long axes coincide with the intersection of primary and secondary foliation. The sulphide deposits appear to have been only slightly affected by the regional metamorphism of phyllite host rocks.

Figure 3
GEOLOGY OF ANVIL DISTRICT
YUKON TERRITORY



PROJECT AREA



LEGEND

- | | |
|---|--|
| CRETACEOUS | |
| 10 | BRANDORITE PORPHYRY AND VOLCANIC EQUIVALENTS |
| 12 | MUSCOVITE BIOTITE GRANODIORITE |
| 12a | BIOTITE QUARTZ MONZONITE |
| PERMIAN OR YOUNGER | |
| 11 | MASSIVE COBBLE AND PEBBLE CONGLOMERATE |
| 14 | SEPIENTINE |
| PENNSYLVANIAN AND/OR PERMIAN | |
| 13a | ANGESTIC VOLCANICS |
| 13b | CHERT AND CHERT PEBBLE CONGLOMERATE |
| UPPER DEVONIAN AND MISSISSIPPIAN | |
| 8 | LIMY SLATE AND ANILLACEOUS CHERT |
| MIDDLE DEVONIAN | |
| 7 | LIME STONE |
| PROTEROZOIC AND SILURIAN | |
| 5 | BLACK GRAPHIC GRAPTOLITE SLATE |
| MIDDLE AND LOWER CAMBRIAN (?) | |
| 6 | CALCAREOUS SLISTONE AND PHYLLITE SLISTONE |
| 9 | CHERT QUARTZ PHYLLITE, CALCITIC PUFF, GARNET STALACTITE, WHITE QUARTZ SCHIST |
-
- | | |
|--------------------|---|
| PROTEROZOIC | |
| 1 | THINLY LAMINATED BIOTITE - GARNET-DIOPSIDE QUARTZ SLAIN; LIGHT GREY MARBLE, AMPHIBOLITE |
| 2 | MUSCOVITE QUARTZ SCHIST AND MICACEOUS QUARTZITE |
-
- | | |
|----------------|---|
| SYMBOLS | |
| | GEOLOGICAL BOUNDARY (DEFINED, APPROXIMATE, ASSUMED) |
| | LINEAR |
| | POLYGENIC OR BEDDING |
| | FAULT (DEFINITE, ASSUMED) |

However, a distinct average grain size increase from the Swim northwest to the Faro deposits reflects a thermal metamorphic gradient caused by the intrusion of the Anvil Batholith. The base metals have been introduced into the phyllite prior to its metamorphism and deformation.

It appears that two units, the pelitic schists and phyllites, are host rocks for the four economically important sulphide masses and are also host to several smaller, presently non-economic deposits in the area.

Chloritic tuffaceous greenstone outcrops are close to all four deposits but are nowhere immediately against ore. Graphite is present in host rocks around all four deposits, but it is far more prevalent around the Swim body than near the Vangorda, Grum or Faro deposits.

A description of the rocks that make up the stratigraphic section of the Anvil Arch, and their tentative ages is listed on the following page. The description has been taken from Templemen-Kluit (1968) and modified by field observations and by information obtained from Cyprus-Anvil Mining Company.

ERA	PERIOD OR EPOCH	FORMATION	MAP UNIT	LITHOLOGY	
Cenozoic	Tertiary		14b	Rhyolitic tuff	
			14a	Quartz-feldspar porphyry	
RELATIONS NOT KNOWN					
Mesozoic	Cretaceous or Tertiary		13	Saussuritized porphyritic hornblende diorite	
			INTRUSIVE INTO UNITS 2, 3, AND 11		
	Age unknown		12b	Hornblende diorite, gabbro	
			12a	Pyroxenite, sometimes cataclastic and serpentinized	
	INTRUSIVE INTO UNITS 2 AND 3				
	Cretaceous	Anvil Batholith	11	Porphyritic biotite-quartz monzonite and granodiorite; muscovite-biotite granodiorite; foliated equivalents	
	INTRUSIVE INTO UNITS 2, 3, AND 8				
Lower or Middle Triassic		10	Massive, well indurated cobble and pebble conglomerate with fragments of mica quartz schist (Unit 1), basalt (Unit 8), chert (Unit 8a), limestone (Unit 8c) and serpentinite (Unit 9); brown sandstone slate and argillaceous limestone		
Upper Permian or Lower Triassic		9	Serpentinite and serpentinized peridotite		
FAULT BOUNDED					
Paleozoic	Upper Permian	Anvil	8c	Light grey, massive resistant recrystallized limestone	
	Lower Permian	Range	8b	Massive green basalt, commonly amygdaloidal, includes common pyroclastic and less common pillowed varieties, metamorphosed equivalents near granitic bodies	
	Lower Permian and Upper Permian		Group	8a	Greenish grey, pale green and brick red argillaceous and tuffaceous chert
	UNCONFORMABLE ON UNITS 3, 4, 5, 6, 7				
	Upper Devonian		7	Grey slate, chert, greywacke, chert pebble conglomerate and limestone	
	UNCONFORMABLE ON UNITS 3 AND 4				
	Middle Devonian		6	Limestone and dolomite	
	Silurian and Devonian		5	Light grey, medium bedded, medium-grained orthoquartzite	
	CONFORMABLE				
	Middle Ordovician Lower Silurian		4	Dark grey and black graptolitic slate, minor thin-bedded black chert	
	UNCONFORMABLE 7				
	Ordovician-Silurian			3d	Rhyolitic quartz-feldspar porphyry, sometimes pyritic
				3c	Medium green foliated actinolite schist, andesitic greenstone, foliated fine grained amphibolite, amygdaloidal chlorite phyllite
				3b	Sulphide horizon; muscovite phyllite and quartzite, siliceous graphitic phyllite, massive and banded pyrite and pyrrhotite
3a				Dark grey biotite-chlorite schist and phyllite, medium greenish grey lustrous chlorite-muscovite-quartz phyllite, locally calcareous or graphitic	
GRADATIONAL CONTACT					
Cambro-Ordovician			2b	Foliated amphibolite, pale green chloritic phyllite, greenstone, chlorite	
			2a	Calc-silicate schist, phyllite, and gneiss with interbedded biotite and calc-silicate rich layers, can contain 2b	
GRADATIONAL CONTACT					
Cambrian			1d	Chloritic schist and phyllite, and greenstone	
			1c	Muscovite schist, muscovite-biotite schist, muscovite-andalusite schist + graphite, biotite-andalusite-muscovite schist + garnet and staurolite, graphitic schist	
			1b	Faro sulphide horizon, muscovite quartzite + sulphides, massive and banded pyrite and pyrrhotite	
			1a	Quartz-feldspathic biotite-muscovite schist and gneiss, in part bleached and hornfelsed	

TABLE 1 LITHOLOGIC SECTION, ANVIL DISTRICT

PREVIOUS WORK

In April, 1966 Swim Lake Mines Ltd. staked the SCOTT claims (re-staked in part as the IRENE 49-56 claims) and flew an airborne magnetometer and EM survey in June of the same year. Later in that year the company conducted line cutting and geochemical, electromagnetic, and magnetic surveys over the claims.

Rodstrom Yellowknife Mines Ltd. staked the ROD claims (presently IRENE 1-40) in June, 1966 and allowed the claims to lapse due to overstaking.

The TRY claims, just east of the IRENE claims, were staked in July, 1971 by Spartan Exploration Ltd., which conducted geological mapping, geochemical and I.P. surveys later in the year. The TRY claims were restaked again by Anvil Mining Corp. in August, 1973.

GEOLOGY

Extensive deposits of deep overburden mask most outcrops on the IRENE claims, however the geologic setting has been based on limited outcrop observed and an extrapolation of geological information from adjoining properties to the east. The property lies on the north limb of the Anvil anticlinorium and is bordered to the south by the Anvil Batholith [Unit (11)]. The predominant rock type underlying the property is a gently northerly dipping biotite-muscovite schist of Unit (1c) which in turn is overlain by pale grey, graphitic phyllites of Unit (3a), similar to those rocks of Unit (3a) which onlap the southern side of the Anvil Batholith.

Lithology

Grey weathering medium-grained biotite-garnet-quartz schist of Unit (1c) crops out at the base of a hill between lines 16E and 24E at 15S (see Plate 8) and 4000 feet east of station L112E 24S in a tributary of Anvil Creek.

On the eastern boundary of the property, Unit (1c) is observed in contact with Unit (3a) in outcrop exposed by a bluff along Anvil Creek. The contact is characterized by a decrease in grain size and biotite content in the schist of Unit (1c) resulting in gradation of the rock to phyllite of Unit (3a). The phyllites of Unit (3a) are typified by silvery-grey lustrous chlorite-muscovite-quartz phyllite. Lustrous rusty coloured surfaces are observed on partings rich in muscovite. Near the base of the bluff exposing the rocks of Units (1c) and (3a) epsomite occurs as pinkish-white botryoidal encrustations which are found to form along an exposed shear in the biotite schist.

Unit (3a) also crops out in the northeast corner of the property between lines 104E and 112S at 20N as limy phyllites.

Massive dark grey to green andesitic greenstone of Unit (3c) occurs in Unit (3a) as lenses up to 10 feet thick. Lenses of Unit (3c)

were found within the limy phyllites on the northern portion of the property and within the phyllites found on Anvil Creek at the eastern boundary of the property.

Large bluffs composed of Anvil Range basalts occur along the northern boundary of the property. These basalts, which overlie the phyllites of Unit (3a), are composed of medium-grained chloritized gabbroic rocks at their base. Pyrite is present as 1/4 inch cubes which make up 5% of the rock. Some of the pyrite has been altered to earthy hematite.

The Anvil Batholith which composes the peaks to the south of the property is characterized by massive biotite-muscovite granodiorite. The contact between the schists of Unit (1c) and the batholith is not exposed anywhere on the property.

Structure

Rocks underlying the property are affected by at least three periods of deformation. Three axial plane cleavages and related schistosesities have been developed in the area. The cleavage and schistosity associated with the first period of deformation (called S_1) has destroyed any bedding relationships in the rocks. This cleavage and schistosity is dominant near the crests of folds produced by the second period of deformation.

The second period of deformation is represented by a very strong axial plane cleavage and schistosity (S_2) which strikes NW where exposed on the property. S_2 completely transposes S_1 on the flanks of second deformation folds such that only remnants of S_1 can be seen between major S_2 surfaces but S_2 is much less dominating over S_1 at crests of these folds.

The third period of deformation is represented by a very weak cleavage and schistosity (S_3) which is related to northeast trending folds that gently warp the S_2 surfaces. Minor folds seen in outcrop show the S_3 axial plane surfaces dipping moderately to the southeast. These

minor folds resemble "kink" folds but are slightly overturned to the west.

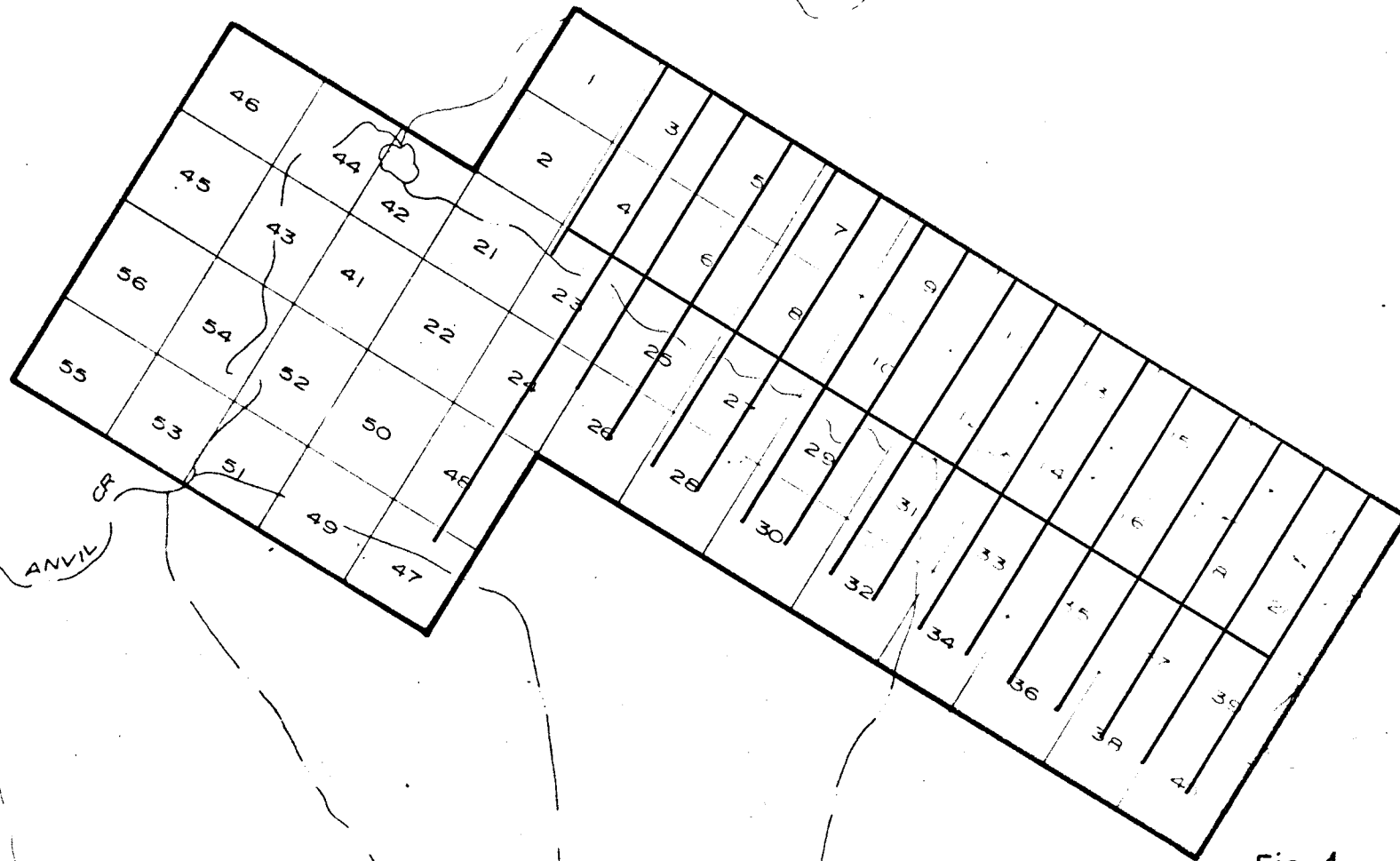
Intersections of S_1 , S_2 and S_3 produce crenulations which are best observed on phyllitic partings.

Present data obtained from limited outcrop on the property is insufficient to determine if major folds exist in the rocks underlying the property or what their axial trends might be.

LINE CUTTING

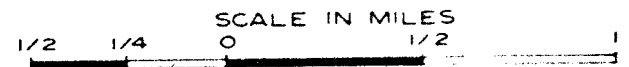
Line cutting was carried out on the property by line cutters of Eastern Associates, hired on a contractual basis from Whitehorse. The grid system consists of a 13,600 foot long base line trending at 120° with perpendicular crosslines of varying length spaced 800 feet apart along the base line. Survey control was maintained by picket and chain methods with periodic line bearing checks by Sylva compass. Picket stations were established on the cross lines at 100-foot intervals.

A total of 21.86 miles of line were cut on the property (see Fig. 4).



ANVIL

Fig. 4
 VANGORDA 75 PROJECT
 WELCOME NORTH/
 GETTY MINING PACIFIC
 IRENE I-56
 105-K-6



GEOCHEMICAL SURVEYS

1. Method of Survey

After close study of geochemical evidence leading to the discovery of the Anvil massive sulphide deposit, it was decided to modify the geochemical sampling method to better adapt to the search for deep-seated sulphide deposits.

Sampling was confined to the base of slope contours, sidehill silt seepages, stream sediments and frost boils in order to tap possible drainage emergence from deep-seated sources.

Previous results from other 'grid controlled' geochemical surveys were available for review and revised interpretation.

All soil samples were obtained with a prospector's grub hoe, which was found adequate as a tool for cutting through heavy layers of organic material overlying the soil.

Certain areas determined as being anomalous in lead, zinc, and copper from previous surveys were further investigated with rock geochemistry to determine if the geochemical anomalies in soils were either in situ or transported. All geochemical samples were collected in Kraft brown paper bags and shipped for testing to Acme Analytical Laboratories in Ross River, Yukon.

2. Method of Analysis

All samples were analysed by Acme Analytical Laboratories Ltd. at Ross River. When the samples were received, each was dried while in its Kraft bag, then screened to 80 mesh, weighed out to 0.5 grams and digested in hot aqua regia. Rock samples were crushed and pulverized before undergoing this process. Samples were then diluted, clarified for 20 hours and then tested for copper, lead and zinc content on an

atomic absorption spectrophotometer. The 'AA' unit used was a Perkins Model 290 and accuracy of the instrument ideally is 1% of the amount of metal present. Individual cathode lamps were used for each element determination, a direct readout being given in parts per million of the element being tested.

3. Treatment of Data

All results of geochemical tests were returned to the field where results were plotted on field maps kept by the party chief for aid in carrying out preliminary follow up of anomalous areas while still in the field.

All results were grouped under soil, silt, rock analyses for each of Cu, Pb and Zn. Data for each of these categories was plotted later onto graphs of trace element quantity (ppm) versus cumulative percent.

A partitioning procedure (see A.J. Sinclair 1973) was used to separate two populations, one being anomalous and the other being background. The overlap of these two populations was determined and thresholds chosen arbitrarily to isolate three priority populations. The population of first priority consists of only anomalous values. Of second priority is a population consisting mainly of anomalous values and a small percentage of background values. Finally, of third priority is a population consisting only of background values. Where only two priority populations are shown, the partitioning procedure could not be applied or no overlap of populations existed.

Separate maps were prepared using a scale of 1" = 400', showing values obtained for copper, lead and zinc. Values were color coded to aid in distinguishing areas anomalous in copper, lead, and zinc.

4. Interpretation of Results


Study of the statistical analysis for copper content in soils sampled during the 1975 season by the Vangorda project in the Anvil District reveals that an anomalous population whose threshold value is 41 ppm (arbitrarily chosen) overlaps with a lower background population as illustrated in Fig. 5. The overlap of these two populations, again arbitrarily chosen, occurs between 41 ppm and 55 ppm. Samples obtained with values in this range (41-55 ppm) are considered to be anomalous only if other samples collected in the immediate vicinity of these yield distinctly anomalous values; otherwise samples with values in the 41-55 ppm range are considered as samples in areas of high background geochemistry.

Inspection of the statistical analysis for copper content in silts sampled in the Anvil District (Fig. 6) reveals that three geochemical populations, such as those outlined above for copper in soils, exist and that the overlap between the anomalous and background populations ranges between 30 to 34 ppm.

Inspection of statistical analysis for lead content in soils (Fig. 7) reveals that as above three populations exist and that the overlap between the anomalous and background populations ranges between 38 to 49 ppm.

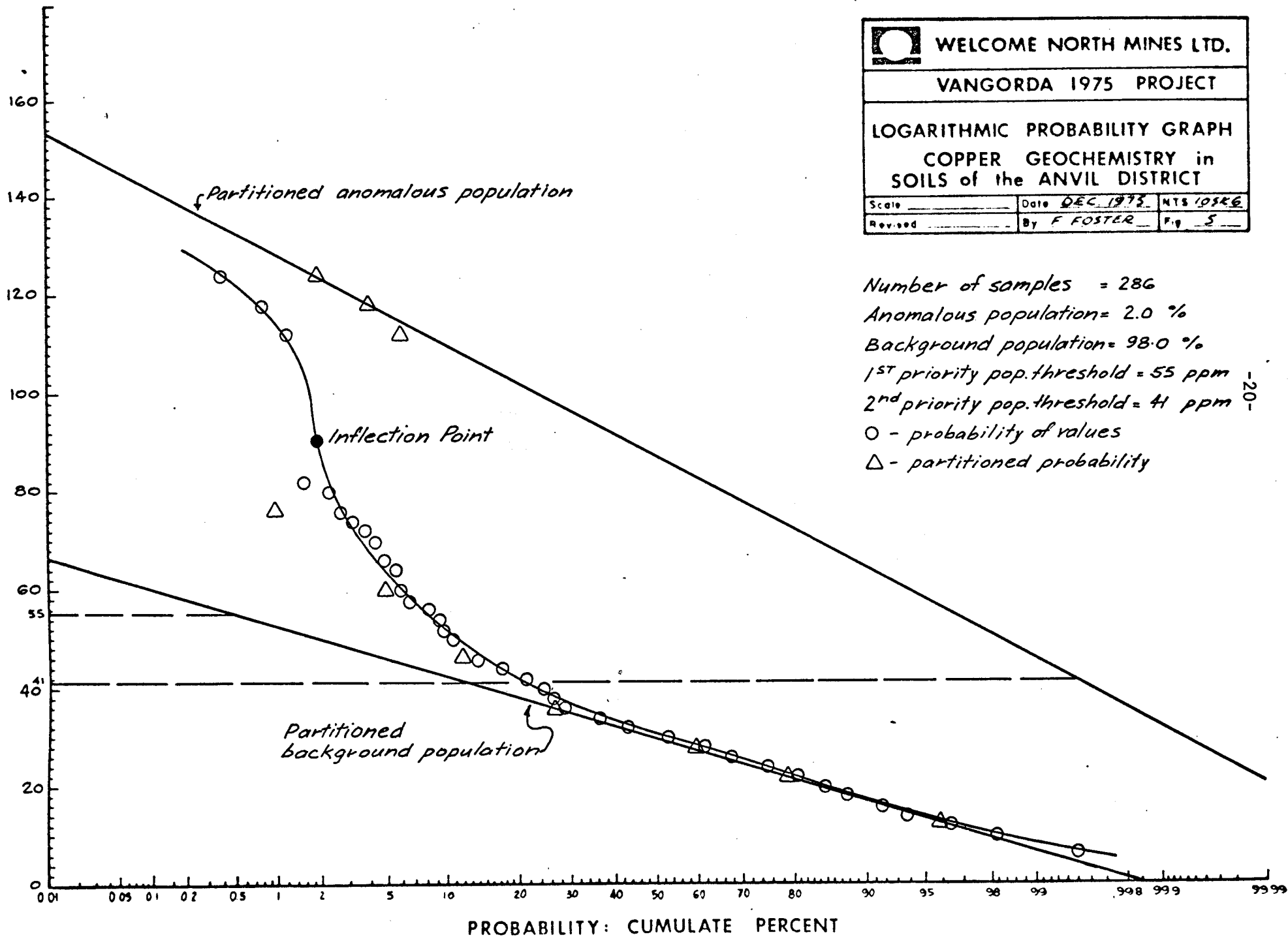
With reference to lead content in silts, the statistical analysis for this (Fig. 8) reveals three populations exist such as described above for copper in soils and silts and lead in soils. Values greater than 34 ppm are anomalous, values in the range 26 to 33 ppm are either anomalous or high background, and values less than 25 ppm are background.


The statistical analysis for zinc content in soils (Fig. 9) shows three populations as well. Values greater than 100 ppm are anomalous, values in the range 90 to 100 ppm are either anomalous or high background, and the values less than 89 ppm are background.

 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH COPPER GEOCHEMISTRY in SOILS of the ANVIL DISTRICT		
Scale _____	Date <u>DEC 1975</u>	NTS <u>1:5K6</u>
Revised _____	By <u>F FOSTER</u>	Fig <u>5</u>

Number of samples = 286
 Anomalous population = 2.0 %
 Background population = 98.0 %
 1st priority pop. threshold = 55 ppm
 2nd priority pop. threshold = 41 ppm
 ○ - probability of values
 △ - partitioned probability

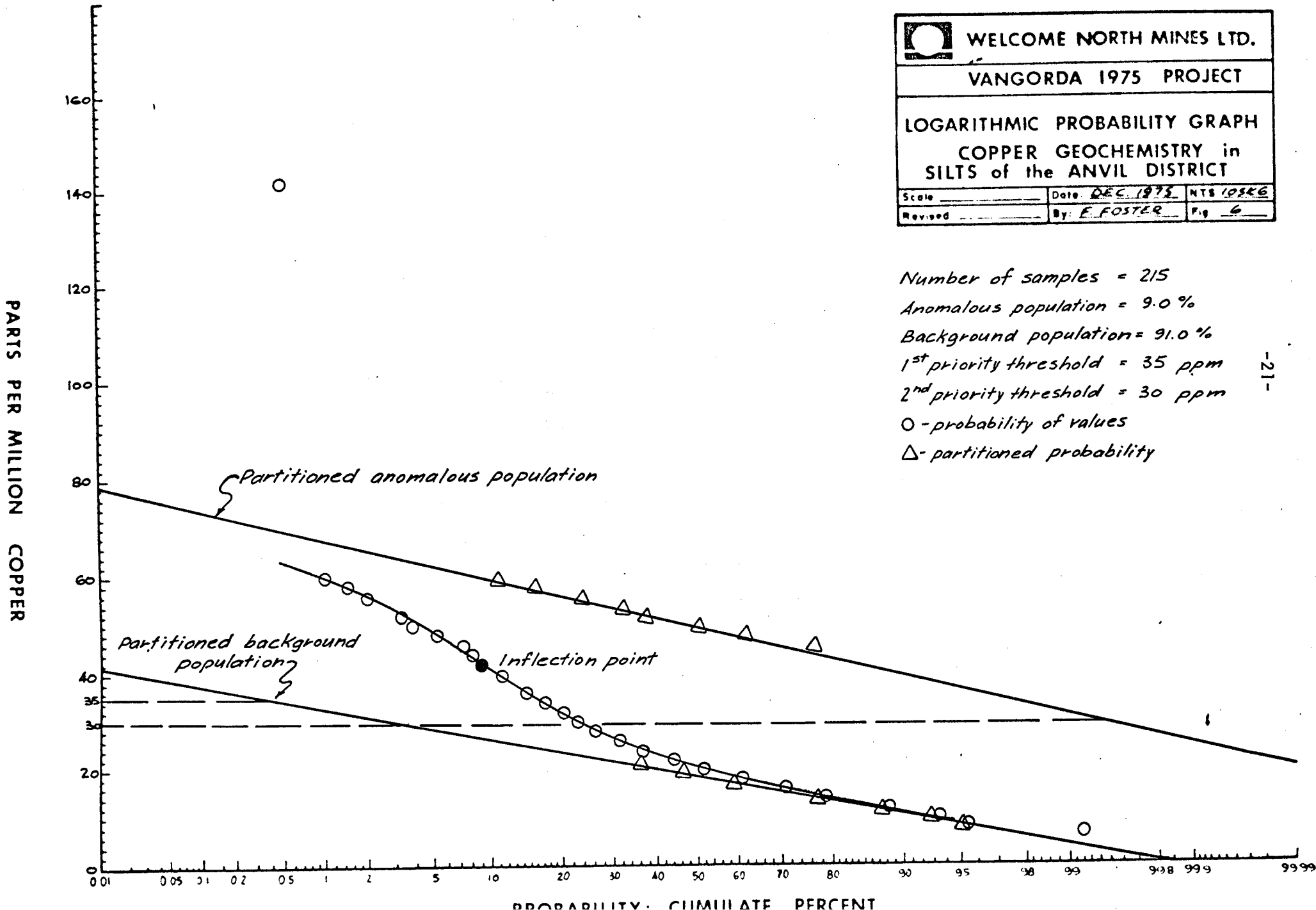
-20-




 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH COPPER GEOCHEMISTRY in SILTS of the ANVIL DISTRICT		
Scale _____	Date <u>DEC. 1975</u>	NTS <u>10SK6</u>
Revised _____	By: <u>E. FOSTER</u>	Fig. <u>6</u>

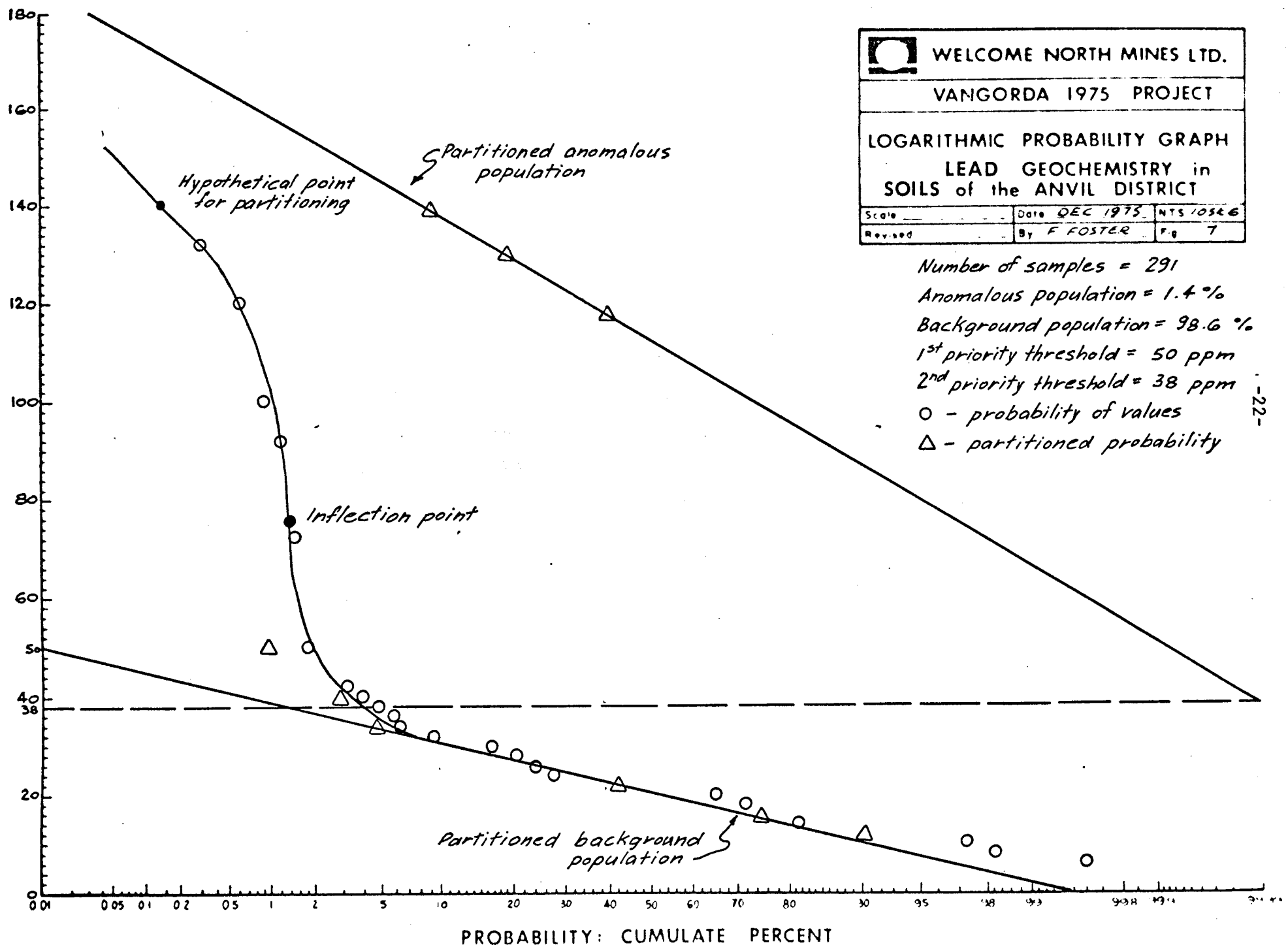
Number of samples = 215
 Anomalous population = 9.0 %
 Background population = 91.0 %
 1st priority threshold = 35 ppm
 2nd priority threshold = 30 ppm
 ○ - probability of values
 △ - partitioned probability

-21-




 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH LEAD GEOCHEMISTRY in SOILS of the ANVIL DISTRICT		
Scale	Date DEC 1975	NTS 10546
Revised	By F FOSTER	Pg 7

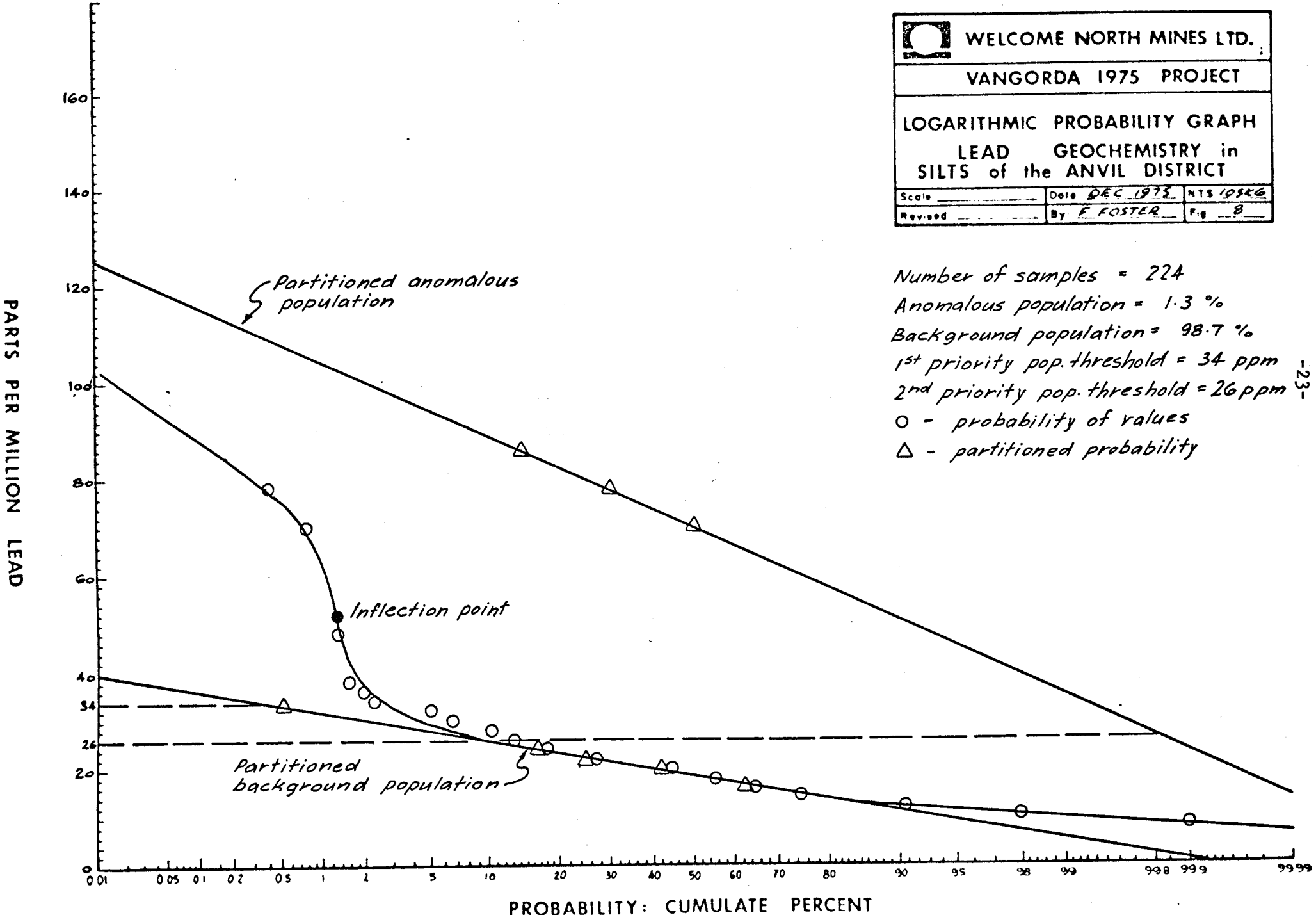
Number of samples = 291
 Anomalous population = 1.4 %
 Background population = 98.6 %
 1st priority threshold = 50 ppm
 2nd priority threshold = 38 ppm
 ○ - probability of values
 △ - partitioned probability



PARTS PER MILLION LEAD

PROBABILITY: CUMULATE PERCENT

 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH LEAD GEOCHEMISTRY in SILTS of the ANVIL DISTRICT		
Scale _____	Date <u>DEC. 1975</u>	NTS <u>1:50K6</u>
Revised _____	By <u>F. FOSTER</u>	Fig. <u>8</u>



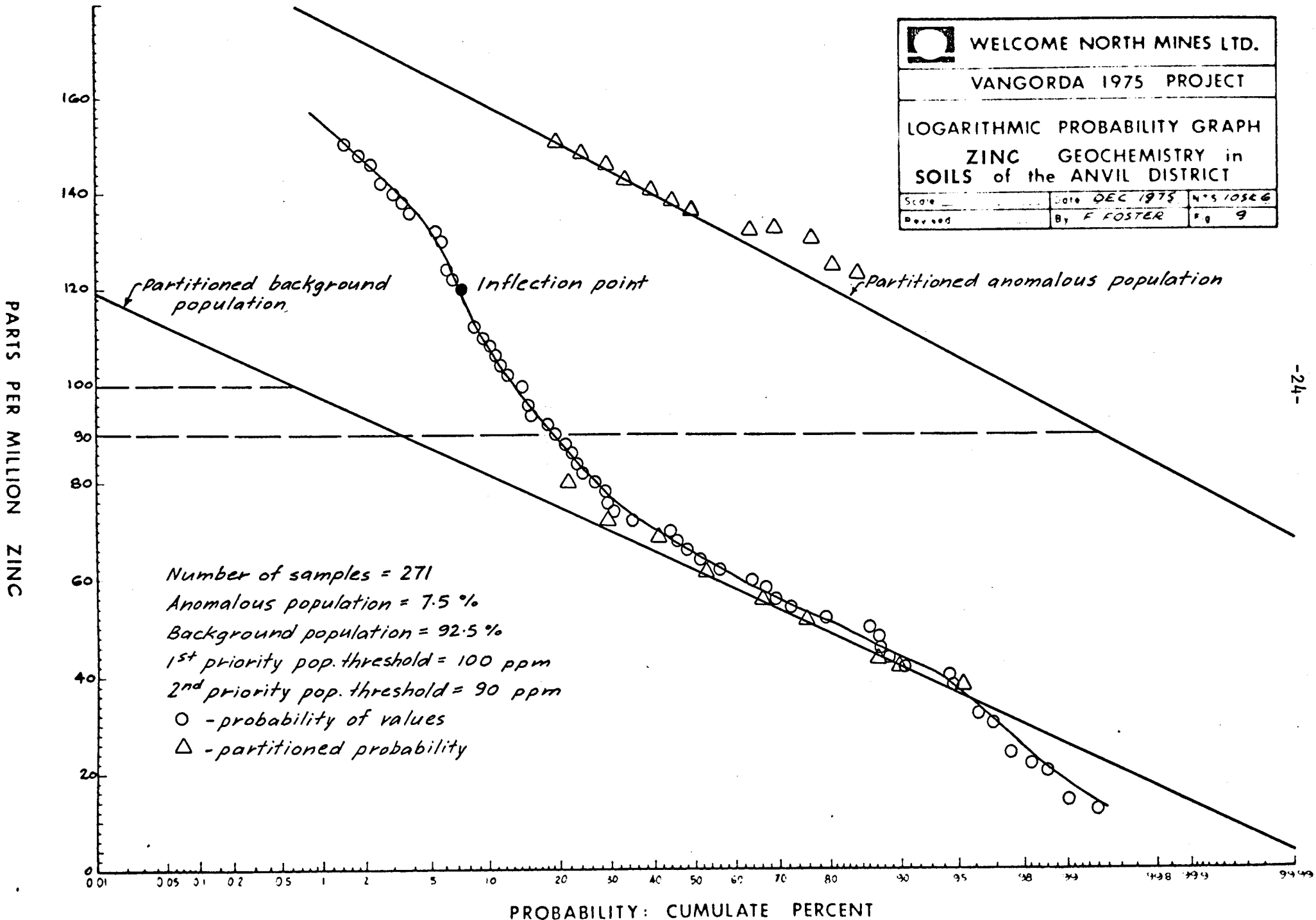


WELCOME NORTH MINES LTD.

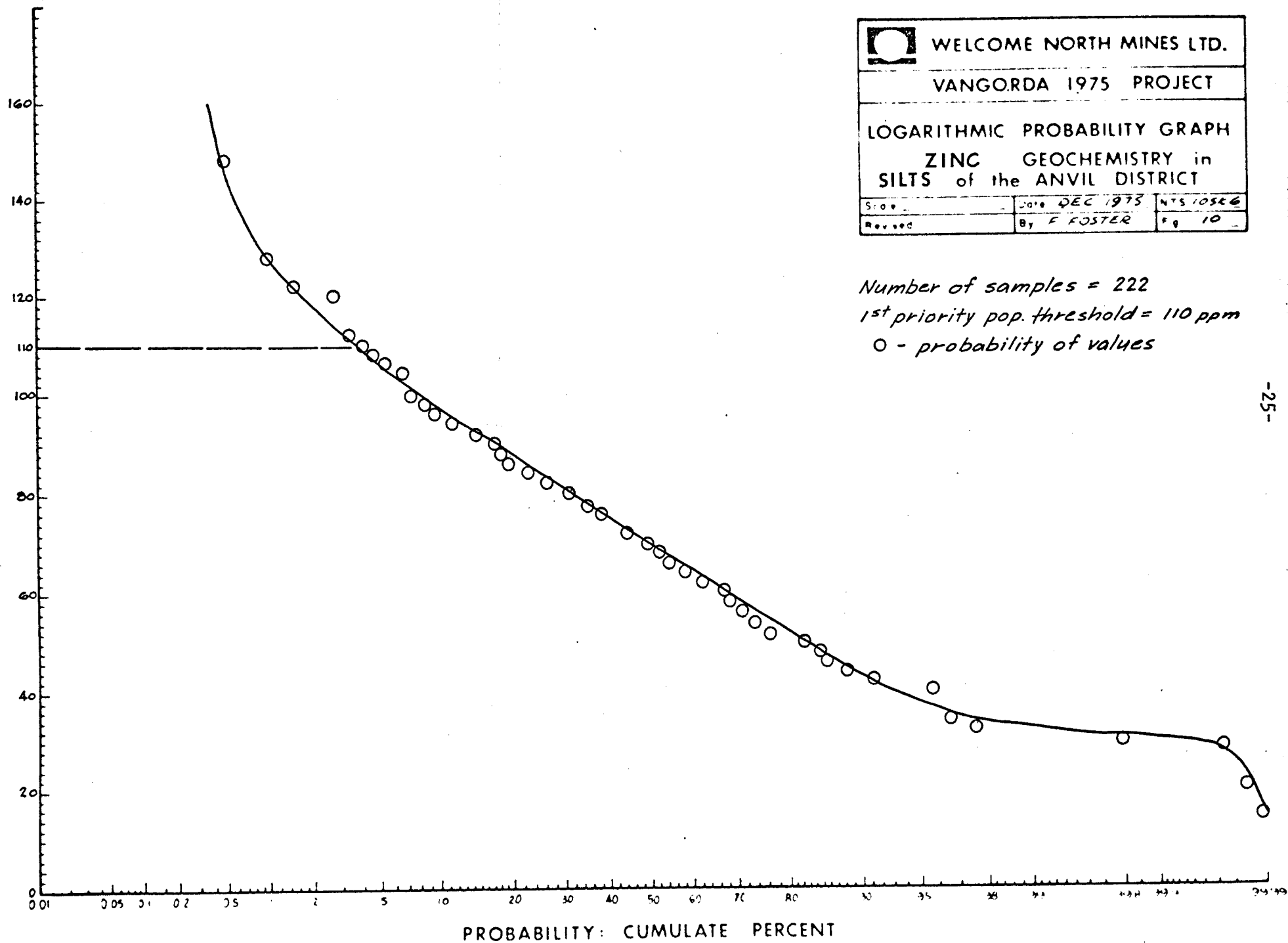
VANGORDA 1975 PROJECT

LOGARITHMIC PROBABILITY GRAPH
ZINC GEOCHEMISTRY in
SOILS of the ANVIL DISTRICT

Scale	Date DEC 1975	N°S 10546
Revised	By F FOSTER	Fig 9



PARTS PER MILLION ZINC



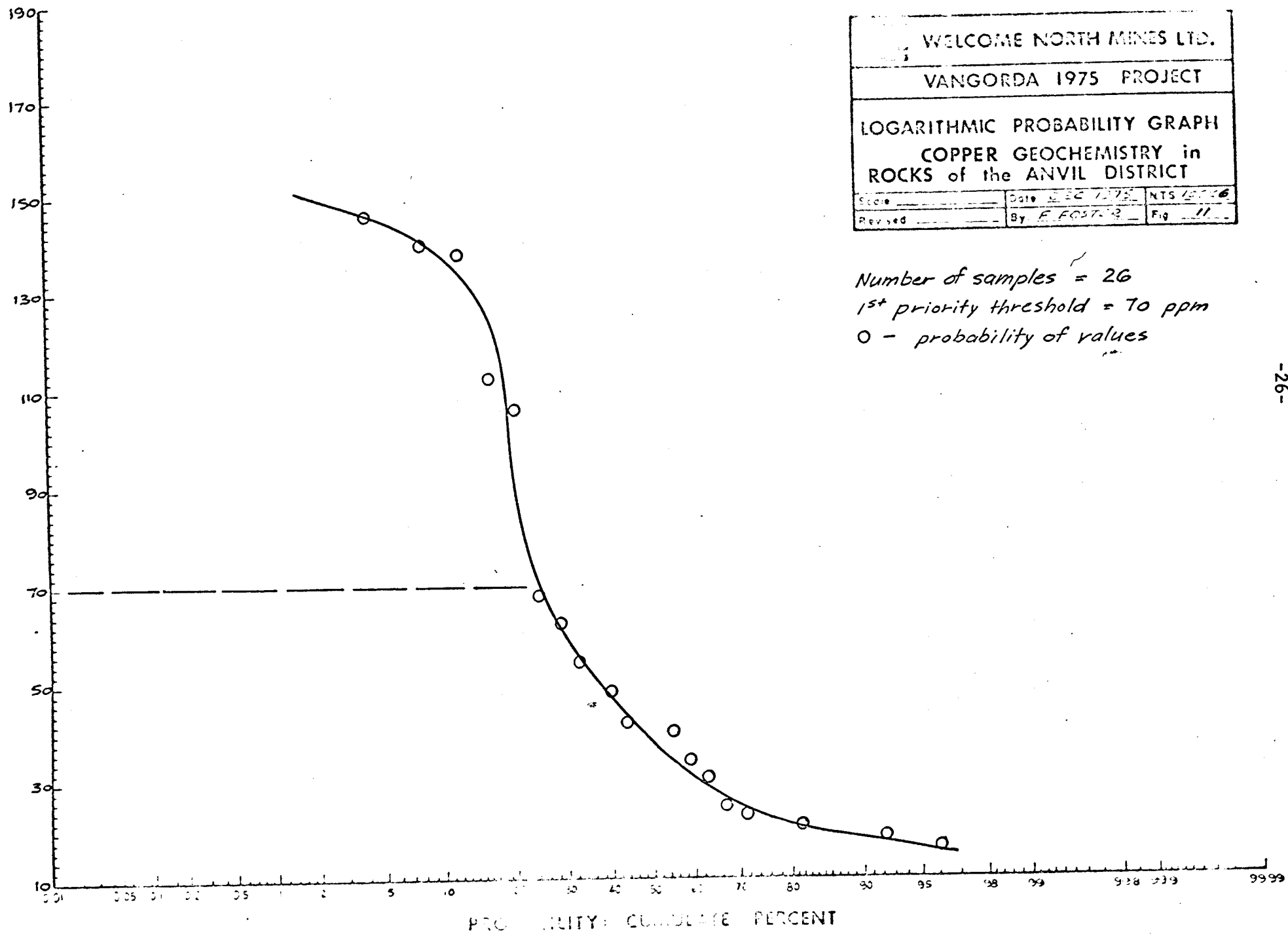
WELCOME NORTH MINES LTD.

VANGORDA 1975 PROJECT

LOGARITHMIC PROBABILITY GRAPH
ZINC GEOCHEMISTRY in
SILTS of the ANVIL DISTRICT


Date	DEC 1975	NTS 10526
Revised	By F FOSTER	Fig 10

Number of samples = 222
1st priority pop. threshold = 110 ppm
O - probability of values

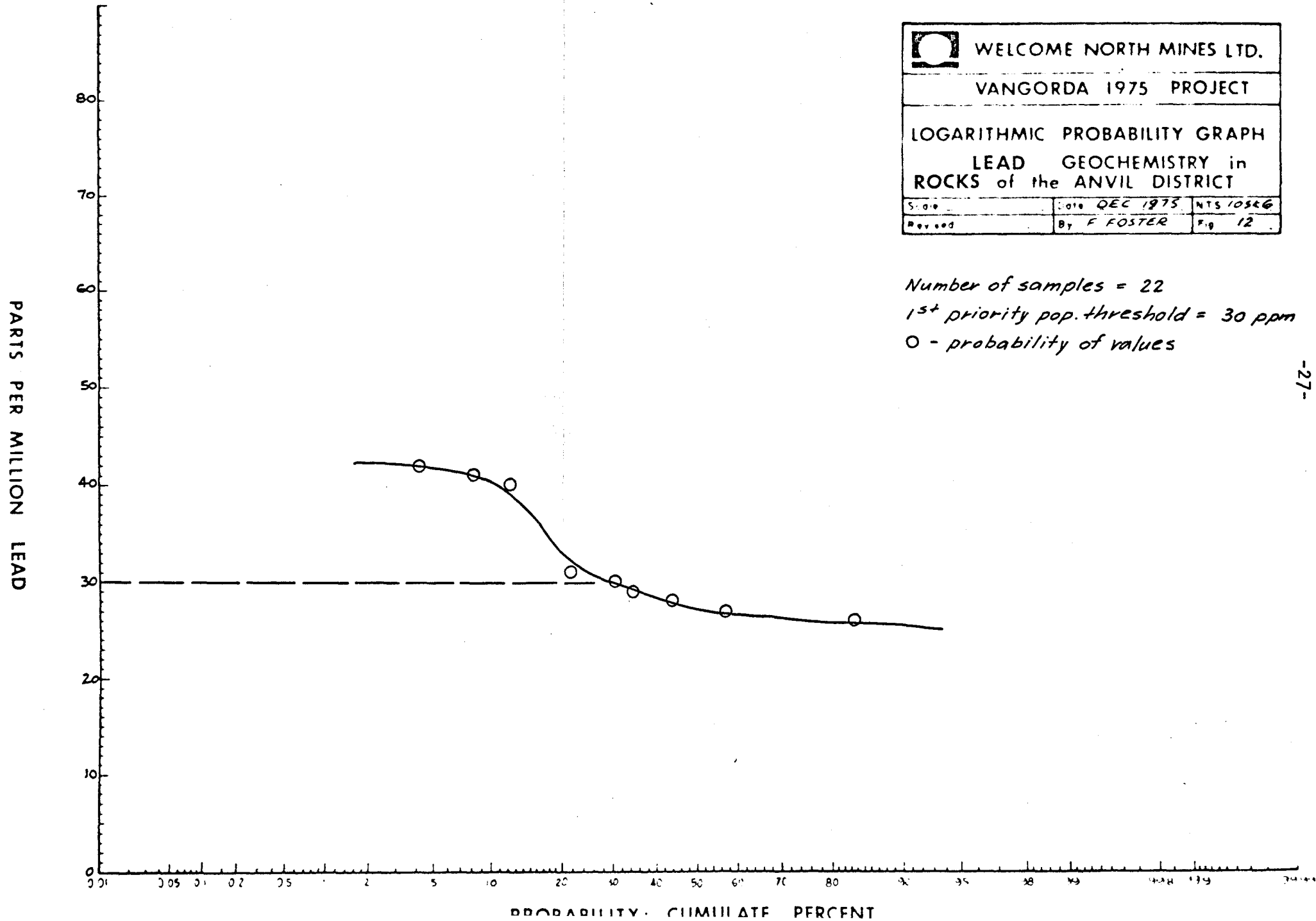



WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH		
COPPER GEOCHEMISTRY in		
ROCKS of the ANVIL DISTRICT		
Scale _____	Date DEC 7, 1975	NTS 1:50,000
Revised _____	By E. FOSTER	Fig 11

Number of samples = 26
 1st priority threshold = 70 ppm
 O - probability of values

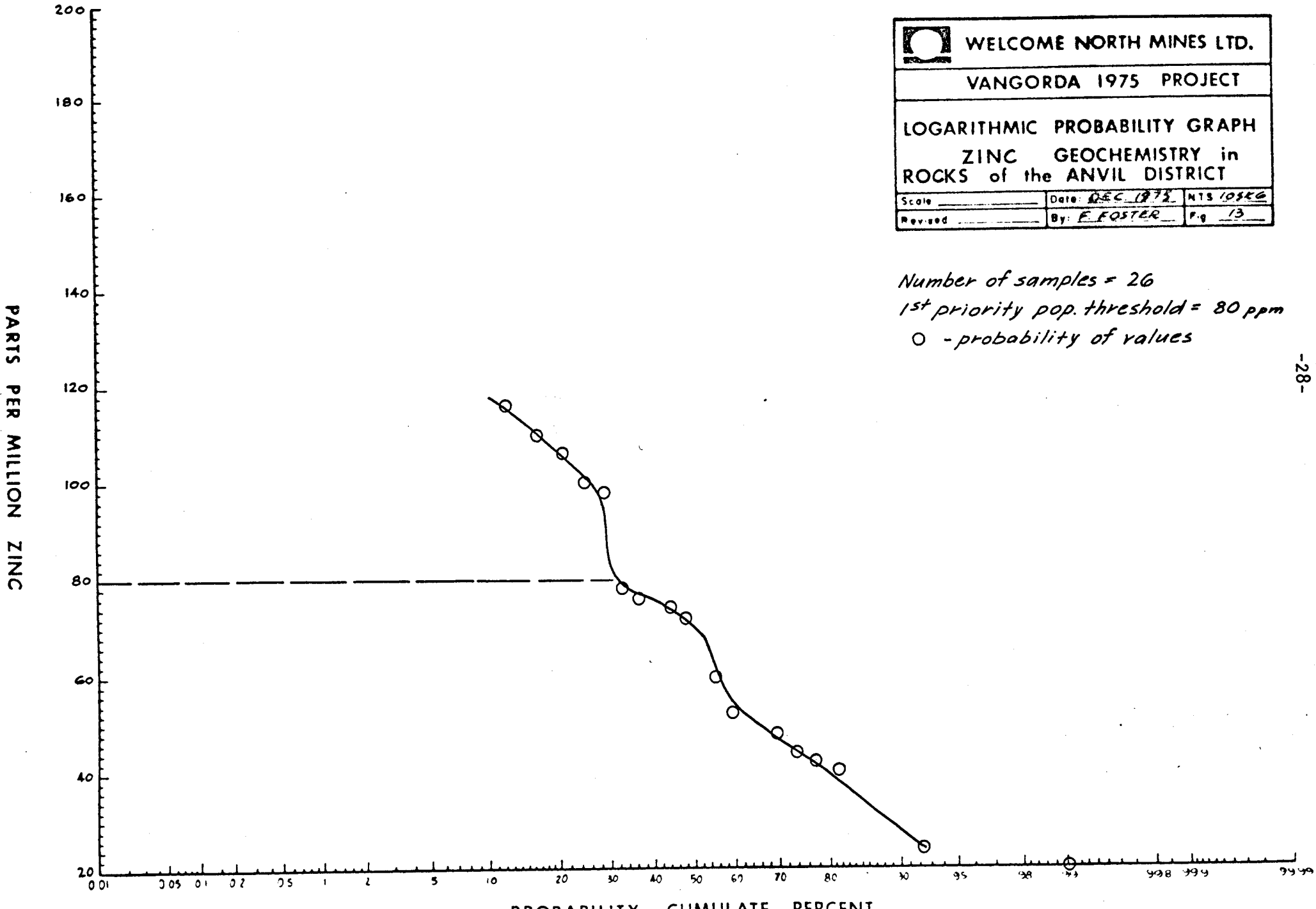
 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH LEAD GEOCHEMISTRY in ROCKS of the ANVIL DISTRICT		
Date DEC 1975	Drawn by F FOSTER	No. NTS 10546 Fig 12

Number of samples = 22
 1st priority pop. threshold = 30 ppm
 O - probability of values



 WELCOME NORTH MINES LTD.		
VANGORDA 1975 PROJECT		
LOGARITHMIC PROBABILITY GRAPH		
ZINC GEOCHEMISTRY in		
ROCKS of the ANVIL DISTRICT		
Scale _____	Date: DEC 1975	NTS 10566
Revised _____	By: E. FOSTER	Pg 13

Number of samples = 26
 1st priority pop. threshold = 80 ppm
 O - probability of values



Examination of the statistical analysis for zinc content in silts (Fig. 10) shows that a major background population exists. The partitioning procedure cannot be applied in this case due to there being such a small percentage of anomalous samples. The configuration of the logarithmic probability plot shown in Fig. 10 suggests that the values greater than the arbitrarily chosen threshold of 110 ppm contain high background values as well as anomalous values. Unfortunately there is insufficient data to distinguish the highest possible background value and all values greater than 110 ppm are thus considered as anomalous.

Insufficient data was collected for a proper statistical analysis of the copper, lead, and zinc content in rocks sampled in the Anvil District, therefore threshold values of 70, 30, and 80 ppm for copper, lead, and zinc, respectively were arbitrarily chosen by visual inspection of the logarithmic probability plots (Fig. 11, 12, and 13).

On the IRENE claims anomalous geochemical expression of copper, lead and zinc is generally poor. However, this is anticipated over most of the property since the area surveyed is covered with deep overburden.

Copper

Copper appears to be concentrated in anomalous quantities within two major areas on the property.

The first area is located over what is believed to be phyllite of Unit (3a) between lines 56E and 72E from 21N to 30N. Within this zone, sidehill seeps and soil samples yielded moderately to weakly anomalous values in copper (max. 66 ppm Cu in silts, Max. 118 ppm Cu in soils).

The second area is located over phyllites of Unit (3a) containing a small (10 feet thick) lens of andesitic greenstone [Unit (3c)] between lines 104E and 112E from 18N to 26N. In this zone, a great deal of sidehill frost boiling and slumping prevails, soil samples and silt samples taken from these slumps and frost boils yielded moderately anomalous values of copper (80 ppm Cu in soils and 56 ppm Cu in silts).

Elsewhere on the property isolated, moderately anomalous values of copper were obtained at:

- a) grid location 14E-17S
- b) station 32E-10S
- c) grid location 97E-22N

These samples are all believed to be derived over phyllites of Unit (3a).

Lead

Lead geochemical response is very poor on the property. Weakly anomalous values were obtained over areas previously outlined as being anomalous in copper:

- a) location: area bounded by lines 32E and 48E from 8S to 10S
anomaly: sidehill seepages yielding up to 34 ppm lead
- b) location: area bounded by lines 64E and 72E from 26N to 28N
anomaly: sidehill seepages yielding up to 34 ppm lead
- c) location: area bounded by lines 104E and 112E from 19N to 24N
anomaly: several rock chips yielding 32 ppm lead

All these areas are located over what is believed to be phyllites of Unit (3a).

Zinc

Zinc geochemical response on the property is moderately strong in three major areas, the first two of which are previously outlined as being anomalous in copper and lead. These three areas as well as other weakly anomalous areas which are located over areas previously determined as anomalous in copper are as listed below:

- a) location: area bounded by lines 24E and 48E from 9S to 11S
anomaly: sidehill seepages yielding up to 120 ppm zinc and a soil sample yielding 110 ppm zinc.

- b) location: area bounded by lines 96E and 112E from 17N to 27N
anomaly: rock chips yielding up to 106 ppm zinc, frost boils yielding up to 110 ppm zinc, and sidehill seepages yielding up to 92 ppm zinc.
- c) location: area bounded by lines 56E and 64E from 0S to 7S
anomaly: silt samples from streams yielding 136 ppm zinc and a soil sample yielding 108 ppm zinc.
- d) location: area bounded by lines 64E and 72E from 24N to 28N
anomaly: sidehill seepage yielding 108 ppm zinc and soil sample yielding 110 ppm zinc.
- e) location: 300 feet east of station 8E-21S
anomaly: sidehill seepage yielding 120 ppm zinc.

All the above-mentioned areas with the exception of the last area [location (e)], located over Unit (1c), are situated over phyllites of Unit (3a) which are exposed as outcrop only in the north-east corner of the property and to the east outside the claim group boundary.

GEOPHYSICAL SURVEYS

The geophysical surveys were carried out on a contract basis by geophysical crews of Peter E. Walcott and Associates Ltd. hired out of Vancouver, B.C.

1. Instruments Used

For the magnetometer survey, a McPhar M700 fluxgate magnetometer was used. The instrument is hand-held and measures the vertical magnetic component by use of an oil-dampened fluxgate which automatically levels itself in the direction of the vertical field. The magnetometer is of light weight and a direct read-out of gamma values can be obtained quickly.

The electromagnetic survey was carried out with a Crone CEM dual frequency unit. The Crone is of the inductive type and may be used either as a horizontal or vertical loop apparatus. Measurements are made of the resultant dip angle of the field and the width of null or out of phase component. It is designed to be operated with a maximum coil spread of 600 feet on frequencies of 390 and 1830 cycles per second with no inter-connecting cables. The effective depth penetration is 300 feet for a horizontal conductor with maximum coil spread (no skin effect allowance) and 100 feet for a vertical conductor. The effective lateral coverage is a direct function of the spread under ideal conditions. The equipment was chosen in order to give reliable information on the attitude and configuration of a conductor, the physical properties of the host rock, dimensions of the conductor, and results free from error due to topographic relief.

2. Method of Survey

a) Magnetometer Survey

Prior to the actual magnetometer survey, readings were taken along the central base line at cross line intersection points. These stations were looped and re-read every hour as a means of controlling drift and diurnal variations. With base stations of an established value serving as a means of controlling drift and diurnal variations, a rapid and

precise check was kept on magnetic variations and the entire survey was thus kept on a relative basis during day to day operation. Each cross line was read with re-checks at the base station within every hour, this method provided an internal control for detecting diurnal and drift variations. The survey was done by one operator using the same instrument.

b) Electromagnetic Survey

All surveys were run with horizontal loop configuration and 300 foot coil spacing in order that highest response could be obtained from flat lying sulphide bodies. Readings at 1830 cps were taken at each station. The coil configuration was not adaptable to conditions of conductive overburden and maximum response from such was expected. All traverses were made by the "in line method" and done over the same grid as used for the magnetometer surveys. In some cases a lower frequency (390 cps) was adopted for better resolution of conductors, within areas of more specific interest. The two-man EM crew did all their ground work in coincidence with the magnetometer crew.

3. Treatment of Data

a) Magnetic Results

Magnetic results were corrected in the field for diurnal and drift variations by the field operator. The final gamma values were then plotted on a grid plan using scale of 400 feet to 1 inch. This data was presented to the party chief who profiled and contoured the data on overlay material in order that he could remain familiar with day to day results and progress of the survey, direct its course, and have results available for the project geologist when he carried out geochemical surveys and geological mapping on the property. Magnetic data is presented in this report on a map of 1" = 400' scale showing gamma values and contoured results (see Appendix). The map shows major drainage features and locations of mineral claim posts.

b) Electromagnetic Results

All results as derived in the field were plotted each night by the EM operators on a grid plan using a scale of 1" = 400'. Results were presented to the party chief for inspection, profiling and preliminary contouring in order that this data be compared with the magnetometer survey and the results be available to the project geologist when he carried out geochemical and geological surveys on the property. Final plotting was done on maps of 1" = 400' scale similar to that used for the magnetic map. Electromagnetic data is presented in this report showing values profiled and contoured.

Interpretation of Results

a) Magnetometer Survey

Results from the magnetic survey carried out over the claim group show the area to exhibit a fairly uniform magnetic response above which small strong local anomalies and lower, broader highs are discernible (Plate W-202-1).

One very local, isolated magnetic high (300 γ) occurs at station 96E-22S and is attributed to some irregularity along the contact between the Anvil Batholith, Unit (11) and Unit (1c) over which the anomaly lies.

Although no significant anomalies exist on the property, close study of the magnetic profiles in conjunction with the electromagnetic profiles reveals that there is a definite correlation between the fine details of the profiles of the dip-angle response and the magnetic response.

b) Electromagnetic Survey

The electromagnetic survey shows the presence of essentially four complex conductive zones, A, B, C, and D (Plate W-202-2) striking northwesterly across the eastern portion of the property. These zones

exhibit poor to moderate conductivity and most probably represent graphitic horizons which are host to the massive sulphide deposits contained within both Units (1c) and (3a) elsewhere in the Anvil district.

Fairly steep northward and southward dips for individual conductors are indicated by the profile shapes (Plate W-202-3), however, profile shape is probably influenced by the proximity of conductor axes as mostly northward dips are expected in the area.

The higher more erratic dip-angle readings obtained from line 0 westwards are believed to be due to conductive overburden in a broad swampy valley.

Anomaly A, a pronounced negative dip-angle response of east-west trend which appears to indicate two closely spaced conductors, one being north of the other, is situated between 48E and 96E, its most northern limits, 200 feet south of the baseline. The maximum dimensions of this anomaly are 4800 feet X 1200 feet. The anomaly is most likely due to graphitic horizons contained in the underlying biotite-muscovite schists of Unit (1c), further supported by I.P. conductive zones on strike to the east delineated in a previous survey by Spartan Explorations Ltd.

Anomaly B, another pronounced negative dip-angle response of east-west trend and open to the east, is located between lines 96E and 112E, its northern limits being 1000 feet south of the baseline and its dimensions 2000+ feet X 800 feet. This anomaly could well be an extension of Anomaly A and again is interpreted as representing graphitic horizons within the biotite-muscovite schist Unit (1c).

Anomaly C, a narrow, weak conductor located along the northern limits of the property over the contact between Unit (3a) and Unit (8b), is approximately 6000 feet long in an east-west direction and open to the north. The Anvil Range volcanics, Unit (8b), contain significant amounts of pyrite which may be the source of the negative dip-angle response. However it should be noted that the only line of the EM survey which actually extends over the volcanics to any great extent, line 72E, does

not necessarily extend this anomaly. Thus, the underlying phyllites of Unit (3a) cannot be ruled out as a source for this conductor. Further support for the source of the conductor lying in Unit (3a) is given by a weak conductor, 1600 feet X 800 feet and elongate in an east-west direction, which is located over Unit (3a) in the area bounded by lines 56E and 72E from 17N to 24N. This conductor may, indeed, be an extension of Anomaly C.

Anomaly D, another weak, east-west trending conductor located over phyllites of Unit (3a) in the area bounded by lines 96E and 112E from 8N to 30N, is on strike with an I.P. conductor lying to the east. The source of the conductor for the I.P. anomaly has been previously suggested as graphitic phyllites in Unit (3a) and it is believed that these would also be the source of Anomaly D.

RECOMMENDATIONS

Based on the delineation of four moderate electromagnetic conductors and three areas of weak geochemical response within a favourable geological environment several lines of gravity survey are recommended along with further detailed geochemical evaluation and diamond drilling contingent upon the results obtained from these surveys.

The gravity survey should include the following lines with further "fill in" gravity work being contingent upon the results obtained:

Line 32E from 20S to 30N

Line 64E from 20S to 30N

Line 80E from 20S to 28N (contingent on topographic complications)

Line 104E from 20S to 28N (contingent on topographic complications)

The geochemical survey should consist of further sampling in areas of geophysical interest and previous geochemical anomalies. Topography and depth of overburden should be considered and sample locations chosen accordingly.

Diamond drill hole locations should be contingent on results obtained from the gravity survey and the geochemical survey in conjunction with presently compiled data.

BIBLIOGRAPHY

Archer, Cathro & Associates Ltd., Northern Cordillera Mineral Inventory: Yukon and Northwest Territories, 1975.

Dept. of Indian and Northern Affairs; Mineral Industry Reports, 1965 to 1973.

Sinclair, A.J., Selection of Threshold Values in Geochemical Data Using Probability Graphs: Journal of Geochemical Exploration, V.3, p. 129-149, 1974.

Templeman-Kluit, D.J.; Geology and Origin of the Faro, Vangorda and Swim Concordant Zinc-Lead Deposits, Central Yukon Territory: Geological Survey of Canada Bulletin 208, 1972.

Map: Dynasty Exploration Ltd., Anvil District, 105K, Airborne Magnetometer Survey, scale 1" = 1 mile, Lockwood Survey Corp., 1965.

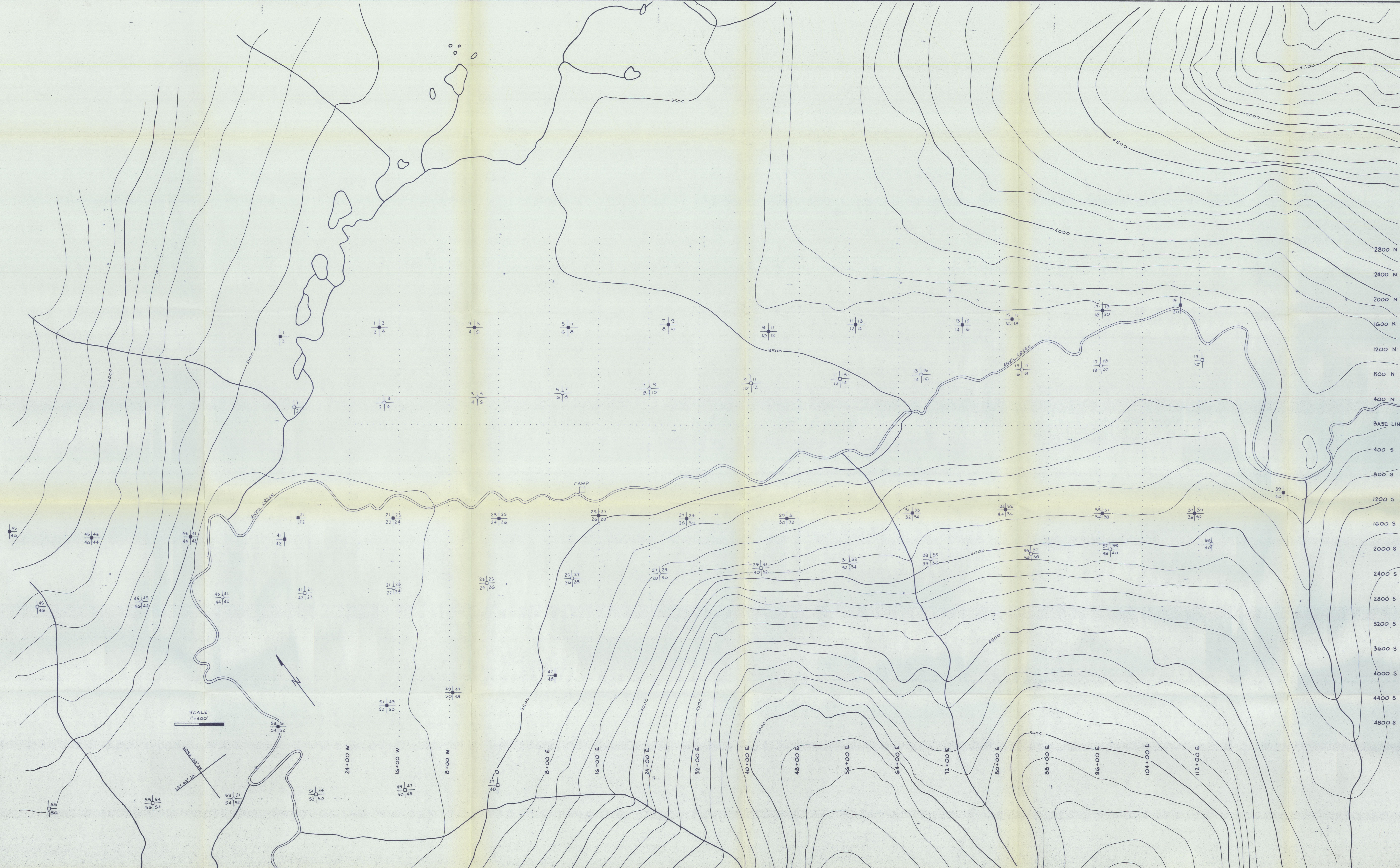
Map: Dynasty Exploration Ltd., Anvil District, 105K, Airborne Electromagnetic Survey, Lockwood Survey Corp., 1965.

Spartan Explorations Ltd., TRY Claims, 105K-6, Induced Polarization and Resistivity Survey, 4 maps, scale 1 inch = 400 feet, M.A. Goudie and P.G. Hallof, 1971.

Swim Lake Mines Ltd., SCOTT Claims, 105K-6, Geological, Geochemical, and Geophysical Report, 8 maps, J.S. Brock, 1966.

Swim Lake Mines Ltd., SCOTT Claims, 105K-6, Geophysical and Geological Report, 3 maps, H. Wober, 1966.

Welcome North Mines Ltd., 105K, Magnetic and Electromagnetic Surveys, 15 maps, Scale 1 in. = 400 ft., P.E. Walcott, 1975.

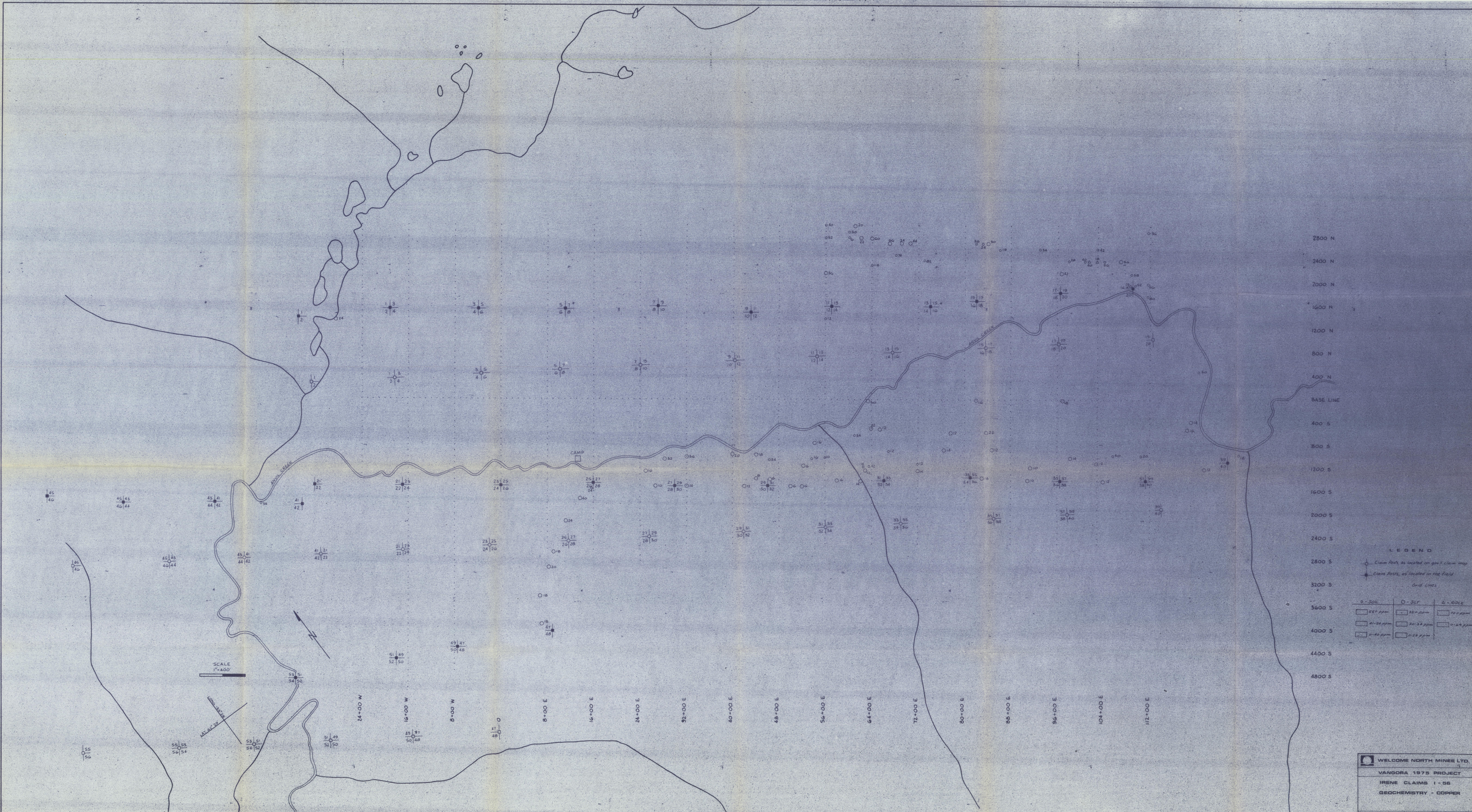


SCALE
1"=400'

1/4"=100'
1/8"=50'

LEGEND
 □ Claim Posts, as located on gov't claim map
 ● Claim Posts, as located in the field
 Grid Lines

WELCOME NORTH MINES LTD.
VANGORA 1975 PROJECT
IRENE CLAIMS 1-58
GRID LOCATION MAP
 Scale 1/4"=100' Date AUGUST 1976 NTS JOB# 6
 Revised By: E. FOSTER Page 1

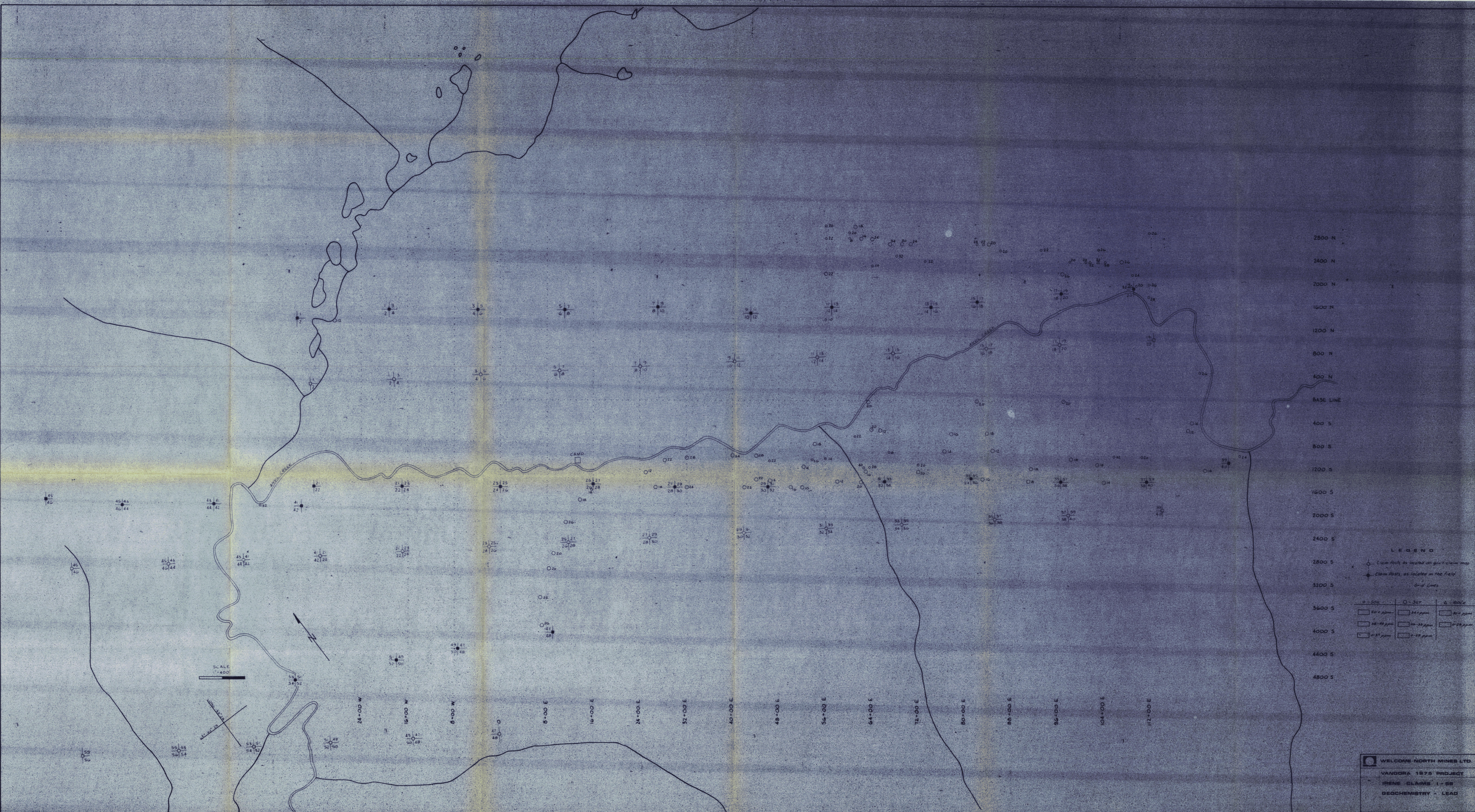


LEGEND
 ◊ Claim Posts, as located on gov't claim map
 ◻ Claim Posts, as located in the field
 --- Grid Lines

0 - 500	0 - 500	Δ - 600
35-40 ppm	35-40 ppm	70-75 ppm
40-50 ppm	30-35 ppm	0-20 ppm
0-40 ppm	0-20 ppm	

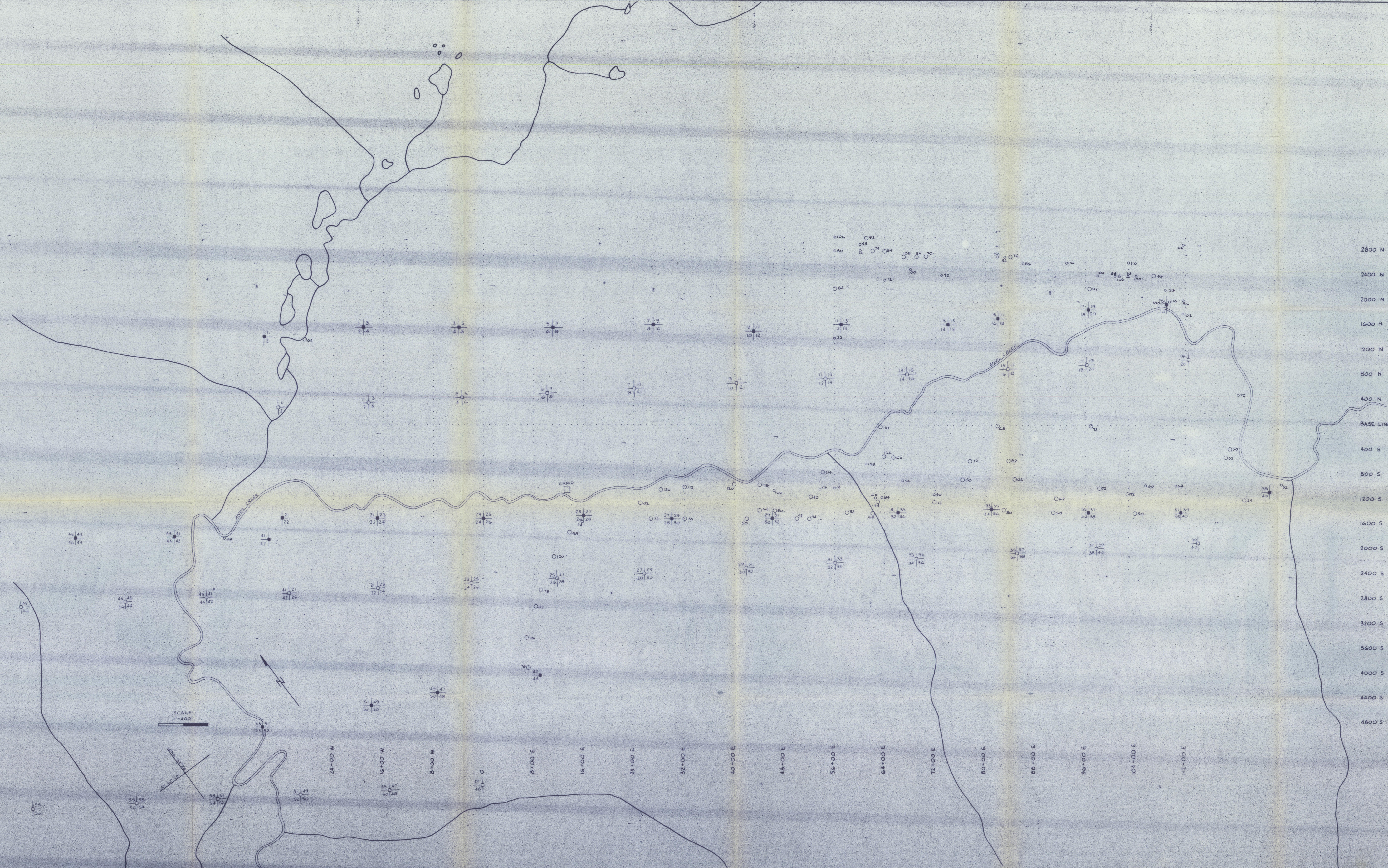
WELCOME NORTH MINES LTD.
 VANGORA 1975 PROJECT
 IRENE CLAIMS 1-56
 GEOCHEMISTRY - COPPER

Scale: 1:40000 Date: 10/25/75 NTS: 108-636
 Project: V. 1-56/75-76 Date: 10/25/75



LEGEND
 ○ Claim Posts, as located on grant claim map
 ● Claim Posts, as located in the field
 --- Grid Lines

0 - 300'		0 - 300'		0 - 300'	
□ 50+ ppm	□ 34+ ppm	□ 40+ ppm	□ 28-33 ppm	□ 20-25 ppm	□ 0-25 ppm



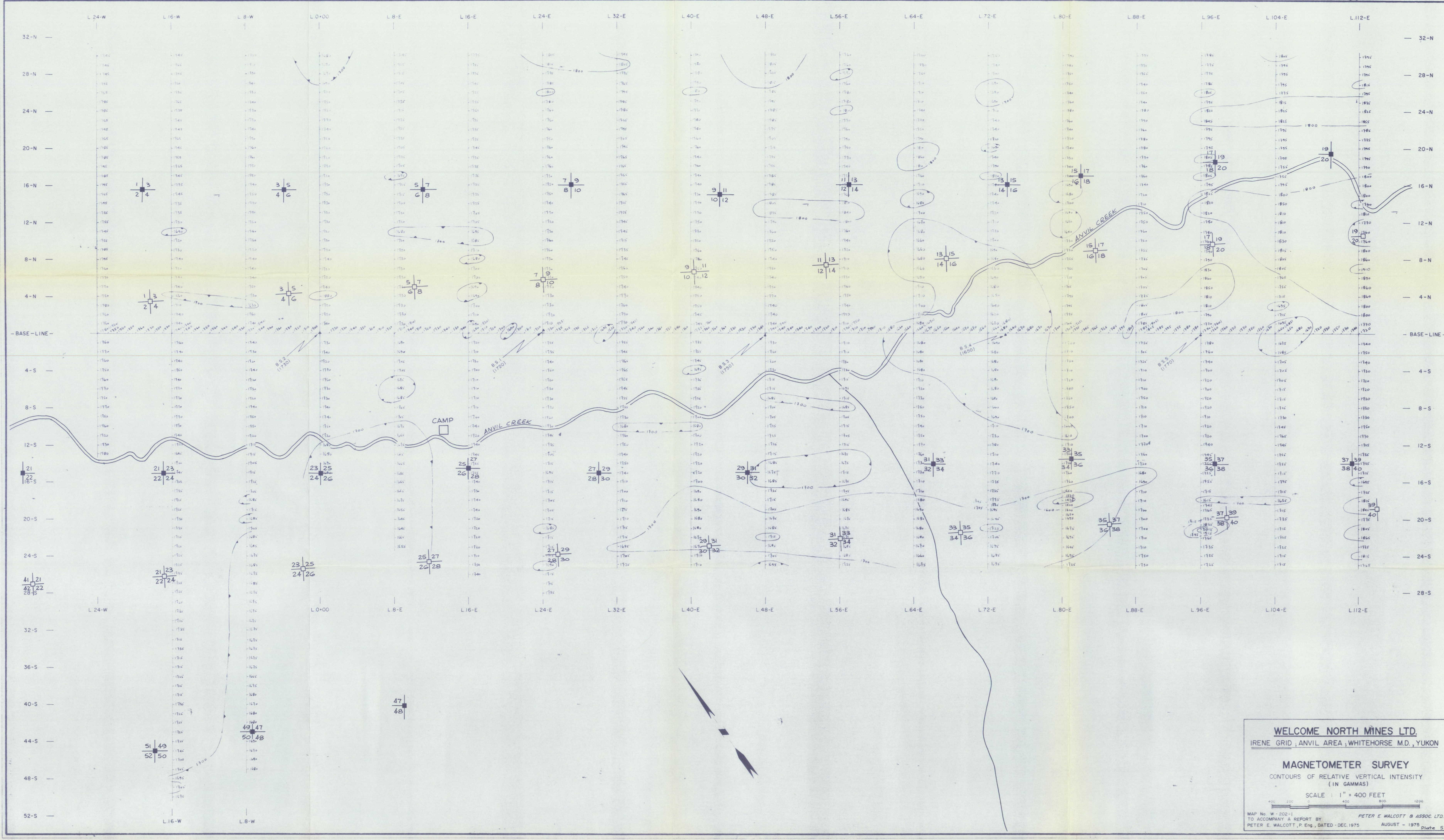
2800 N
 2400 N
 2000 N
 1600 N
 1200 N
 800 N
 400 N
 BASE LINE
 400 S
 800 S
 1200 S
 1600 S
 2000 S
 2400 S
 2800 S
 3200 S
 3600 S
 4000 S
 4400 S
 4800 S

LEGEND
 ○ Claim Posts, as located on gov't claim map
 ● Claim Posts, as located in the field
 --- Grid Lines

0 - 50% S&T	0 - 50% S&T	Δ - ROCK
□ 100+ ppm	□ 110+ ppm	□ 80+ ppm
□ 90-99 ppm	□ 0-109 ppm	□ 0-79 ppm
□ 0-89 ppm		

SCALE 1:400

W 07° 50'

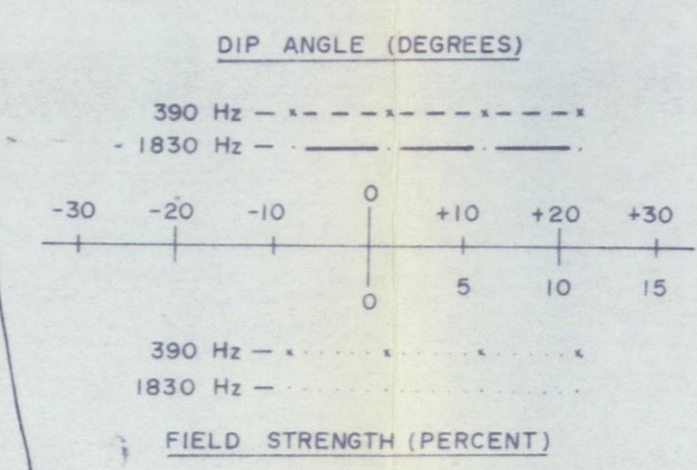
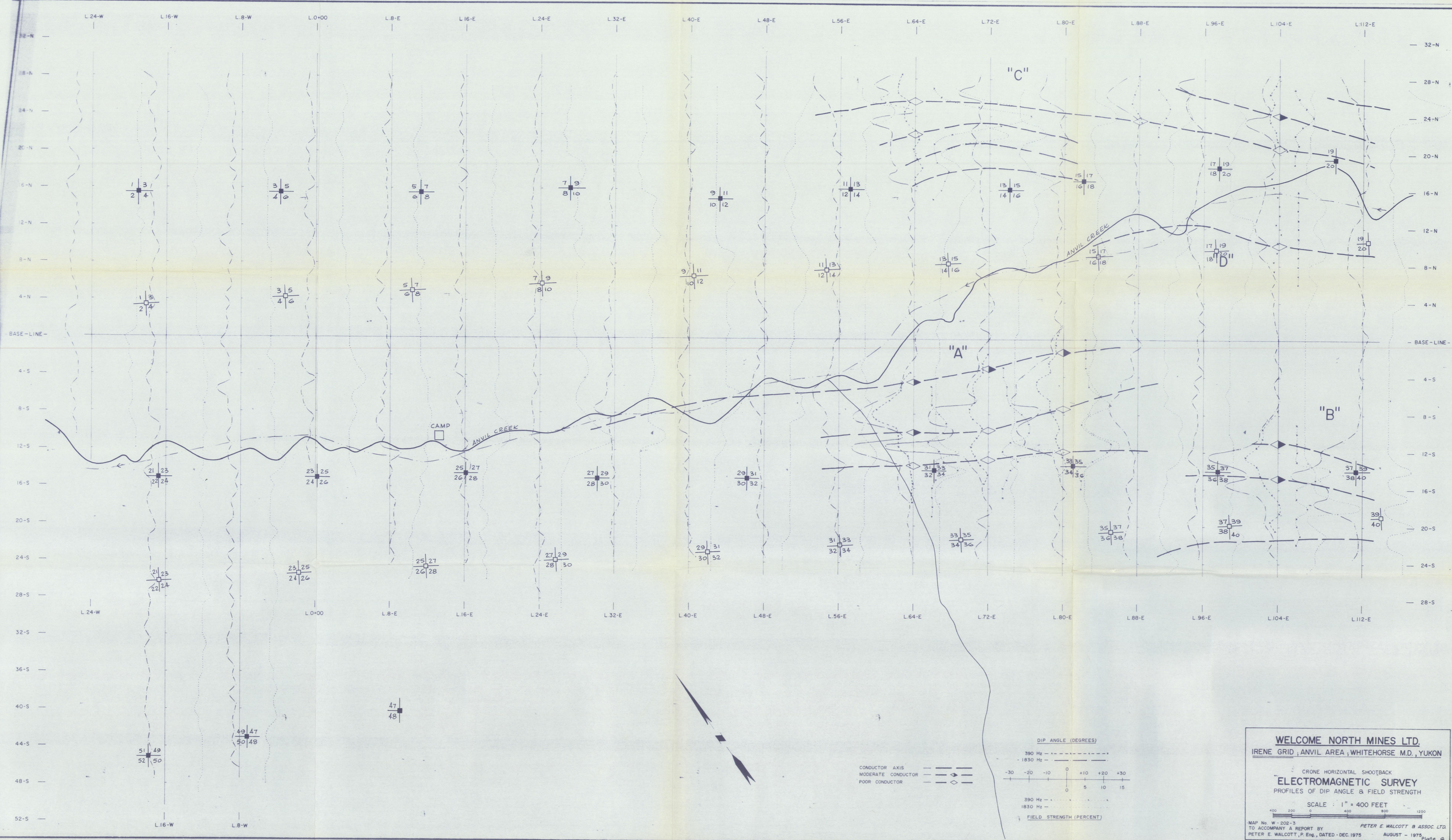


WELCOME NORTH MINES LTD.
 IRENE GRID, ANVIL AREA, WHITEHORSE M.D., YUKON

MAGNETOMETER SURVEY
 CONTOURS OF RELATIVE VERTICAL INTENSITY
 (IN GAMMAS)

SCALE : 1" = 400 FEET

MAP No. W-202-1
 TO ACCOMPANY A REPORT BY PETER E. WALCOTT & ASSOC. LTD.
 PETER E. WALCOTT, P. Eng., DATED - DEC. 1975
 AUGUST - 1975 Plate 5



CONDUCTOR AXIS
 MODERATE CONDUCTOR
 POOR CONDUCTOR

WELCOME NORTH MINES LTD.
 IRENE GRID; ANVIL AREA; WHITEHORSE M.D., YUKON

CRONE HORIZONTAL SHOOTBACK
ELECTROMAGNETIC SURVEY
 PROFILES OF DIP ANGLE & FIELD STRENGTH

SCALE: 1" = 400 FEET

MAP No. W-202-3
 TO ACCOMPANY A REPORT BY
 PETER E. WALCOTT, P. Eng., DATED - DEC. 1975

PETER E. WALCOTT & ASSOC. LTD.
 AUGUST - 1975



WELCOME NORTH MINES LTD.
 IRENE GRID; ANVIL AREA; WHITEHORSE M.D., YUKON

CRONE HORIZONTAL SHOOTBACK
ELECTROMAGNETIC SURVEY
 CONTOURS OF DIP ANGLE

SCALE : 1" = 400 FEET

COIL SEPARATION - 300 FEET
 FREQUENCY - 1830 Hz

MAP No. W-202-2
 TO ACCOMPANY A REPORT BY
 PETER E. WALCOTT, P. Eng., DATED - DEC. 1975

PETER E. WALCOTT & ASSOC. LTD.
 AUGUST - 1975 Plate 7



LEGEND

2800 N	MUSCOVIC	11	Cretaceous Alupytic biotite-quartz muscovite and granodiorite, muscovite-biotite granodiorite, diabase dykes
2400 N		8b	Massive green basalt (columnar), amygdaloidal, includes common pyroclastic & less common pillowed varieties, metamorphosed equivalents near granitic bodies
2000 N	PALEOZOIC	3a	Ondevician-Silurian Dark grey biotite-kyanite schist and phyllite
1600 N		1c	Muscovite-biotite schist, muscovite andalusite- biotite schist & garnet and staurolite
1200 N			
800 N			
400 N			Geological boundary (defined approx, gradational, assumed)
BASE LINE			First foliation (S ₁)
			Second foliation (S ₂)
400 S			Third foliation (S ₃)
			Lineation
800 S			Main fold axis related to S ₂
			Joints (inclined vertical)
1200 S			Fault (defined approx, assumed)
			Anticline (approx, assumed)
			Arrow indicates direction of plunge
1600 S			Syncline (approx, assumed)
			Arrow indicates direction of plunge
2000 S			Adelcline, Syncline overturned
			Outcrop
			Subcrop
2400 S			C&M Conductor
2800 S			Claim Posts, as located on gov't claim map
			Claim Posts, as located in the field
3200 S			Grid Lines
			○ - Soil Cu = 41 ppm, Pb = 38 ppm, Zn = 901 ppm
3600 S			○ - Soil Cu = 30 ppm, Pb = 26 ppm, Zn = 110 ppm
			△ - Rock Cu = 70 ppm, Pb = 29 ppm, Zn = 80 ppm
4000 S			
4400 S			
4800 S			

SCALE
1"=400'