MAP NO.: 105 M/15,16 106 D/1,2

**ASSESSMENT REPORT** X
**PROSPECTUS**
**CONFIDENTIAL** X
**OPEN FILE**

**DOCUMENT NO:** 092915
**MINING DISTRICT:** Mayo
**TYPE OF WORK:** Diamond drilling,trenching

**REPORT FILED UNDER:** Marg Joint Venture (NDU Resources Ltd./Cameco)

**DATE PERFORMED:** May 26 to September 7, 1990

**DATE FILED:** January 2, 1991

**LOCATION:** **LAT.:** 64° 01'N

**LONG.:** 134° 28'W

**AREA:** Patterson Range

**VALUE $:** 850 000

**CLAIM NAME & NO.:**

| | |
|---|---|
| MARG 1-144 | YB 02385 - YB 02528 |
| MARG 145-178 | YB 02580 - YB 02613 |
| MARG 179-190 | YB 02944 - YB 92955 |
| MARG 191-290 | YB 03107 - YB 03206 |
| MARG 291-370 | YB 03606 - YB 03685 |
| TUDL 1-32 | YA 76768 - YA 76799 |

**WORK DONE BY:** Archer, Cathro and Associates (1981) Ltd.

**WORK DONE FOR:** Marg Joint Venture (NDU Resources Ltd./Cameco)

**DATE TO GOOD STANDING:**

**REMARKS:** MINFILE #106D - 09
Nine diamond drill holes were collared in 1990 on the Marg volcanogenic massive sulphide deposit. Total footage was 4119 metres in the $850,000.00 program. A small trenchng program was conducted on the nearby Jane showing.

ARCHER, CATHRO
& ASSOCIATES (1981) LIMITED
CONSULTING GEOLOGICAL ENGINEERS

1016 - 510 WEST HASTINGS STREET
VANCOUVER, B. C. V6B 1L8
(604) 688-2568

RECEIVED
DEC 20 1990
MINING RECORDER
MAYO, Y.T.
I.A. & N.D.

# FINAL REPORT

# 1990 FIELD PROGRAM

## MARG PROPERTY, YUKON

Latitude 64°01'N; Longitude 134°28'W

NTS 106D/1

MAYO MINING DISTRICT

OFFICE OF THE REGIONAL MANAGER
MINERAL RIGHTS
JAN 02 1991
WHITEHORSE
YUKON TERRITORY

| | | |
|---|---|---|
| Tudl | 1-32 | YA76768-YA76799 |
| Marg | 1-144 | YB02385-YB02528 |
| | 145-178 | YB02580-YB02613 |
| | 179-190 | YB02944-YB02955 |
| | 191-290 | YB03107-YB03206 |
| | 291-370 | YB03606-YB03685 |

MARG JOINT VENTURE
(NDU RESOURCES LTD. AND CAMECO CORPORATION)

M.L. MacLellan, M.Sc.

R.C. Carne, M.Sc.

December, 1990

Work done between May 26 and September 7, 1990

BOX 4127, 3125 THIRD AVENUE, WHITEHORSE, Y. T. Y1A 3S9
(403) 667-4415

This report has been examined by the Geological Evaluation Unit under Section 53 (4) Yukon Quartz Mining Act and is allowed as representation work in the amount of $ ~~Approved by~~ mining recorder for diamond drilling costs

Regional Manager, Exploration and Geological Services for Commissioner of Yukon Territory.

## TABLE OF CONTENTS


| | PAGE |
|---|---|
| SUMMARY AND RECOMMENDATIONS | 1 |
| INTRODUCTION | 3 |
| LOCATION AND ACCESS | 4 |
| CLAIM STATUS | 5 |
| HISTORY AND PREVIOUS WORK | 6 |
| 1990 PROGRAM | 7 |
| PROPERTY GEOLOGY | 9 |
| PROPERTY GEOCHEMISTRY | 11 |
| MARG ZONE | 13 |
| STRATIGRAPHY | 13 |
| STRUCTURAL GEOLOGY | 16 |
| DIAMOND DRILLING AND BULLDOZER UTILIZATION | 17 |
| MINERALIZATION | 20 |
| MINERAL RESERVES | 27 |
| GEOCHEMISTRY AND GEOPHYSICS | 28 |
| ENVIRONMENTAL SURVEY | 30 |
| JANE ZONE | 31 |
| DETAILED GEOLOGY | 32 |
| GEOCHEMISTRY AND GEOPHYSICS | 33 |
| TRENCHING | 34 |
| BIBLIOGRAPHY | 35 |


## TABLES


| | | |
|---|---|---|
| I | Drill Hole Summary | 18 & 19 |
| II | Significant Diamond Drill Hole Intersections | 24 to 26 |

## APPENDICES


| | | |
|---|---|---|
| A | Authors' Statements of Qualifications ..... | In Text |
| B | List of Archer, Cathro Personnel and Calendar of Events; 1990 Program ..... | In Text |
| C | Report on Mineral Reserves, December, 1990 by J.P.Franzen, P.Eng. ..... | In Pocket 3 |
| D | Water Quality Investigations of the Marg Claims, June, 1990 and August, 1990 by J.E. Gibson ... | In Pocket 4 |
| E | Assay Certificates, 1990 Drill Core Samples ..... | In Text |
| F | 1988, 1989 and 1990 Summary Drill Logs ..... | In Pocket 5 |
| G | Jane Trench Plans, TR-1 and TR-3, Geochemical and Assay Certificates ..... | In Text |

## LIST OF FIGURES


| | | LOCATION |
|---|---|---|
| 1 | Location Map ..... | Following Page 4 |
| 2 | Access Map ..... | Following Page 4 |
| 3 | Claim Map ..... | Following Page 5 |
| 4 | Property Geology ..... | Following Page 9 |
| 5 | Geology, Marg Property ..... | In Pocket 6 |
| 6 | Lead Geochemistry, Marg Property ..... | In Pocket 7 |
| 7 | Copper Geochemistry, Marg Property ..... | In Pocket 8 |
| 8 | Zinc Geochemistry, Marg Property ..... | In Pocket 9 |
| 9 | Sample Locations, Marg Property ..... | In Pocket 10 |
| 10 | Detailed Geology, Marg Zone ..... | In Pocket 11 |
| 11 | Oblique Cross Section ..... | Following Page 13 |
| 12 | Drill Hole Location ..... | Following Page 21 |
| 13 | Drill Section 2375E ..... | In Pocket 12 |
| 14 | Drill Section 2225E ..... | In Pocket 12 |
| 15 | Drill Section 2075E ..... | In Pocket 12 |
| 16 | Drill Section 2000E ..... | In Pocket 12 |
| 17 | Drill Section 1940E ..... | In Pocket 12 |
| 18 | Drill Section 1880E ..... | In Pocket 12 |
| 19 | Drill Section 1800E ..... | In Pocket 12 |
| 20 | Drill Section 1725E ..... | In Pocket 12 |
| 21 | Drill Section 1620E ..... | In Pocket 12 |
| 22 | Drill Section 1485E ..... | In Pocket 12 |
| 23 | Drill Section 1290E ..... | In Pocket 12 |
| 24 | Drill Section 1195E ..... | In Pocket 12 |
| 25 | Drill Section 1075E ..... | In Pocket 12 |
| 26 | Drill Section 875E ..... | In Pocket 12 |
| 27 | Drill Section 700E ..... | In Pocket 12 |
| 28 | 1350 m Level Plan ..... | In Pocket 13 |
| 29 | 1300 m Level Plan ..... | In Pocket 13 |
| 30 | 1250 m Level Plan ..... | In Pocket 13 |
| 31 | 1200 m Level Plan ..... | In Pocket 13 |
| 32 | 1150 m Level Plan ..... | In Pocket 13 |
| 33 | 1100 m Level Plan ..... | In Pocket 13 |

## LIST OF FIGURES (cont'd)


| | | LOCATION |
|---|---|---|
| 34 | D Horizon Longitudinal Section, True Thickness . | In Pocket 14 |
| 35 | D Horizon Longitudinal Section, Gross Metal Value x Width ..... | In Pocket 14 |
| 36 | D Horizon Longitudinal Section, Cu/Cu+Pb+Zn .... | In Pocket 14 |
| 37 | D Horizon Longitudinal Section, Au/Ag x 10 ..... | In Pocket 14 |
| 38 | C Horizon Longitudinal Section, True Thickness . | In Pocket 15 |
| 39 | C Horizon Longitudinal Section, Gross Metal Value x Width ..... | In Pocket 15 |
| 40 | C Horizon Longitudinal Section, Cu/Cu+Pb+Zn .... | In Pocket 15 |
| 41 | C Horizon Longitudinal Section, Au/Ag x 10 ..... | In Pocket 15 |
| 42 | B Horizon Longitudinal Section, True Thickness . | In Pocket 16 |
| 43 | B Horizon Longitudinal Section, Gross Metal Value x Width ..... | In Pocket 16 |
| 44 | B Horizon Longitudinal Section, Cu/Cu+Pb+Zn .... | In Pocket 16 |
| 45 | B Horizon Longitudinal Section, Au/Ag x 10 ..... | In Pocket 16 |
| 46 | A Horizon Longitudinal Section, True Thickness . | In Pocket 17 |
| 47 | A Horizon Longitudinal Section, Gross Metal Value x Width ..... | In Pocket 17 |
| 48 | A Horizon Longitudinal Section, Cu/Cu+Pb+Zn .... | In Pocket 17 |
| 49 | A Horizon Longitudinal Section, Au/Ag x 10 ..... | In Pocket 17 |
| 50 | Lead Geochemistry, Marg Zone ..... | In Pocket 18 |
| 51 | Copper Geochemistry, Marg Zone ..... | In Pocket 19 |
| 52 | Zinc Geochemistry, Marg Zone ..... | In Pocket 20 |
| 53 | Sample Locations, Marg Zone ..... | In Pocket 21 |
| 54 | PEM Compilation Map, Marg Zone..... | Following Page 29 |
| 55 | Compilation Map, Jane Zone ..... | Following Page 31 |
| 56 | Detailed Geology, Jane Zone ..... | In Pocket 22 |
| 57 | Lead Geochemistry, Jane Zone ..... | In Pocket 23 |
| 58 | Copper Geochemistry, Jane Zone ..... | In Pocket 24 |
| 59 | Zinc Geochemistry, Jane Zone ..... | In Pocket 25 |
| 60 | Sample Location Map, Jane Zone ..... | In Pocket 26 |

## SUMMARY AND RECOMMENDATIONS

The Marg Deposit, located in central Yukon, is a precious metal-rich polymetallic, volcanogenic massive sulphide (VMS) occurrence of Lower Mississippian age. Drilling in 1988-90 totals 11,976 m in 47 holes.

Mineralization consists of relatively continuous, tabular, massive sulphide horizons at four stratigraphic intervals plus a number of smaller sulphide lenses located between them. The horizons are subparallel, striking approximately east-west and dipping 50° south. They are up to 23 m thick, averaging about 5 m. Mineralization has been traced by drilling for a 1500 m strike length. The highest grade and thickest intersections occur at the east end of the mineralized area within lenses that plunge southeasterly at about 35° and are still open at depths more than 1000 m downplunge. Mineralogy is a typical fine to medium grained VMS assemblage comprised principally of pyrite with major amounts of interstitial sphalerite, chalcopyrite and galena. Non-sulphide gangue is primarily quartz with lesser iron-carbonate, sericite and barite.

In November, 1990, independent engineer J.P. Franzen, P.Eng. calculated drill-indicated, diluted reserves totalling 2,861,750 tonnes averaging 1.62% copper, 2.25% lead, 4.17% zinc, 1.63 oz/ton Ag and 0.026 oz/ton Au. Average diluted sulphide thickness is 6.1 m. At current metal prices and assuming average recoveries and metallurgical characteristics for copper, lead, zinc, silver and gold in VMS deposits, these reserves have a calculated net smelter return of $72.57/tonne.

The drill-indicated reserves occur at the extreme east end of the known mineralization where detailed drilling has explored a 350 m long area for 300 m downplunge. In addition, wide-spaced drill intersections outline the potential to at least double the current reserves both downplunge to the southeast and at relatively shallow depth along strike to the west. The next phase of exploration

should consist of infill drilling at about 70 m spacing within these areas with the objective of defining total drill-indicated reserves of at least 6 million tonnes with grade equivalent to the present reserve. Drill site preparation for this work will require a larger bulldozer than the machine currently on-site. The larger minimum contract hours should be utilized to prepare access to a proposed portal site at the 1100 m elevation as well as start of construction of eventual winter road access to the property. A program of 12 to 15 holes totalling 5000 m at a cost of $1,000,000 is proposed for 1991 as outlined in the following exploration budget.

PROPOSED 1991 MARG JOINT VENTURE BUDGET

| | |
|---|---|
| Diamond Drilling - 5000 m NQ @ $96/m ..... | $ 480,000 |
| Salaries<br>Geologist, camp manager/core splitter, cook, senior supervision, expediting, accounting and secretarial ..... | 160,000 |
| Helicopter - 130 hours Bell 206 @ $720/hr, including fuel ..... | 94,000 |
| Bulldozer - 600 hours D-7 @ $150/hr, including fuel ..... | 90,000 |
| Field Room and Board - 900 mandays @ $65/day ..... | 58,000 |
| Travel and Freight ..... | 24,000 |
| Assaying ..... | 18,000 |
| Drafting and Printing ..... | 12,000 |
| Environmental Surveys ..... | 11,000 |
| Assessment Filing ..... | 7,000 |
| Management ..... | 46,000 |
| TOTAL - | $1,000,000 |

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

M.L. MacLellan, M.Sc.

R.C. Carne, M.Sc.

## INTRODUCTION

The Marg property in central Yukon hosts a volcanogenic massive sulphide (VMS) deposit discovered in 1988 while drilling a strong geochemical anomaly. During 1990, approximately $850,000 was spent on diamond drilling (9 holes totalling 4119.6 m) at the Marg Zone and a small trenching program at the Jane Zone. The program was managed by Archer, Cathro & Associates (1981) Limited on behalf of Marg Joint Venture. Marg JV is comprised of NDU Resources Ltd. (66-2/3%) and Cameco Corporation (33-1/3%).

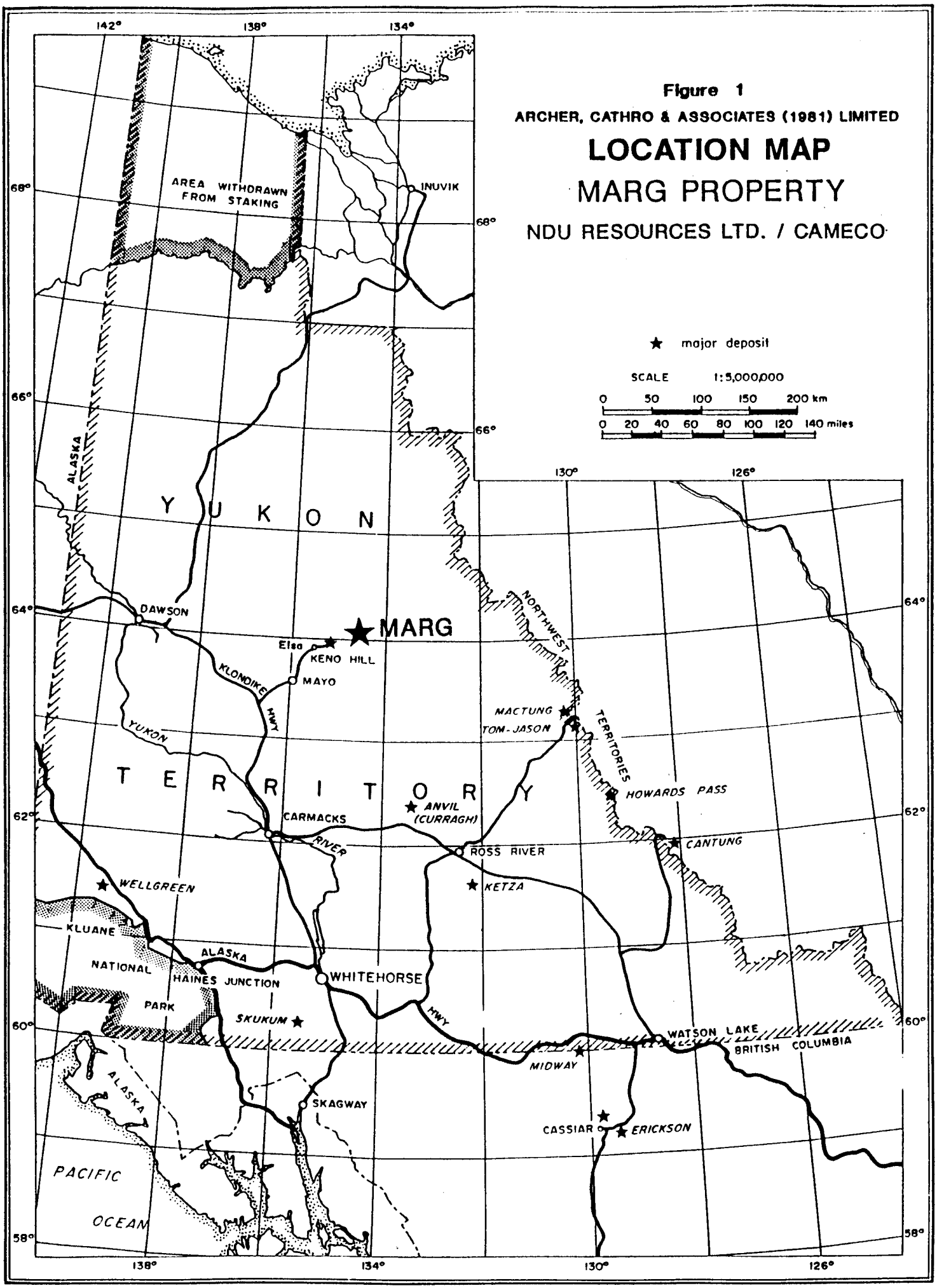
## LOCATION AND ACCESS

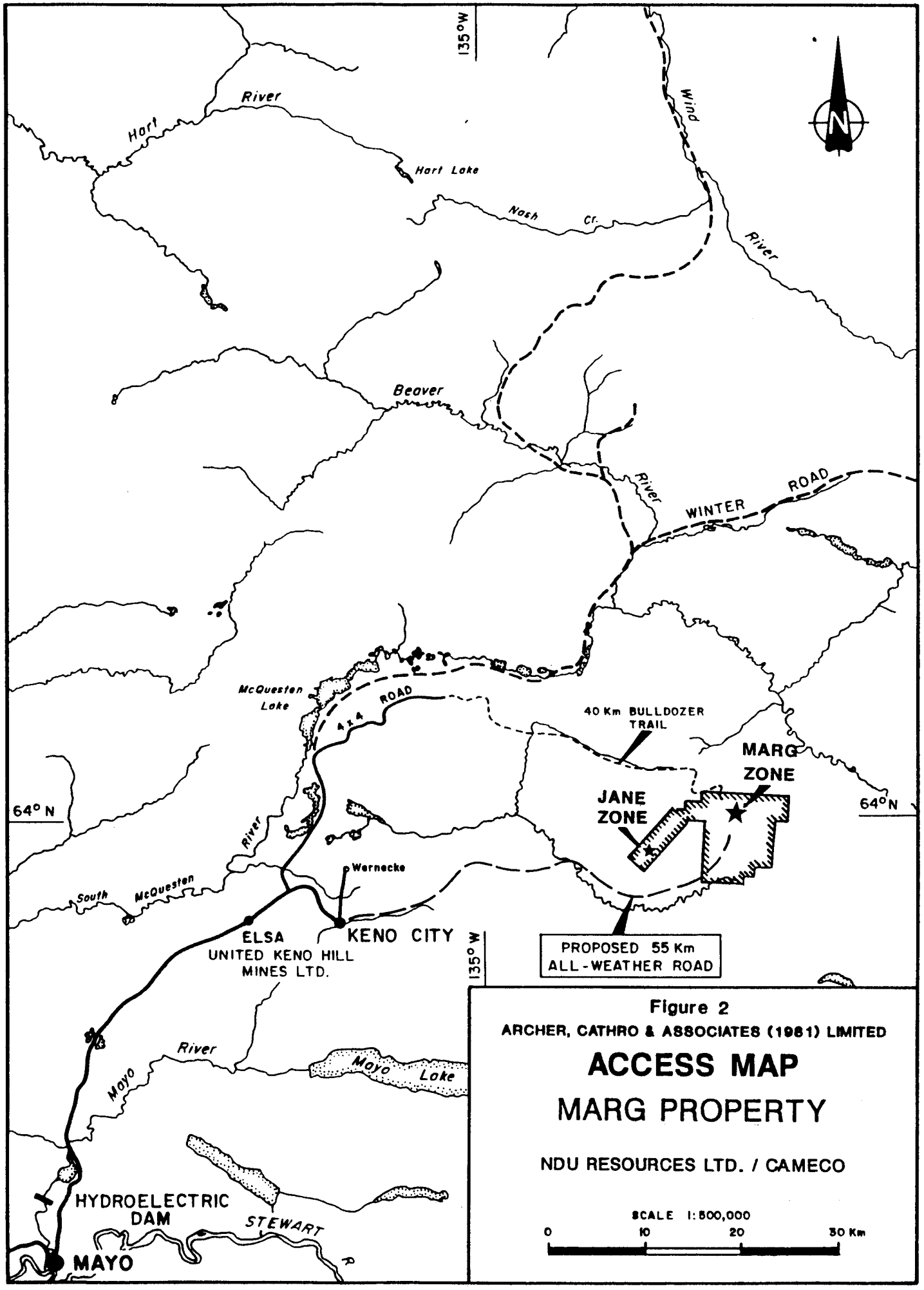
The Marg Zone is located in the Mayo Mining District, 42 km northeast of Keno City, Yukon at 64°01'N and 134°28'W, within NTS map sheet 106D/1. The Jane Zone is located approximately 7 km southwest of the Marg Zone at 63°59'N and 134°37'W, within NTS map sheet 105M/15. Keno City is 415 km by all-weather highway from Whitehorse and 600 km from the deepsea port of Skagway, Alaska (Figure 1).

Access is by helicopter from the nearest road at Keno City or the nearest helicopter base at Mayo (83 km). A proposed 55 km all-weather road route and a 40 km bulldozer trail that presently connects the property with a 4-wheel drive road serving lead-zinc-silver prospects in the Davidson Range are shown on Figure 2.

The Marg JV 1990 program was supported with a contract helicopter coordinated by an Archer, Cathro expeditor based at the abandoned town of Wernecke. Wernecke is located approximately 7 km north of Keno City and about 70 km by road from the supply base at Mayo. The helicopter was shared with several other exploration programs managed by Archer, Cathro and with GSC and DIAND regional mapping projects in central Yukon. A 380 m airstrip was constructed on the property at the end of the 1988 season but has not yet been used because helicopter mobilization is cheaper from Keno City at contract rates and because wheel-equipped, medium-sized fixed wing aircraft are not currently available for charter in the Yukon.

A site suitable for a mill is present within a few kilometres of the deposit while a 12 megawatt hydroelectric plant is located near Mayo, about 85 km from the property (Figure 2). The generating facility has been operating at a substantially reduced capacity since the recent shutdown of the United Keno Hill Mines Limited silver-lead mining and milling operation at Elsa.


Figure 1
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
LOCATION MAP
MARG PROPERTY
NDU RESOURCES LTD. / CAMECO
major deposit
SCALE 1:5,000,000
0 50 100 150 200 km
0 20 40 60 80 100 120 140 miles
142°
138°
134°
130°
126°
68°
66°
64°
62°
60°
58°
AREA WITHDRAWN FROM STAKING
INUVIK
ALASKA
YUKON
TERRITORY
NORTHWEST TERRITORIES
DAWSON
MARG
Elsa
KENO HILL
MAYO
KLONDIKE HWY
YUKON RIVER
MACTUNG
TOM-JASON
HOWARDS PASS
ANVIL (CURRAGH)
CARMACKS
ROSS RIVER
CANTUNG
WELLGREEN
KETZA
KLUANE NATIONAL PARK
ALASKA HIGHWAY
HAINES JUNCTION
WHITEHORSE
SKUKUM
ALASKA HWY
WATSON LAKE
BRITISH COLUMBIA
MIDWAY
SKAGWAY
CASSIAR
ERICKSON
PACIFIC OCEAN


135°W
Hart River
Hart Lake
Nash Cr.
Wind River
Beaver River
WINTER ROAD
McQuesten Lake
4x4 ROAD
40 Km BULLDOZER TRAIL
MARG ZONE
JANE ZONE
64° N
64°N
Wernecke
South McQuesten River
ELSA
UNITED KENO HILL MINES LTD.
KENO CITY
135° W
PROPOSED 55 Km ALL-WEATHER ROAD
Mayo River
Mayo Lake
HYDROELECTRIC DAM
STEWART
MAYO
N
Figure 2
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
ACCESS MAP
MARG PROPERTY
NDU RESOURCES LTD. / CAMECO
SCALE 1:500,000
0 10 20 30 Km

## CLAIM STATUS

At the beginning of the 1990 exploration season, the property consisted of 322 claims, staked in 1982, 1988 and 1989. An additional 80 claims were staked during 1990 to cover the proposed site for an adit and a possible mill site (Figure 3). The claims are registered in the name of Archer, Cathro & Associates (1981) Limited on behalf of the joint venture at the Mayo Mining Recorder's office as follows:

| Claim Name | Total | Record Numbers | Expiry Date* |
|---|---|---|---|
| Tudl 1-32 | 32 | YA76768-YA76799 | September 14, 2002 |
| Marg 1-144 | 144 | YB02385-YB02528 | September 14, 2001 |
| 145-178 | 34 | YB02580-YB02613 | September 14, 2001 |
| 179-190 | 12 | YB02944-YB02955 | September 14, 1998 |
| 191-290 | 100 | YB03107-YB03206 | January 14, 1999 |
| 291-370 | 80 | YB03606-YB03685 | January 14, 1996 |
| | 402 | | |

*Includes 1990 field expenditures that have been filed for assessment credit but are not yet approved by the Mining Recorder.

134°30'

64°00'

R-4

NO STAKING PENDING NATIVE
LAND CLAIM SETTLEMENT

MARG

TUDL

MARG DEPOSIT

PATTERSON RANGE

JANE ZONE

Figure 3

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# CLAIM MAP

## MARG PROPERTY

NDU RESOURCES LTD/ CAMECO

0 1000 2000 Metres

To accompany report dated December, 1990

## HISTORY AND PREVIOUS WORK

The Marg Zone was first staked in 1965 by a joint venture between United Keno Hill Mines Limited and Canadian Superior Exploration Ltd. following release of results from a GSC reconnaissance stream sediment survey. The anomalous values were quickly traced upstream to a large transported gossan unusual for its high lead values (up to 1.5%). Exploration in 1966-67 by Archer, Cathro for the joint venture outlined coincident soil geochemical anomalies for lead, zinc, copper and silver on the adjacent hillsides. The exploration objective was a Keno Hill-type silver vein and, when prospecting and hand trenching turned up only a few partially oxidized laminated sulphide fragments, the project was terminated and the claims allowed to lapse.

The area was restaked in August, 1982 by ZX Joint Venture, a sedex lead-zinc exploration program operated by Archer, Cathro on behalf of SMD Mining Co. Ltd. (now Cameco Corporation), Chevron Minerals Ltd. and Enterprise Exploration Limited (the Australian exploration subsidiary of Rio Tinto). ZX JV performed a program of hand trenching in 1982 and 1984 before optioning the property to All-North Resources Ltd. Enterprise abandoned its interest prior to the 1986 field season.

All-North carried out geochemical and geophysical surveys (VLF and MaxMin EM, magnetometer and IP) and hand trenching in 1986 to earn a 50% interest. All-North's interest was purchased by NDU Resources in 1987. In early 1988, Chevron converted its 25% working interest to a 5% net profits interest that was later purchased by NDU (3.33%) and Cameco (1.67%) in 1990.

In 1988 and 1989, the NDU/Cameco joint venture carried out 7856.2 m of diamond drilling in 38 holes as well as additional geochemical and geophysical (VLF and Pulse EM) surveys.

## 1990 PROGRAM

Exploration during 1990 consisted of 4119.6 m of drilling in nine holes. A small hand trenching program was also undertaken at the Jane Zone (located 7 km southwest of the Marg Zone). The work was done under direct supervision of the authors and their Statements of Qualifications are given in Appendix A,

Drilling was carried out between June 6 and September 5 by contractor E. Caron Diamond Drilling Ltd. of Whitehorse using a Longyear 38 wireline-equipped diamond drill. The drill was winterized and left on site.

Mineralized intervals were split and one-half was sent to Chemex Labs Ltd., North Vancouver, B.C. Samples were assayed for copper, lead and zinc (in percent) and silver and gold (in ounces per ton).

The drill core is stored at the campsite, with the exception of Hole 89-36 which is stored at the Department of Indian and Northern Affairs Bostock Core Library in Whitehorse and the mineralized section of Hole 88-5 which is stored in the Archer, Cathro office in Vancouver, B.C.

Access, camp supply and field support was provided by a Bell 206B helicopter chartered from Trans North Air Ltd. of Whitehorse. The machine, based at Wernecke near the town of Keno City, was piloted by Dave Reid with holiday relief provided by Peter Kelly. Total flying time was 128.4 hours. Supplies and logistics were coordinated by Lasha Reid, an Archer, Cathro expeditor based with the helicopter.

Field management and geological crew was provided by an Archer, Cathro crew led by field manager and project geologist Mary MacLellan under the direction of R.C. Carne. The Archer, Cathro personnel employed on the project during 1990 and a Calendar of Events are listed in Appendix B.

Caron Drilling provided a D6 bulldozer that was driven into the property in May, 1990 along a previously established tote trail. The bulldozer was used to construct drill sites and roads and to move the drill. A total of 231 hours of bulldozer time were used during the field program. The machine was winterized and left on site.

A new 100,000N baseline and a number of short cross lines were cut over the Marg Deposit to coincide with the survey grid. This new grid was used to locate drill sites.

A small hand trenching program was undertaken at the Jane Zone. Three trenches were excavated by blasting and hand trenching to define the source of the soil geochem anomaly.

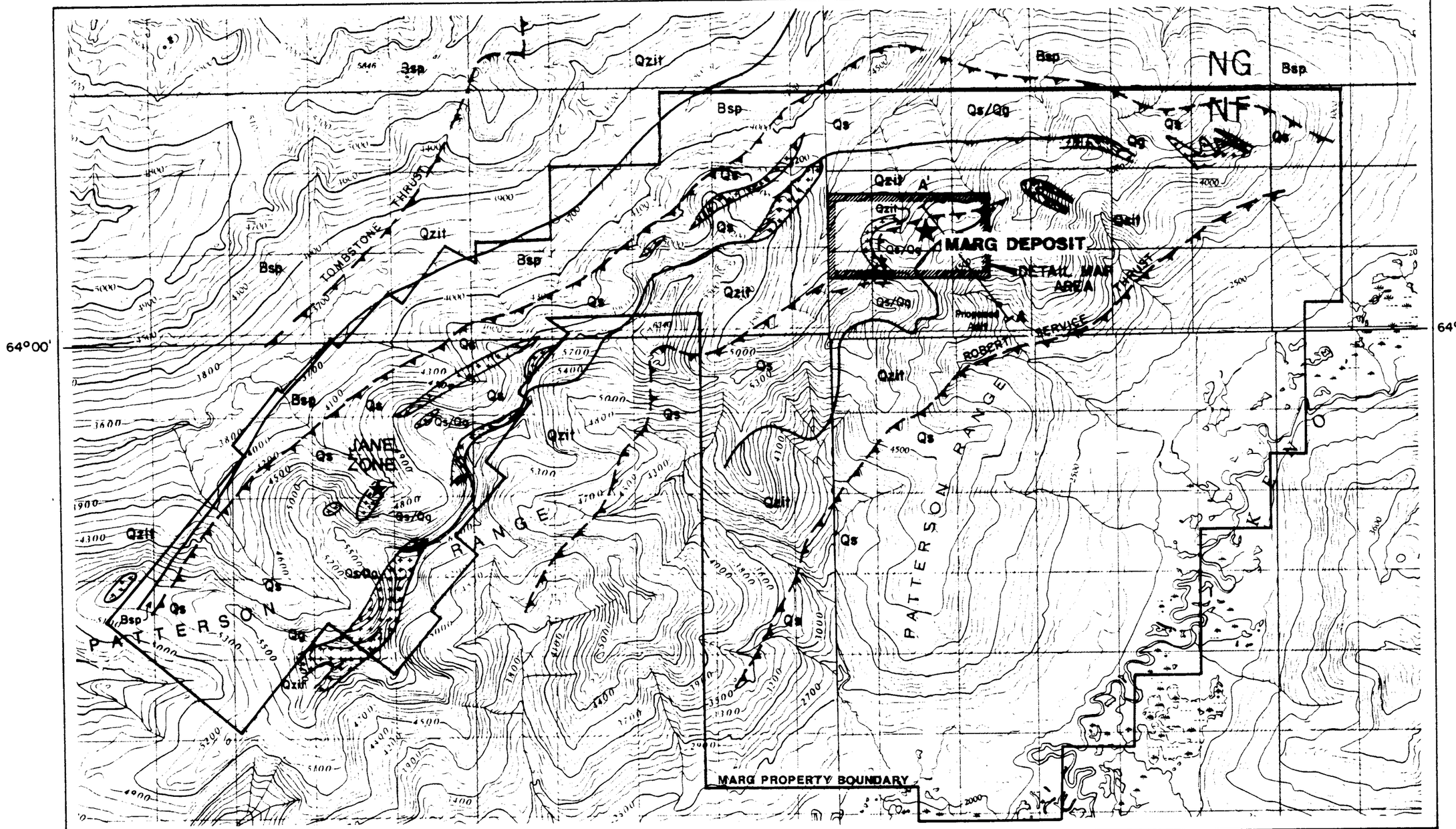
J.P. Franzen, P.Eng. prepared an independent mineral reserve assessment dated December 4, 1990. His report is included as Appendix C.

In June and August, J.E. Gibson continued baseline environmental monitoring surveys initiated in 1988. Results of this work are contained in Appendix D.

## PROPERTY GEOLOGY

Lithologies in the Marg area are divided into four major units which are repeated by southeast-dipping thrust faults. The two major faults are the Tombstone Thrust and the Robert Service Thrust (Figure 4). One thrust panel contains the Marg Zone while the Jane Zone lies in a structurally lower panel. All rocks are lower greenschist metamorphic grade and despite evidence of three phases of small-scale deformation, the thrust sheets appear to be uniformly homoclinal in nature.

The Tombstone Thrust places the northern thrust panel onto siliceous black phyllite of the "Lower Schist" (Figure 5). The "Lower Schist" was previously considered to be Jurassic (Tempelman-Kluit, 1970) but recent work indicates that it is probably Devonian to Jurassic. The central and southern thrust panels are composed of repeated sequences of quartzite, quartz-eye quartz sericite phyllite and black graphite phyllite. The quartzite is correlated with the "Keno Hill Quartzite" of Mississippian age. The recessive black graphite phyllite is commonly interbedded with the quartz sericite phyllite and the age of these units is uncertain. The quartz sericite phyllite unit contains quartz augen similar to those found in the latest Precambrian to Lower Cambrian "Grit Unit", now known as the Hyland Group (Gordey, in press). However, a radiometric age obtained from fission-track dating of zircons in quartz-eye quartz sericite phyllite in drill core at the Marg Deposit has yielded an Early Mississippian age (J. Mortensen, pers. comm., 1989). Grant Abbott, regional geologist for the Department of Indian and Northern Affairs, has identified a remarkably similar quartz grit some distance to the northeast which overlies the Hyland Group and forms the base of the "Lower Schist". He proposes that the quartz sericite phyllite may be correlative with this unit.




**LEGEND**

MESOZOIC AND OLDER?

- Massive greenstone, diorite
- Bsp — Black siliceous phyllite

MISSISSIPPIAN

- Qzit — Quartzite, thin black phyllite interbeds
- Qs/Qg — Quartz sericite phyllite interbedded with black graphite phyllite

**Figure 4**

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# PROPERTY GEOLOGY

## MARG PROPERTY

NDU RESOURCES LTD. / CAMECO

SCALE 1:50,000

0 1 2 3Km

To accompany report dated December, 1990

The Robert Service Thrust places quartzo-feldspathic grit, quartzite, shale and limestone onto the southern thrust panel. These rocks are similar in appearance to the quartz sericite phyllite of the central and southern thrust panel but seem to be more heterogeneous and may be correlative with the Hyland Group (Turner and Abbott, 1990). The quartz grits north and south of the Robert Service Thrust have not been differentiated on Figures 4 and 5 because of the difficulties in separating them in the field and their uncertain relative ages.

Most of the units in the central thrust panel have been intruded by gabbroic to dioritic sills. These sills are correlated with rocks of probable Triassic age (Mortensen and Thompson, 1989) in the Ogilvie Mountains.

## PROPERTY GEOCHEMISTRY

The Marg Zone was explored by grid soil sampling on lines 122 m apart in 1966. This relatively wide-spaced sampling outlined a large area of interest but exploration was terminated when initial follow-up prospecting in 1967 did not produce positive results.

The current geochemical data base on the Marg Zone largely results from grid resampling of the anomalous area in 1986. This was augmented by additional grid soil sampling on the Marg Zone in 1988 and with grid soil sampling over the Jane Zone in conjunction with property-wide reconnaissance-scale soil and silt sampling in 1989. No geochemical sampling was carried out in 1990.

Summaries of lead, copper and zinc geochemistry for the Marg property are plotted on Figures 6 to 8, respectively. Sample numbers are given on Figure 9.

Attention was originally drawn to the Marg and Jane areas in 1965 following release of results from a GSC reconnaissance stream sediment survey. Cansup Creek, which drains the Marg Zone, returned values of 205 ppm Pb, 1200 ppm Cu and 2300 ppm Zn 1.4 km downstream of the mineralization. A silt sample taken nearby in 1982 returned values of 425 ppm Pb, 1500 ppm Cu and 2550 ppm Zn. The Jane Zone is reflected by a GSC silt sample which contained 240 ppm Pb, 210 ppm Cu and 900 ppm Zn. This sample was taken about 250 m downstream of the presently defined multi-element soil geochemical anomaly.

Several other areas of potential mineralization are indicated by the results of reconnaissance geochemical sampling. A 2 km long multi-element soil geochemical anomaly occurs about 4 km northeast of, and along strike of, the Jane Zone. The strongest response occurs at the west end of the anomaly off the claim block in a non-staking area reserved for Native Land Claims, where lead values in soils up to 1125 ppm are present. Copper values range up to 311 ppm with accompanying zinc values to 1400 ppm. Float occurrences of galena-bearing quartz

veins in quartz-eye sericite phyllite and gabbro located by prospecting in 1989 may explain the anomaly although further sampling and prospecting should be performed to confirm this since the stratigraphic setting is similar to both the Marg and Jane Zones. Similarly, erratic and generally weaker multi-element geochemical response from reconnaissance sampling in cirques to the southwest and northeast of the Jane Zone indicate that extensions to that mineralization are probably present and further detailed sampling is warranted.

## MARG ZONE

### STRATIGRAPHY

The Marg Zone is located within a relatively thin package of interbedded Mississippian quartz graphite phyllite and quartz sericite phyllite (Figure 10). The host sequence is bounded to the north and south by fault contacts with quartzite. The sulphide horizons show an overall stratabound and conformable nature. Figure 11 is an oblique cross section across the Marg Zone illustrating these relationships (see Figures 4 and 10 for location of the cross section). All of the layered units are intruded by gabbroic to dioritic sills.

#### Carbonate Quartz Chlorite Phyllite (CARB)

This unit outcrops as localized beds or lenses of orange to buff weathering carbonate quartz chlorite phyllite. Outcrops tend to occur in the vicinity of soil geochemical anomalies and are the only surface indication of the mineralized horizons. In drill core, this unit forms thin beds which are closely associated with the quartz sericite phyllite and massive sulphide intervals.

This unit contains variable amounts of quartz and sericite or chlorite with up to 50%, 1 to 3 mm ivory coloured iron-carbonate (ankerite?) phenocrysts. The 1990 drilling encountered several new varieties of carbonate-rich rock. One variety of uncertain origin contains 10 to 50%, 3 to 5 mm, ivory coloured orbicular carbonate crystals in a grey carbonate matrix. Another possibly related unit, which occurs in very thin bands, is black, siliceous and brecciated limestone cherts up to 5 mm in a white calcite matrix.

In order to simplify the drill sections and level plans, the Carbonate Quartz Chlorite Phyllite is grouped with the Quartz Sericite Phyllite as drill core logging suggests that these two units probably grade into each other.

Quartz-carbonate bands may be deformed syn-ore veinlets or syn-metamorphic segregation lenses. The association of these bands with relatively high pyrite

S

N

1500 m

1400 m

1300 m

1200 m

1100 m

1000 m

PROPOSED ADIT

Qzit

Qzit

Qg

Qzit

Qg

Qzit

Qs

Qs

13

30A

35

40

39

DIAMOND DRILL HOLE

Qzit QUARTZITE

Qg QUARTZ GRAPHITE PHYLLITE

Qs QUARTZ SERICITE PHYLLITE

MASSIVE SULPHIDE

Figure 11

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# OBLIQUE CROSS SECTION

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300 m

Dec/90

and ferroan carbonate content in phyllite and the close proximity to the sulphide horizons suggest that the protolith was a stockwork of quartz-carbonate veinlets in sericite-carbonate-pyrite altered volcanic rocks. These altered rocks likely formed in the upflow zone or vent complex of the hydrothermal system that formed the sulphide body (Turner and Abbott, 1990).

Quartz Sericite Phyllite (QMPH, Qs)

This unit encompasses a wide range of textural and compositional varieties. The most common type is a strongly foliated rock composed of up to 40% sericite, 60% quartz and 5 to 10%, 1 to 2 mm quartz eyes. The quartz eyes are frequently cut by foliation which can completely obliterate them. This rock corresponds to the unit that was termed quartz-muscovite phyllite (QMPH) in the 1988 report. The name has been revised to more accurately reflect the actual composition of the rock but the QMPH symbol has been retained in the drill logs for continuity. Pale to dark green, chloritic phyllites and occasional buff and grey marbles are included within the the overall map unit. The quartz sericite phyllites probably represent altered quartz phenocryst-bearing volcanic or intrusive rocks of felsic to intermediate composition.

Quartz Graphite Phyllite (QGPH, Qg)

The quartz graphite phyllite is a recessive, black unit that is generally "sooty" to the touch and can contain up to 50% thin quartz and sericite laminae. In places the sericite content can reach up to 40% although the average is about 10%. The unit contains up to 10% pyrite, or leached pits after pyrite, that are up to 10 mm across. This unit is associated with the massive sulphides in the Marg Deposit and is the major unit seen in drill core. Turner and Abbott (1990) describe the rock as a black, siliceous, pyritic metachert. They believe that deposition coincided with the formation of the massive sulphides and reflects

pelagic or hydrothermal silica and organic matter accumulation within an anoxic basin.

Quartzite (QZIT, Qzit)

The quartzite unit is generally light to medium grey in colour, fine grained and thin bedded to massive. In bedded varieties, 15 cm to 3 m thick quartzite horizons are interbedded with black graphitic phyllite. The quartzite is highly resistant and, together with the greenstones, forms the majority of the ridges on the property. This unit has been correlated by previous workers with the "Keno Hill Quartzite". The interbedded nature of the quartzite with black phyllite suggests deposition as fine-grained quartz sand by turbidity currents.

Greenstone (Gdg)

Cliff-forming sills and lens-shaped bodies of diorite, gabbro and their altered equivalents intrude all other units. Textures vary from massive to strongly foliated with a fabric parallel to foliation in surrounding rocks. The rock is generally dark green in colour, fine to medium grained and is composed of hornblende, commonly altered to chlorite, and feldspar. Many of the greenstones have also undergone variable carbonate alteration. In places the rock has a distinctly banded appearance and it is possible that some of the highly altered and foliated greenstones may have originally been submarine basalt flows while most appear to be sill-like intrusive bodies that are structurally dismembered. This unit has not yet been intersected by drilling.

## STRUCTURAL GEOLOGY

Two phases of deformation are recognized in the Marg area. The first is characterized by an intense mineral lineation and a strong S1 axial planar foliation which typically dips moderately to the south and approximately parallels lithologic contacts. It is defined by preferred orientation of minerals and by compositional and textural banding. The second phase of deformation is represented by crenulation or kink band cleavage varying in intensity from absent to a penetrative foliation that obscures S1. Second phase structures consist of small scale, upright, tight to isoclinal folds accompanied by a weakly developed axial planar cleavage. The broad arc formed by the map units on Figures 5 and 10 may be a second phase fold, but other large-scale second phase structures have not been recognized.

A localized south-dipping thrust fault, called the Footwall Fault, juxtaposes the Marg "ore stratigraphy" against underlying quartzite. It steepens updip and truncates the sulphide horizon to the east at surface. The fault is a several metre wide zone of intensely foliated rock, boudinaged quartzite beds and/or zones of graphitic gouge. Other zones of graphitic or sericitic gouge occur throughout the hanging wall phyllites. These can be anywhere from several centimetres to several metres thick and generally are subparallel to S1 foliation.

A 2 to 5 m thick zone of fault gouge and brecciated rock, called the Hanging Wall Fault, marks the contact between the Marg "ore stratigraphy" and overlying quartzite. This structure appears to roughly parallel compositional layering in both phyllites and quartzite at the east end of the Marg Zone but it cuts down-section through the mineralized sequence toward the west end of the zone.

DIAMOND DRILLING AND BULLDOZER UTILIZATION

Drilling was carried out between June 6 and September 5 and totalled 4119.6 m in ten holes. Eight of the 1990 drill sites as well as the new drill roads were surveyed in June by Diane Lister for Archer, Cathro using the survey datum established by Underhill Engineering Ltd. in 1988. A new survey station was established to give clear line of sight to the drill sites on the south end of the ridge above the Marg camp. The actual drill collars have not been surveyed to date and the last two holes drilled during the 1990 season (90-46 and 90-47) were located solely by chain and compass. Location and orientation of all Marg holes are summarized in Table 1 on the following page.

Drill hole orientations were measured at approximately 100 m intervals using a Pajari (Tro-Pari) downhole magnetic instrument. The holes flattened as much as 20° in 400 to 500 m but 5 to 10° flattening per 300 m is more normal. Most holes showed 5 to 10° azimuth deflection to the west but steeper holes may show greater deflection.

Drilling conditions at the Marg site are generally good, averaging 23 m per twelve hour shift. Some difficulty was encountered with shearing and faulting in the quartzite and quartz graphite phyllite units particularly on the south side of the ridge above camp. Hole 39 had to be abandoned after the rods broke off in one of these faults. Subsequently, the four other holes drilled south of the ridge were started using HQ-sized equipment and were reduced to NQ once through the Hanging Wall Fault. The remaining holes were drilled with NQ-sized equipment. Drill moves, including pulling rods, dismantling, moving and reassembling the drill, typically took eight to ten hours. A total of seven shifts were lost due to machine breakdown during the course of the program. Two days were spent mobilizing crew and setting up equipment on the first site. The drill was winterized and left on the Marg airstrip at the end of the program.

TABLE I
DRILL HOLE SUMMARY

1988 DRILLING

| Hole | 1989 Drill Section | 1990** Drill Section | Survey Grid Coordinates (m) N | E | Elevation (m) | Collar Dip (°) | Azimuth (Astronomic) | Depth (m) |
|---|---|---|---|---|---|---|---|---|
| 88-1 | 1650E | 1075E | 100,113.73 | 99,091.78 | 1,373.08 | -50 | 343 | 182.0 |
| -2 | 2450E | 1880E | 100,187.63 | 99,883.13 | 1,438.28 | -50 | 359 | 113.1 |
| -3 | 2450E | 1880E | 100,187.63 | 99,883.13 | 1,438.28 | -80 | 359 | 81.4 |
| -4 | 2370E | 1800E | 100,093.56 | 99,790.14 | 1,438.89 | -50 | 003 | 91.1 |
| -5 | 2370E | 1800E | 100,093.56 | 99,790.14 | 1,438.89 | -70 | 003 | 87.5 |
| -6 | 2290E | 1725E | 99,989.28 | 99,720.70 | 1,416.85 | -50 | 000 | 145.4 |
| -7 | 1280E | 700E | 99,985.42 | 98,701.92 | 1,324.91 | -50 | 343 | 139.3 |
| -8 | 1760E | 1195E | 100,223.01 | 99,197.19 | 1,357.35 | -50 | 340 | 124.1 |
| -9 | 2290E | 1725E | 100,084.26 | 99,727.85 | 1,412.85 | -50 | 354 | 163.7 |
| -10 | 2450E | 1880E | 100,124.41 | 99,884.59 | 1,464.07 | -70 | 358 | 156.1 |
| -11 | 2450E | 1880E | 100,124.41 | 99,884.59 | 1,464.07 | -85 | 358 | 172.8 |
| -12 | 2510E | 1940E | 100,165.96 | 99,943.19 | 1,461.80 | -50 | 358 | 134.7 |
| -13 | 2510E | 1940E | 100,165.96 | 99,943.19 | 1,461.80 | -70 | 358 | 124.1 |
| -14 | 2580E | 2000E | 100,171.05 | 99,993.89 | 1,470.18 | -50 | 358 | 153.9 |
| -15 | 2370E | 1800E | 100,147.64 | 99,807.95 | 1,432.44 | -55 | 355 | 96.6 |
| -16 | 2370E | 1800E | 100,026.88 | 99,800.17 | 1,445.94 | -50 | 358 | 213.7 |
| -17 | 2370E | 1800E | 100,026.88 | 99,800.17 | 1,445.94 | -65 | 358 | 160.0 |
| -18 | 2370E | 1800E | 100,026.88 | 99,800.17 | 1,445.94 | -80 | 358 | 131.7 |
| -19 | 2440E | 1880E | 99,942.18 | 99,877.59 | 1,480.48 | -50 | 358 | 288.3 |
| -20 | 2510E | 1940E | 100,024.01 | 99,940.80 | 1,509.00 | -60 | 358 | 259.7 |
| -21 | 1650E | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -67 | 358 | 306.3 |
| -22 | 2180E | 1620E | 100,070.07 | 99,612.85 | 1,380.09 | -50 | 358 | 203.3 |
| -23 | 2510E | 1940E | 100,024.01 | 99,940.80 | 1,509.00 | -75 | 358 | 294.7 |
| -24 | 2050E | 1485E | 100,134.00 | 99,483.00 | 1,360.00* | -50 | 358 | 54.9 |
| -25 | 2510E | 1940E | 100,024.01 | 99,940.80 | 1,509.00 | -48 | 358 | 248.7 |
| -26 | 1650E | 1075E | 100,034.22 | 99,073.09 | 1,399.42 | -50 | 358 | 215.5 |
| -27 | 1450E | 875E | 100,033.81 | 98,877.01 | 1,355.94 | -50 | 358 | 189.0 |
| -28 | 2580E | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -50 | 358 | 213.7 |
| -29 | 1280E | 700E | 100,039.52 | 98,744.00 | 1,326.40 | -50 | 358 | 212.4 |
| -30 | 2580E | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -88 | 358 | 126.8 |
| -30a | 2580E | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -88 | 358 | 281.9 |
| -31 | 1850E | 1290E | 100,120.48 | 99,289.10 | 1,363.79 | -50 | 358 | 160.9 |
| -32 | 2050E | 485E | 100,085.09 | 99,485.70 | 1,362.25 | -50 | 358 | 204.8 |
| -33 | 2440E | 1880E | 99,942.18 | 99,877.59 | 1,480.48 | -80 | 358 | 305.4 |
| TOTAL - 1988 | | | | | | | | 6,037.5 |

* Approximate
** Drill Sections: 98,000 (Grid) East = 000 (Drill Section) East

TABLE I (cont'd)

1989 DRILLING

| Hole | 1989 Drill Section | 1990** Drill Section | Survey Grid Coordinates (m) N | E | Elevation (m) | Collar Dip (°) | Azimuth (Astronomic) | Depth (m) |
|---|---|---|---|---|---|---|---|---|
| 89-34 | 2580E | 2000E | 99,848.68 | 100,021.19 | 1478.00 | -71 | 358 | 443.8 |
| 89-35 | 2650E | 2075E | 99,845.19 | 100,089.08 | 1449.91 | -60 | 354 | 400.5 |
| 89-36 | 2180E | 1620E | 99,907.24 | 99,618.26 | 1396.00 | -51.5 | 358 | 304.5 |
| 89-37 | 1850E | 1290E | 99,951.87 | 99,292.78 | 1392.23 | -56.5 | 358 | 247.8 |
| 89-38 | 2180E | 1620E | 99,762.87 | 99,629.80 | 1419.5 | -58 | 360 | 422.1 |
| TOTAL - 1989 | | | | | | | | 1,818.7 |
| 1990 DRILLING | | | | | | | | |
| 90-39 | | 2375E | 99,750 | 100,360 | 1332* | -60 | 002 | 111.3 |
| 90-39a | | 2375E | 99,751 | 100,364 | 1332* | -60 | 355 | 434.0 |
| 90-40 | | 2225E | 99,725 | 100,217 | 1351* | -60 | 005 | 445.3 |
| 90-41 | | 2225E | 99,630 | 100,206 | 1327* | -70 | 360 | 524.0 |
| 90-42 | | 2375E | 99,660 | 100,376 | 1283* | -70 | 008 | 497.4 |
| 90-43 | | 1800E | 99,690 | 99,826 | 1485* | -70 | 001 | 582.8 |
| 90-44 | | 1725E | 99,865 | 99,375 | 1428* | -65 | 359 | 378.7 |
| 90-45 | | 1485E | 99,890 | 99,503 | 1392* | -55 | 360 | 411.2 |
| 90-46 | | 1290E | 99,790 | 99,310 | 1445*** | -60 | 360 | 431.3 |
| 90-47 | | 700E | 99,730 | 98,730 | 1365*** | -60 | 360 | 303.6 |
| TOTAL - 1990 | | | | | | | | 4,119.6 |
| TOTAL DRILLING | | | | | | | | 11,975.8 |

* Approximate
** Drill Sections: 98,000 (Grid) East = 000 (Drill Section) East
*** Collars not surveyed, locations chained from surveyed baseline

One hundred and sixty-four hours of D6 bulldozer time were used building drill site and drill roads and 40 hours were used for drill moves. A further 27 hours were used to mobilize the bulldozer at the beginning of the program. The bulldozer was winterized and left at the Marg airstrip at the end of the program.

MINERALIZATION

The Marg mineralization consists of two relatively continuous, tabular, massive sulphide bodies termed the A and D Horizons, plus two other less well defined sulphide lenses (C and B Horizons) located between them and along strike to the west. The zones are subparallel, striking approximately east-west and dipping 50° south. They are up to 23 m thick, averaging about 3 to 5 m.

Mineralization has been traced by drilling for a 1500 m strike length. The thickest and highest grade intersections discovered to date occur at the east end of the mineralized area within lenses that plunge southeasterly at about 35°. These are still open at depths more than 1000 m downplunge.

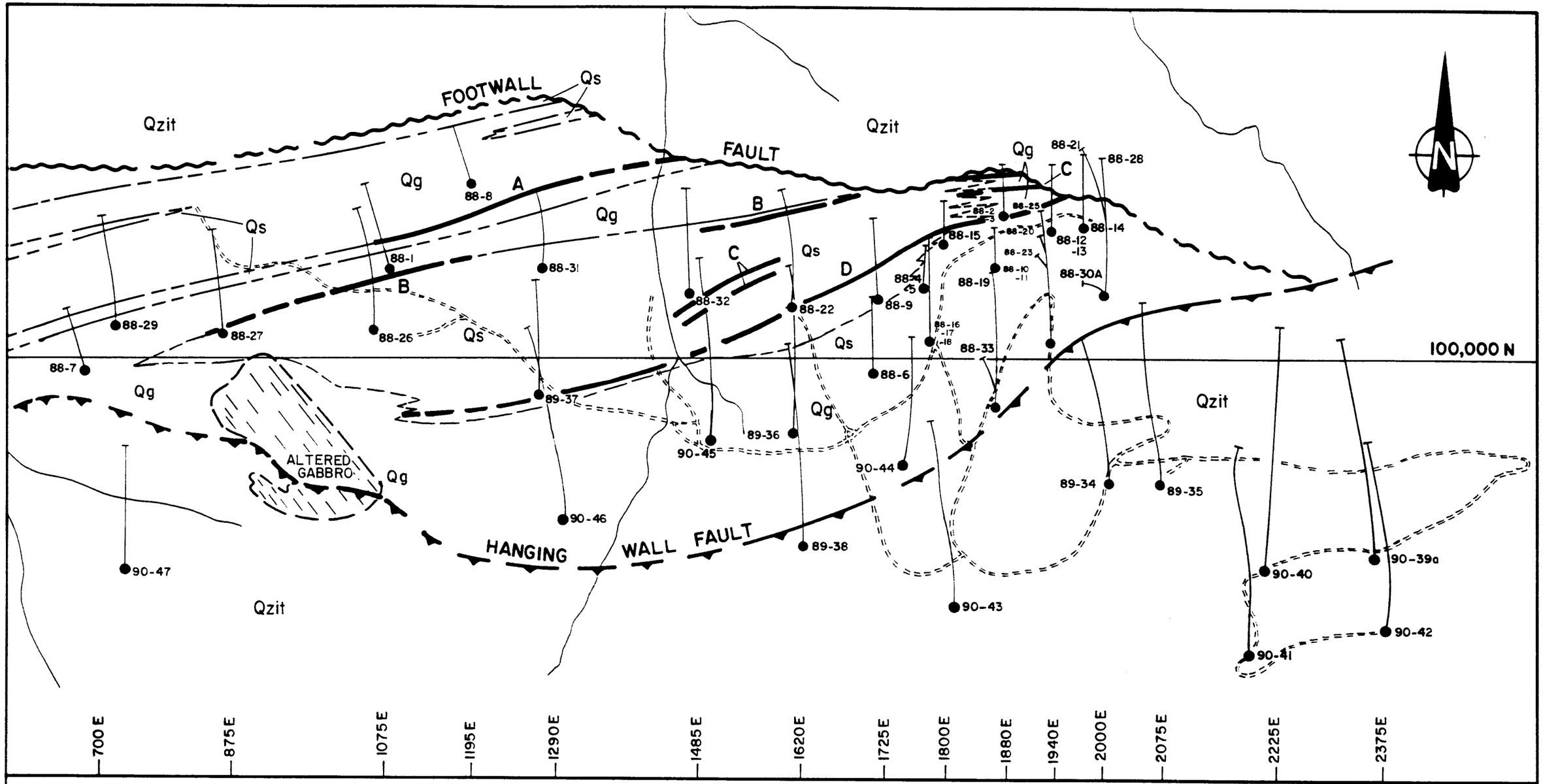
Mineralogy is a typical fine-grained, polymetallic VMS assemblage comprised principally of pyrite with major amounts of interstitial sphalerite, chalcopyrite and galena. Minor tetrahedrite occurs in association with galena or chalcopyrite. Non-sulphide gangue is primarily quartz with lesser iron-carbonate, sericite and minor barite.

Massive sulphide layers generally have sharp upper contacts with somewhat more gradational lower contacts and they are usually underlain by a thin zone of heavily disseminated sulphides with scattered thick sulphide laminae. Mineral banding is often more evident near the base of the massive sulphide layers with dark coloured sphalerite and galena bands separated by lighter coloured chalcopyrite-rich bands.

Figure 12 illustrates the projected surface traces of mineralization with locations of drill holes and simplified geology. Figures 13 to 27 are drill sections showing lithology and assay intervals. Assay certificates for 1990 drill core sampling are given in Appendix E and 1988, 1989 and 1990 summary drill logs are included in Appendix F. Level plans were generated every 50 m elevation (Figures 28 to 33) and a series of longitudinal sections were generated for the four horizons showing piercement points, true thickness, gross metal values and metal zoning (Figures 34 to 49).

The sulphide horizons appear to pinch and swell along strike and are sometimes difficult to correlate between drill sections. In order to facilitate correlation, a series of level plans were generated at 50 m intervals between 1350 and 1100 m. These clarify geological relationships and allow more definite correlation of the sulphide horizons. After generation of the level plans, the horizon nomenclature was transferred back to the drill sections prior to generation of longitudinal sections for each of the horizons. The level plans demonstrate the conformable, stratiform nature of the mineralization, commonly occurring at stratigraphic breaks between quartz sericite phyllite and quartz graphite phyllite.

The D Horizon is the uppermost of four massive sulphide-bearing intervals discovered to date and it contains the bulk of known mineralization. Drilling has intersected a sheet-like body of massive sulphide mineralization interrupted near surface on Section 1725E by a narrow barren interval. The horizon has been well defined by close-spaced drilling over a 75,000 m2 area (in the plane of mineralization) immediately adjacent to and downdip of the discovery area at the east end of the Marg Zone. Wide-spaced drill intersections extend the known D Horizon mineralization to the west and to depth for an additional 210,000 m2 area.




DRILL ROAD

DIAMOND DRILL HOLE

Qzit — QUARTZITE

Qg — QUARTZ GRAPHITE PHYLLITE

Qs — QUARTZ SERICITE PHYLLITE

MASSIVE SULPHIDE

Figure 12

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DRILL HOLE LOCATION

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300 m

Dec./90

True thickness of D Horizon massive sulphide mineralization ranges up to 11 m with thicker and better grade intersections occurring in a 200 m wide, southeast-plunging zone that parallels the contact of the mineralized assemblage with barren quartzite across the Footwall Fault. This is also the attitude of mineral lineation in the host rocks. Base metal ratios have no uniform distribution although maximum Au/Ag ratios describe a southerly to southeasterly aspect that parallels the axis of thickest intersections. This trend has not yet been explored at depth by close-spaced drilling between Holes 30a and 39a, a downplunge distance of 450 m.

Shallow drilling on Section 1725E did not intersect mineralization at the D Horizon stratigraphic position although this 100 m wide barren interval may not persist to depth. West of Section 1725E, the D Horizon was intersected by four wide-spaced 1990 holes where massive sulphide mineralization occurs in widths up to 3 m with some of the best grades seen on the property to date. In addition to fill-in drilling, this area warrants additional exploration along strike to the west and to depth.

Both B and C Horizons consist of massive sulphide lenses rather than sheet-like masses. Although areally restricted, these demonstrate good internal continuity. The combined area of B and C Horizon mineralization totals about 335,000 m2. This is greater than the D Horizon although true thicknesses are generally less than the latter. Thickest and highest grade massive sulphide mineralization follows a trend that parallels the Footwall Fault Zone, thus directly underlying the area of maximum economic potential in the D Horizon. As in the D Horizon massive sulphides, base metal ratios do not have consistent variation although better Au/Ag ratios correlate with the thickest intersections. Wide-spaced drill intersections of the B and C Horizons indicate the presence of

a number of other massive sulphide lenses that are also elongate downplunge in a southeast direction.

The A Horizon occurs as two or three relatively large massive sulphide lenses that display the southeast elongation observed for the B, C and D Horizons. Total area of mineralization outlined to date is 290,000 m2. Similar to the overlying massive sulphide zones, the thicker and higher grade areas of the horizon occur as southeast-plunging cores within the lenses. Unlike the case for the other horizons, however, both base metal and precious metal zonation trends coincide with the axes of maximum thickness.

Because the D Horizon is generally thicker and more widespread than the other three underlying massive sulphide zones, exploration priority should be given to demonstrating continuity within this horizon. The potentially economic portions of the A, B and C Horizons appear to be stacked vertically and drill holes can be oriented and extended far enough to test all four zones efficiently.

A summary of significant drill intersections of all four horizons follows on Table II.

TABLE II
SIGNIFICANT DIAMOND DRILL HOLE INTERSECTIONS

| Hole | Interval (m) | Thickness (m) | Cu (%) | Pb (%) | Zn (%) | Ag (oz/t) | Au (oz/t) | Horizon |
|---|---|---|---|---|---|---|---|---|
| 88-1 | 29.0 - 34.2 | 5.2 | 0.7 | 0.5 | 1.5 | 0.3 | <0.002 | B |
| 88-2 | 18.9 - 25.1 | 6.2* | 0.3 | 5.8 | <0.1 | 9.3 | 0.050 | B |
| | 28.2 - 32.6 | 4.4 | 4.0 | 1.7 | 3.4 | 1.7 | 0.029 | A |
| | 37.2 - 38.7 | 1.5 | 3.5 | 1.2 | 1.4 | 0.5 | 0.010 | A |
| 88-3 | 28.3 - 29.4 | 1.1 | 5.4 | 3.1 | 6.7 | 3.0 | 0.010 | B |
| | 40.2 - 41.7 | 1.5 | 1.3 | 1.8 | 3.8 | 1.5 | 0.024 | A |
| | 45.4 - 46.8 | 1.4 | 1.1 | 1.0 | 2.1 | 0.9 | 0.008 | A |
| 88-4 | 65.2 - 68.3 | 3.1* | 0.1 | 6.2 | <0.1 | 2.8 | 0.027 | D |
| 88-5 | 64.1 - 74.8 | 10.7 | 3.3 | 3.7 | 6.6 | 2.1 | 0.030 | D |
| 88-6 | 120.6 - 121.2 | 0.6 | 0.2 | 0.9 | 1.3 | 0.7 | 0.008 | C |
| 88-9 | 32.6 - 35.7 | 3.1 | 2.3 | 4.6 | 2.9 | 2.4 | 0.028 | C |
| 88-10 | 62.6 - 68.6 | 6.0 | 2.9 | 3.3 | 5.9 | 1.8 | 0.048 | D |
| | 110.7 - 133.6 | 22.9 | 0.9 | 1.8 | 3.2 | 1.4 | 0.031 | A |
| 88-11 | 82.2 - 87.8 | 5.6 | 2.2 | 3.1 | 5.9 | 1.2 | 0.027 | D |
| | 150.0 - 152.9 | 2.9 | 1.5 | 3.2 | 5.6 | 2.5 | 0.050 | A |
| 88-12 | 65.0 - 68.7 | 3.7 | 3.1 | 4.8 | 9.2 | 3.2 | 0.053 | D |
| | 73.9 - 79.8 | 5.9 | 2.0 | 3.3 | 5.9 | 3.1 | 0.042 | A |
| 88-13 | 65.9 - 68.5 | 2.6 | 1.3 | 1.0 | 1.9 | 0.9 | 0.004 | D |
| | 82.3 - 94.0 | 11.7 | 1.4 | 2.5 | 4.5 | 2.3 | 0.031 | A |
| 88-14 | No significant intersections | | | | | | | |
| 88-15 | 39.5 - 41.2 | 1.7 | 3.4 | 2.5 | 4.6 | 2.4 | 0.033 | D |
| | 58.8 - 61.2 | 2.4 | 1.7 | 2.7 | 5.2 | 2.2 | 0.032 | D |
| 88-16 | 104.0 - 114.9 | 10.9 | 2.5 | 2.5 | 5.3 | 1.8 | 0.022 | D |
| 88-17 | 108.0 - 111.9 | 3.9 | 2.2 | 3.0 | 6.1 | 1.8 | 0.024 | D |
| | 116.9 - 118.3 | 1.4 | 2.3 | 1.4 | 3.7 | 0.9 | 0.016 | C |
| 88-18 | 114.3 - 120.7 | 6.4 | 1.2 | 1.2 | 2.8 | 0.7 | 0.010 | D |
| 88-19 | 203.7 - 214.9 | 11.2 | 2.6 | 2.7 | 6.3 | 1.9 | 0.022 | D |
| | 261.9 - 262.4 | 0.5 | 1.6 | 2.0 | 4.0 | 2.1 | 0.012 | B |
| 88-20 | 187.2 - 189.3 | 2.1 | 1.7 | 1.9 | 4.0 | 1.9 | 0.034 | D |
| | 221.3 - 223.5 | 2.2 | 1.3 | 2.1 | 4.0 | 1.6 | 0.018 | C |
| | 226.7 - 229.2 | 2.5 | 0.9 | 1.8 | 3.2 | 1.4 | 0.014 | B |
| | 231.7 - 233.4 | 1.7 | 1.1 | 1.8 | 3.4 | 1.6 | 0.022 | A |

* Oxidized surface mineralization leached of most copper and zinc.

TABLE II (cont'd)

| Hole | Interval (m) | Thickness (m) | Cu (%) | Pb (%) | Zn (%) | Ag (oz/t) | Au (oz/t) | Horizon |
|---|---|---|---|---|---|---|---|---|
| 88-21 | 156.6 - 158.2 | 1.6 | 1.2 | 1.5 | 2.7 | 1.3 | 0.013 | D |
| | 161.4 - 164.8 | 3.4 | 2.6 | 2.5 | 5.3 | 2.1 | 0.034 | D |
| | 171.7 - 174.2 | 2.5 | 1.5 | 2.1 | 4.1 | 1.8 | 0.022 | C |
| | 182.4 - 187.5 | 5.1 | 1.5 | 2.3 | 4.8 | 2.0 | 0.031 | B |
| | 190.6 - 194.2 | 3.6 | 0.8 | 1.0 | 2.0 | 1.0 | 0.006 | A |
| 88-22 | 107.7 - 111.3 | 3.6 | 2.0 | 2.9 | 5.6 | 2.0 | 0.026 | A |
| 88-23 | 209.2 - 215.1 | 5.9 | 1.9 | 3.1 | 6.5 | 2.2 | 0.028 | D |
| | 263.8 - 269.2 | 5.4 | 1.2 | 2.1 | 4.0 | 1.9 | 0.038 | A |
| 88-25 | 181.5 - 187.5 | 6.0 | 2.0 | 1.2 | 3.4 | 1.5 | 0.023 | D |
| | 208.9 - 209.7 | 0.8 | 0.9 | 1.8 | 3.4 | 1.2 | 0.014 | C |
| | 221.0 - 222.0 | 1.0 | 1.5 | 1.9 | 4.1 | 1.7 | 0.020 | A |
| 88-26 | 63.0 - 63.3 | 0.3 | 1.1 | 2.7 | 6.4 | 1.7 | 0.014 | C |
| 88-28 | 156.9 - 158.8 | 1.9 | 2.3 | 3.0 | 5.6 | 2.4 | 0.024 | D |
| 88-30a | 188.6 - 192.2 | 3.6 | 1.1 | 2.9 | 5.2 | 1.7 | 0.027 | D |
| | 229.7 - 231.4 | 1.7 | 0.9 | 1.5 | 2.7 | 1.2 | 0.017 | C |
| | 234.7 - 239.6 | 4.9 | 0.6 | 1.0 | 1.8 | 0.8 | 0.010 | B |
| | 243.3 - 245.1 | 1.8 | 1.3 | 2.0 | 3.9 | 1.4 | 0.021 | A |
| 88-31 | 74.6 - 76.2 | 1.6 | 0.6 | 2.8 | 5.3 | 1.5 | 0.046 | A |
| 88-33 | 222.5 - 227.2 | 4.7 | 1.6 | 2.2 | 4.3 | 1.4 | 0.016 | D |
| 89-34 | 320.2 - 323.6 | 3.4 | 1.3 | 2.2 | 4.0 | 1.4 | 0.017 | D |
| 89-35 | 292.5 - 297.2 | 4.7 | 1.5 | 2.9 | 5.4 | 1.4 | 0.037 | D |
| | 334.9 - 336.0 | 1.1 | 2.2 | 1.5 | 3.2 | 1.3 | 0.014 | C |
| | 362.2 - 365.0 | 2.8 | 0.7 | 1.3 | 2.5 | 0.9 | 0.014 | B |
| 89-36 | 139.5 - 141.4 | 1.9 | 1.5 | 3.7 | 4.7 | 2.6 | 0.056 | D |
| | 148.5 - 149.4 | 0.9 | 2.2 | 5.3 | 9.6 | 3.7 | 0.072 | D |
| | 170.1 - 177.2 | 7.1 | 1.2 | 2.4 | 4.4 | 1.9 | 0.060 | C |
| | 188.9 - 200.3 | 11.4 | 1.5 | 2.3 | 4.2 | 2.0 | 0.040 | C |
| | 259.5 - 260.3 | 0.8 | 0.9 | 0.7 | 1.6 | 0.7 | 0.004 | A |
| 89-37 | 174.0 - 176.1 | 2.1 | 0.7 | 1.1 | 2.5 | 0.7 | 0.056 | B |
| | 186.2 - 188.2 | 2.0 | 1.3 | 1.8 | 4.3 | 1.7 | 0.007 | A |
| | 203.1 - 205.7 | 2.6 | 0.3 | 0.8 | 2.4 | 0.6 | 0.010 | B |
| 89-38 | 362.2 - 362.8 | 0.6 | 0.4 | 1.6 | 3.2 | 0.8 | 0.002 | A |

TABLE II (cont'd)

| Hole | Interval (m) | Thickness (m) | Cu (%) | Pb (%) | Zn (%) | Ag (oz/t) | Au (oz/t) | Horizon |
|---|---|---|---|---|---|---|---|---|
| 90-39a | 349.9 - 354.1 | 4.2 | 1.0 | 1.5 | 2.6 | 1.1 | 0.013 | D |
| | 363.6 - 370.6 | 7.0 | 0.6 | 0.9 | 1.7 | 0.8 | 0.013 | B |
| | 403.0 - 407.2 | 4.2 | 1.0 | 1.4 | 2.5 | 1.1 | 0.010 | A |
| 90-40 | 327.5 - 330.0 | 2.5 | 2.1 | 2.3 | 3.6 | 1.6 | 0.041 | D |
| | 359.4 - 360.9 | 1.5 | 0.2 | 0.4 | 0.8 | 0.4 | 0.004 | C |
| | 375.1 - 376.6 | 1.5 | 1.8 | 1.8 | 3.6 | 1.5 | 0.010 | C |
| 90-41 | 407.2 - 408.7 | 1.5 | 0.4 | 0.3 | 0.6 | 0.2 | 0.004 | D |
| 90-42 | 397.9 - 398.8 | 0.9 | 1.7 | 1.5 | 2.9 | 1.6 | 0.029 | D |
| | 453.4 - 455.5 | 2.1 | 0.5 | 0.8 | 1.5 | 0.6 | 0.007 | A |
| 90-43 | 389.8 - 391.7 | 1.9 | 0.9 | 0.8 | 1.6 | 0.7 | 0.010 | D |
| | 516.1 - 517.8 | 1.7 | 1.4 | 2.9 | 4.7 | 2.1 | 0.033 | B |
| | 544.0 - 544.5 | 0.5 | 2.2 | 2.6 | 5.3 | 1.8 | 0.016 | A |
| 90-44 | 234.1 - 236.1 | 2.0 | 0.3 | 1.8 | 2.6 | 2.2 | 0.067 | C |
| | 312.0 - 314.2 | 2.2 | 0.2 | 0.8 | 1.2 | 0.5 | 0.014 | B |
| | 329.5 - 332.8 | 3.3 | 1.6 | 2.5 | 4.9 | 1.6 | 0.026 | A |
| 90-45 | 111.1 - 115.6 | 4.5 | 1.8 | 0.4 | 1.2 | 0.4 | 0.005 | D |
| | 301.6 - 309.7 | 8.1 | 0.3 | 1.5 | 3.0 | 0.8 | 0.007 | A |
| 90-46 | 154.9 - 156.5 | 1.6 | 3.0 | 2.7 | 7.2 | 2.1 | 0.022 | D |
| | 177.4 - 178.4 | 1.0 | 3.2 | 2.8 | 7.5 | 1.6 | 0.016 | C |
| | 288.8 - 291.8 | 3.0 | 0.7 | 0.8 | 1.9 | 0.6 | 0.004 | C |
| | 311.1 - 311.8 | 0.7 | 0.8 | 1.8 | 3.9 | 1.1 | 0.016 | B |
| 90-47 | No significant intersections | | | | | | | |

MINERAL RESERVES

A new mineral reserve estimate of the Marg deposit was performed by J.P. Franzen, P.Eng. to evaluate the results of drilling to date. This report, dated December 4, 1990, is included as Appendix C. The drill-indicated mineral reserve zone measures 350 m along strike and 150 to 350 m downdip, with average diluted sulphide thickness of 6.1 m. For the purpose of the estimate, all drill hole intercepts less than 3.0 m were diluted to 3.0 m. Franzen calculated the total drill-indicated tonnage, average grade and net smelter returns (NSR) for reserve blocks in the area of close-spaced drilling at the east end of the deposit. Many of the 1989 intersections and all of the 1990 intersections, which outlined mineralization over a much larger area, were too wide-spaced to be included in the estimate of drill-indicated reserves.

Total diluted drill-indicated mineral reserves of the four mineralized horizons is 3.15 million tons grading 1.62% Cu, 2.25% Pb, 1.17% Zn, 1.63 oz/ton Ag and 0.026 oz/ton Au. These reserves have a combined NSR of $50.73/ton using conservative "base case" metal prices of $US 0.90/lb for Cu, $US 0.30/lb for Pb, $US 0.55/lb for Zn, $US 5.00/oz for Ag and $US 400/oz for Au with a Canadian dollar value of $US 0.86. Application of current metal prices and exchange rates increases the NSR to $65.84/ton. Diluted drill-indicated mineral reserves have been assigned to those areas demonstrating continuous mineralization at an NSR of $20/ton with a diluted thickness of 3.0 m or greater.

The A Horizon contributes reserve blocks measuring 200 m along strike and 250 m downdip. The horizon contributes 29.9% of the tonnage and 22.8% of the NSR metal value to the reserve. The B Horizon is less widespread and poorly defined, contributing only 6.9% of the tonnage and 5.0% of the NSR metal value. The C Horizon is thin and poorly defined except for two intersections in drill hole 89-36. This horizon contributes 15% of the tons and 14.7% of the NSR metal value.

The D sulphide horizon is the major contributor to the mineral reserve. It contributes 48.3% of the tons and 57.6% of the NSR metal values. Unlike the other horizons, the D reserve blocks remain continuous up to a $60/ton cutoff grade. Wide-spaced drill intersections of the D Horizon downplunge of, and west of, the reserve block meet Franzen's cutoff criteria and the best potential for doubling drill-indicated reserves lies in the D Horizon within the area of known mineralization.

GEOCHEMISTRY AND GEOPHYSICS

Lead, copper and zinc results for 1986, 1988 and 1989 sampling are plotted on Figures 50, 51 and 52, respectively. These maps show the position of soil and stream sediment anomalies outlined in 1986 and other small soil anomalies revealed by results of the 1989 sampling. Sample numbers and claim locations are plotted on Figure 53.

The results demonstrate that the relationship between mineralization and soil geochemical anomalies is weak and inconsistent. The main portion of the deposit, which was discovered by drilling the uphill end of a strong lead anomaly, produces no anomalous copper or zinc response in soil. The lead anomalies trend southwest, oblique to the strike of the deposit. The strong steam sediment anomaly below the campsite is probably derived from the westerly extension of this zone.

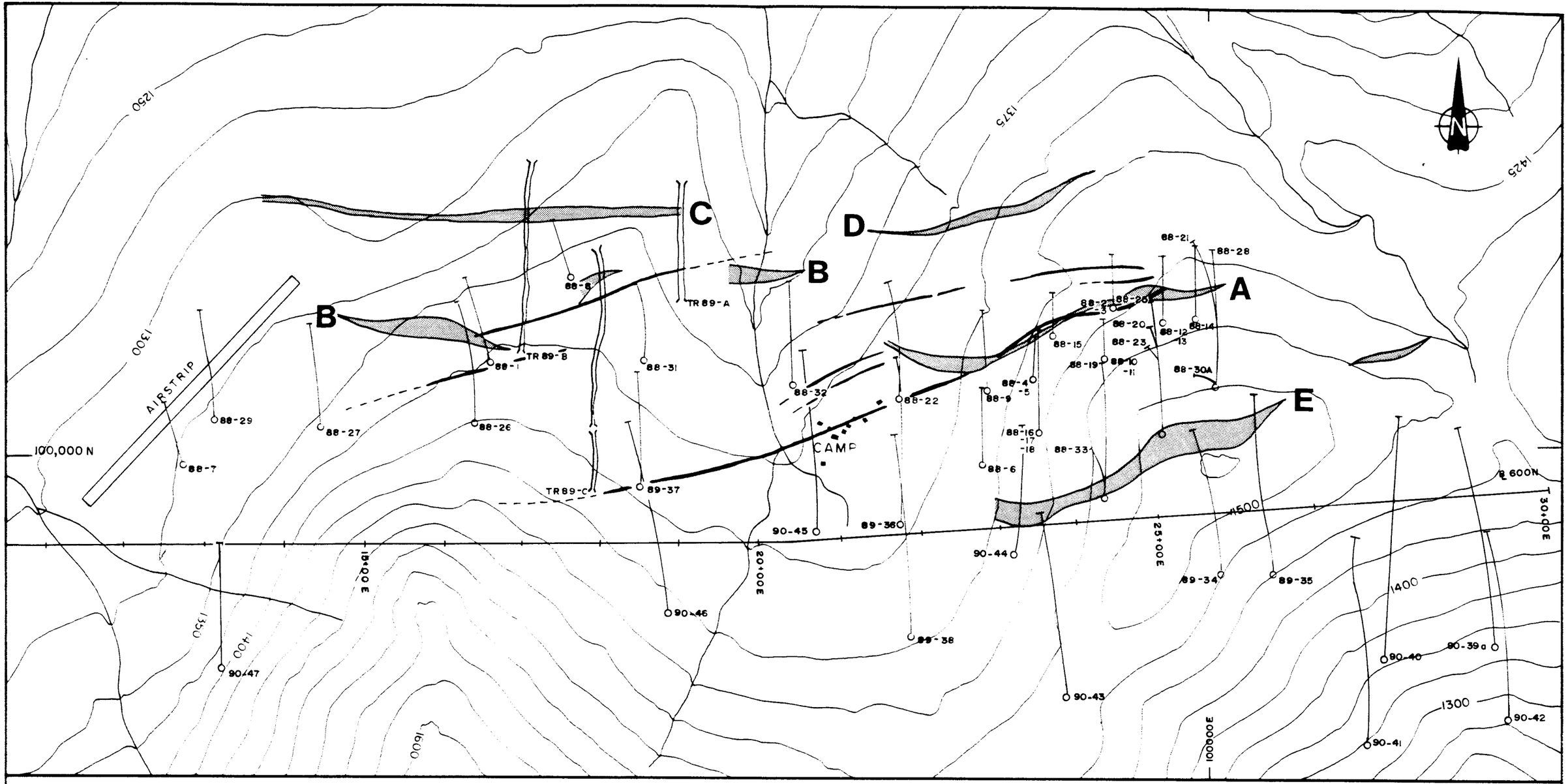
The problems in interpreting geochemical anomalies are partly due to geomorphological complications. The deposit subcrops beneath a glaciofluvial terrace that is interpreted as a lateral moraine or kame terrace deposited during the latest valley glaciation. The southwest trend of the top of the lead anomaly associated with the main part of the deposit follows the contour of the hillside and could have resulted from glacial transport or by alluvial dispersion by an

ice-marginal stream flowing over surface exposures of the mineralization. The part of the property lying above the terrace is less well glaciated and covered with a much thinner veneer of glacial drift while lower hillsides are mantled both with thick drift and a heavy vegetation cover.

The strong, poorly defined soil geochemical anomalies at the west end of the drill grid in the vicinity of the airstrip are of uncertain origin. The eastern portion of these anomalies is probably related to the western extension of the sulphide horizons. None of the holes drilled in the vicinity of the airstrip encountered any mineralization but several chalcopyrite-bearing float samples were found within the area of gabbro outcrop. The airstrip anomaly is possibly derived from solutions percolating along the Hanging Wall Fault and the anomalous metals are probably derived from the D Horizon.

During the 1988 season, several geophysical surveys were carried out over the Marg Zone. These surveys included magnetometer and Pulse EM methods. In 1989, several fill-in lines were surveyed using Pulse EM.

The 1988-89 Pulse EM surveys identified five major bedrock conductors (Figure 54). Conductor A is definitely related to the near surface D Horizon sulphide body and Conductor B appears to be related to the western extension of the A Horizon sulphide body. Conductors C, D and E have a strong correlation with the contact between the quartz graphite phyllite and the quartzite units and may represent a graphite-rich bed or sheared zone. There does not seem to be any distinctive feature that can be used to differentiate conductors representing sulphide bodies from those that are merely graphitic horizons. Consequently, the usefulness of Pulse EM or other geophysical techniques has not yet been determined for the Marg Deposit.




## LEGEND

- Diamond Drill Hole
- Bulldozer Trench
- Projected Surface Trace of Mineralization
- Trace of PEM Conductor Axis (see text for description)

**Figure 54**

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# PEM COMPILATION MAP

## MARG ZONE

NDU RESOURCES LTD. / CAMECO

SCALE 1:5000

0 50 100 200 300 m

0 100 500 1000 ft

To accompany report dated December, 1980

ENVIRONMENTAL SURVEY

J.E. Gibson, a Whitehorse environmental consultant, was contracted by the joint venture to continue the baseline environmental monitoring started in 1988. He visited the property on June 26 and August 21 to collect water samples. A total of nine stations were sampled in June and seven stations in August. Reports by J.E. Gibson are included as Appendix D.

The water quality tests show that surface waters in the Marg area generally have low alkalinity and hardness values. Consequently, streams draining the area have a limited buffering capacity and acid neutralizing potential in the event of acid mine drainage.

Most metals values were very low or below detection limits. Copper, iron and zinc all showed high values at the sample site below the gossanous seep on Cansup Creek. The majority of these metals are in dissolved form therefore the source is likely groundwater dissolution of the pyrite, sphalerite and chalcopyrite in the massive sulphide horizons. Upstream from the gossan, all metal values are within safe levels for the protection of aquatic life.

Gibson recommends further sampling at low flow (April or May) in order to complete the annual flow picture. Annual or biannual sampling should be continued at the existing sample sites and further sample sites may become necessary if development continues. In addition, a survey of benthic and fish populations should be started.

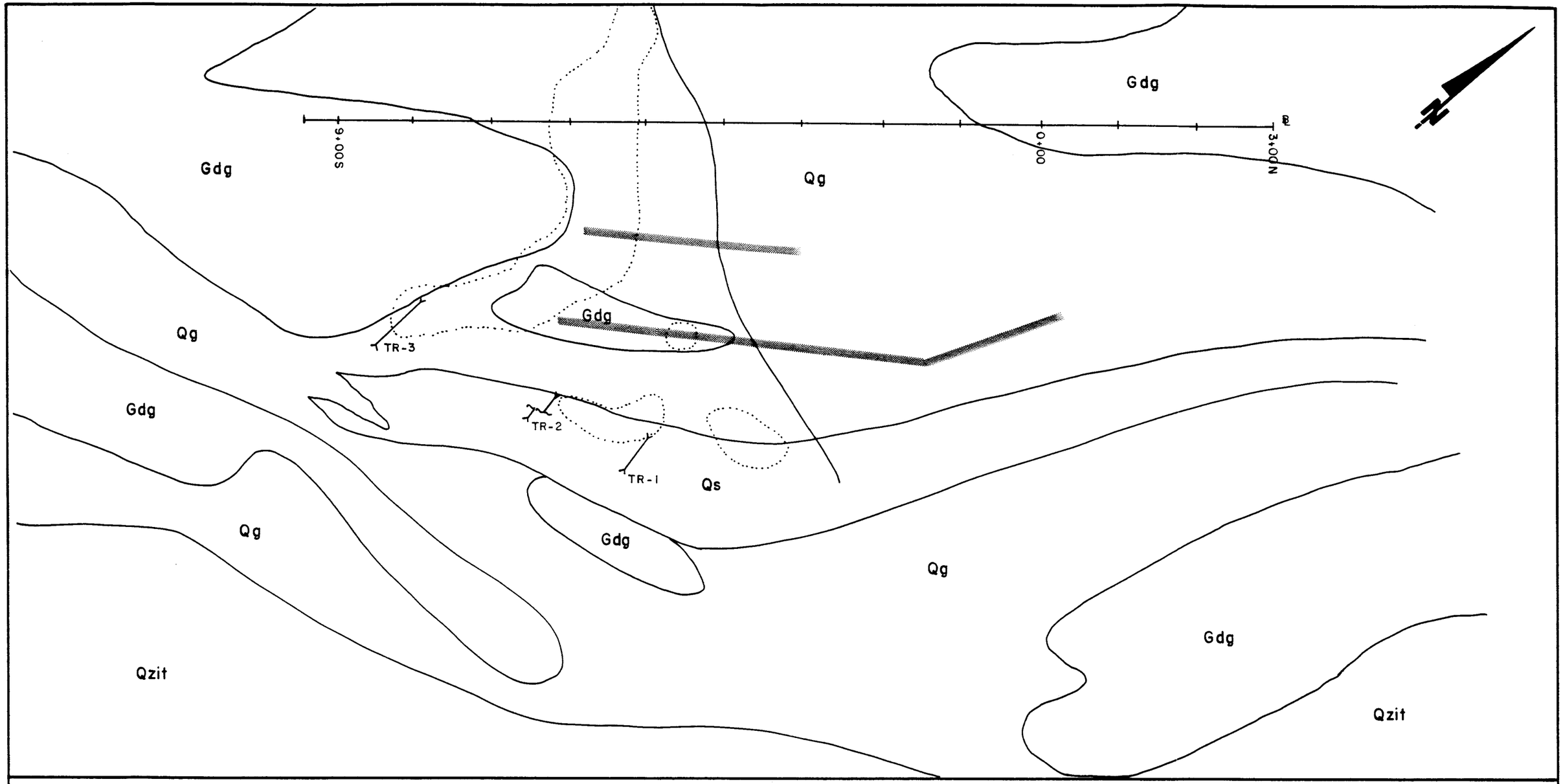
As soon as a development decision is made, a preliminary development proposal should be submitted to the Regional Environmental Review Committee to initiate the environmental assessment process.

## JANE ZONE

The 1965 Operation Keno reconnaissance stream sediment survey first revealed the geochemical anomaly in Jane Creek. This anomaly was followed up by stream, soil and rock sampling and geological mapping in 1988 and 1989. Mapping revealed stratigraphic similarities to the Marg Zone and geochemical sampling discovered a 600 m long, 50 to 100 m wide discontinuous lead soil geochemical anomaly with coincident copper and zinc values (Figure 55).

A brief prospecting traverse in 1988 located small fragments of strongly oxidized, sulphide-bearing rock in coarse talus below a steep slope at the head of Jane Creek. The best assay was 0.29% Cu, 4.34% Pb, 5.14% Zn, 1.12 oz/ton Ag, 0.008 oz/ton Au and >1.0% As. Another specimen containing low values in the other metals assayed 1.64% Cu. These specimens closely resemble the original oxidized Marg float both in appearance and metal ratios, which suggests a volcanogenic massive sulphide origin.

A small trenching program was undertaken during the 1990 exploration season in an effort to discover the source of the soil anomalies and mineralized float samples.




Gdg Gabbro

Qzit Quartzite

Qs Quartz Sericite Phyllite

Qg Quartz Graphite Phyllite

> 50 ppm Pb in Soil

Trench

Trace of Pulse EM Anomaly

**Figure 55**

**ARCHER, CATHRO & ASSOCIATES (1981) LIMITED**

# JANE ZONE COMPILATION MAP

## MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300 m

DETAILED GEOLOGY

The Jane Zone stratigraphy is similar to that of the Marg Zone although the two areas are separated by a regionally extensive thrust fault. The Jane Zone is underlain by a thick sequence of quartz graphite phyllite and is located near the contact with a thin unit of quartz-eye quartz sericite phyllite (Figure 56). Greenstone intrusions are more abundant in the Jane Zone than Marg Zone resulting in numerous steep sided cirques and greater exposure of some of the recessive units.

Several of the lithologies in the Jane area have varieties not previously seen in the Marg Zone. For example, the carbonate quartz chlorite phyllite unit has a predominantly vein-like appearance and the thinner members (<1 m) contain up to 5% fine-grained pyrrhotite. The greenstones which intrude quartzites and quartz sericite phyllites have felsic margins, indicating that they may have assimilated some of the wallrocks.

Figure 56 shows the detailed geology of the Jane Zone, as well as the location of the grid baseline and the trace of the Pulse EM conductor axes. Jane Zone float mineralization appears to be derived from the western slope of the Jane cirque but no sulphide horizons are exposed, probably because of thick scree cover. Abundant ferricrete rubble occurs at the base of the western slope and lesser amounts of ferricrete are found up to elevations of 1680 m. The ferricrete is spatially related to the thin quartz-eye quartz sericite phyllite member.

GEOCHEMISTRY AND GEOPHYSICS

VLF-EM, Pulse EM and magnetometer geophysical surveys were conducted over the Jane Zone in 1989. The magnetic profiles show very little contrast, while the VLF and Pulse EM profiles outline nearly identical conductors. The trace of the Pulse EM conductor axes are shown on Figures 55 and 56. At this point it is uncertain whether the conductors are a massive sulphide-bearing horizon or whether they are a reflection of some contact or fault. Due to the rugged topography of the west wall of the Jane cirque, the geophysical surveys could not be conducted over the probable source area of the anomalous geochemical response.

A 600 m long, 50 to 100 m wide lead soil geochemical anomaly extends downslope from an area of pyrrhotite-bearing carbonate quartz chlorite veins associated with the quartz-eye quartz sericite phyllite unit about 400 m upslope of the mineralized float localities (Figure 57). Ferricrete is abundant within the anomalous area and much of the downslope dispersion may be due to hydromorphic transport. The strongest parts of the copper and zinc anomalies have a similar distribution while moderately anomalous values are more widespread than those for lead (Figures 58 and 59). Additional copper and zinc anomalies are located on the east and west sides of the cirque near a contact between quartz sericite phyllite and gabbro. Because of the steep terrain, the multi-element grid soil geochemical anomaly is not closed off at the southern, uphill edge. Contour and close-spaced reconnaissance sampling is required in conjunction with prospecting and detailed geological mapping to identify drill targets on the Jane Zone.

TRENCHING

In 1990, one week was spent excavating three trenches over the Jane Zone in an attempt to identify the source area of the soil geochemical anomalies. The trenches were excavated by blasting and hand mucking. Trench locations are shown on Figures 55 and 56. Trenches 1 and 3 encountered bedrock at their upslope margins and several small samples of oxidized layered and disseminated sulphide were found. Trench 2 was in overburden for its full length. Sulphide samples from Trenches 1 and 3 contained <1% combined copper, lead and zinc. The sulphides, therefore, are either disseminated throughout the quartz-eye quartz sericite phyllite unit and represent a low grade source for the geochemical anomaly, or the source area has not yet been discovered. No mineralization similar to the original float specimens was located. Trench Plans for Trenches 1 and 3 are included in Appendix G along with Geochemical and Assay certificates.

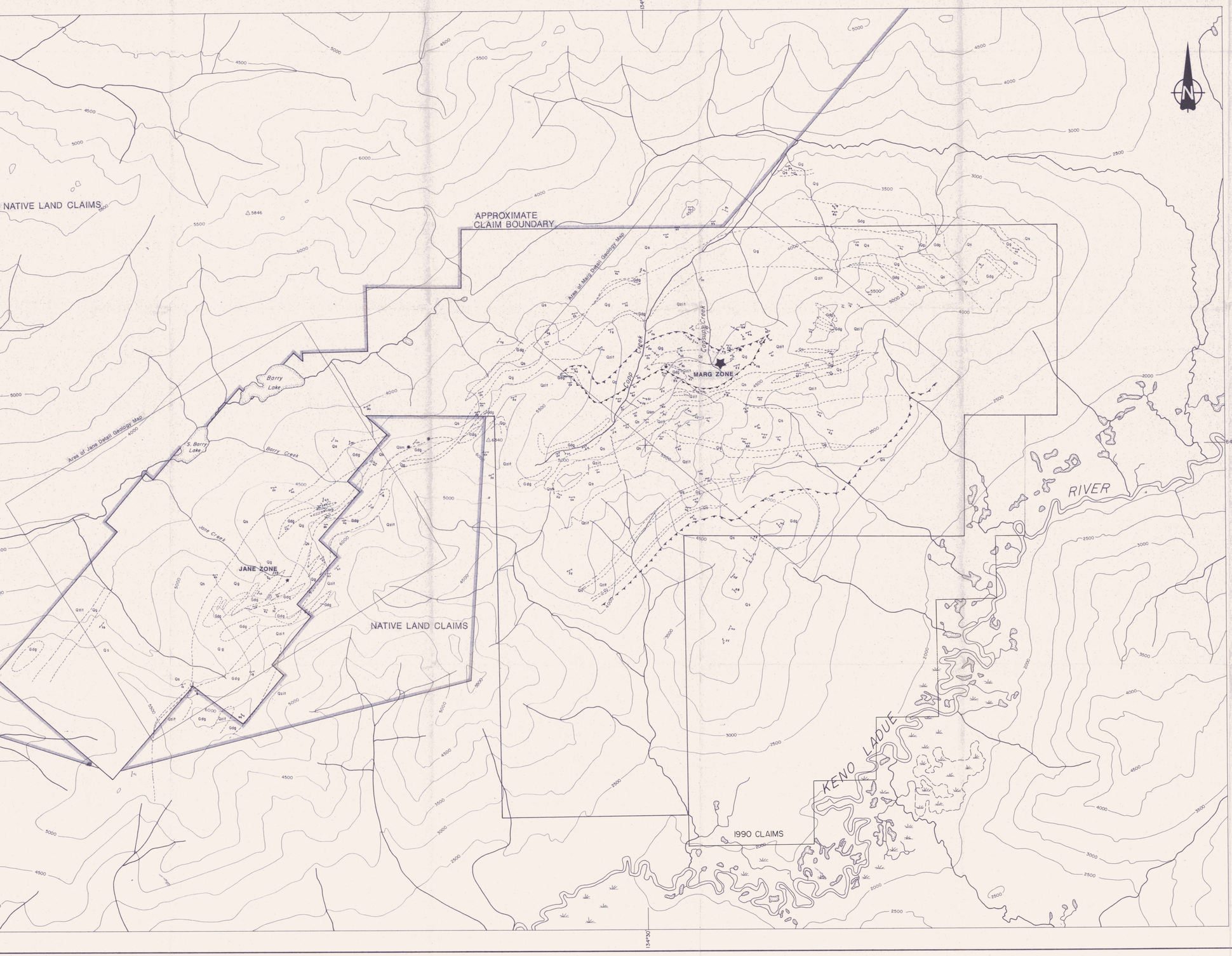
## BIBLIOGRAPHY

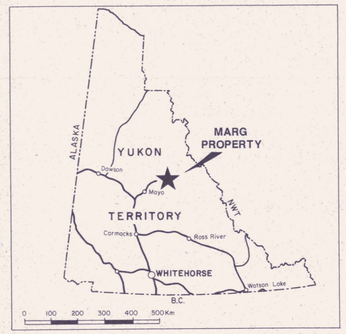
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## LEGEND

TRIASSIC(?)

Gdg — Greenstone - sills of diorite and gabbro and their altered equivalents

MISSISSIPPIAN (and older?)

Qzit — Quartzite - massive, medium grey quartzite with thin black phyllite interbeds

Qg — Quartz Graphite Phyllite - black phyllite with up to 60% pinstripe quartz, 2-10% pyrite

Qs — Quartz Sericite Phyllite - variably carbonate altered, commonly with up to 20%, 1-2 mm, blue quartz eyes, variably chloritic; occasional buff and grey marbles (Qsm)

Carb — Carbonate Quartz Chlorite Phyllite - orange to buff weathering, iron-carbonate rock. Medium grained, generally massive

## SYMBOLS

- Contact, approximate
- Thrust Fault, approximate
- Foliation (S1) - with dip
- Foliation (S2) - with dip
- Bedding (S0) - with dip
- Minor Fold - with plunge
- Pyrrhotite Mineralization
- Galena (± Sphalerite) Mineralization
- Chalcopyrite ± Sphalerite ± Galena Mineralization

Figure 5

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# GEOLOGY

MARG PROPERTY

NDU RESOURCES LTD. / CAMECO

SCALE 1:20,000

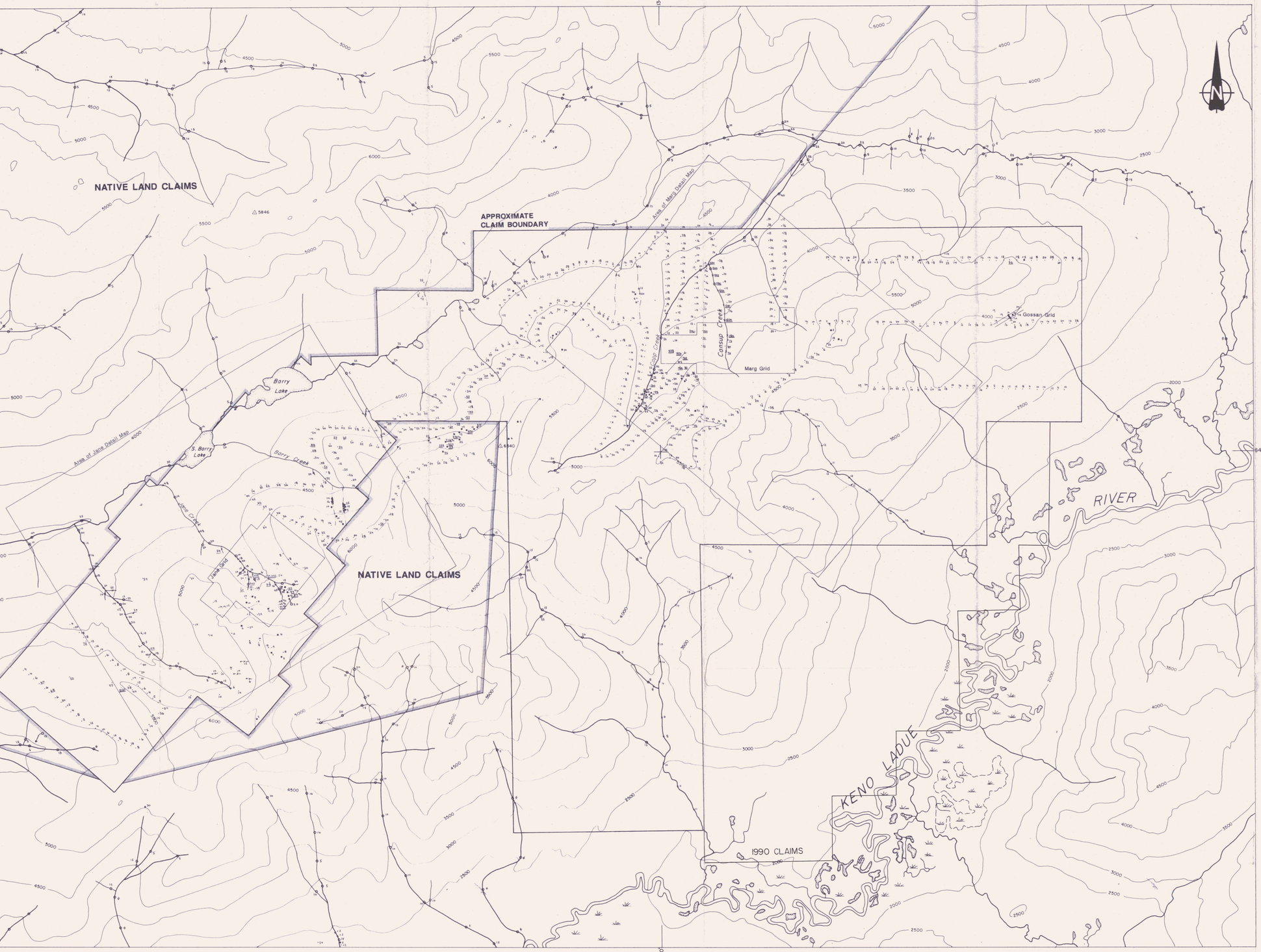
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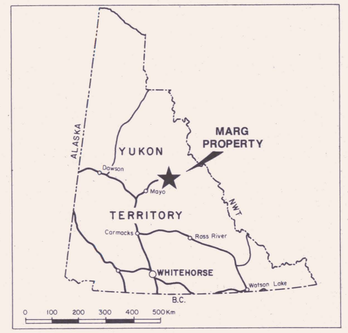
0 1/2 1 Mile

092915

To accompany report dated December, 1990

MAPS 105M/15,16; 106D/1,2




## LEGEND

- × Stream sediment sample (1982,1988,1989)
- . Soil sample (1982,1988,1989)
- • Rock sample (1982,1988,1989)
- ○ GSC stream sediment sample
- Limonitic spring gossan
- 18 Lead Value (ppm)
- 60 Anomalous Values (>50 ppm)
- 600 Highly Anomalous Values (>500 ppm)

Figure 6

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# LEAD GEOCHEMISTRY

MARG PROPERTY

NDU RESOURCES LTD. / CAMECO

SCALE 1:20,000

0 500 1000 1500 Metres

0 1/2 1 Mile

092915

To accompany report dated December, 1990

(11) MAPS 105 M/15,16, 106 D/1,2

NATIVE LAND CLAIMS

APPROXIMATE CLAIM BOUNDARY

Area of Marg Detail Map

Area of Jane Detail Map

Barry Lake

S. Barry Lake

Barry Creek

Jane Creek

Jane Grid

Copup Creek

Marg Grid

Gossan Grid

NATIVE LAND CLAIMS

1990 CLAIMS

RIVER

KENO LADUE

134°30'

64°00'

△5846

△6340

## LEGEND

- × Stream sediment sample (1982,1988,1989)
- . Soil sample (1982,1988,1989)
- • Rock sample (1982,1988,1989)
- ○ GSC stream sediment sample
- Limonitic spring gossan
- 48 Copper Value (ppm)
- 148 Anomalous Values(>100ppm)
- 520 Highly Anomalous Values (>400 ppm)

ALASKA

YUKON TERRITORY

MARG PROPERTY

Dawson

Mayo

Carmacks

Ross River

WHITEHORSE

Watson Lake

N.W.T.

B.C.

0 100 200 300 400 500Km

Figure 7

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# COPPER GEOCHEMISTRY

MARG PROPERTY

NDU RESOURCES LTD. / CAMECO

SCALE 1:20,000

0 500 1000 1500 Metres

0 1/2 1 Mile

092915

To accompany report dated December, 1990

(78) MAP 105 M/15,16; 106 P/1,2

NATIVE LAND CLAIMS

APPROXIMATE CLAIM BOUNDARY

Area of Marg Detail Map

Area of Jane Detail Map

Marg Grid

Gossan Grid

Jane Grid

Consuo Creek

Barry Lake

S. Barry Lake

Barry Creek

Wolverine Creek

△5846

△6340

NATIVE LAND CLAIMS

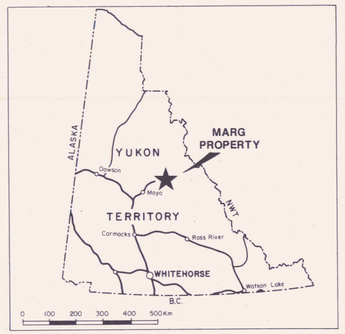
1990 CLAIMS

KENO LAKE

RIVER

64°00'

134°30'




## LEGEND

- × Stream sediment sample (1982,1988,1989)
- · Soil sample (1982,1988,1989)
- ▪ Rock sample (1982,1988,1989)
- ○ GSC stream sediment sample
- Limonitic spring gossan
- 1+8 Zinc Value (ppm)
- 3/11 Anomalous Values (>250ppm)
- 1/15 Highly Anomalous Values (>1000 ppm)

Figure 8

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# ZINC GEOCHEMISTRY

MARG PROPERTY

NDU RESOURCES LTD. / CAMECO

SCALE 1:20,000

0 500 1000 1500 Metres

0 1/2 1 Mile

092915

To accompany report dated December, 1990

(99) MAP # 105A/13,16; 106D/1,2

NATIVE LAND CLAIMS

APPROXIMATE CLAIM BOUNDARY

Area of Marg Detail Map

Area of Jane Detail Map

Barry Lake

S. Barry Lake

Barry Creek

Jane Creek

Jane Grid

Consup Creek

Marg Grid

Gossan Grid

NATIVE LAND CLAIMS

1990 CLAIMS

KENO LADUE

RIVER

64°00'

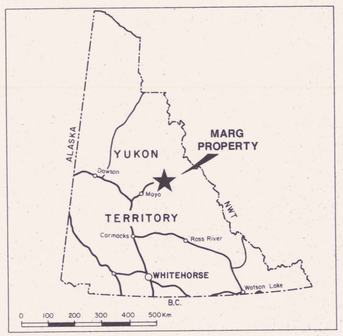
135°30'

135°00'

△5846

△6340

N




## LEGEND

- × Stream sediment sample (1982,1988,1989)
- . Soil sample (1982,1988,1989)
- • Rock sample (1982,1988,1989)
- ○ GSC stream sediment sample
- Limonitic spring gossan
- 5555 Sample Number

Figure 9

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# SAMPLE LOCATION MAP

MARG PROPERTY

NDU RESOURCES LTD. / CAMECO

SCALE 1:20,000

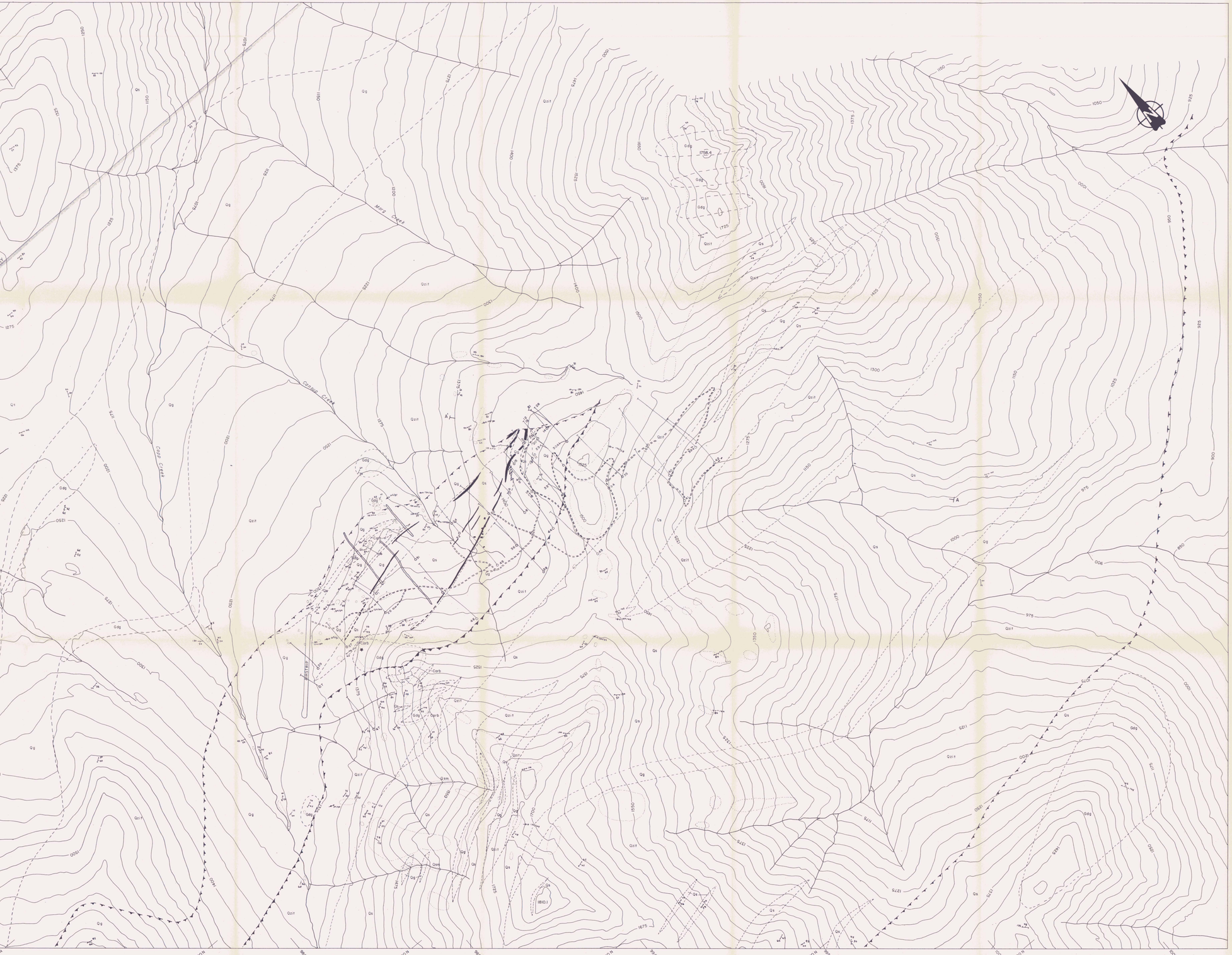
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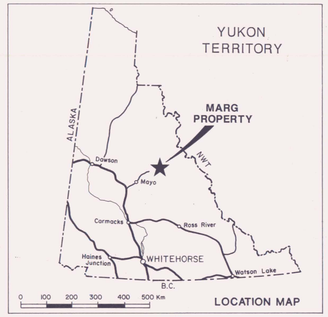
0 1/2 1 Mile

092915

To accompany report dated December, 1990

(30) MAP # 105M/15,16; 106D/1,2




## LEGEND

TRIASSIC(?)

- Gdg — Greenstone - sills of diorite and gabbro and their altered equivalents

MISSISSIPPIAN (and older?)

- Qzit — Quartzite - massive, medium grey quartzite with thin black phyllite interbeds
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- Carb — Carbonate Quartz Chlorite Phyllite - orange to buff weathering, iron-carbonate rock. Medium grained, generally massive

## SYMBOLS

- Outcrop Outline
- Contacts, approximate
- Thrust Fault, approximate
- Foliation (S1) - strike, dip
- Foliation (S2) - strike, dip
- Bedding (S0) - strike, dip
- Minor Fold - strike and plunge
- Diamond Drill Hole
- Bulldozer Trench
- Chalcopyrite ± Sphalerite ± Galena Float
- Surface Trace of Sulphide Mineralization
- Bulldozer Road

Figure 10

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DETAILED GEOLOGY

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./CAMECO

SCALE 1:5000

0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092915

To accompany report dated December, 1980

(81) MAP 105M/15W; 106D/1,2

S

100,000N

N

1500m

1000 m

Qzit

Qs

Qg

39 (abandoned)

39a

42

0.73, 1.08, 3.69, 0.62, 0.018
0.7

0.99, 1.49, 2.64, 1.08, 0.013
4.2
"D" HORIZON

0.61, 0.94, 1.74, 0.76, 0.013
7.0
"B" HORIZON

0.95, 1.36, 2.47, 1.14, 0.010
4.2
"A" HORIZON

1.72, 1.48, 2.94, 1.56, 0.029
0.9
"D" HORIZON

0.49, 0.78, 1.45, 0.63, 0.007
2.1
"A" HORIZON

## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE / SEMI-MASSIVE SULPHIDE

23 — DRILL HOLE

LITHOLOGIC CONTACT

FAULT

1.24, 2.07, 3.95, 1.94, .034
5.34

%Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au
Metres

Figure 13

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DRILL SECTION
# 2375E

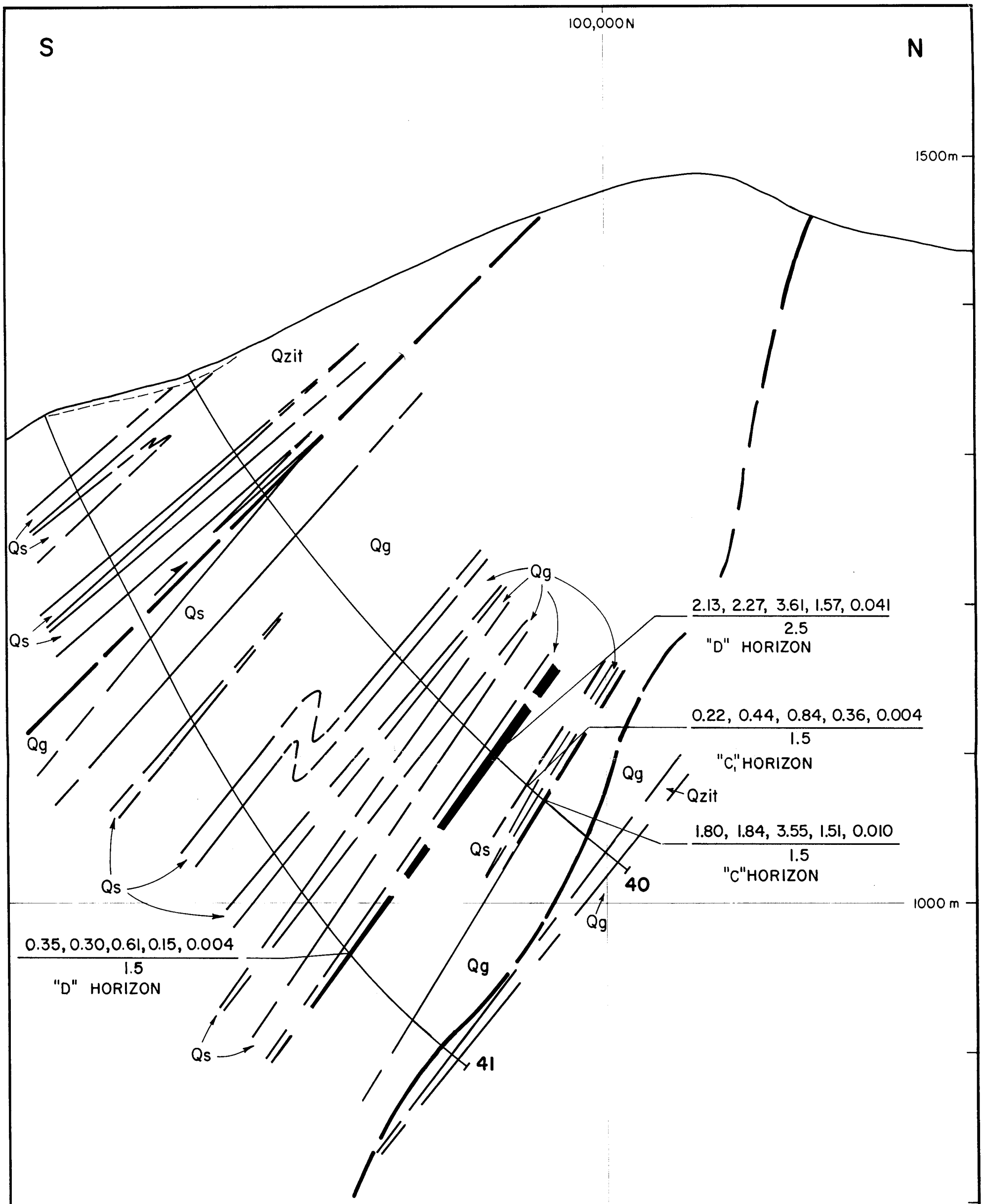
MARG ZONE

NDU RESOURCES LTD./CAMECO

092915

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE / SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 14

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DRILL SECTION 2225E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90

S

N

100,000N

1500m

1000 m

Qzit

Qs

Qg

Qg

Qzit

1.46, 3.74, 5.12, 1.34, .035
4.65

2.15, 1.51, 3.15, 1.28, .014
1.08

0.58, 0.65, 1.27, 0.47, .004
1.48

0.73, 1.26, 2.45, 0.94, .014
2.78
"B" HORIZON

Qs

"D" HORIZON

"C"

35

Qs

## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE /SEMI-MASSIVE SULPHIDE

23 — DRILL HOLE

LITHOLOGIC CONTACT

FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 15

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DRILL SECTION 2075E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90

S

100,000N

N

1500m

1000 m

Qzit

Qg

Qs

14

28

21

30A

34

"C"

"B"

"A" HORIZON

1.33, 2.16, 3.99, 1.38, .017
3.36
"D" HORIZON

① 2.26, 2.95, 5.62, 2.42, .024 / 1.90
② 1.16, 1.46, 2.70, 1.29, .013 / 1.59
③ 2.56, 2.48, 5.25, 2.11, .034 / 3.35
④ 1.46, 2.10, 4.10, 1.78 .022 / 2.50
⑤ 1.50, 2.32, 4.84, 1.97, .031 / 5.05
⑥ 0.75, 1.02, 2.02, 0.96, .006/ 3.60
⑦ 1.05, 2.85, 5.21, 1.70, .027 / 3.55
⑧ 0.89, 1.45, 2.74, 1.19, .017 / 1.70
⑨ 0.57, 0.96, 1.84, 0.81, .010 / 4.91
⑩ 1.25, 2.04, 3.91, 1.38, .021 / 1.75

## LEGEND

Qzit — QUARTZITE

Qg — QUARTZ GRAPHITE PHYLLITE

Qs — QUARTZ SERICITE PHYLLITE

MASSIVE/SEMI-MASSIVE SULPHIDE

23 — DRILL HOLE

LITHOLOGIC CONTACT

FAULT

1.24, 2.07, 3.95, 1.94, .034
5.34

%Cu,%Pb,%Zn,oz/ton Ag,oz/ton Au
Metres

Figure 16

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

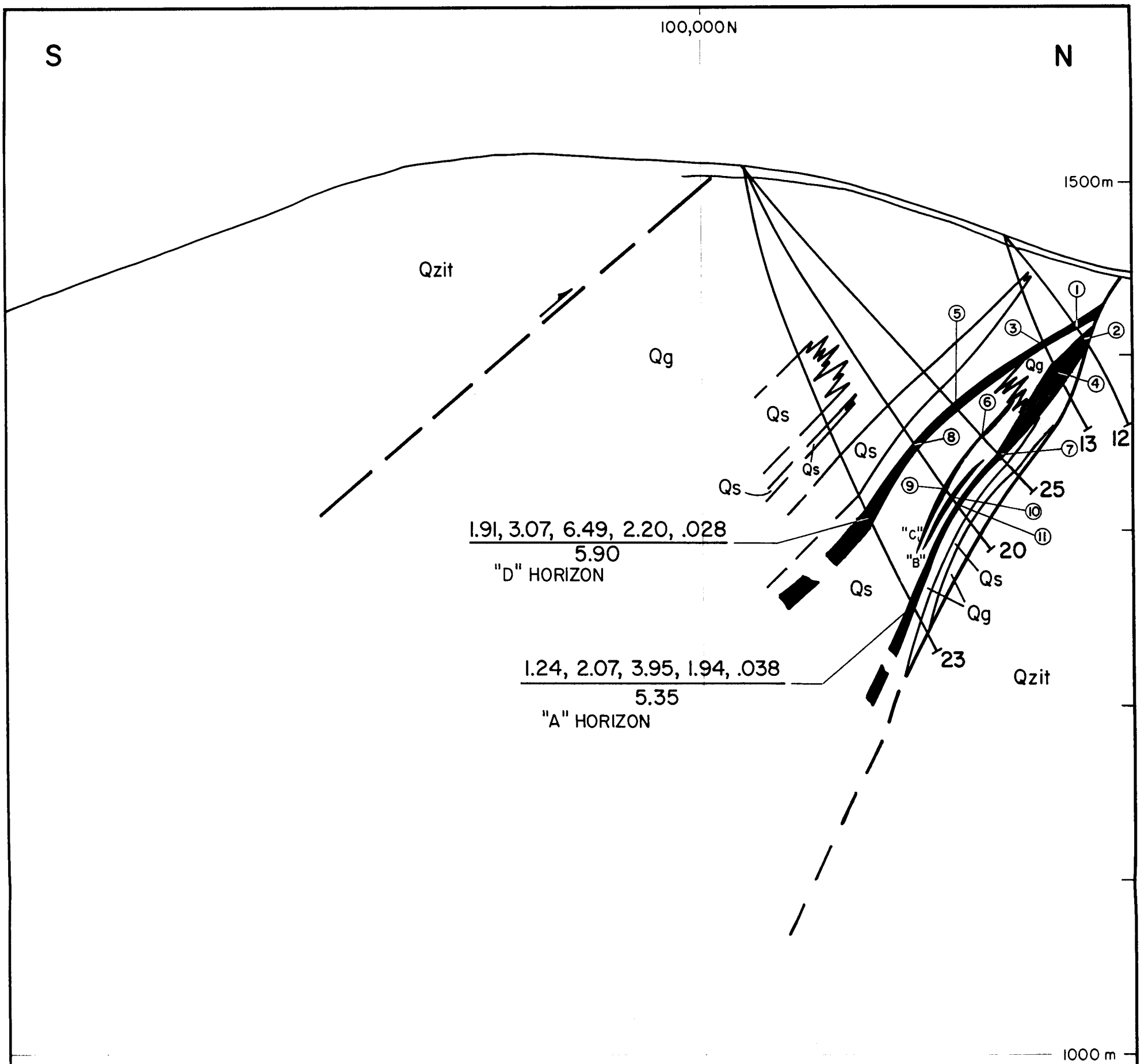
# DRILL SECTION 2000E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




① 3.14, 4.84, 9.21, 3.18, .053 / 3.70
② 2.03, 3.31, 5.85, 3.09, .042 / 5.95
③ 1.33, 0.98, 1.93, 0.88, .002 / 2.55
④ 1.41, 2.52, 4.45, 2.25, .031 / 11.70
⑤ 1.98, 1.22, 3.40, 1.47, .023 / 5.98
⑥ 0.94, 1.75, 3.36, 1.24, .014 / 0.80
⑦ 1.45, 1.90, 4.11, 1.65, .020 / 1.00
⑧ 1.74, 1.87, 3.97, 1.91, .034 / 2.10
⑨ 1.26, 2.10, 4.04, 1.55, .034 / 2.20
⑩ 0.93, 1.77, 3.23, 1.41, .014 / 2.45
⑪ 1.12, 1.75, 3.36, 1.90, .025 / 1.65

## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE /SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au
5.34 — Metres

Figure 17

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

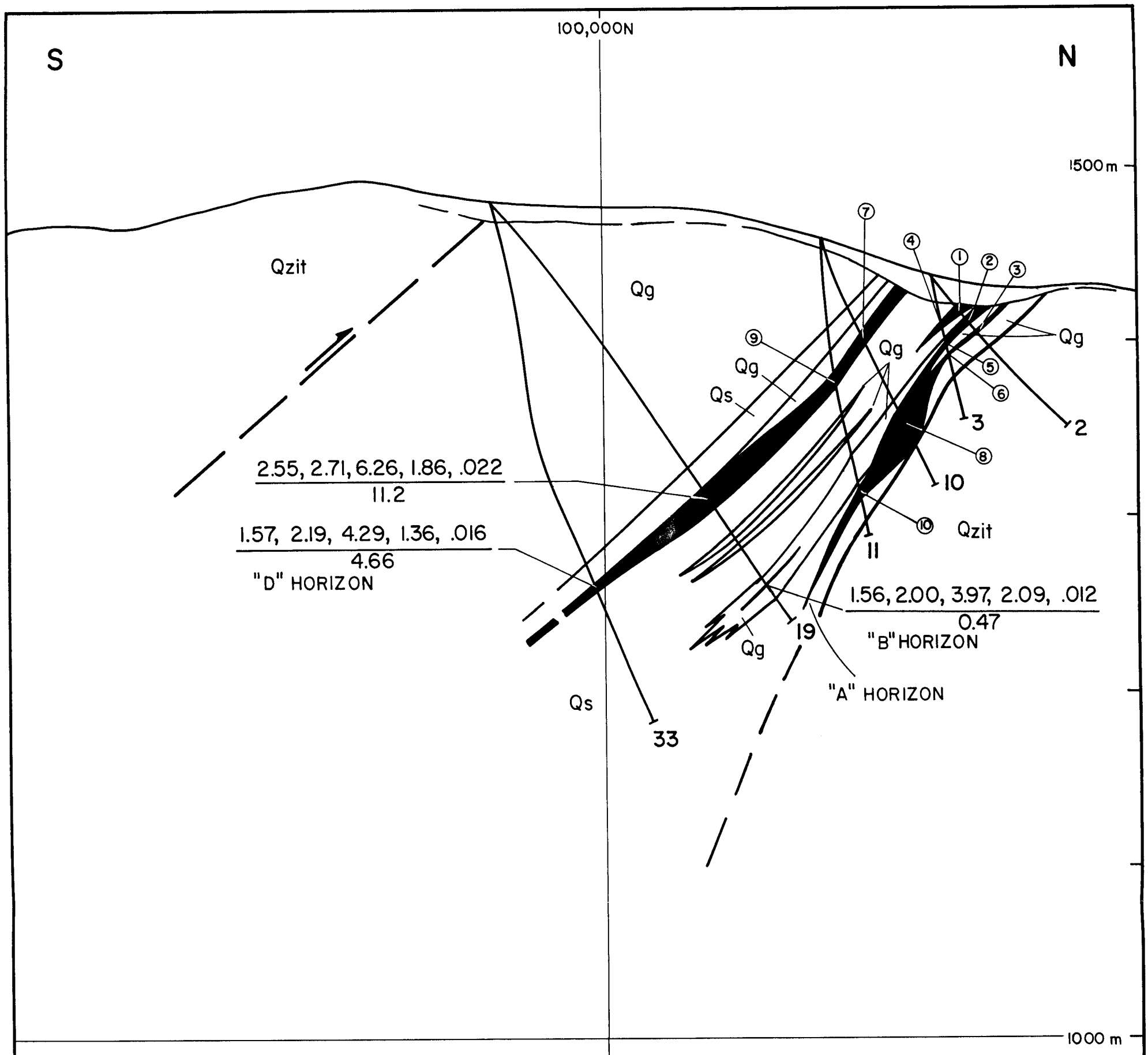
# DRILL SECTION
# 1940E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




★① 0.26, 5.77, 0.02, 9.30, .050 / 6.19
② 3.99, 1.74, 3.44, 1.66, .029 / 4.42
③ 3.48, 1.22, 1.37, 0.51, .010 / 1.52
④ 5.41, 3.05, 6.42, 2.97, .010 / 1.07
⑤ 1.33, 1.84, 3.84, 1.49, .008 / 1.52
⑥ 1.10, 1.00, 2.09, 0.92, .008 / 1.37
⑦ 2.92, 3.33, 5.93, 1.81, .048 / 5.93
⑧ 0.94, 1.79, 3.19, 1.38, .031 /22.85
⑨ 2.24, 3.05, 5.87, 1.16, .027 / 5.55
⑩ 1.52, 3.17, 5.57, 2.47, .050 / 2.90

★ partly oxidized

## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE /SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 18

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DRILL SECTION
# 1880E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90

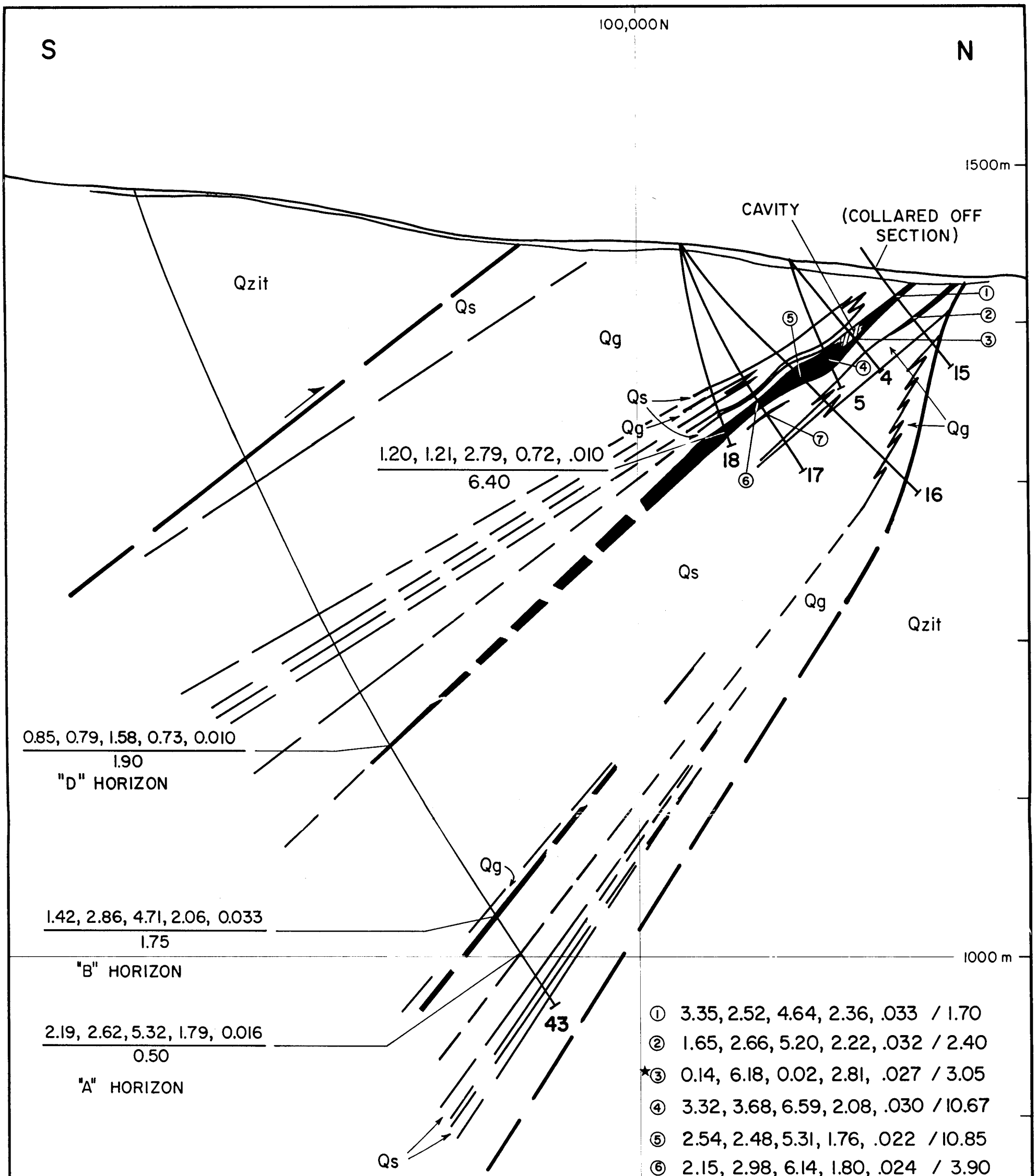



Figure 19

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

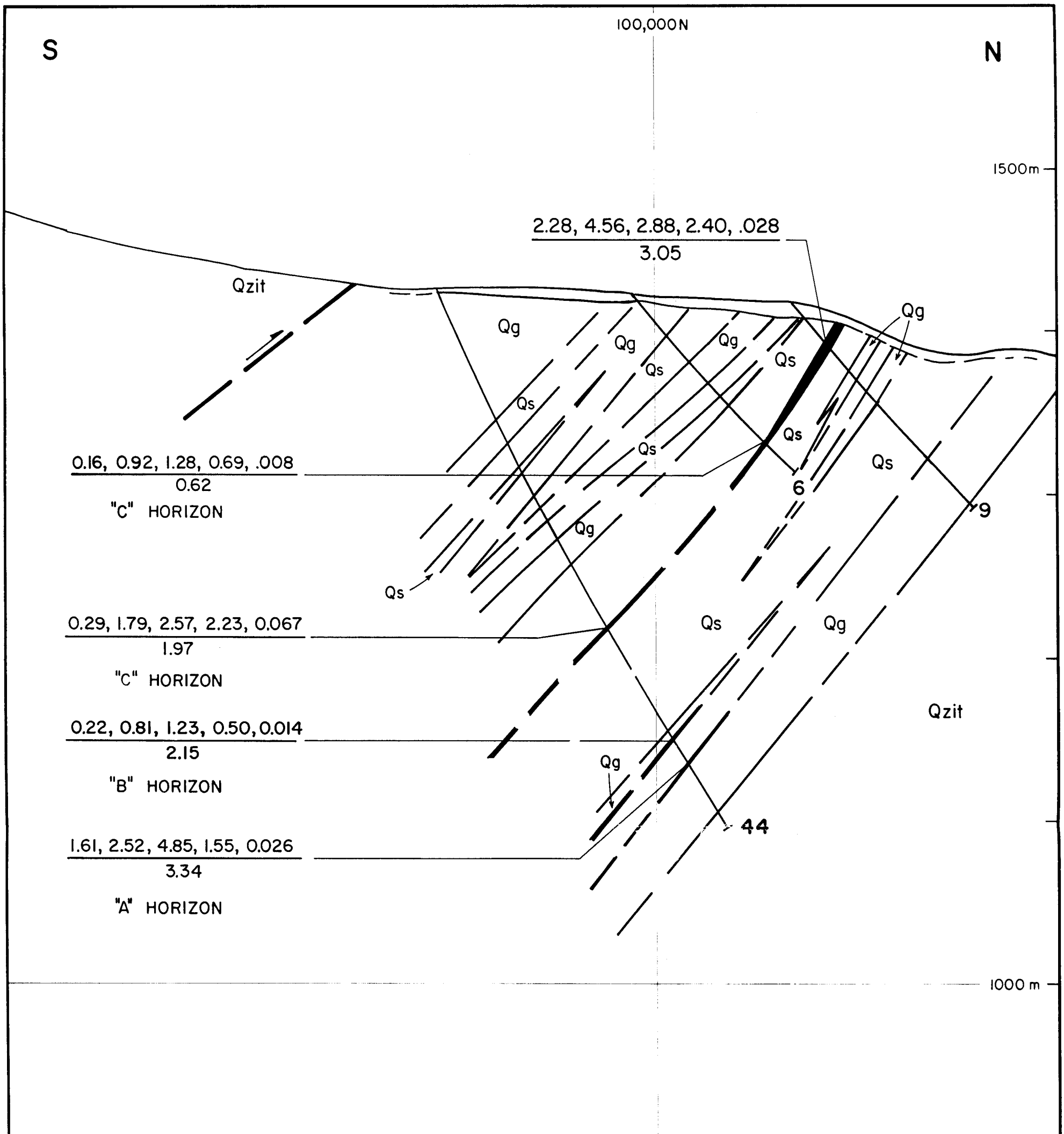
# DRILL SECTION 1800E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE / SEMI- MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 20

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DRILL SECTION 1725E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90

100,000N

S

N

1500m

2.21, 5.29, 9.63, 3.73, .072
0.91

1.15, 2.43, 4.36, 1.88, .060
7.11
"C" HORIZON

1.45, 3.65, 4.67, 2.60, .056
1.96

1.47, 2.27, 4.15, 1.94, .040
11.44
"$C_1$" HORIZON

Qzit

Qg

Qg

Qs

Qs

Qs

Qs

Qg

22

36

38

1.30, 0.03, 0.06, 0.12, .006
0.73

1.44, 0.03, 0.05, 0.11, .004
0.70
"D" HORIZON

1.97, 2.87, 5.64, 2.00, .026
3.56

0.87, 0.72, 1.63, 0.74, .004
0.83

0.41, 1.57, 3.15, 0.75, .002
0.65
"A" HORIZON

1000 m

## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE /SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034
5.34

%Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au
Metres

Figure 21

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

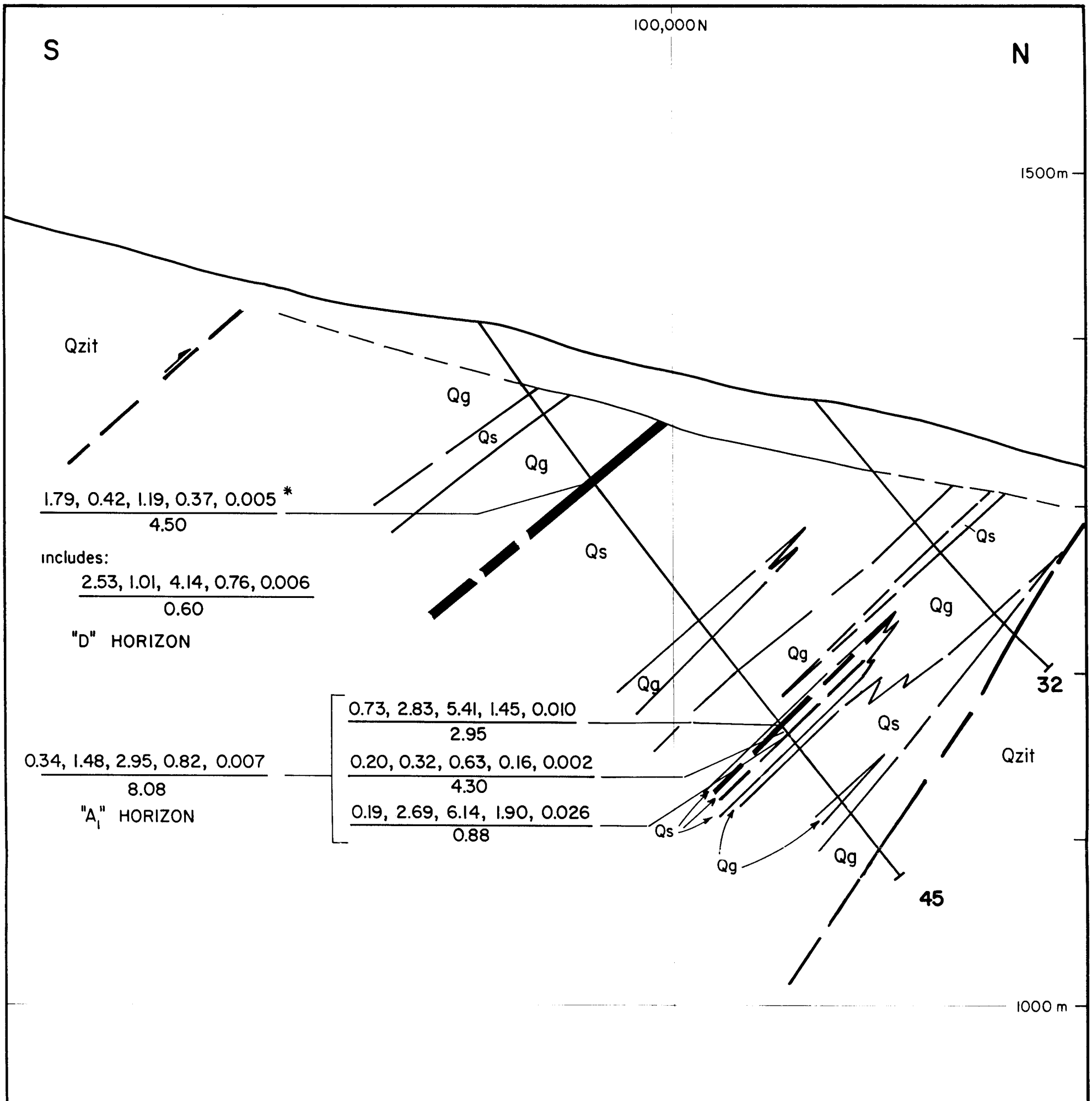
# DRILL SECTION
# 1620E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




* The upper intersection in Hole 45 consists of a 0.60m thick massive sulphide interval enveloped by a 4.50m wide, chalcopyrite-rich quartz-carbonate vein swarm

## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE / SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 22

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

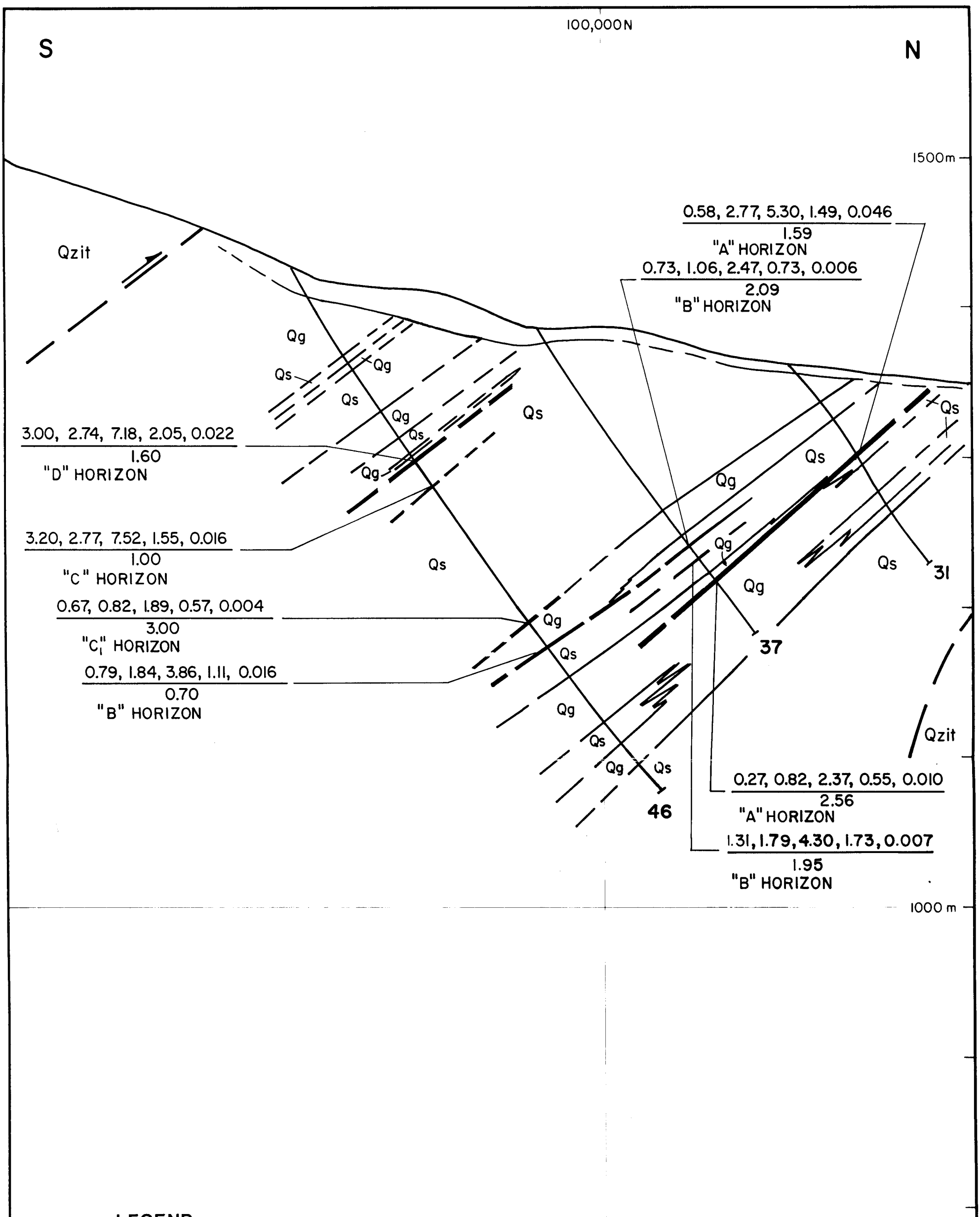
# DRILL SECTION 1485E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE/SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 23

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

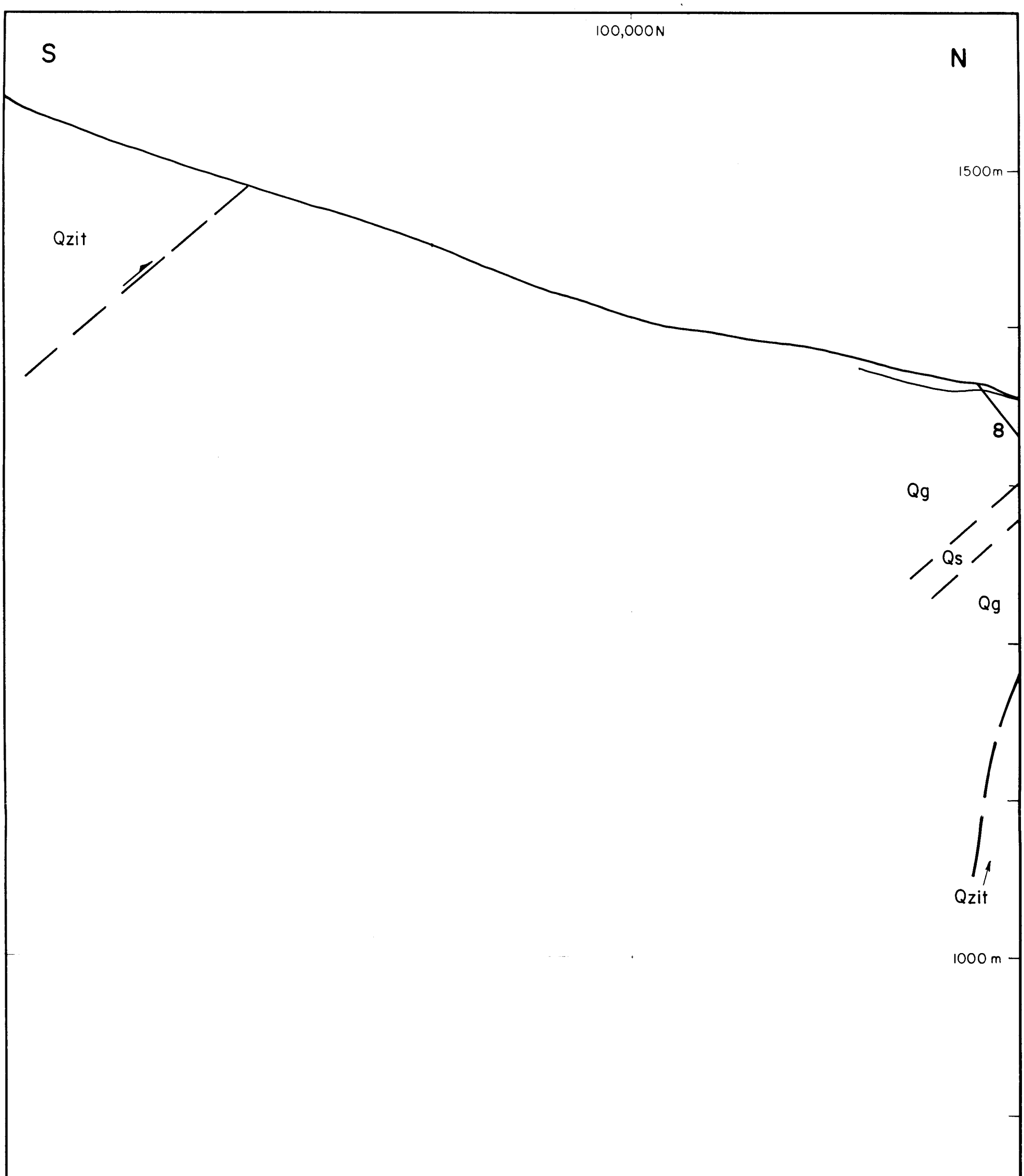
# DRILL SECTION 1290E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE /SEMI-MASSIVE SULPHIDE

23 — DRILL HOLE

LITHOLOGIC CONTACT

FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 24

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

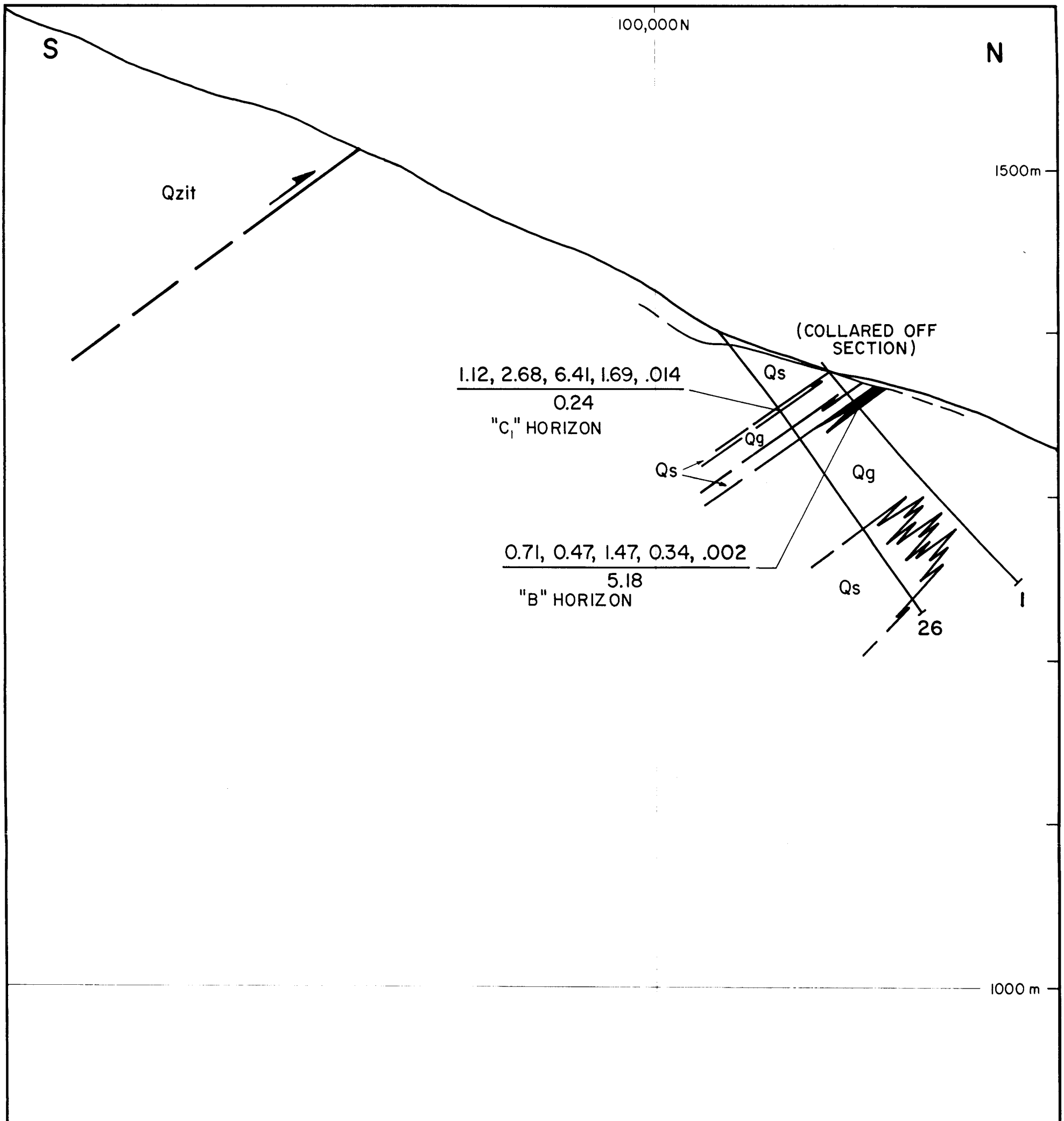
# DRILL SECTION 1195E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE /SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 25

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

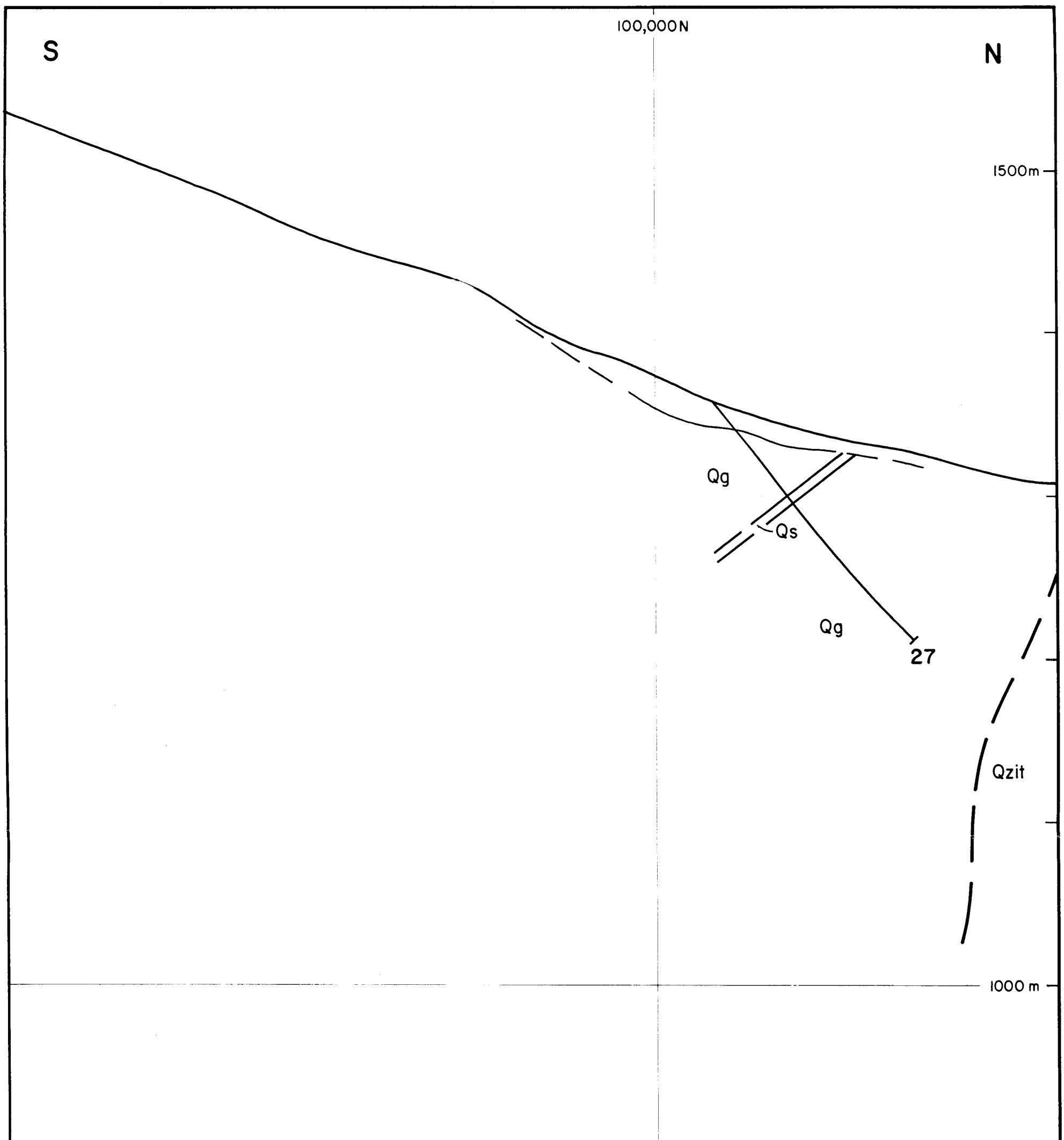
# DRILL SECTION 1075E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE /SEMI-MASSIVE SULPHIDE

23 — DRILL HOLE

LITHOLOGIC CONTACT

FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 26

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

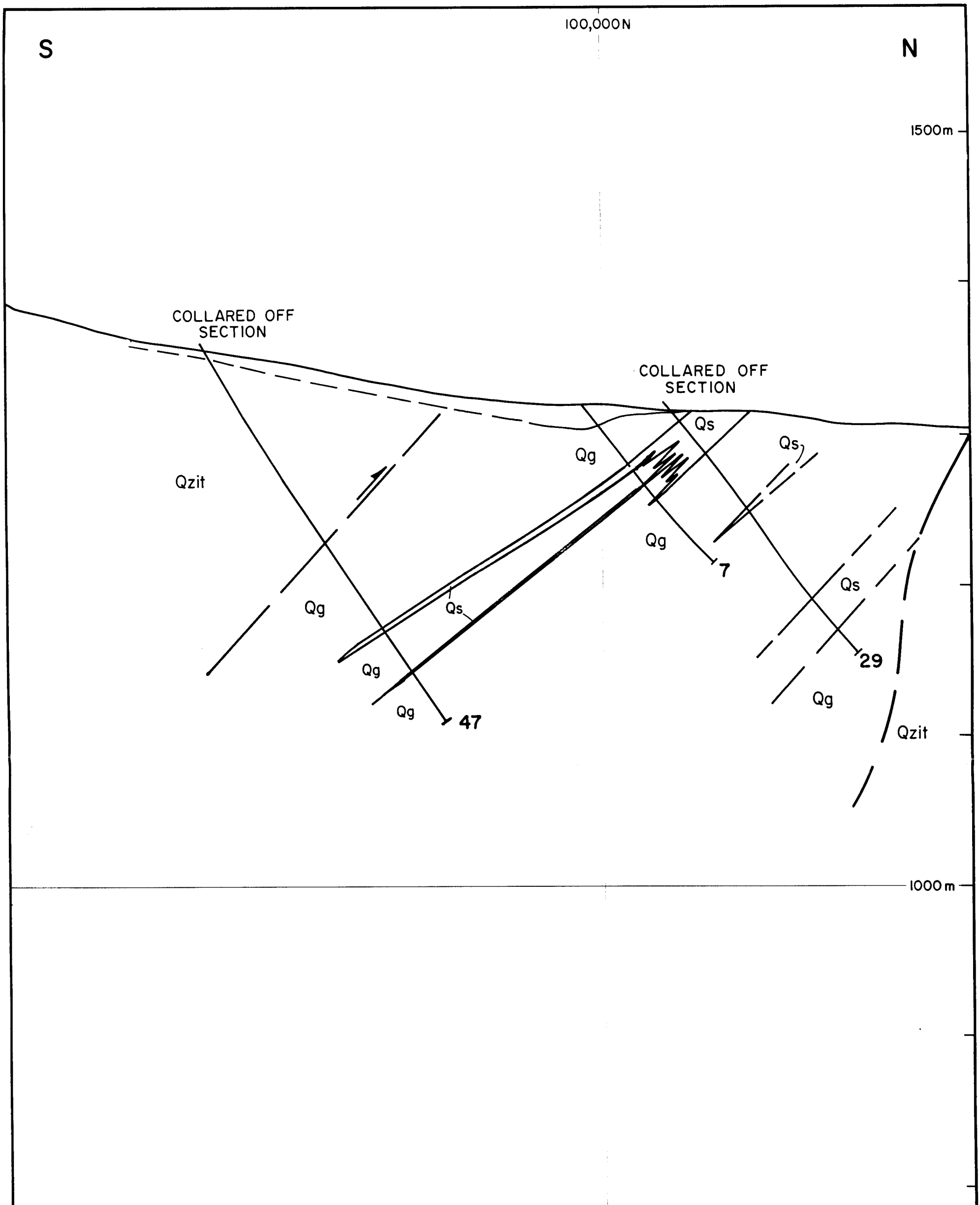
# DRILL SECTION
# 875E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE / SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE
- LITHOLOGIC CONTACT
- FAULT

1.24, 2.07, 3.95, 1.94, .034 / 5.34 — %Cu, %Pb, %Zn, oz/ton Ag, oz/ton Au / Metres

Figure 27

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

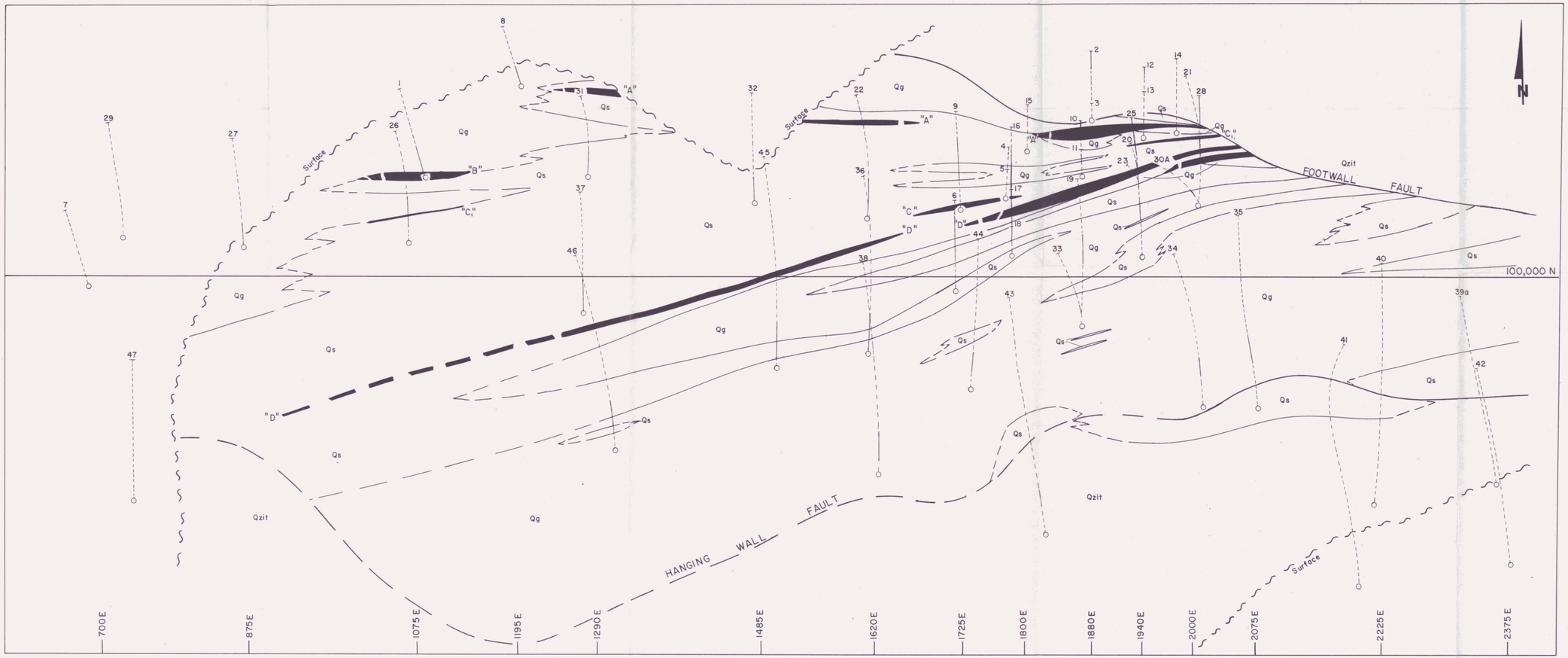
# DRILL SECTION 700E

MARG ZONE

NDU RESOURCES LTD./CAMECO

0 50 100 m

Dec/90




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE/SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE – PIERCEMENT
- LITHOLOGIC CONTACT
- FAULT

Figure 28

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# GEOLOGY

## 1350m LEVEL PLAN

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

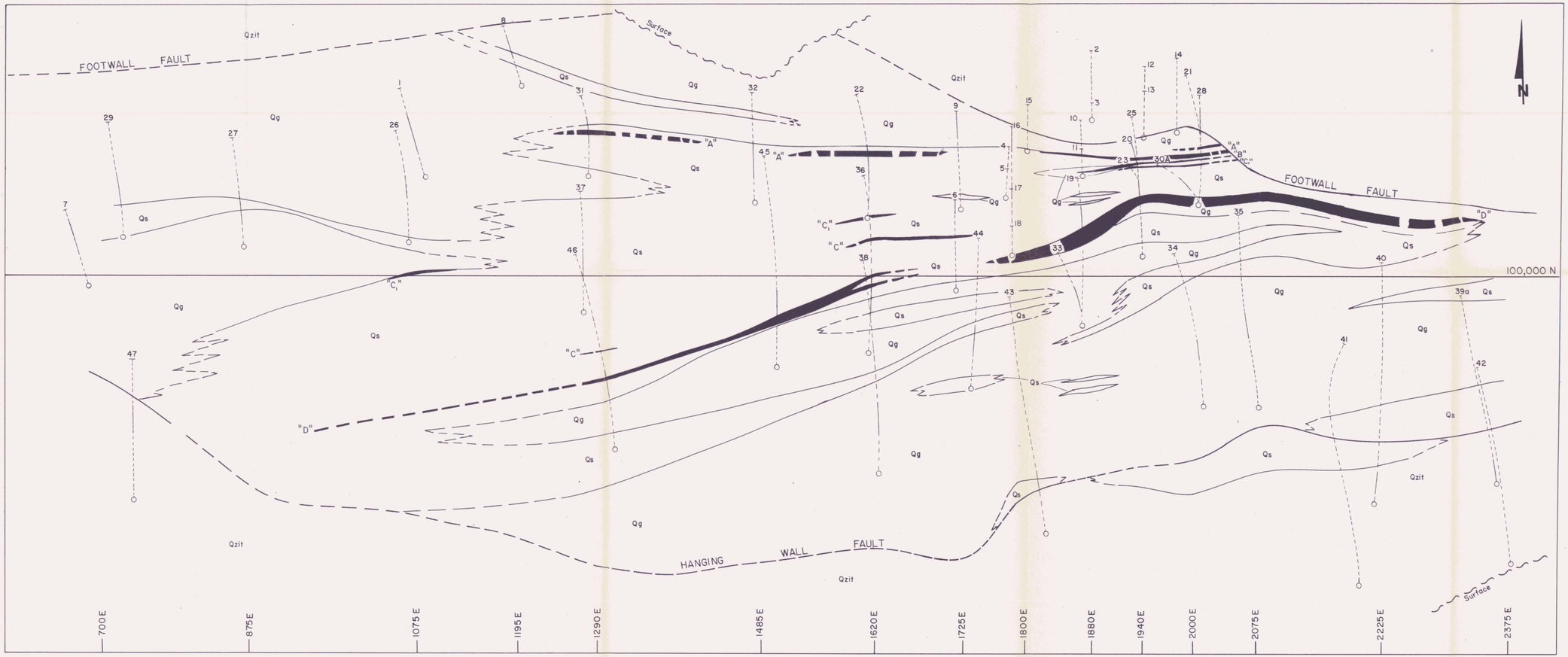
SCALE – 1:2500

50 25 0 25 50 75 100 Metres

100 50 0 100 200 300 Feet

092915 Dec./90

(82) MAP 105 M/15, 16; 106 P/1, 2




N

**LEGEND**

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE/SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE – PIERCEMENT
- LITHOLOGIC CONTACT
- FAULT

Figure 29

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# GEOLOGY

## 1300m LEVEL PLAN

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

SCALE - 1:2500

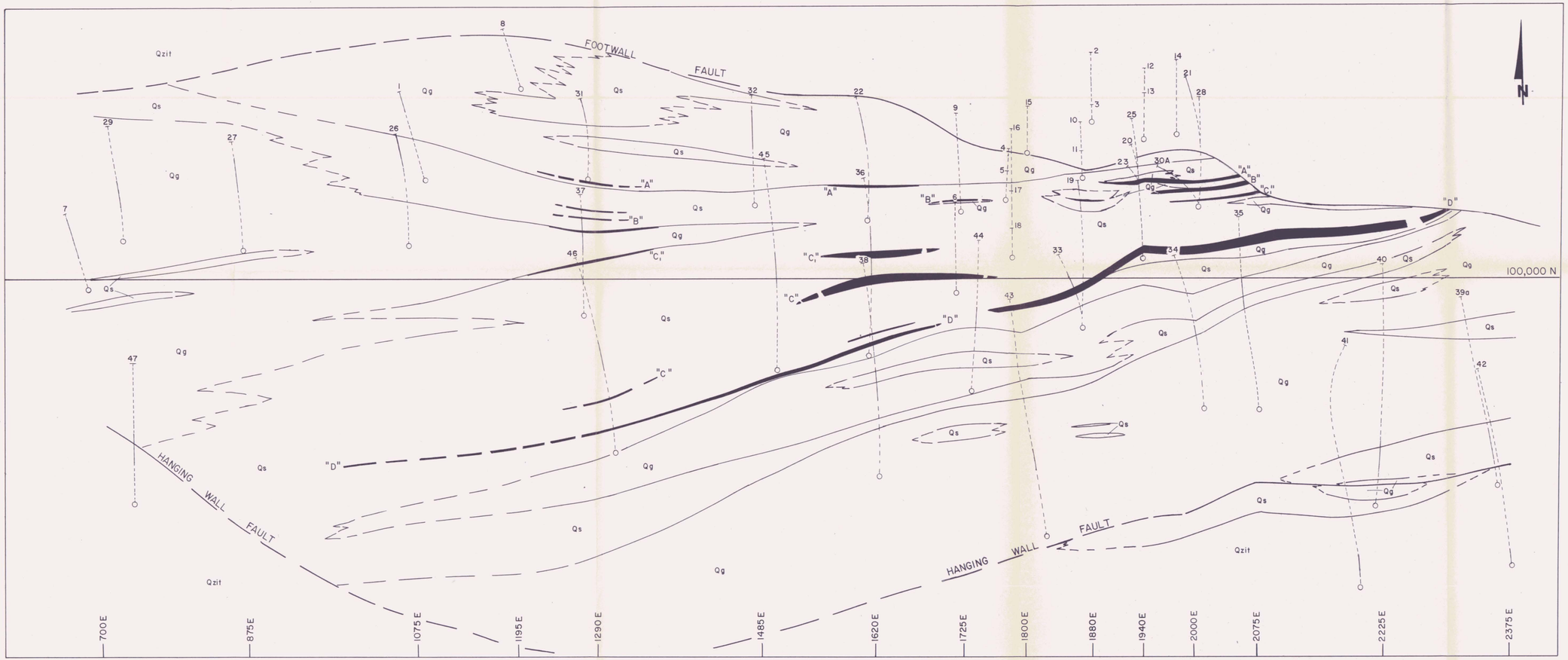
50 25 0 25 50 75 100 Metres

100 50 0 100 200 300 Feet

Dec/90

092015

(83) MAP# 105M/15,16; 106D/1,2




**LEGEND**

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE/SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE – PIERCEMENT
- LITHOLOGIC CONTACT
- FAULT

Figure 30

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# GEOLOGY

## 1250m LEVEL PLAN

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

SCALE – 1:2500

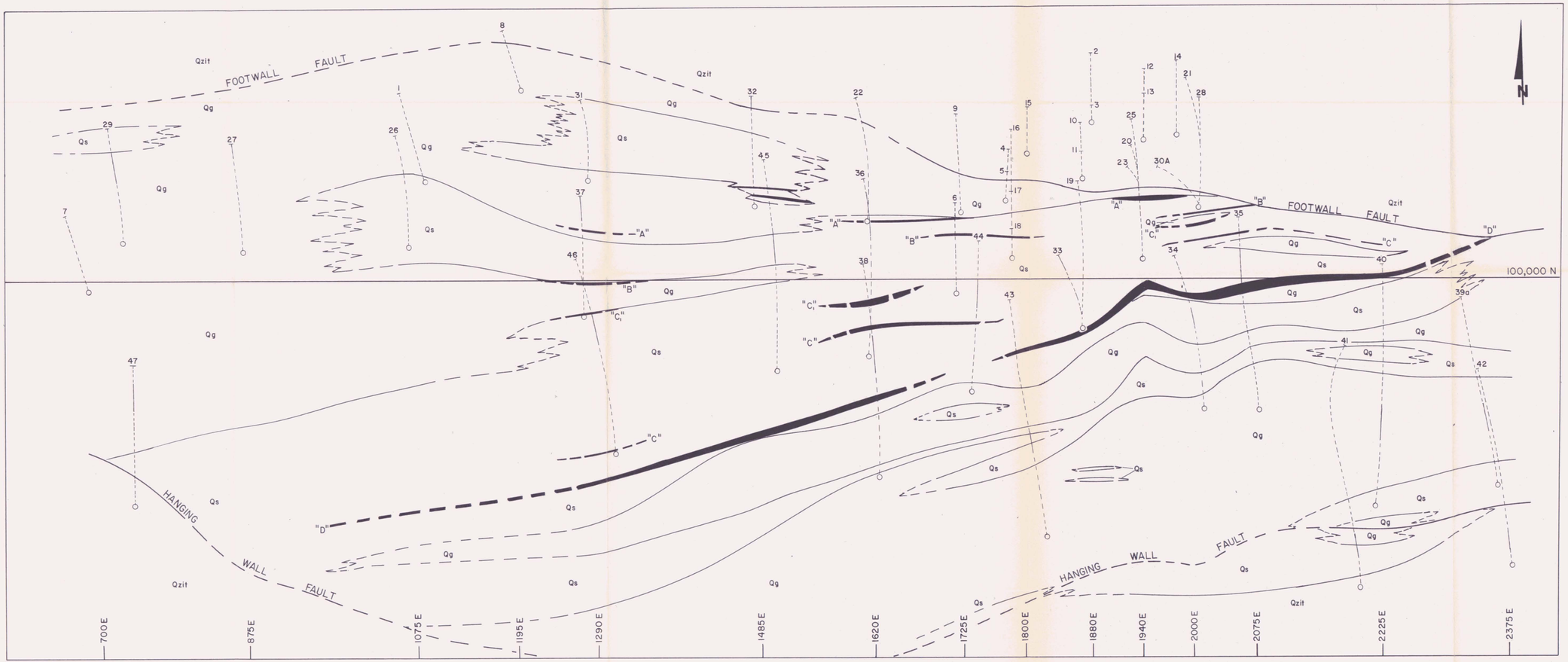
50 25 0 25 50 75 100 Metres

100 50 0 100 200 300 Feet

092915

Dec/90

(84) MAP# 105M/15,16; 106D/1,2




N

**LEGEND**

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE/SEMI-MASSIVE SULPHIDE
- DRILL HOLE – PIERCEMENT
- LITHOLOGIC CONTACT
- FAULT

Figure 31

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# GEOLOGY

## 1200m LEVEL PLAN

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

SCALE – 1:2500

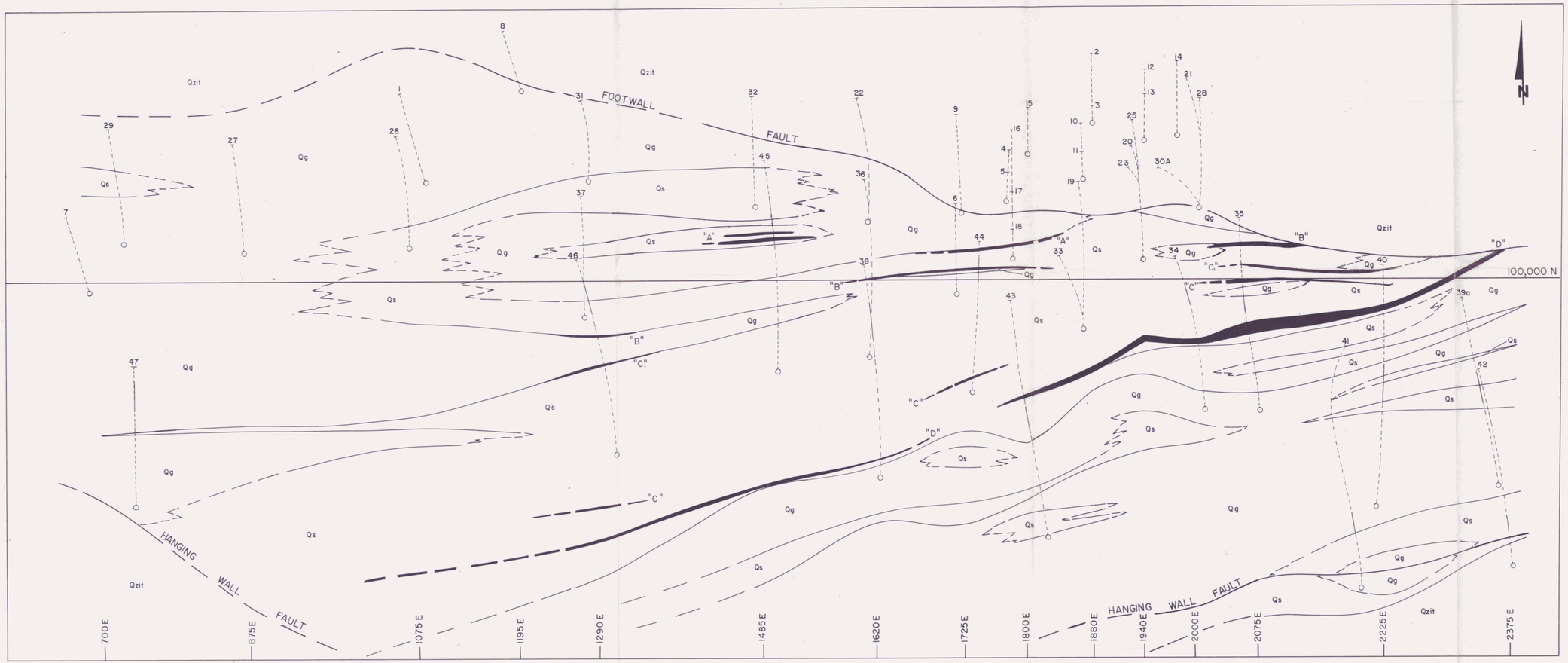
50 25 0 25 50 75 100 Metres

100 50 0 100 200 300 Feet

092915

Dec/90

(85) MAP# 105M/15,16; 106P/1,2




## LEGEND

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE/SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE – PIERCEMENT
- LITHOLOGIC CONTACT
- FAULT

Figure 32

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# GEOLOGY

## 1150m LEVEL PLAN

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

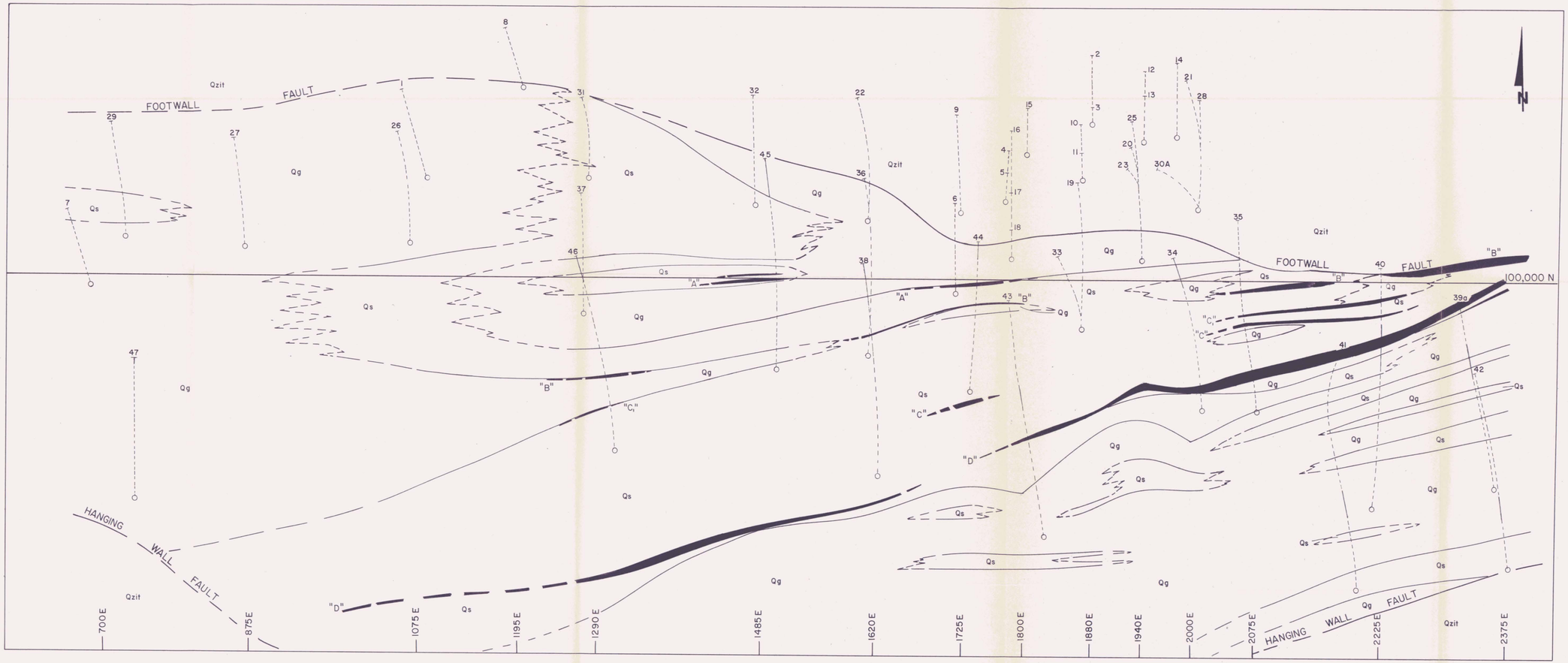
SCALE – 1:2500

50 25 0 25 50 75 100 Metres

100 50 0 100 200 300 Feet

092915 Dec/90

(86) MAP# 105M/15/16; 106D/1,2




**LEGEND**

- Qzit — QUARTZITE
- Qg — QUARTZ GRAPHITE PHYLLITE
- Qs — QUARTZ SERICITE PHYLLITE
- MASSIVE/SEMI-MASSIVE SULPHIDE
- 23 — DRILL HOLE – PIERCEMENT
- LITHOLOGIC CONTACT
- FAULT

Figure 33

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# GEOLOGY

## 1100m LEVEL PLAN

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./ CAMECO

SCALE – 1:2500

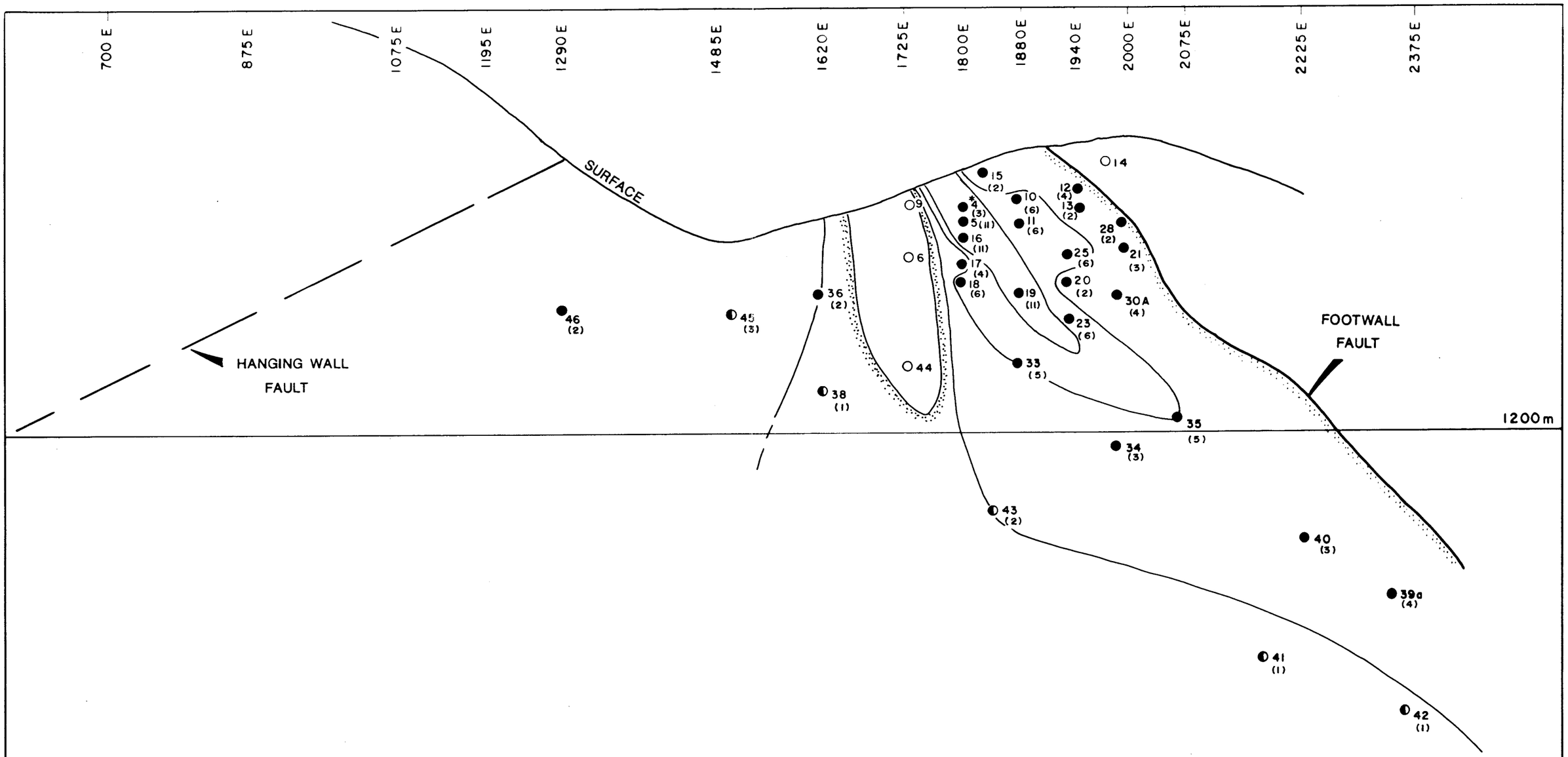
50 25 0 25 50 75 100 Metres

100 50 0 100 200 300 Feet

092915

Dec/90

(87) MAP#105-11/15/16; 106-9/1,2




- ● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m
- ◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m
- ○ PIERCEMENT POINT – Barren

10 / 5 / 2 / 0 — True thickness of massive sulphide horizon (m)

(* Highly Oxidized Sulphide)

Figure 34

# D HORIZON LONGITUDINAL SECTION
# TRUE THICKNESS

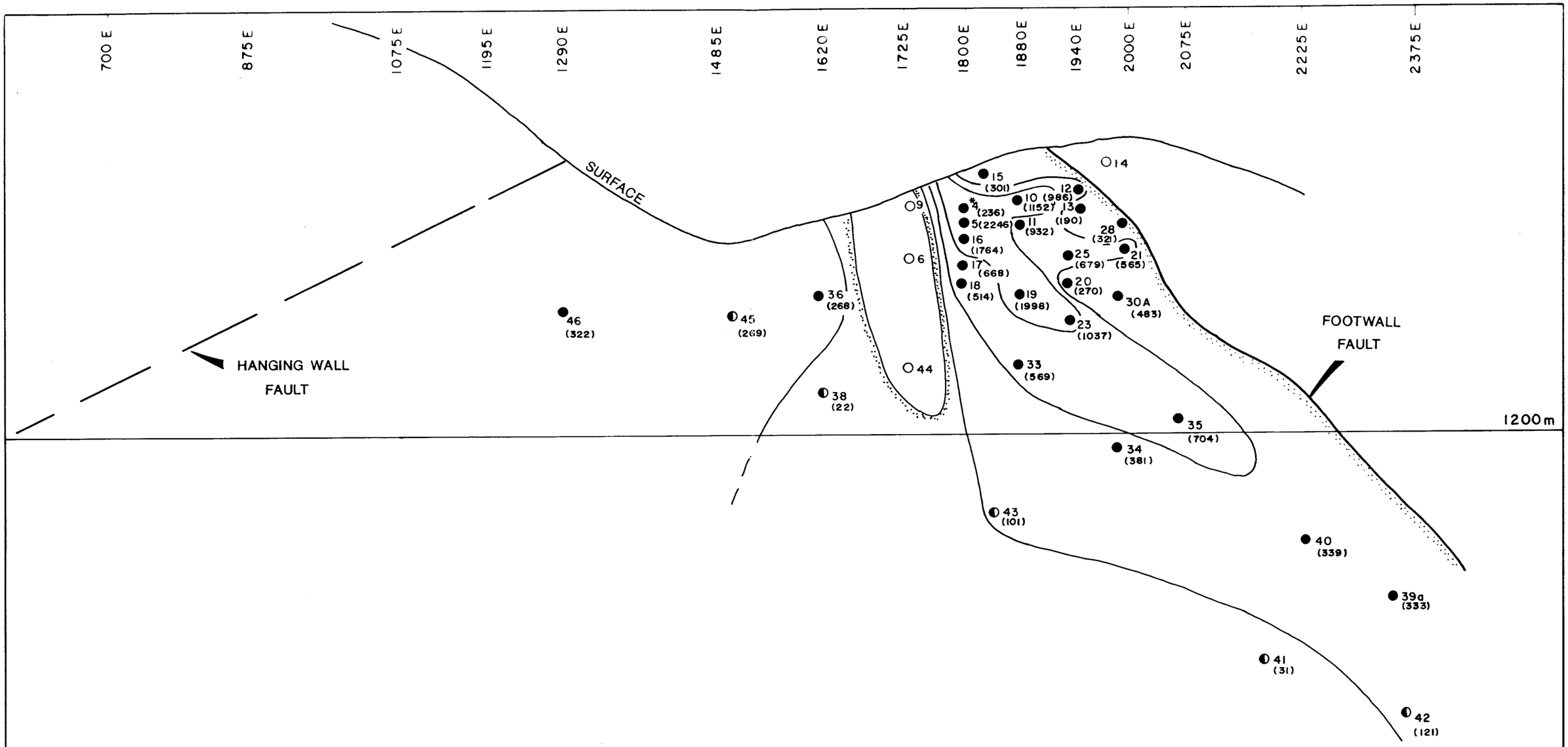
MARG ZONE **092915**

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Note: Section is constructed in the plane of the horizon on a north-south projection

Dec/90




● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

—— 1000 ——

—— 500 ——

—— 100 ——

0

GROSS METAL VALUE =Total Value ($US)

Using metal prices of (in$US):

Cu=$1.00 Pb=$0.40 Zn=$0.70 /pound

Ag=$5.00 Au=$400.00/ounce

(* Highly Oxidize Sulphide)

Figure 35

# D HORIZON LONGITUDINAL SECTION

# GROSS METAL VALUE x WIDTH

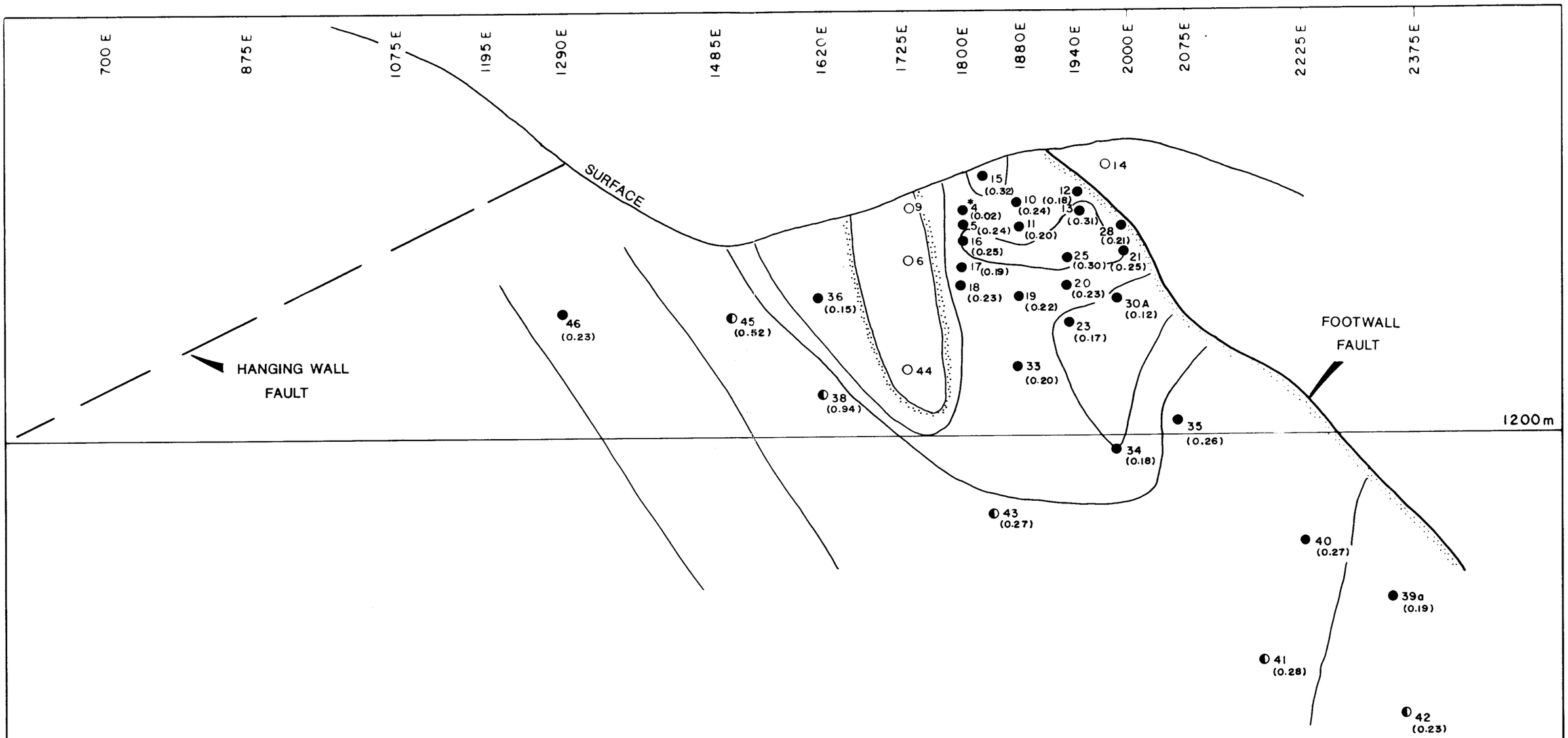
## MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Note: Section is constructed in the plane of the horizon on a north-south projection

Dec/90




● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

—0.25— Ratio

—0.18— Cu/Cu+Pb+Zn

0.0

(* Highly Oxidized Sulphide)

Note: Section is constructed in the plane of the horizon on a north-south projection

Figure 36

# D HORIZON LONGITUDINAL SECTION

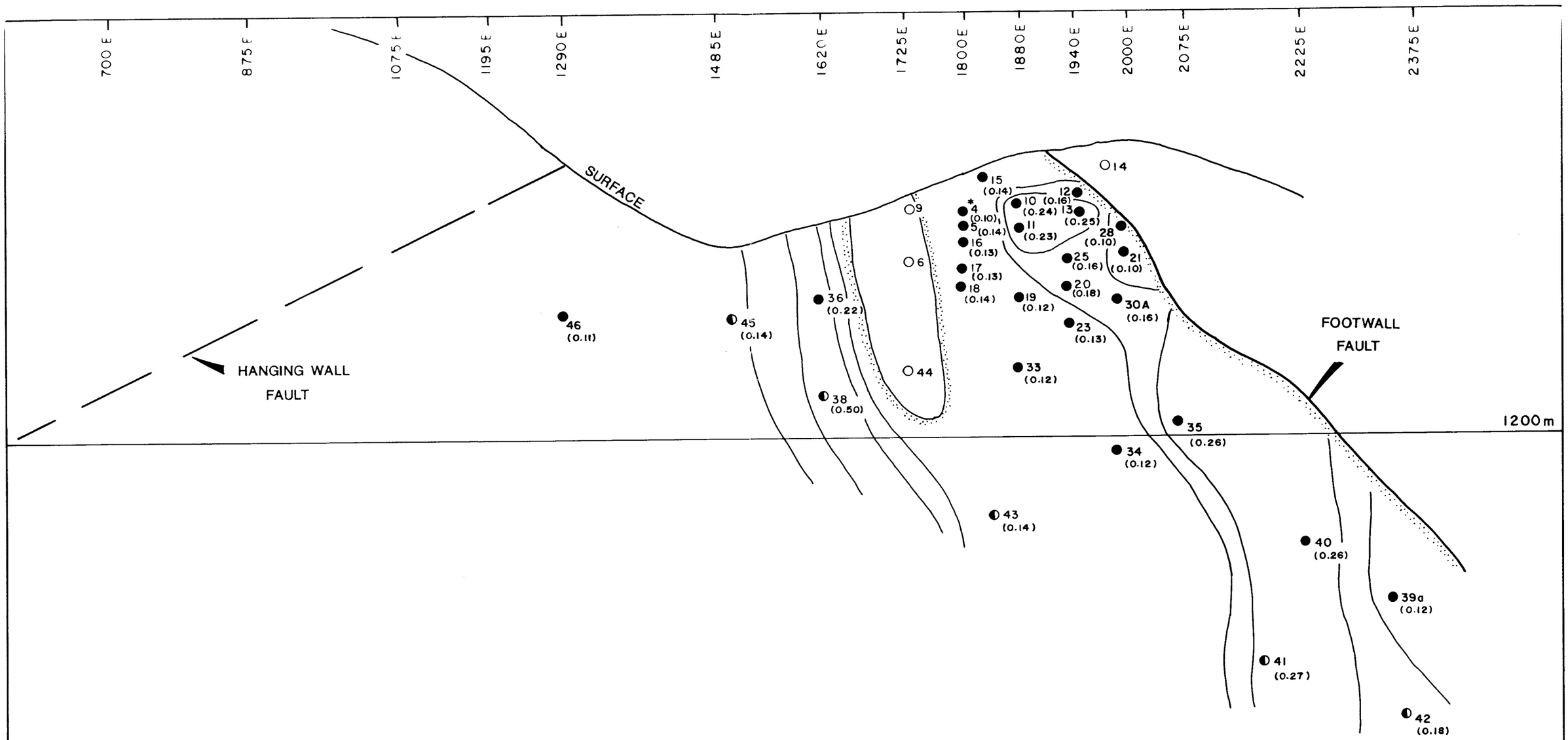
## Cu / Cu+Pb+Zn

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90




● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

—— 0.20 ——
—— 0.15 ——
0.0

Aggregate Average Value: Au/Ag x 10

(* Highly Oxidized Sulphide)

Note: Section is constructed in the plane of the horizon on a north–south projection

Figure 37

# D HORIZON LONGITUDINAL SECTION

## Au/Ag x 10

## MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90

700 E
875 E
1075 E
1195 E
1290 E
1485 E
1620 E
1725 E
1800 E
1880 E
1940 E
2000 E
2075 E
2225 E
2375 E

SURFACE

FOOTWALL FAULT

1200m

26 (1)
37
46 (1)
29
7
46 (3)
47
32
22
45
36 (7)
36 (11)
44 (2)
38
43
15 (2)
9 (3)
4
5
16
6 (1)
17 (2)
2
3
10
11
19
33
14
12
13
28
21 (3)
25 (1)
20 (2)
30A (2)
23
35 (1)
34
40 (2)
39a
41
42

● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

5
2
0

True thickness of massive sulphide horizon (m)

Note: Section is constructed in the plane of the horizon on a north-south projection

Figure 38

# C HORIZON LONGITUDINAL SECTION TRUE THICKNESS

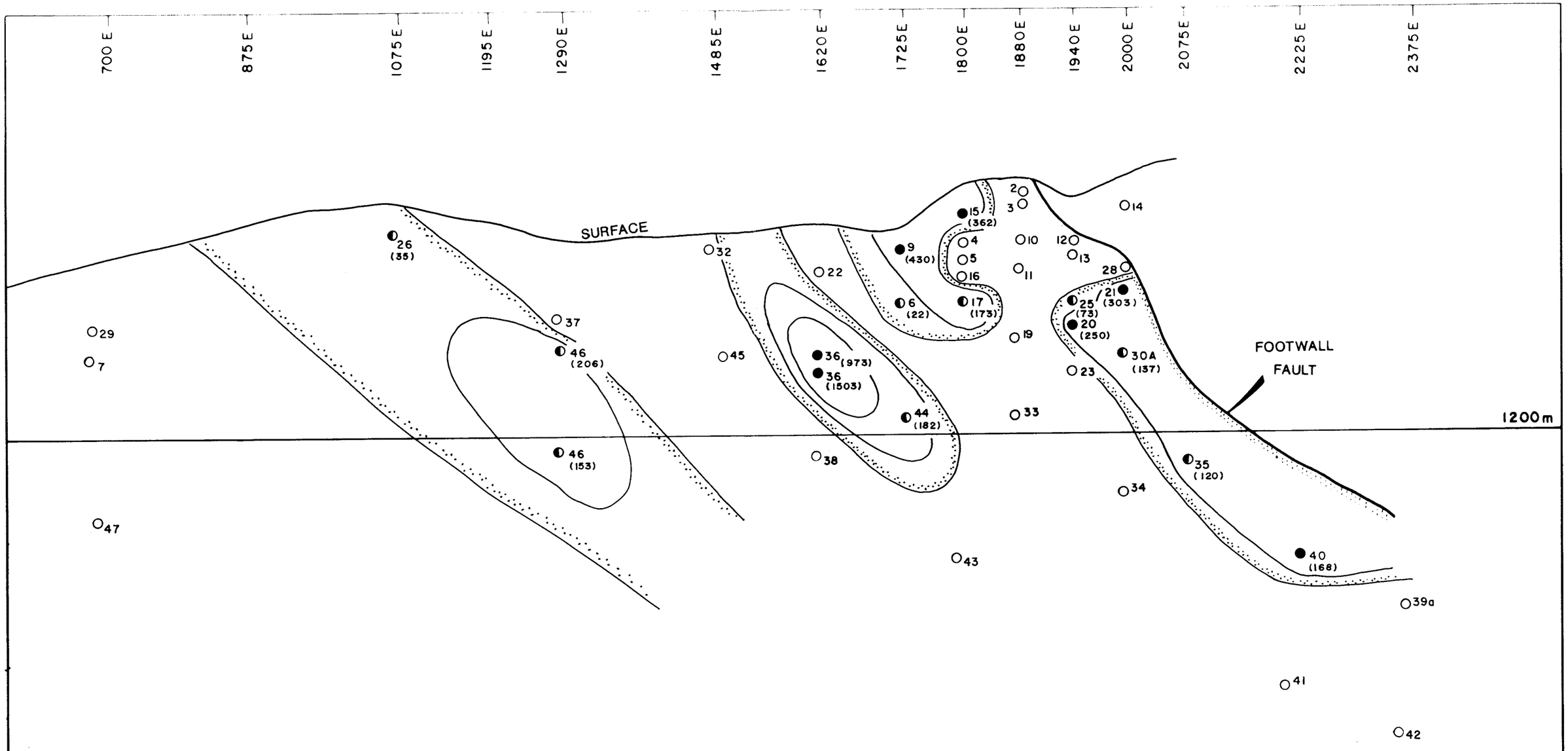
092915

## MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90




● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

500

100

0

GROSS METAL VALUE = Total Value ($US)

Using metal prices of (in $US):

Cu=$1.00 Pb=$0.40 Zn=$0.70/pound

Ag=$5.00 Au=$400.00/ounce

Figure 39

# C HORIZON LONGITUDINAL SECTION GROSS METAL VALUE x WIDTH

## MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Note: Section is constructed in the plane of the horizon on a north-south projection

700 E
875 E
1075 E
1195 E
1290 E
1485 E
1620 E
1725 E
1800 E
1880 E
1940 E
2000 E
2075 E
2225 E
2375 E

SURFACE

FOOTWALL FAULT

1200m

26 (0.11)
37
46 (0.24)
46 (0.20)
29
7
47
32
22
45
36 (0.14)
36 (0.19)
38
44 (0.06)
43
15 (0.17)
9 (0.24)
4
5
16
6 (0.07)
17 (031)
2
3
10
11
19
33
14
12
13
28
21 (0.21)
25 (0.16)
20 (0.17)
30A (0.18)
23
34
35 (0.32)
40 (0.25)
39a
41
42

● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

—— 0.25 ——
—— 0.18 ——
0.0

Ratio
Cu /Cu+Pb+Zn

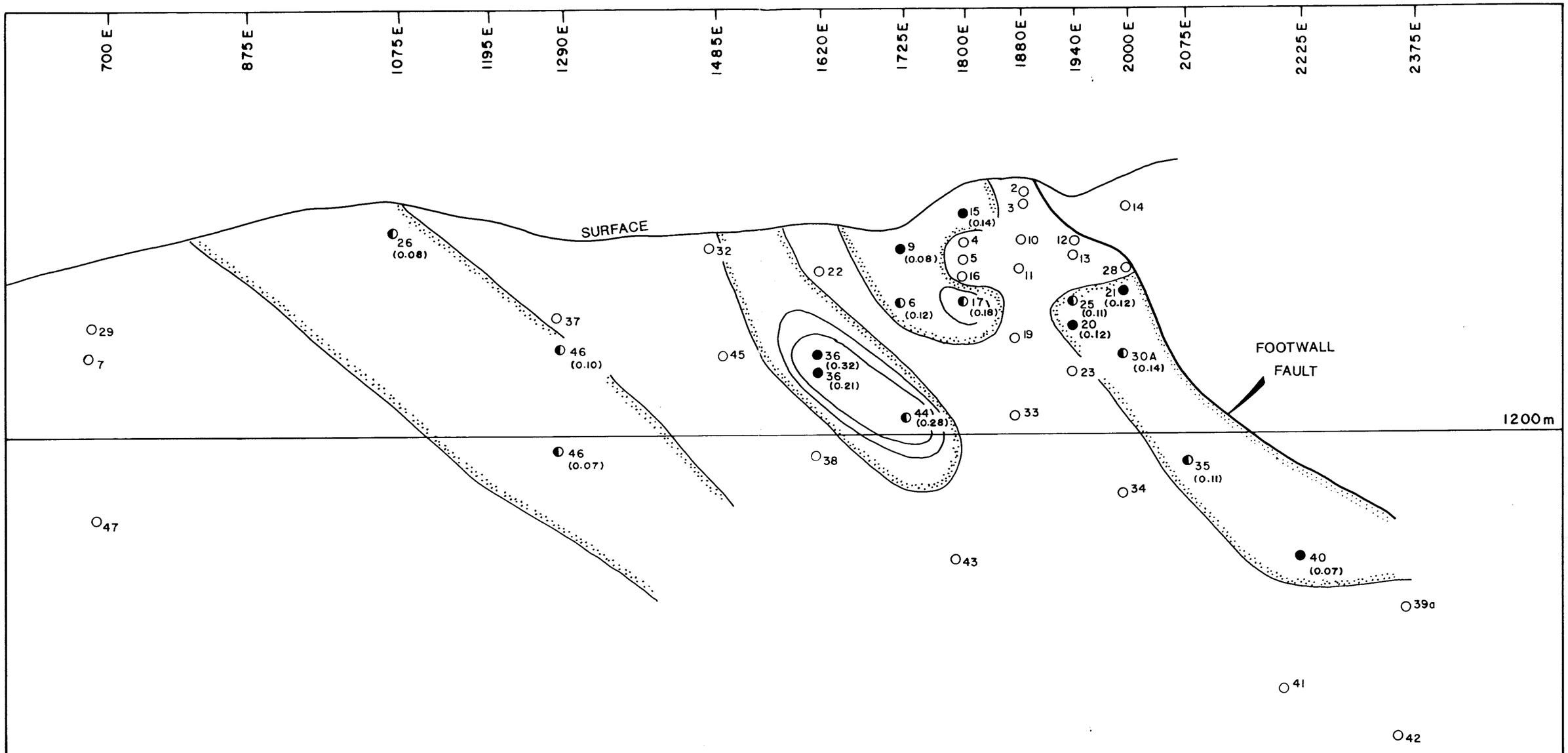
Note: Section is constructed in the plane of the horizon on a north-south projection

Figure 40

# C HORIZON LONGITUDINAL SECTION
## Cu / Cu+Pb+Zn
## MARG ZONE
### NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90




● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

—— 0.20 ——
—— 0.15 ——
····· 0.0 ·····

Aggregate Average Value: Au/Ag x 10

Figure 41

# C HORIZON LONGITUDINAL SECTION
## Au/Ag x 10

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90

Note: Section is constructed in the plane of the horizon on a north south projection

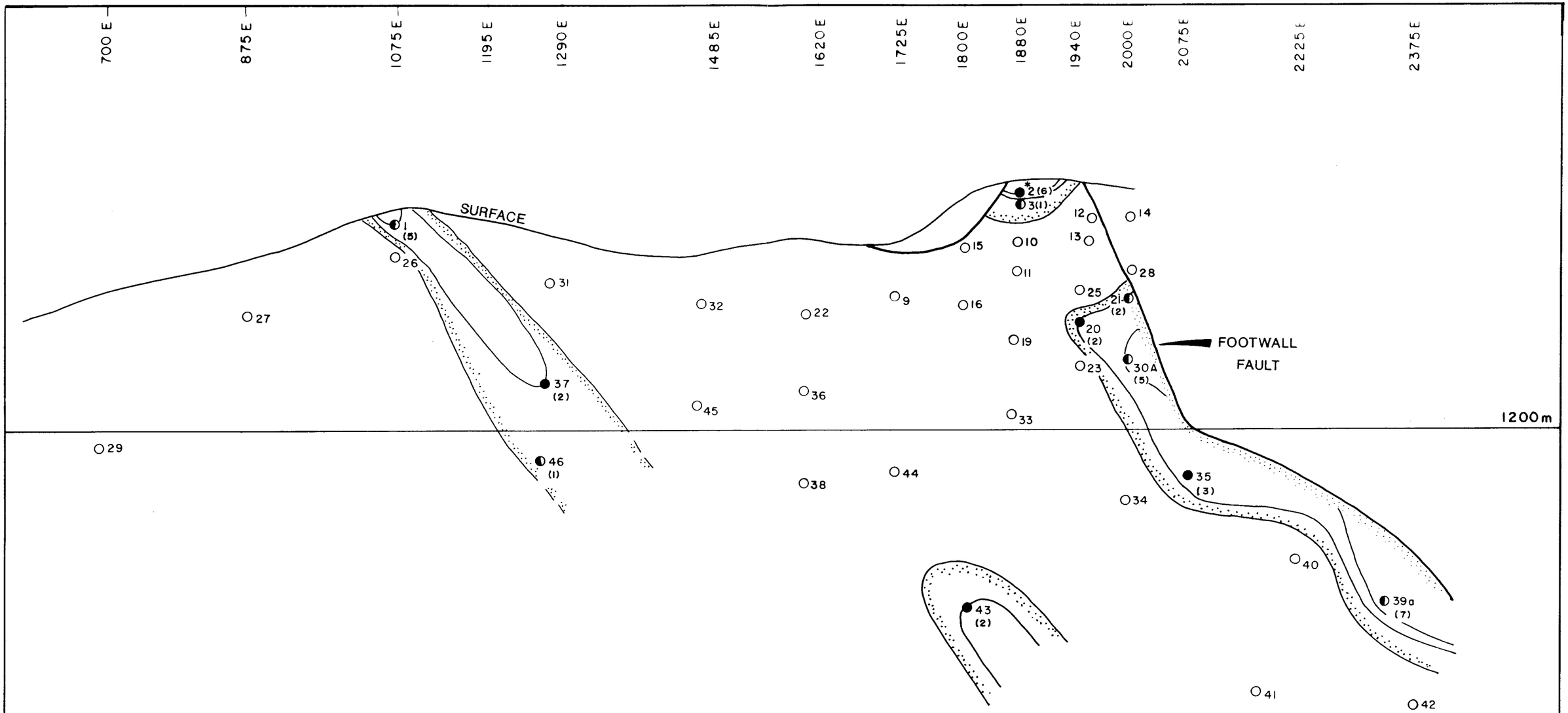
700 E
875 E
1075 E
1195 E
1290 E
1485 E
1620 E
1725 E
1800 E
1880 E
1940 E
2000 E
2075 E
2225 E
2375 E

SURFACE

1 (5)
2 (6)
3 (1)
37 (2)
46 (1)
43 (2)
35 (3)
20 (2)
21 (2)
30A (5)
39a (7)

FOOTWALL FAULT

1200m



- ● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m
- ◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m
- ○ PIERCEMENT POINT – Barren

5 / 2 / 0 — True thickness of massive sulphide horizon (m)

(* Highly oxidized sulphide)

Note: Section is constructed in the plane of the horizon on a north-south projection

Figure 42

# B HORIZON LONGITUDINAL SECTION
# TRUE THICKNESS

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90

092915

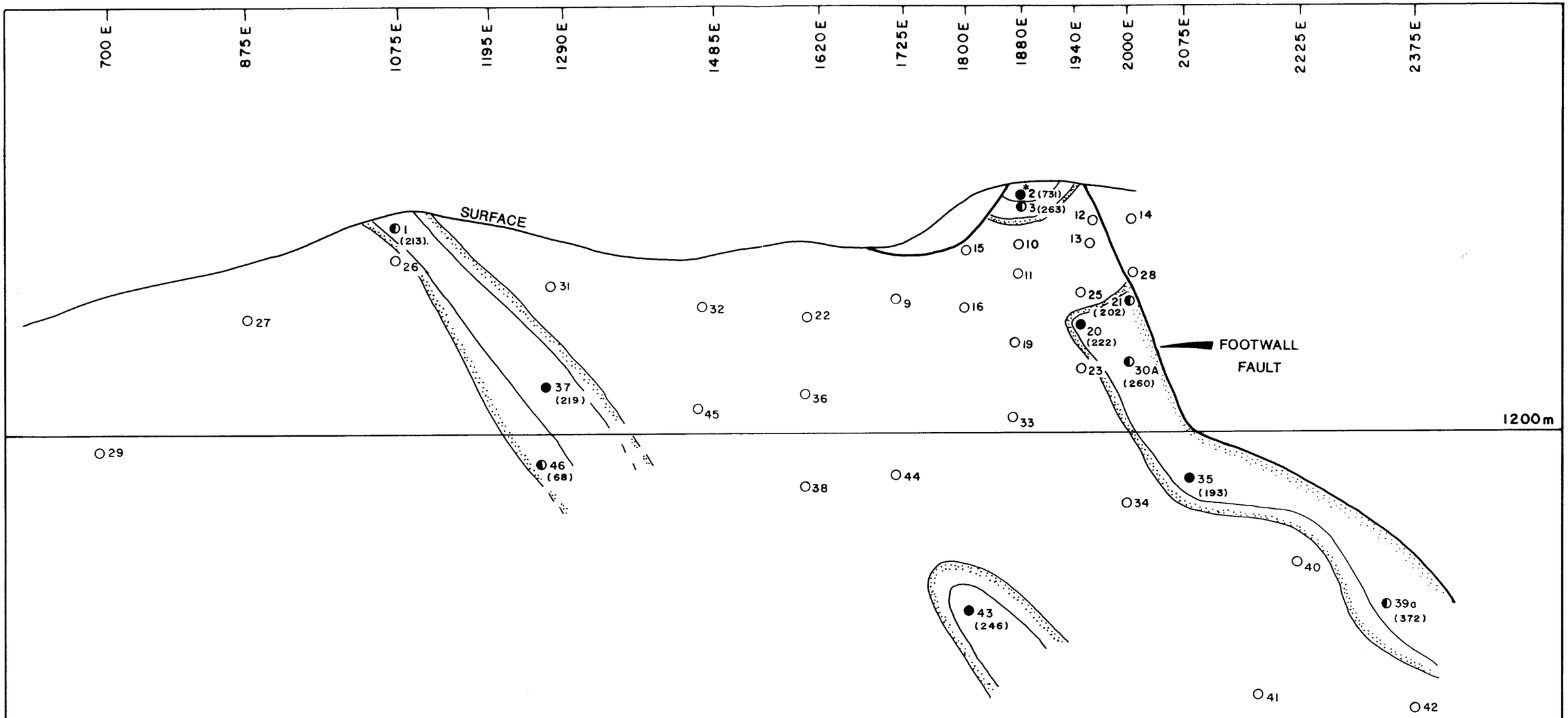
700 E
875 E
1075 E
1195 E
1290 E
1485 E
1620 E
1725 E
1800 E
1880 E
1940 E
2000 E
2075 E
2225 E
2375 E

SURFACE

1 (213)
2 (731)
3 (263)
20 (222)
21 (202)
30A (260)
35 (193)
37 (219)
39a (372)
43 (246)
46 (68)

FOOTWALL FAULT

1200m



- PIERCEMENT POINT – >5% Cu+Pb+Zn/2m
- PIERCEMENT POINT – <5% Cu+Pb+Zn/2m
- PIERCEMENT POINT – Barren

500
100
0

GROSS METAL VALUE = Total Value ($US)
Using metal prices of (in $US):
Cu=$1.00 Pb=$0.40 Zn=$0.70/pound
Ag=$5.00 Au=$400.00/ounce

(* Highly oxidized sulphide)

Note: Section is constructed in the plane of the horizon on a north-south projection

Figure 43

# B HORIZON LONGITUDINAL SECTION
# GROSS METAL VALUE x WIDTH

## MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90

700 E
875 E
1075 E
1195 E
1290 E
1485 E
1620 E
1725 E
1800 E
1880 E
1940 E
2000 E
2075 E
2225 E
2375 E

SURFACE

1 (0.27)
2 (0.04)
3 (0.36)
20 (0.16)
21 (0.25)
30A (0.17)
35 (0.16)
37 (0.17)
39a (0.19)
43 (0.16)
46 (0.12)

FOOTWALL FAULT

1200m

26 27 29 31 32 45 22 36 9 38 44 16 15 10 11 33 19 12 13 14 28 25 23 34 40 41 42

PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

PIERCEMENT POINT – Barren

0.25
0.18
0.0

Ratio
Cu/Cu+Pb+Zn

(* Highly oxidized sulphide)

Note: Section is constructed in the plane of the horizon on a north-south projection

Figure 44

# B HORIZON LONGITUDINAL SECTION

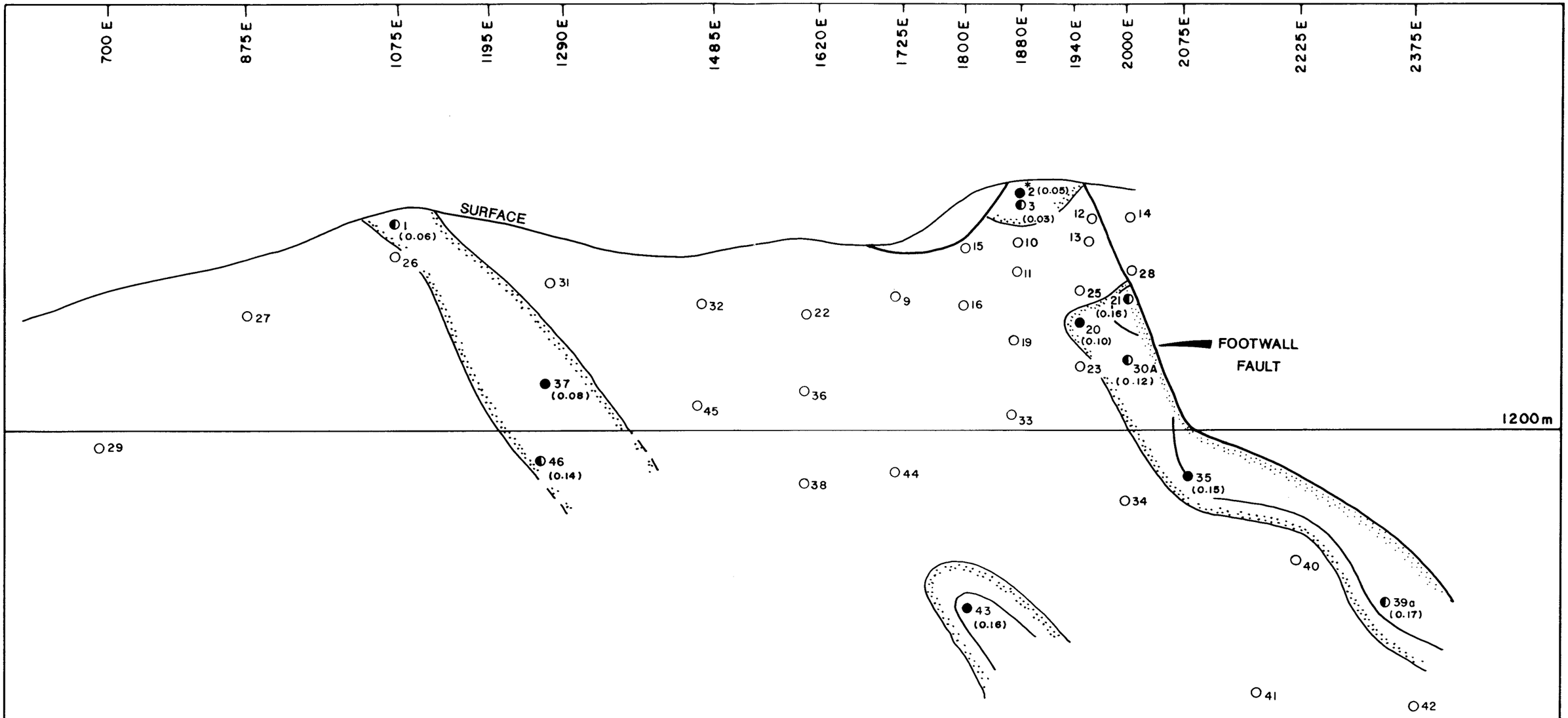
## Cu / Cu+Pb+Zn

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90




● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

—— 0.15 ——

····· 0.0 ·····

Aggregate Average Value: Au/Ag x 10

(* Highly oxidized sulphide)

Note: Section is constructed in the plane of the horizon on a north–south projection

Figure 45

# B HORIZON LONGITUDINAL SECTION

## Au/Ag x 10

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300m

Dec/90

700E 875E 1075E 1195E 1290E 1485E 1620E 1725E 1800E 1880E 1940E 2000E 2075E 2225E 2375E

SURFACE

1200 m

FOOTWALL FAULT

27 1 26 29 46 32 31 (2) 37 (2) 45 (3) 22 (4) 36 (1) 38 (1) 9 44 (3) 43 (1) 15 16 2 (4) 3 (2) 10 (22) 11 (3) 19 (1) 33 14 28 12 (4) 13 (2) 25 (6) 21 (5) 20 (2) 23 (5) 30A (2) 35 34 40 39a (4) 41 42 (2)

● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

10.0 — 5.0 — 2.0 — 0.0

True thickness of massive sulphide horizon (m)

Note: Section is conatructed in the plane of the horizon on a north–south projection

Figure 46

# A HORIZON LONGITUDINAL SECTION

# 092915 TRUE THICKNESS

## MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300 m

Dec/90

700E 875E 1075E 1195E 1290E 1485E 1620E 1725E 1800E 1880E 1940E 2000E 2075E 2225E 2375E

SURFACE

1200 m

FOOTWALL FAULT

2 (715)
3 (160)
10 (2218)
12 (1078)
13 (1571)
11 (482)
25 (98)
21 (220)
20 (165)
19 (70)
30A (195)
23 (650)
31 (213)
22 (561)
37 (132)
36 (43)
45 (366)
44 (482)
38 (48)
43 (77)
42 (90)
39a (341)

27 1 26 29 46 32 9 15 16 14 28 33 35 34 40 41

- PIERCEMENT POINT – >5% Cu+Pb+Zn/2m
- PIERCEMENT POINT – <5% Cu+Pb+Zn/2m
- PIERCEMENT POINT – Barren

1000
500
100
0

**GROSS METAL VALUE = Total Value ($US)**
**Using metal prices of (in $US):**
**Cu=$1.00 Pb=$0.40 Zn=$0.70/pound**
**Ag=$5.00 Au=$400.00/ounce**

Figure 47

# A HORIZON LONGITUDINAL SECTION

# GROSS METAL VALUE x WIDTH

## MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300 m

**Note:** Section is conatructed in the plane of the horizon on a north-south projection

Dec/90

700E 875E 1075E 1195E 1290E 1485E 1620E 1725E 1800E 1880E 1940E 2000E 2075E 2225E 2375E

SURFACE

1200 m

FOOTWALL FAULT

2 (0.44)
3 (0.20)
10 (0.16)
12 (0.18)
13 (0.17)
11 (0.15)
25 (0.19)
21 (0.17)
20 (0.18)
19 (0.16)
30A (0.17)
23 (0.17)
22 (0.20)
31 (0.07)
37 (0.08)
36 (0.27)
44 (0.18)
45 (0.08)
38 (0.08)
43 (0.22)
39a (0.20)
42 (0.18)

14 15 28 27 1 26 32 9 16 33 35 34 29 46 40 41

● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

0.25
0.18
0.0

Ratio Cu/Cu+Pb+Zn

Note: Section is constructed in the plane of the horizon on a north–south projection

Figure 48

# A HORIZON LONGITUDINAL SECTION

## Cu / Cu+Pb+Zn

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300 m

Dec/90

700E 875E 1075E 1195E 1290E 1485E 1620E 1725E 1800E 1880E 1940E 2000E 2075E 2225E 2375E

SURFACE

1200 m

FOOTWALL FAULT

2 (0.17)
3 (0.16)
10 (0.23)
12 (0.14)
13 (0.14)
11 (0.20)
25 (0.12)
21 (0.06)
20 (0.14)
19 (0.06)
23 (0.20)
30A (0.15)
31 (0.31)
22 (0.13)
37 (0.18)
36 (0.05)
45 (0.07)
44 (0.17)
38 (0.03)
43 (0.09)
39a (0.09)
42 (0.11)

27 1 26 29 46 32 9 15 16 14 28 33 35 34 40 41

● PIERCEMENT POINT – >5% Cu+Pb+Zn/2m

◐ PIERCEMENT POINT – <5% Cu+Pb+Zn/2m

○ PIERCEMENT POINT – Barren

0.20 — 0.15 — 0.0 Aggregate Average Value: Au/Ag x 10

Note: Section is constructed in the plane of the horizon on a north–south projection

Figure 49

# A HORIZON LONGITUDINAL SECTION

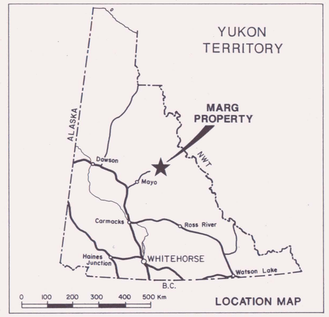
## Au/Ag x 10

MARG ZONE

NDU RESOURCES LTD./ CAMECO

0 50 100 200 300 m

Dec/90




## LEGEND

- Soil Sample (1986,88,89)
- Rock Sample (1989)
- Stream Sediment Sample (1986,88,89)
- Diamond Drill Hole
- Bulldozer Trench
- Assay Value in ppm
- Anomalous Value (>500ppm)
- Soil Anomaly (ppm)
- Sulphide Horizon
- Thrust Fault

Figure 50

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# LEAD GEOCHEMISTRY

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./CAMECO

SCALE 1:5000

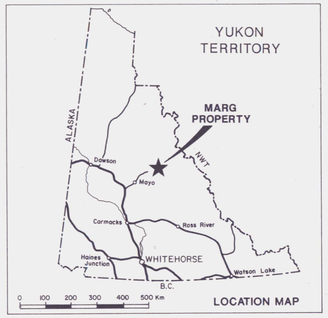
0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092915

To accompany report dated December, 1989

(58) MAP# 105M/15/16; 106P/12




## LEGEND

- Soil Sample (1986,88,89)
- Rock Sample (1989)
- Stream Sediment Sample (1986,88,89)
- 88 — Diamond Drill Hole
- Bulldozer Trench
- 83 Assay Value in ppm
- 418 Anomalous Value (>100 ppm)
- 400 / 100 Soil Anomally (ppm)
- Sulphide Horizon
- Thrust Fault

Figure 51

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# COPPER GEOCHEMISTRY

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./CAMECO

092915

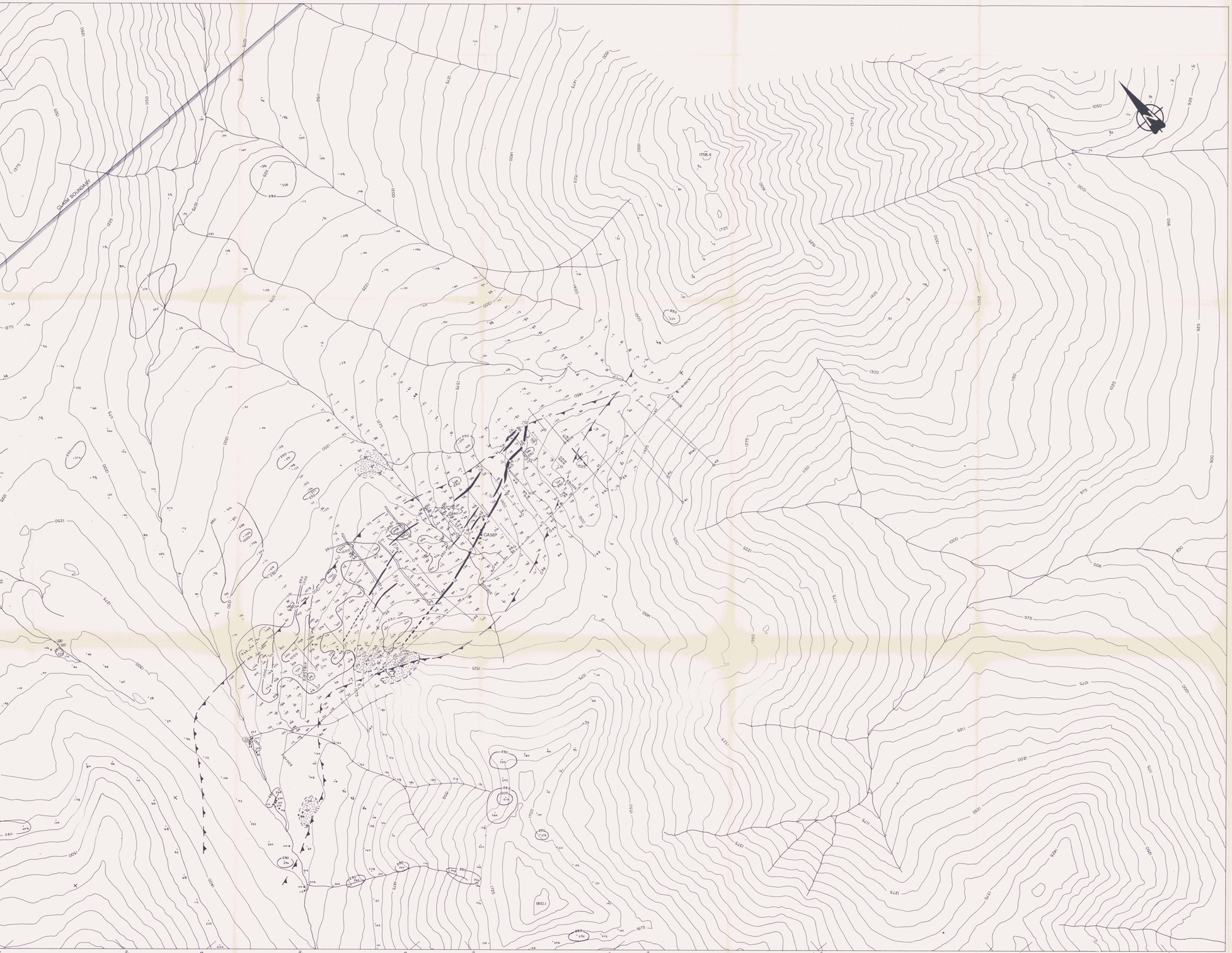
SCALE 1:5000

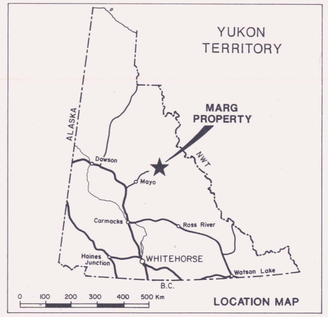
0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

To accompany report dated December, 1990

(97) MAPS 105 M/15,16; 106 P/1,2




## LEGEND

- Soil Sample (1986,88,89)
- Rock Sample (1989)
- Stream Sediment Sample (1986,88,89)
- Diamond Drill Hole
- Bulldozer Trench
- Assay Value in ppm
- Anomalous Value (>250 ppm)
- Soil Anomaly (ppm)
- Sulphide Horizon
- Thrust Fault

Figure 52

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# ZINC GEOCHEMISTRY

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./CAMECO

SCALE 1:5000

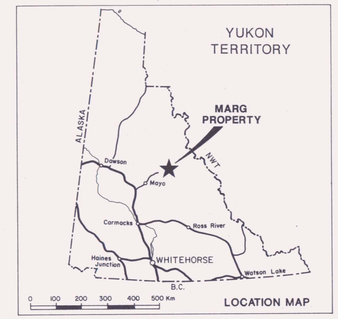
0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092915

To accompany report dated December, 1990

(20) MAP# 105M/15,16; 106D/1,2




LEGEND

- Soil Sample (1986,88,89)
- Rock Sample (1989)
- Stream Sediment Sample (1986,88,89)
- Diamond Drill Hole
- Bulldozer Trench
- #574 Sample Number

Figure 53

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# SOIL SAMPLE LOCATIONS

MARG ZONE

MARG PROPERTY

NDU RESOURCES LTD./CAMECO

SCALE 1:5000

0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092915

092015

To accompany report dated December, 1990

(21) MAP # 105M/5,16; 106D/1,2







## LEGEND

TRIASSIC(?)

**Gdg** — Greenstone - sills of diorite and gabbro and their altered equivalents

MISSISSIPPIAN (and older?)

**Qzit** — Quartzite - massive, medium grey quartzite with thin black phyllite interbeds

**Qg** — Quartz Graphite Phyllite - black phyllite with up to 60% pinstripe quartz, 2-10% pyrite

**Qs** — Quartz Sericite Phyllite - variably carbonate altered, commonly with up to 20%, 1-2 mm, blue quartz eyes, variably chloritic; occasional buff and grey marbles (Qsm)

**Carb** — Carbonate Quartz Chlorite Phyllite - orange to buff weathering, iron-carbonate rock. Medium grained, generally massive

## SYMBOLS

- Outcrop Outline
- Contacts, approximate
- Foliation - strike, dip
- Minor Fold - strike and plunge
- Pulse EM Conductor Axis
- Gossanous Seep
- Pyrrhotite Mineralization
- ★ Chalcopyrite & Sphalerite & Galena Mineralized Float
- Fe Ferricrete
- Hand Trenches

Figure 56

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# DETAILED GEOLOGY

JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:5000

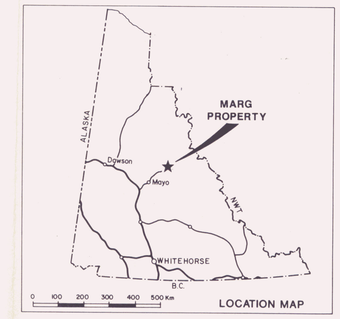
0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092915

To accompany report dated December, 1990

(92) MAPS 105M/15,16; 106P/1,2






## LEGEND

- Stream sediment sample (1982,1988,1989)
- Soil sample (1982,1988,1989)
- Rock sample (1982,1988,1989)
- GSC stream sediment sample
- Limonitic spring gossan
- Lead Values (ppm)
- Anomalous Values (>50ppm)
- Soil Anomaly (ppm)
- Trenches

Figure 57

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# LEAD GEOCHEMISTRY

JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:5000

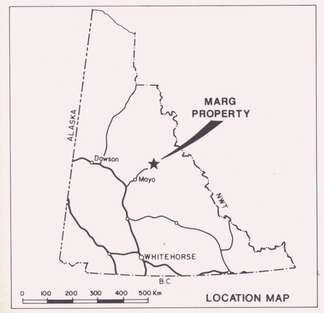
0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092915

To accompany report dated December, 1990

(93) MAP# 105M/15,16; 106P/1,2






## LEGEND

- Stream sediment sample (1982,1988,1989)
- Soil sample (1982,1988,1989)
- Rock sample (1982,1988,1989)
- GSC stream sediment sample
- Limonitic spring gossan
- Copper Values (ppm)
- Anomalous Values (>100ppm)
- Soil Anomaly (ppm)
- Trenches

Figure 58

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# COPPER GEOCHEMISTRY

JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:5000

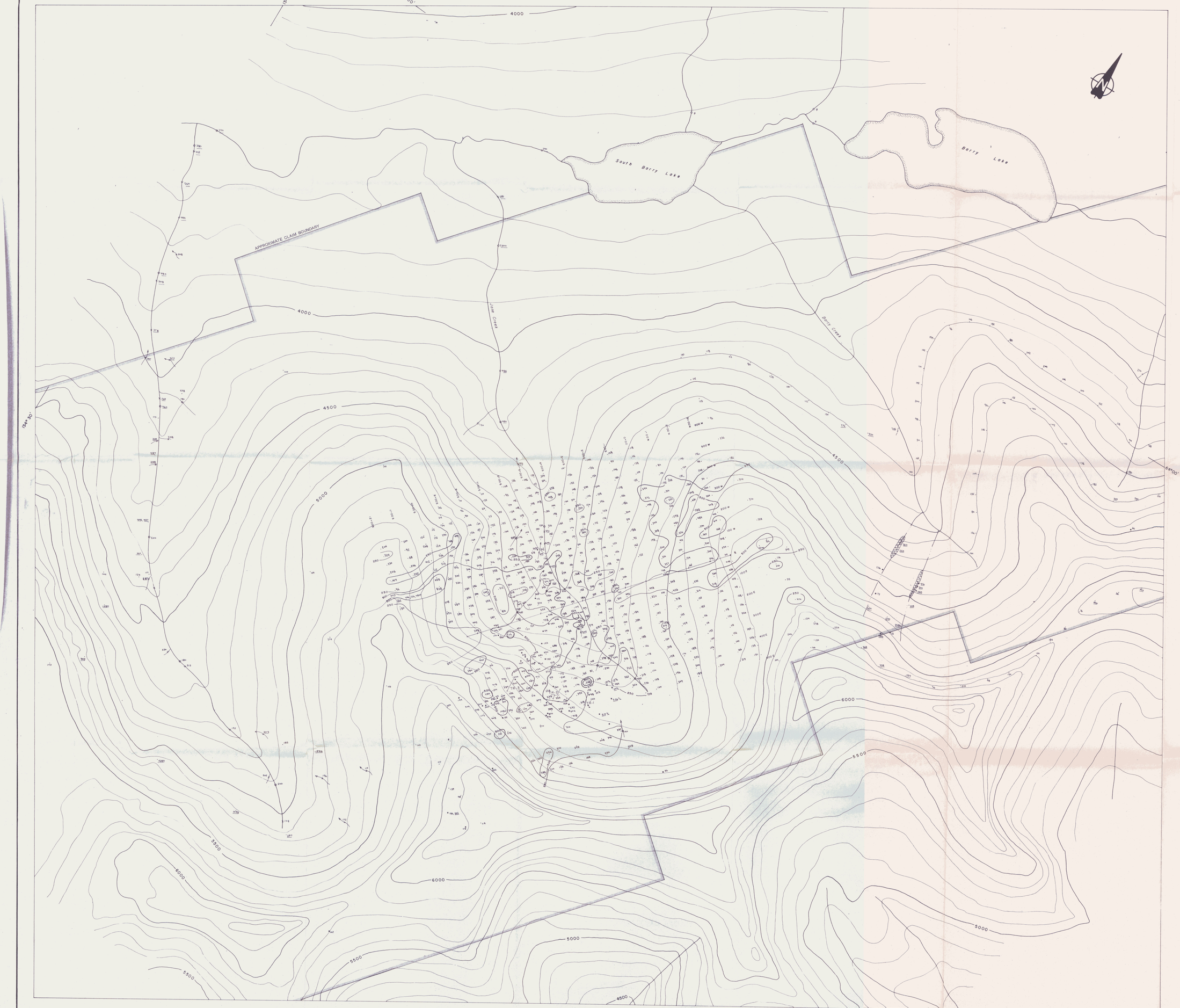
0 50 100 200 300 400 500 Metres

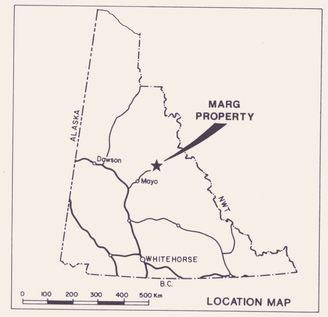
0 100 500 1000 1500 Feet

092915

To accompany report dated December, 1990

GA MAP# 105A/15/16; 106P/1,2




## LEGEND

- Stream sediment sample (1982,1988,1989)
- Soil sample (1982,1988,1989)
- Rock sample (1982,1988,1989)
- GSC stream sediment sample
- Limonitic spring gossan
- Zinc Values (ppm)
- Anomalous Values (>250ppm)
- Soil Anomaly (ppm)
- Trenches

Figure 59

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# ZINC GEOCHEMISTRY

JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:5000

0 50 100 200 300 400 500 Metres

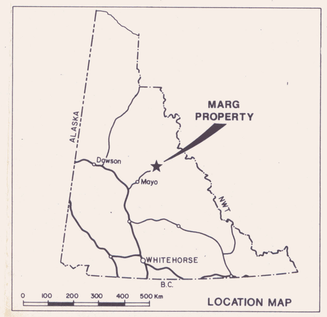
0 100 500 1000 1500 Feet

092915

To accompany report dated December, 1990

(15) MAP# 105M/15/76/106 of 1/2




## LEGEND

- × Stream sediment sample (1982,1988,1989)
- · Soil sample (1982,1988,1989)
- • Rock sample (1982,1988,1989)
- ○ GSC stream sediment sample
- e222b Limonitic spring gossan
- to 151 Sample Numbers

Figure 60

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

# SAMPLE LOCATION MAP

JANE ZONE

MARG PROPERTY

NDU RESOURCES LTD / CAMECO

SCALE 1:5000

0 50 100 200 300 400 500 Metres

0 100 500 1000 1500 Feet

092915

092915

To accompany report dated December, 1989

(16) MAP# 105P/15,16; 106P/1,2

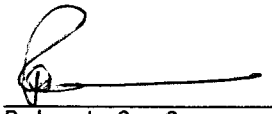
# APPENDIX A

# AUTHORS' STATEMENTS OF QUALIFICATIONS

## STATEMENT OF QUALIFICATIONS

I, Robert C. Carne, geologist, with business addresses in Whitehorse, Yukon Territory and Vancouver, British Columbia and residential address in Burnaby, British Columbia, hereby certify that:

1. I graduated from the University of British Columbia in 1974 with a B.Sc. and in 1979 with an M.Sc. majoring in Geological Sciences.
2. I am a member of the Geological Association of Canada.
3. From 1974 to present, I have been actively engaged as a geologist in mineral exploration in British Columbia and Yukon Territory and on June 1, 1981 became a partner of Archer, Cathro & Associates (1981) Limited.
3. I have personally participated in or supervised the field work reported herein and have interpreted all data resulting from this work.



Robert C. Carne, B.Sc.,M.Sc.

## STATEMENT OF QUALIFICATIONS

I, Mary L. MacLellan, geologist, with business addresses in Whitehorse, Yukon Territory and Vancouver, British Columbia and residential address in Vancouver, British Columbia, hereby certify that:

1. I graduated from the University of Manitoba in 1984 with a B.Sc. and I graduated from Michigan Technological University in 1988 with an M.Sc. in Geology.
2. From 1988 to present, I have been actively engaged as a geologist in mineral exploration in Yukon Territory and am presently employed with Archer, Cathro & Associates (1981) Limited. I was previously engaged as a geologist in mineral exploration in Manitoba from 1984.
3. I have personally participated in or supervised the field work reported herein.

Mary L. MacLellan, B.Sc., M.Sc.

# APPENDIX B

# LIST OF ARCHER, CATHRO PERSONNEL

# AND CALENDAR OF EVENTS,

# 1990 PROGRAM

ARCHER, CATHRO PERSONNEL ON
1990 PROGRAM, MARG PROPERTY, YUKON

| NAME | POSITION | DAYS ON PROJECT | PERIOD |
|---|---|---|---|
| Rob Carne | Project Manager | 20 | May 26 - September 7 |
| Doug Eaton | Senior Geologist | 4 | June 28 - August 28 |
| Mary MacLellan | Project Geologist/ Field Manager | 96 | May 26 - September 7 |
| Dave Parry | Geologist | 16 | June 22 - July 17 |
| Tom Becker | Geologist | 3 | September 4 - 6 |
| Rob Hancox | Assistant | 102 | May 28 - September 7 |
| Colin Kreller | Assistant | 56 | May 26 - July 31 |
| Greg Evancio | Assistant | 42 | May 27 - July 7 |
| Gord MacIntosh | Assistant | 2 | May 26 - 27 |
| Janet Souther | Cook | 89 | May 27 - August 23 |
| Russell Tough | Cook | 16 | August 23 - September 7 |
| Lasha Reid | Expeditor | 104 | May 26 - September 7 |

# CALENDAR OF EVENTS
## 1989 PROGRAM, MARG PROPERTY, YUKON

| | |
|---|---|
| Mobilization | May 26-27 |
| Bulldozer Operator | May 29, June 13, 20-22, July 1-2, 25, August 5, 13, August 23, 28 |
| Drilling | June 6 - September 5 |
| Jane Trenching | July 11-14, 16, September 4-6 |
| Surveying | June 26 |
| J.E. Gibson, Water Sampling | June 26, August 21 |
| NDU Directors Property Tour | July 5 |
| NDU Stock Analysts Tour | July 26 |
| Cameco Management Tour | July 26-27 |
| GSC Tour | July 21 |
| Grant Abbott, DIAND (regional mapping) | July 31 |
| Trevor Bremner, Bill LeBarge, DIAND Tour | August 31 |
| Demobilization | September 6-7 |

092915

APPENDIX C

REPORT ON MINERAL RESERVES

DECEMBER, 1990

BY J.P. FRANZEN, P.ENG.

# ASSESSMENT

OF

# MINERAL RESERVES

AND

# MINERAL RESERVE POTENTIAL

MARG CU - ZN - PB - AU - AG PROPERTY

FOR

NDU RESOURCES LTD.

AND

CAMECO CORPORATION

MAYO MINING DISTRICT

YUKON TERRITORY

BY

FRANZEN MINERAL ENGINEERING LTD.

J.P. FRANZEN, P.ENG.

NORTH VANCOUVER, B.C. DECEMBER 4, 1990

## TABLE OF CONTENTS


| | Page |
|---|---|
| Summary | 1 |
| Introduction | 3 |
| Mineral Reserve Assessment Procedure | 3 |
| Geology | 3 |
| Net Smelter Return (NSR) | 5 |
| Mineral Reserves | 7 |
| Mineral Reserves and Mineral Reserve Potential | 9 |
| 'A' Horizon | 9 |
| 'B' Horizon | 14 |
| 'C' Horizon | 14 |
| 'D' Horizon | 18 |
| Discussion | 22 |
| References | 27 |
| Certificate | 28 |

## LIST OF FIGURES


| | | Page |
|---|---|---|
| 1. | Diamond Drill Hole Collar Plan (1:2500) | Pocket A |
| 2. | Drill Section 2375E (1:2500) | Pocket A |
| 3. | Drill Section 2225E (1:2500) | Pocket A |
| 4. | Drill Section 2075E (1:2500) | Pocket A |
| 5. | Drill Section 2000E (1:2500) | Pocket B |
| 6. | Drill Section 1940E (1:2500) | Pocket B |
| 7. | Drill Section 1880E (1:2500) | Pocket B |
| 8. | Drill Section 1800E (1:2500) | Pocket B |
| 9. | Drill Section 1725E (1:2500) | Pocket B |
| 10. | Drill Section 1620E (1:2500) | Pocket C |
| 11. | Drill Section 1485E (1:2500) | Pocket C |
| 12. | Drill Section 1290E (1:2500) | Pocket C |
| 13. | Drill Section 1075E (1:2500) | Pocket C |
| 14. | Construction Method For Strike Line Maps (Schematic) | 4 |
| 15. | 'A' Sulphide Horizon - Drill Intercept and Strike Line Map (1:2500) | Pocket D |
| 16. | 'A" Sulphide Horizon - Diluted Mineral Reserve Blocks and Strike Line Map (1:2500) | Pocket D |
| 17. | 'B' Sulphide Horizon - Drill Intercept and Strike Line Map (1:2500) | Pocket D |
| 18. | 'B' Sulphide Horizon - Diluted Mineral Reserve Blocks and Strike Line Map (1:2500) | Pocket D |
| 19. | 'C' Sulphide Horizon - Drill Intercept and Strike Line Map (1:2500) | Pocket E |
| 20. | 'C' Sulphide Horizon - Diluted Mineral Reserve Blocks and Strike Line Map (1:2500) | Pocket E |
| 21. | 'D' Sulphide Horizon - Drill Intercept and Strike Line Map (1:2500) | Pocket E |
| 22. | 'D' Sulphide Horizon - Diluted Mineral Reserve Blocks and Strike Line Map (1:2500) | Pocket E |
| 23. | Net Smelter Return - Tonnage Curves - Individual Sulphide Horizons | 13 |
| 24. | Net Smelter Return - Tonnage Curves - Individual and Total Sulphide Horizons | 16 |
| 25. | Net Smelter Return - Tonnage Curves for Comparison of 'A + B + C' and 'D' Horizon Reserves | 21 |
| 26. | Net Smelter Return - Tonnage Curves - Comparison of 'D' Horizon Reserves at Base Case and Current Metal Prices | 26 |

## LIST OF TABLES


| | | Page |
|---|---|---|
| I. | Undiluted Drill Indicated Mineral Reserve Summary | 10 |
| II. | Diluted (+3.0 m) Drill Indicated Mineral Reserve Summary | 11 |
| III. | 'A' Sulphide Horizon - Diluted (+3.0 m) Mineral Reserves and Cut-off Grade Summary | 12 |
| IV. | 'B' Sulphide Horizon - Diluted (+3.0 m) Mineral Reserves and Cut-off Grade Summary | 15 |
| V. | 'C' Sulphide Horizon - Diluted (+3.0 m) Mineral Reserves and Cut-off Grade Summary | 17 |
| VI. | 'D' Sulphide Horizon - Diluted (+3.0 m) Mineral Reserves and Cut-off Grade Summary | 19 |
| VII. | 'A + B + C' Sulphide Horizons - Diluted (+3.0 m) Mineral Reserves and Cut-off Grade Summary | 20 |
| VIII. | 'A + B + C + D' Sulphide Horizons - Diluted (+3.0 m) Mineral Reserves and Cut-off Grade Summary | 23 |
| IX. | 'D' Sulphide Horizon - Diluted (+3.0 m) Mineral Reserves and Cut-off Grade Summary - Current Metal Prices | 25 |


## LIST OF APPENDICES


I. Diamond Drill Hole Survey Summary

II. Calculation of Conceptual Metallurgical Balance

III. Calculation of Conceptual Net Smelter Return

IV. 'A' Sulphide Horizon - Tons, Grade and NSR Calculation Summary

V. 'B' Sulphide Horizon - Tons, Grade and NSR Calculation Summary

VI. 'C' Sulphide Horizon - Tons, Grade and NSR Calculation Summary

VII. 'D' Sulphide Horizon - Tons, Grade and NSR Calculation Summary

## SUMMARY

The MARG property covers an important polymetallic massive sulphide deposit near Keno Hill, Yukon Territory. Over the past three years, joint venture partners NDU Resources Ltd. (66.7%) and Cameco Corporation (33.3%) have completed 11,976 m of core drilling in 47 holes.

Widely-spaced (+150 m) drill intersections from this work program have outlined four moderately to steeply inclined, massive sulphide horizons that parallel the metamorphic fabric in quartz-sericite schist and graphitic phyllite wallrocks. The massive sulphide-bearing horizons have been traced over a strike length of 1,200 m and down-dip for 700 m. They remain open to extension.

Close-spaced (20 m to 80 m) drill intersections within the four sulphide horizons have defined an en echelon drill indicated mineral reserve zone measuring some 350 m along-strike and 150 m to 350 m down-dip; average diluted sulphide thickness is 6.1 m. The subcrop of this reserve is coincident with the eastern margin of a 1,500 m long and 400 m wide lead in soils geochemical anomaly. Global diluted mineral reserve tons, grade and net smelter return (NSR) for all reserve blocks with an NSR of $+20/ton are summarized below. Mining dilution has not been applied to reserve blocks with a thickness of +3.0 m. At base case metal prices, copper and zinc contribute almost equally to 78.4% of the NSR; lead, silver and gold contribute approximately equal portions to the remainder.

MARG PROPERTY

DILUTED (+3.0 m) DRILL INDICATED MINERAL RESERVE SUMMARY

BASE CASE METAL PRICES

| Sulphide Horizon | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| 'A' | 7.5 | 941,716 | 1.08<br>12.47 | 1.78<br>3.01 | 3.25<br>16.46 | 1.49<br>2.76 | 0.026<br>4.02 | 38.72 |
| 'B' | 4.8 | 217,876 | 1.04<br>12.02 | 1.80<br>3.04 | 2.97<br>15.05 | 1.80<br>3.34 | 0.020<br>3.20 | 36.65 |
| 'C' | 5.1 | 471,852 | 1.45<br>16.83 | 2.46<br>4.16 | 3.85<br>19.48 | 1.85<br>3.44 | 0.037<br>5.84 | 49.74 |
| 'D' | 5.8 | 1,523,064 | 2.08<br>24.05 | 2.54<br>4.28 | 5.01<br>25.37 | 1.63<br>3.03 | 0.024<br>3.82 | 60.55 |
| Global Average | 6.1 | 3,154,508 | 1.62<br>18.68 | 2.25<br>3.80 | 4.17<br>21.10 | 1.63<br>3.03 | 0.026<br>4.11 | 50.73 |

Application of a series of NSR-based cut-off grades, using conservative base case metal prices, indicates that the work program has defined a significant tonnage of material that is of economic interest. These mineral reserves, at progressively increasing NSR cut-off grades, are summarized below.

MARG PROPERTY

'A + B + C + D' SULPHIDE HORIZONS

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY

BASE CASE METAL PRICES

| Cut-off Grade NSR ($/ton) | Tons | %, $/ton NSR Cu | Pb | Zn | opt, $/ton NSR Ag | Au | Total NSR $/ton |
|---|---|---|---|---|---|---|---|
| Global 20 | 3,154,508 | 1.62 | 2.25 | 4.17 | 1.63 | 0.026 | |
| | | 18.68 | 3.80 | 21.10 | 3.03 | 4.11 | 50.73 |
| 30 | 2,650,497 | 1.79 | 2.44 | 4.60 | 1.77 | 0.029 | |
| | | 20.67 | 4.11 | 23.25 | 3.28 | 4.58 | 55.90 |
| 40 | 2,081,862 | 1.99 | 2.65 | 5.05 | 1.87 | 0.031 | |
| | | 22.98 | 4.46 | 25.55 | 3.46 | 4.81 | 61.27 |
| 50 | 1,634,501 | 2.10 | 2.87 | 5.41 | 1.95 | 0.033 | |
| | | 24.35 | 4.85 | 27.38 | 3.62 | 5.15 | 65.34 |
| 60 | 953,691 | 2.57 | 3.02 | 6.15 | 1.89 | 0.029 | |
| | | 29.78 | 5.09 | 31.10 | 3.50 | 4.61 | 74.08 |
| 70 | 597,700 | 2.79 | 3.09 | 6.27 | 2.01 | 0.032 | |
| | | 32.30 | 5.21 | 31.71 | 3.73 | 4.94 | 77.89 |
| 80 | 244,780 | 3.09 | 3.64 | 6.57 | 2.07 | 0.042 | |
| | | 35.69 | 6.14 | 33.24 | 3.85 | 6.64 | 85.56 |

At the $40/ton NSR cut-off grade the 'D' horizon contributes 58.5% of the tons and 64.4% of the NSR metal values to the total reserve. It is the principal known sulphide horizon on the property. Wide-spaced drilling below the 'D' reserve has outlined a 200 m wide by 600 m down-pitch zone that offers excellent potential to expand these quality reserves.

The joint venture work program has established a significant polymetallic mineral reserve on the MARG property. Reserve tons have the potential to double within the area outlined by wide-spaced drilling; reserve NSR would increase by 32% at current metal prices. This important volcanogenic massive sulphide deposit warrants further exploration work.

## INTRODUCTION

NDU Resources Ltd. and joint venture partner Cameco Corporation are exploring the MARG volcanogenic massive sulphide deposit near Keno Hill, Yukon Territory. The joint venture retained the writer to prepare an assessment of the mineral reserves and potential to develop additional reserves at the MARG property. This report is based on the writer's evaluation of geologic data - principally diamond drill logs for 47 holes totalling 11,976 m (Appendix I) - supplied by Archer, Cathro & Associates (1981) Limited (the joint venture operator) and is the fifth in a series of reserve assessment reports prepared by the writer (Franzen, 1988a, b, c; Franzen, 1989). The writer last visited the subject property on August 22 and 23, 1988.

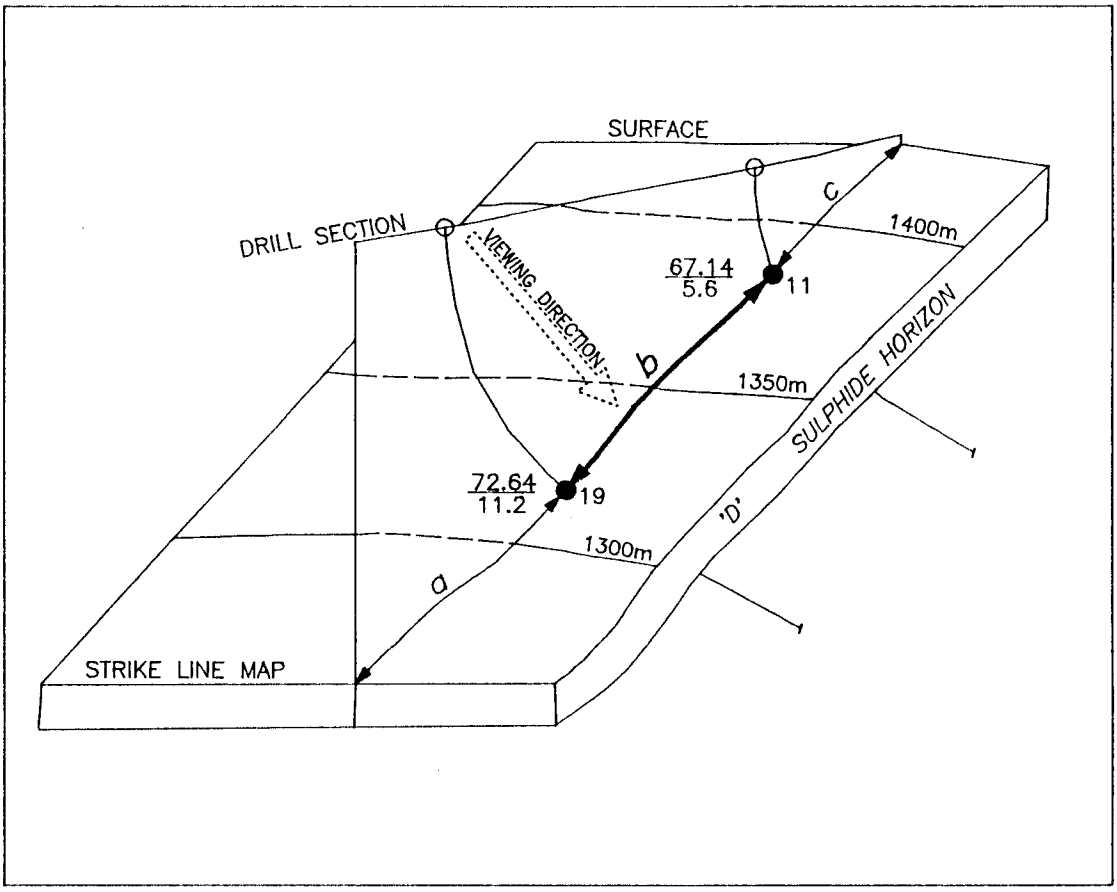
Lotus 123 (Version 2.0) and Autocad 10 files assembled by the writer in the preparation of this report are available at the offices of Archer, Cathro & Associates (1981) Limited in Vancouver.

## MINERAL RESERVE ASSESSMENT PROCEDURE

### Geology

Geology of the MARG property is described by MacLellan and Carne (1990). This report established the basic geologic framework from which the writer assessed mineral reserves and the potential to develop additional reserves on the subject property. Figure 1 shows the location of diamond drill hole collars; Figures 2 through 13 are vertical drill sections, revised after MacLellan and Carne (1990), showing the defined and projected positions of the 'A', 'B', 'C' and 'D' massive sulphide horizons. Use of Figures 1 through 13 allowed the writer to construct strike line maps for each of the sulphide horizons.

Figure 14 illustrates the relationship between a typical drill section and sulphide horizon; and the construction method and viewing direction for each strike line map. The reader should note from Figure 14 that the viewing direction for a strike line map is perpendicular to the sulphide horizon and that as a result distances




NDU RESOURCES LTD.
CAMECO CORPORATION

MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY

# CONSTRUCTION METHOD FOR STRIKE LINE MAP

0 50 100 200
METRES

DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng.

FIGURE: 14

along the line - as defined by the intersection of the drill section and sulphide horizon - and more particularly, as depicted by example intervals 'a', 'b' and 'c' in Figure 14, are measured as true when constructing the strike line map. These distances have not been foreshortened in order to locate the position of strike lines and drill hole intercepts. Figures 15 through 22 are strike line maps (plan views perpendicular to the viewing direction) for each of the sulphide horizons and show NSR values for undiluted and diluted (+3.0 m) drill intercepts and diluted (+3.0 m) drill indicated mineral reserve blocks.

## Net Smelter Return (NSR)

The MARG property is a polymetallic massive sulphide deposit. Because commercial development of such a deposit would generate revenues from five different metals, it is necessary to establish reserve grades and cut-off grades based on the total dollar value of payable metals (NSR) rather than specifying various combinations of grades for each metal. Calculation of NSR-adjusted metal prices for a particular property is normally based on metallurgical test work and calculation of a metallurgical balance for that property. This metallurgical test work has not been undertaken on representative samples from the MARG deposit. In its absence the writer has calculated a conceptual metallurgical balance for the MARG deposit (Appendix II). This conceptual balance is based on the assumption that the MARG metallurgy is "clean". The balance has been applied to a preliminary mineral reserve estimate, prior to application of a +$20/ton NSR cut-off grade, and in the writer's opinion, provides a reasonable basis for a first-pass estimation of the MARG NSR.

The conceptual metallurgical balance is summarized below:

| Product | % Wt | Assays % Cu | % Pb | % Zn | opt Ag | opt Au | % Distribution Cu | % Pb | % Zn | % Ag | % Au |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Head** | 100.00 | 1.6 | 2.2 | 4.1 | 1.6 | 0.026 | 100 | 100 | 100 | 100 | 100 |
| **Cu Conc** | 4.74 | 27.0 | 2.8 | 3.5 | 10.1 | 0.27 | 80 | 6 | 4 | 30 | 50 |
| **Pb Conc** | 3.20 | 4.0 | 55.0 | 10.3 | 12.5 | 0.08 | 8 | 80 | 8 | 25 | 10 |
| **Zn Conc** | 6.42 | 1.7 | 3.1 | 53.0 | 3.7 | 0.04 | 7 | 9 | 83 | 15 | 10 |
| **Tails** | 85.64 | 0.09 | 0.13 | 0.24 | 0.56 | 0.009 | 5 | 5 | 5 | 30 | 30 |

Calculation of a conceptual NSR and NSR-adjusted metal prices for the MARG deposit are detailed in Appendix III. Base case metal prices and the resulting NSR-adjusted metal prices are listed below. The reader should note that use of November 12, 1990 metal prices - $US/lb/oz - (Cu - 1.30; Pb - 0.45; Zn - 0.58; Ag - 4.20; and Au - 384) and exchange rate (0.86) increase the conceptual NSR for the global diluted reserve by 31.7%.

| Revenue | $US / lb / oz Metals Cu | Pb | Zn | Ag | Au | Exchange |
|---|---|---|---|---|---|---|
| Base Case Metal Prices | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| NSR-Adjusted Metal Prices | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

The NSR-adjusted metal prices represent the actual net payable price per lb/oz of metal after deductions for metallurgical recovery and concentrate transportation and treatment charges. These net or adjusted metal prices can then be applied directly to the head grade or drill intercept grade in order to determine, within reasonable limits, the total payable NSR value for all five metals. As indicated below, the payable NSR at the MARG property is 39.3% of the gross metal value.

**Calculation of NSR - Preliminary Mineral Reserve Estimate**

| | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton | % Total Value |
|---|---|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au | | |
| Reserve Grade | 1.6 | 2.2 | 4.1 | 1.6 | 0.026 | | |
| Gross Metal Value | 34.70 | 15.90 | 54.34 | 9.64 | 12.53 | **127.11** | 100.0 |
| Payable NSR | 18.51 | 3.71 | 20.75 | 2.97 | 4.07 | **50.00** | 39.3 |

## Mineral Reserves

Tons, grade and NSR for drill indicated - undiluted and diluted (+3.0 m) - mineral reserves were calculated for each sulphide horizon. These results are tabulated in Appendices IV, V, VI and VII and listed on Figures 15 to 22. Notable reserve calculation parameters include the following:

Tons for each drill indicated reserve block are based on block volume and an estimated, lithogic-interval weighted, specific gravity value for each block. Lithologic units within the reserve blocks (drill hole intersections) were assigned specific gravity values as follows:

| Sulphide Lithology | Assumed Specific Gravity |
|---|---|
| Massive | 4.25 |
| Laminated | 3.75 |
| Disseminated | 3.25 |
| Barren | 2.80 |

Assays for each undiluted and diluted drill hole intersection and drill indicated reserve block are based on the thickness-only, weighted average of individual assay values within the block. Absence of systematic specific gravity determinations in the data base precluded the use of a combined specific gravity and thickness weighting procedure for each assay interval within a particular drill hole. In an earlier report (Franzen, 1988b) it was determined that specific gravity weighting increased the average unit (%, opt) grade of an undiluted reserve block by 2.8%.

Dilution to 3.0 m for all drill hole intercepts less than 3.0 m in thickness increased global drill indicated reserve tons by 6.6% and decreased the global NSR by 6.4%. This confirms that dilution, while calculated from actual assay results, was essentially at an NSR of $0/ton. Mining dilution has not been applied to reserve blocks with a thickness of +3.0 m.

Diluted drill indicated mineral reserves have been assigned to those areas with demonstrated continuity of mineralization at an NSR of +$20/ton and thickness of +3.0 m. The 'C' sulphide horizon is the exception to the continuity rule (Figure 20). Reserves figures are based on the measurement of individual block areas on strike line maps, together with block thickness and estimated average block specific gravity. All drill hole intercept widths were assumed to represent true thickness. In most cases block areas are computed from the projection of a specific drill hole value for a distance of up to 35 m from the drill hole intercept or one-half the distance (not exceeding 35 m) to adjacent drill hole intercepts. This distance was occasionally extended to 50 m where, in the writer's opinion, demonstrated continuity of mineralization justified such an extension.

## MINERAL RESERVES AND MINERAL RESERVE POTENTIAL

Global undiluted and diluted (+3.0 m) drill indicated mineral reserves have been assigned to each of the four known sulphide horizons on the MARG property (Tables I and II). The mineral reserve blocks form a series of en echelon, inclined panels (see Figure 5) between Drill Section 1725 E and 2075 E and between the 1,250 m strike line and surface (approximately 1,425 m). Distance between walls of adjacent panels ranges from 0 m to 40 m. Widely-spaced drill hole intersections down-pitch of these reserves indicate a broad zone of significant mineral reserve potential to the 900 m strike line and beyond. Mineral reserves and mineral reserve potential for each of the sulphide horizons are described below:

### 'A' Horizon

The 'A' horizon dips 50° to the south and measures approximately 1,000 m along-strike and 600 m down-dip (Figure 15). This panel has been outlined with 29 diamond drill holes, 22 of which intersected the horizon and returned an average undiluted thickness of 3.5 m (excluding the 22.9 m intersection in Hole 88-10). The zone of diluted mineral reserve blocks measures 200 m along-strike and 250 m down-dip (Figure 16). Average diluted thickness is 7.5 m. Spacing of drill hole intersections in the reserve zone varies from 20 m to 70 m; outside of the reserve zone drill hole intercepts are 90 m to 220 m apart.

The 'A' horizon contributes 29.9% of the tons and 22.8% of the NSR metal value to the global diluted reserve (Table II). Inspection of Table III and Figure 23 shows a dramatic loss of reserve tons between NSR cut-off grades of $20/ton and $40/ton. At a $30/ton cut-off grade the 'A' horizon reserve blocks no longer form a coherent mass.

Widely-spaced drill hole intercepts, below and to the west of the defined reserve zone returned a number of significant massive sulphide intersections (see Figure 16) including $51.98/ton - 5.2 m and $54.36/ton - 3.3 m; further work is warranted.

TABLE I

MARG PROPERTY

UNDILUTED DRILL INDICATED MINERAL RESERVE SUMMARY

NOVEMBER, 1990

| Sulphide Horizon | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| 'A' | 5.7 | 743,712 | 1.25 | 2.06 | 3.76 | 1.75 | 0.031 | |
| | | | 14.47 | 3.48 | 19.03 | 3.24 | 4.80 | 45.03 |
| 'B' | 4.0 | 247,803 | 1.08 | 1.88 | 3.16 | 1.81 | 0.020 | |
| | | | 12.48 | 3.16 | 15.97 | 3.37 | 3.14 | 38.12 |
| 'C' | 4.4 | 477,872 | 1.53 | 2.58 | 4.09 | 1.94 | 0.039 | |
| | | | 17.72 | 4.36 | 20.71 | 3.61 | 6.09 | 52.48 |
| 'D' | 5.6 | 1,490,817 | 2.13 | 2.59 | 5.13 | 1.67 | 0.025 | |
| | | | 24.64 | 4.38 | 25.97 | 3.10 | 3.91 | 61.99 |
| Global Average | 5.3 | 2,960,204 | 1.72 | 2.40 | 4.45 | 1.75 | 0.028 | |
| | | | 19.94 | 4.04 | 22.53 | 3.24 | 4.44 | 54.20 |

TABLE II

MARG PROPERTY

DILUTED (+3.0 m) DRILL INDICATED MINERAL RESERVE SUMMARY

NOVEMBER, 1990

| Sulphide Horizon | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| 'A' | 7.5 | 941,716 | 1.08 | 1.78 | 3.25 | 1.49 | 0.026 | |
| | | | 12.47 | 3.01 | 16.46 | 2.76 | 4.02 | 38.72 |
| 'B' | 4.8 | 217,876 | 1.04 | 1.80 | 2.97 | 1.80 | 0.020 | |
| | | | 12.02 | 3.04 | 15.05 | 3.34 | 3.20 | 36.65 |
| 'C' | 5.1 | 471,852 | 1.45 | 2.46 | 3.85 | 1.85 | 0.037 | |
| | | | 16.83 | 4.16 | 19.48 | 3.44 | 5.84 | 49.74 |
| 'D' | 5.8 | 1,523,064 | 2.08 | 2.54 | 5.01 | 1.63 | 0.024 | |
| | | | 24.05 | 4.28 | 25.37 | 3.03 | 3.82 | 60.55 |
| Global Average | 6.1 | 3,154,508 | 1.62 | 2.25 | 4.17 | 1.63 | 0.026 | |
| | | | 18.68 | 3.80 | 21.10 | 3.03 | 4.11 | 50.73 |

TABLE III

MARG PROPERTY

'A' SULPHIDE HORIZON

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY

NOVEMBER, 1990

| Cut-off Grade NSR ($/ton) | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| Global 20 | 7.5 | 941,716 | 1.08 | 1.78 | 3.25 | 1.49 | 0.026 | |
| | | | 12.47 | 3.01 | 16.46 | 2.76 | 4.02 | 38.72 |
| 30 | 10.0 | 619,360 | 1.27 | 2.14 | 3.84 | 1.80 | 0.033 | |
| | | | 14.70 | 3.61 | 19.42 | 3.33 | 5.24 | 46.31 |
| 40 | 6.2 | 309,895 | 1.60 | 2.49 | 4.48 | 2.21 | 0.036 | |
| | | | 18.53 | 4.20 | 22.68 | 4.11 | 5.63 | 55.15 |
| 50 | 6.6 | 230,494 | 1.73 | 2.63 | 4.67 | 2.31 | 0.035 | |
| | | | 19.97 | 4.44 | 23.61 | 4.28 | 5.52 | 57.83 |
| 60 | 5.2 | 52,514 | 2.82 | 2.68 | 4.88 | 2.52 | 0.037 | |
| | | | 32.58 | 4.52 | 24.71 | 4.67 | 5.76 | 72.24 |
| 70 | 5.2 | 52,514 | 2.82 | 2.68 | 4.88 | 2.52 | 0.037 | |
| | | | 32.58 | 4.52 | 24.71 | 4.67 | 5.76 | 72.24 |

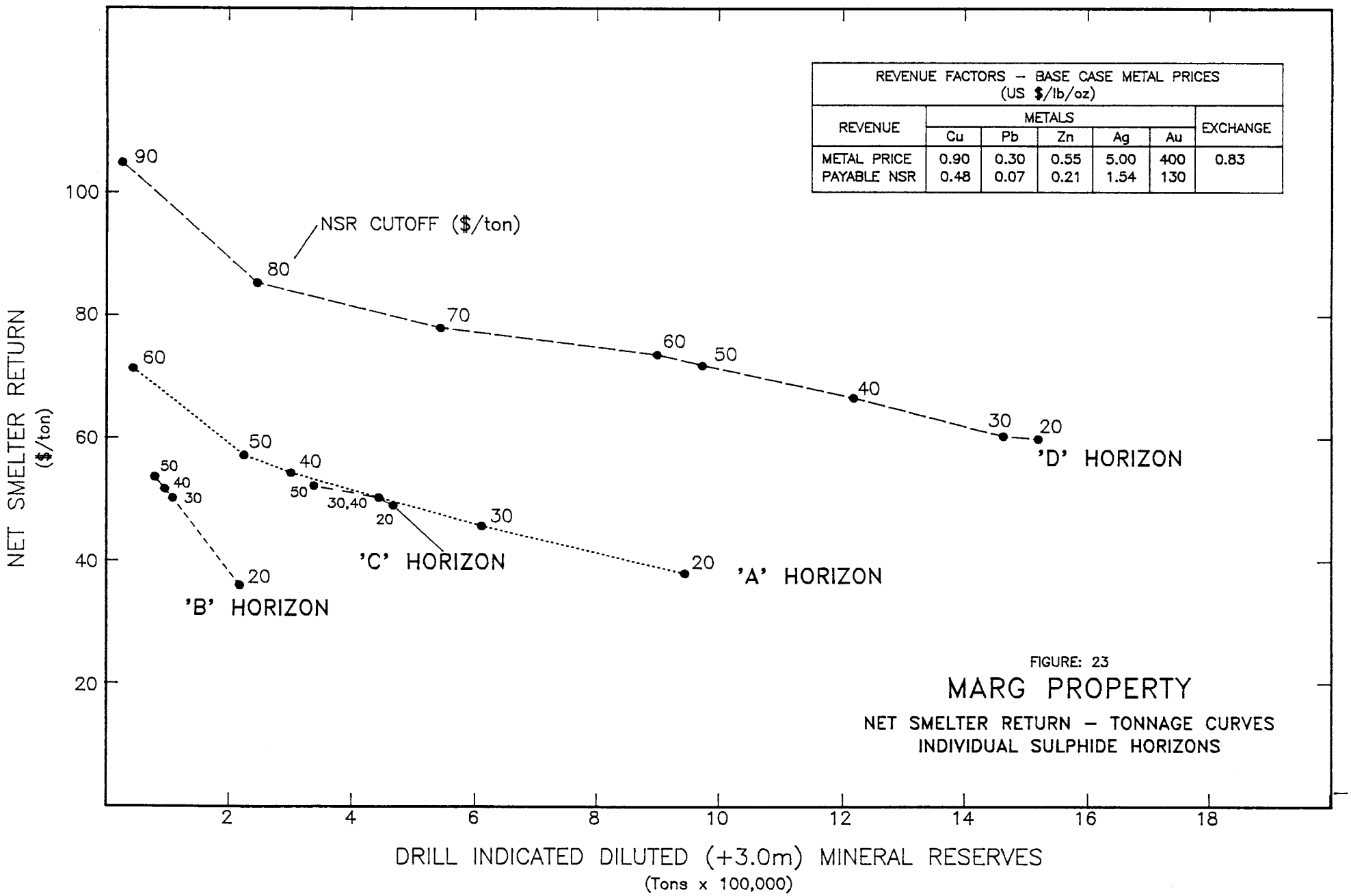



FIGURE: 23

# MARG PROPERTY

NET SMELTER RETURN – TONNAGE CURVES
INDIVIDUAL SULPHIDE HORIZONS

## 'B' Horizon

The 'B' horizon is discontinuous and poorly defined over a strike length of 1,000 m and down-dip for 500 m; 15 out of 31 drill holes intersected the horizon (Figure 17). It has an average undiluted thickness of 2.9 m and dips 50° to the south.

The diluted reserve blocks occupy a 150 m by 200 m area in the immediate hangingwall of the 'A' horizon (Figure 5); average diluted thickness is 4.8 m (Table IV). The 'B' horizon, as presently known, makes a minimal contribution to the global diluted reserve picture at MARG and accounts for only 6.9% of the tons and 5.0% of the NSR metal value (Figures 23 and 24).

Widely-spaced drill hole intersections, west of and beneath the reserve zone, have outlined three - 100 m to 250 m wide areas with reserve potential (Figure 18). The most notable intercepts ($30.64/ton - 3.0 m and $20.89/ton - 7.0 m) occur at the 1,050 m strike line. The possible down-pitch extension of these intercepts remain untested.

## 'C' Horizon

With the exception of the two 'C' horizon intersections in drill hole 89-36 ($52.35/ton - 7.1 m and $51.70/ton - 11.4 m) the horizon is otherwise thin (2.1 m) and poorly defined (Figure 19). It has been intermittently traced over a strike length of 800 m and down-dip for 400 m. It contributes 15.0% of the tons and 14.7% of the NSR metal value to the global diluted reserve (Table II).

Six reserve blocks have been defined within the 'C' horizon (Figure 20). Two of these blocks are centered on drill hole 89-36 and contribute a disproportionate 280,337 tons at $51.59/ton to the reserves listed in Table V.

In spite of the fact that 17 out of 30 drill holes failed to intersect the 'C' horizon, the drilling program did outline three - 125 m wide, east-pitching zones with potential for additional reserves (Figure 20). These zones are more or less coincident with those outlined in the 'A' and 'B' sulphide horizons and parallel the east-pitching metamorphic fabric in the country rock (MacLellan and Carne, 1990).

TABLE IV

MARG PROPERTY

'B' SULPHIDE HORIZON

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY

NOVEMBER, 1990

| Cut-off Grade NSR ($/ton) | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| Global 20 | 4.8 | 217,876 | 1.04 | 1.80 | 2.97 | 1.80 | 0.020 | |
| | | | 12.02 | 3.04 | 15.05 | 3.34 | 3.20 | 36.65 |
| 30 | 4.7 | 116,575 | 1.45 | 2.53 | 3.96 | 2.66 | 0.029 | |
| | | | 16.74 | 4.27 | 20.03 | 4.94 | 4.62 | 50.60 |
| 40 | 4.5 | 103,804 | 1.59 | 2.13 | 4.44 | 1.85 | 0.027 | |
| | | | 18.43 | 3.60 | 22.49 | 3.42 | 4.22 | 52.16 |
| 50 | 5.1 | 87,078 | 1.50 | 2.32 | 4.84 | 1.97 | 0.031 | |
| | | | 17.35 | 3.91 | 24.49 | 3.66 | 4.86 | 54.26 |

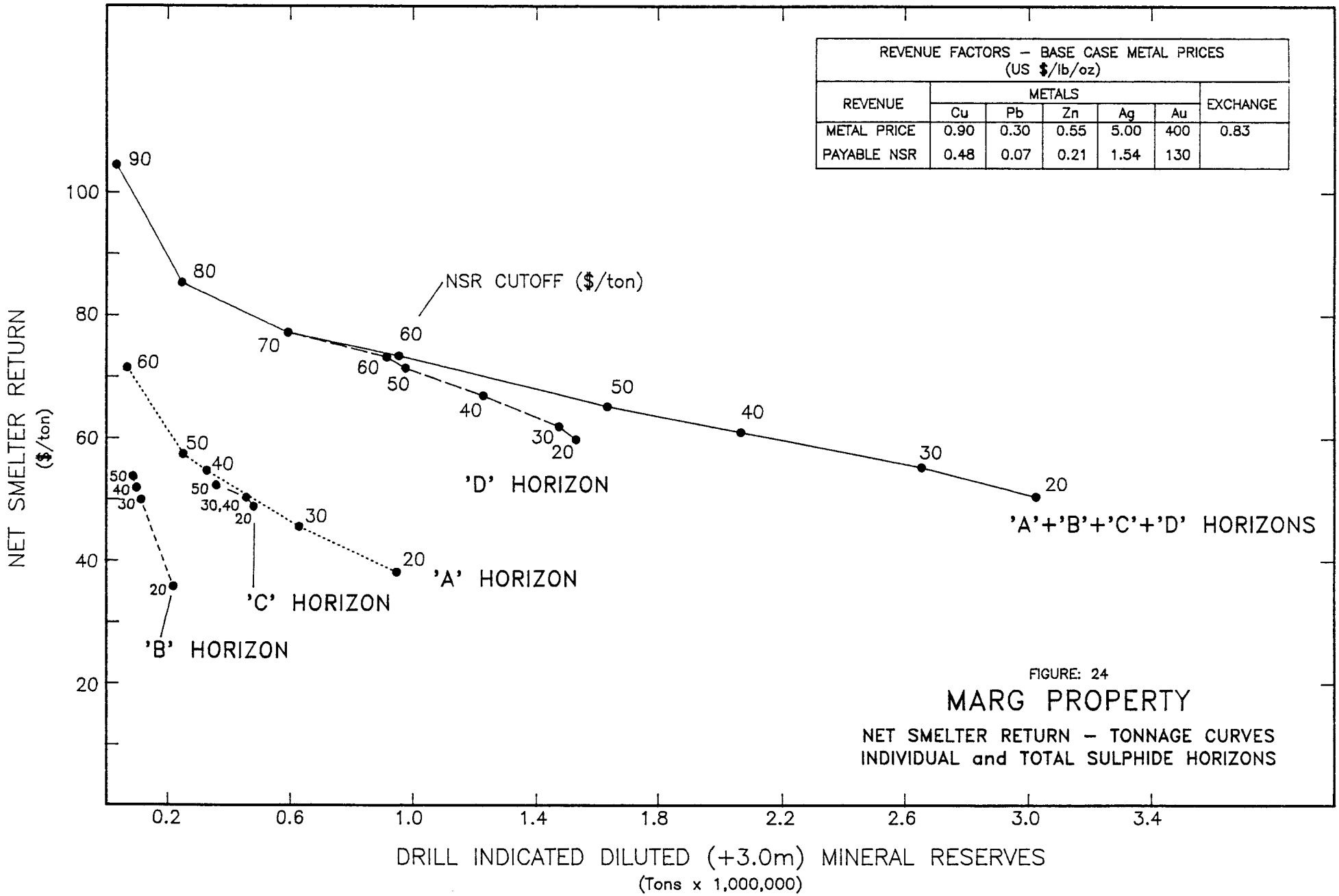



FIGURE: 24

# MARG PROPERTY

NET SMELTER RETURN – TONNAGE CURVES
INDIVIDUAL and TOTAL SULPHIDE HORIZONS

TABLE V

MARG PROPERTY

'C' SULPHIDE HORIZON

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY

NOVEMBER, 1990

| Cut-off Grade NSR ($/ton) | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| Global 20 | 5.1 | 471,852 | 1.45 | 2.46 | 3.85 | 1.85 | 0.037 | |
| | | | 16.83 | 4.16 | 19.48 | 3.44 | 5.84 | 49.74 |
| 30 | 5.3 | 450,159 | 1.47 | 2.54 | 3.93 | 1.92 | 0.038 | |
| | | | 16.95 | 4.29 | 19.89 | 3.56 | 6.01 | 50.70 |
| 40 | 5.3 | 450,159 | 1.47 | 2.54 | 3.93 | 1.92 | 0.038 | |
| | | | 16.95 | 4.29 | 19.89 | 3.56 | 6.01 | 50.70 |
| 50 | 6.8 | 342,835 | 1.53 | 2.73 | 3.98 | 2.01 | 0.043 | |
| | | | 17.66 | 4.61 | 20.13 | 3.72 | 6.81 | 52.93 |

## 'D' Horizon

The 'D' sulphide horizon is the principal known reserve horizon on the MARG property. It has been explored with 32 drill holes, 29 of which cut the horizon over an area measuring 1,200 m along-strike and 700 m down-dip (Figure 21). The horizon has an average undiluted thickness of 4.4 m; average dip is 50° to the south.

A series of closely-spaced (20 m to 100 m) drill holes has defined 18 mineral reserve blocks between surface and the 1,250 m strike line (Figure 22). This reserve zone measures 300 m along-strike and 300 m down-dip; average diluted thickness is 5.8 m. The natural cut-off grade to the zone is approximately $60/ton. Above this point the remaining reserve blocks no longer form a coherent mass. Tables VI and VII and Figures 23 and 24 demonstrate the important contribution that the 'D' horizon makes to the overall tons and NSR for the MARG deposit. It contributes 48.3% of the tons and 57.6% of the NSR metal values to the global diluted reserves. The 'D' horizon is superior in both tons and grade to the 'A + B' + C' horizons combined (Figure 25).

Not unlike the 'A', 'B' and 'C' horizons, 'D' horizon reserves lie against the Footwall Fault. Immediately down-pitch from the mineral reserve zone, widely-spaced drill hole intercepts ($57.07/ton - 4.7 m; $47.05/ton - 3.0 m; and $47.38/ton - 3.0 m) have defined a 200 m wide by 600 m long zone - parallel to the pitch of the fault - that offers excellent potential to expand 'D' horizon reserves (Figure 22). A second broad band with reserve potential lies to the west of the main reserve zone. Both zones warrant further work.

TABLE VI

MARG PROPERTY

'D' SULPHIDE HORIZON

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY

NOVEMBER, 1990

| Cut-off Grade NSR ($/ton) | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| Global 20 | 5.8 | 1,523,064 | 2.08 | 2.54 | 5.01 | 1.63 | 0.024 | |
| | | | 24.05 | 4.28 | 25.37 | 3.03 | 3.82 | 60.55 |
| 30 | 6.1 | 1,464,403 | 2.13 | 2.52 | 5.17 | 1.64 | 0.025 | |
| | | | 24.66 | 4.25 | 26.17 | 3.03 | 3.90 | 62.02 |
| 40 | 6.1 | 1,218,004 | 2.31 | 2.77 | 5.66 | 1.76 | 0.027 | |
| | | | 26.69 | 4.68 | 28.65 | 3.26 | 4.21 | 67.49 |
| 50 | 6.8 | 974,094 | 2.45 | 3.03 | 6.14 | 1.84 | 0.029 | |
| | | | 28.30 | 5.10 | 31.09 | 3.41 | 4.52 | 72.42 |
| 60 | 7.4 | 901,177 | 2.56 | 3.04 | 6.22 | 1.85 | 0.029 | |
| | | | 29.61 | 5.13 | 31.47 | 3.43 | 4.55 | 74.18 |
| 70 | 8.4 | 545,186 | 2.79 | 3.13 | 6.40 | 1.96 | 0.031 | |
| | | | 32.28 | 5.28 | 32.38 | 3.63 | 4.88 | 78.44 |
| 80 | 6.4 | 244,780 | 3.09 | 3.64 | 6.57 | 2.07 | 0.042 | |
| | | | 35.69 | 6.14 | 33.24 | 3.85 | 6.64 | 85.56 |
| 90 | 3.7 | 30,589 | 3.14 | 4.84 | 9.21 | 3.18 | 0.053 | |
| | | | 36.32 | 8.16 | 46.60 | 5.90 | 8.30 | 105.29 |

TABLE VII

MARG PROPERTY

'A + B + C' SULPHIDE HORIZONS

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY

NOVEMBER, 1990

| Cut-off Grade NSR ($/ton) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|
| | | Cu | Pb | Zn | Ag | Au | |
| Global 20 | 1,631,444 | 1.18 | 1.98 | 3.39 | 1.64 | 0.028 | |
| | | 13.67 | 3.34 | 17.13 | 3.03 | 4.45 | 41.62 |
| 30 | 1,186,094 | 1.36 | 2.33 | 3.89 | 1.93 | 0.035 | |
| | | 15.77 | 3.93 | 19.66 | 3.58 | 5.40 | 48.35 |
| 40 | 863,858 | 1.53 | 2.47 | 4.19 | 2.02 | 0.036 | |
| | | 17.71 | 4.17 | 21.20 | 3.74 | 5.63 | 52.45 |
| 50 | 660,407 | 1.60 | 2.64 | 4.33 | 2.11 | 0.039 | |
| | | 18.46 | 4.45 | 21.93 | 3.91 | 6.05 | 54.81 |
| 60 | 52,514 | 2.82 | 2.68 | 4.88 | 2.52 | 0.037 | |
| | | 32.58 | 4.52 | 24.71 | 4.67 | 5.76 | 72.24 |
| 70 | 52,514 | 2.82 | 2.68 | 4.88 | 2.52 | 0.037 | |
| | | 32.58 | 4.52 | 24.71 | 4.67 | 5.76 | 72.24 |

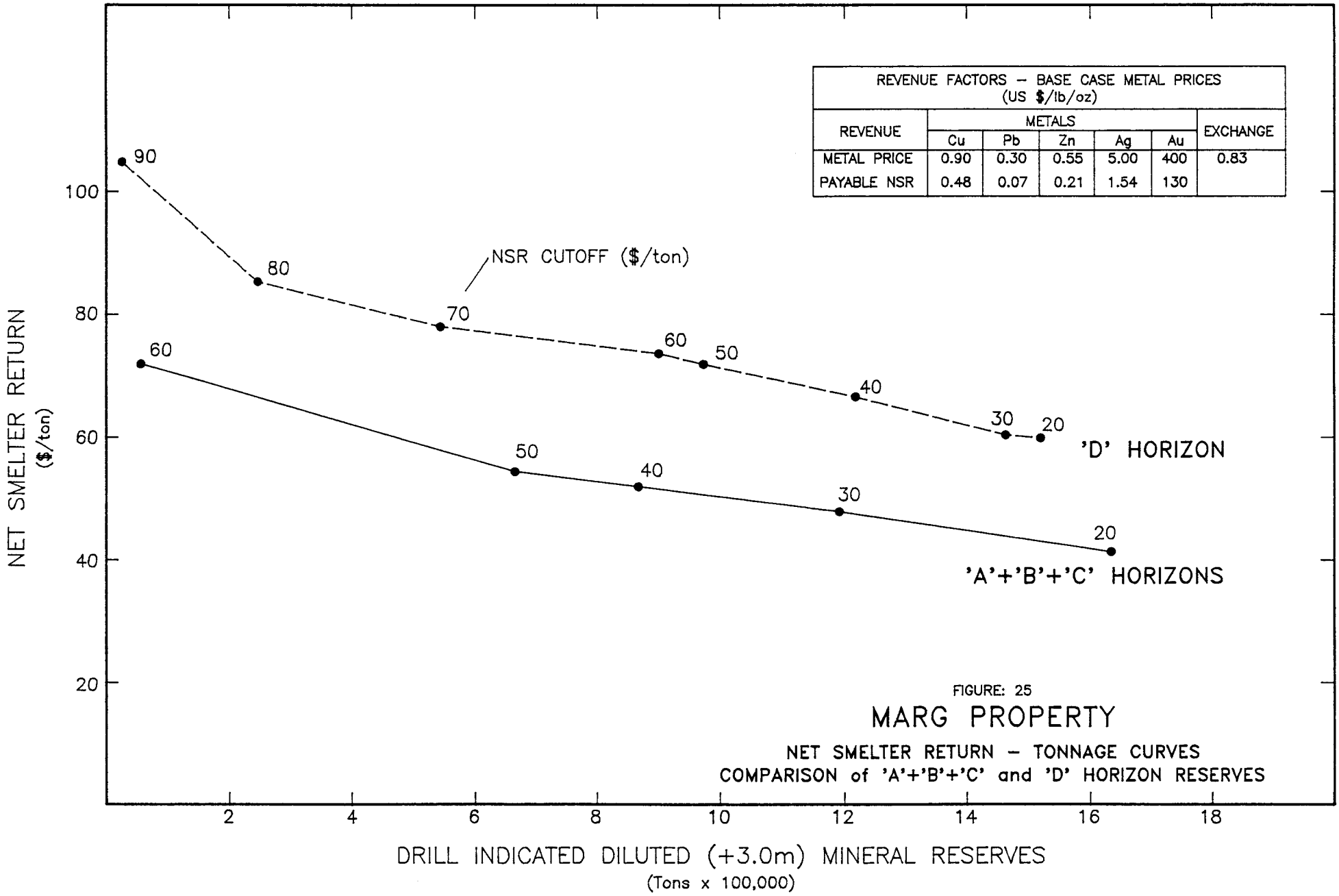



FIGURE: 25

# MARG PROPERTY

NET SMELTER RETURN – TONNAGE CURVES
COMPARISON of 'A'+'B'+'C' and 'D' HORIZON RESERVES

## DISCUSSION

A systematic, three-year, 47-hole diamond drilling program has outlined a significant volcanogenic massive sulphide deposit on the MARG property. As presently known, the deposit consists of four en echelon, moderate to steep south-inclined, massive sulphide horizons that have been traced over a strike length of 1,200 m and down-dip for 700 m.

Closed-spaced drilling along the eastern margin of a 1,500 m long and 400 m wide lead in soils geochemical anomaly has defined a drill indicated mineral reserve. This reserve consists of four en echelon sulphide panels and measures up to 350 m along-strike and 300 m down-dip; average diluted sulphide thickness is 6.1 m. Deep and widely-spaced drill hole intercepts indicate that the reserve is open to expansion at depth with sufficient tonnage potential to accommodate a two-fold increase in the present reserve base.

Figure 24 and Table VIII illustrate grade-tonnage relationships for the 'A + B + C + D' horizons - drill indicated diluted reserves. These reserves show a gradual increase in average NSR with increasing cut-off grade. Reserve tonnage, however, shows a marked decrease the between $30/ton to $40/ton and $50/ton to $60/ton cut-off grades. A relative abundance of material in the $30/ton to $40/ton range in the 'A' and 'D' horizons explains the former; and a relative absence of material in the $50/ton to $60/ton range in 'A', 'B' and 'C' horizons accounts for the latter.

The 'D' sulphide horizon is the principal known mineral reserve horizon on the property and offers the best potential for early development of new reserves. It contributes 48.3% of the tons and 57.6% of the known NSR metal values to the global diluted reserve and unlike the other horizons, 'D' reserve blocks retain continuity up to the $60/ton cut-off grade. This factor becomes particularly important when one considers that an economic evaluation of these reserves and others that may be discovered on the property would probably employ a $40/ton to $50/ton NSR cut-off grade.

TABLE VIII

MARG PROPERTY

'A + B + C + D' SULPHIDE HORIZONS

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY

NOVEMBER, 1990

| Cut-off Grade NSR ($/ton) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|
| | | Cu | Pb | Zn | Ag | Au | |
| Global 20 | 3,154,508 | 1.62 | 2.25 | 4.17 | 1.63 | 0.026 | |
| | | 18.68 | 3.80 | 21.10 | 3.03 | 4.11 | 50.73 |
| 30 | 2,650,497 | 1.79 | 2.44 | 4.60 | 1.77 | 0.029 | |
| | | 20.67 | 4.11 | 23.25 | 3.28 | 4.58 | 55.90 |
| 40 | 2,081,862 | 1.99 | 2.65 | 5.05 | 1.87 | 0.031 | |
| | | 22.98 | 4.46 | 25.55 | 3.46 | 4.81 | 61.27 |
| 50 | 1,634,501 | 2.10 | 2.87 | 5.41 | 1.95 | 0.033 | |
| | | 24.35 | 4.85 | 27.38 | 3.62 | 5.15 | 65.34 |
| 60 | 953,691 | 2.57 | 3.02 | 6.15 | 1.89 | 0.029 | |
| | | 29.78 | 5.09 | 31.10 | 3.50 | 4.61 | 74.08 |
| 70 | 597,700 | 2.79 | 3.09 | 6.27 | 2.01 | 0.032 | |
| | | 32.30 | 5.21 | 31.71 | 3.73 | 4.94 | 77.89 |
| 80 | 244,780 | 3.09 | 3.64 | 6.57 | 2.07 | 0.042 | |
| | | 35.69 | 6.14 | 33.24 | 3.85 | 6.64 | 85.56 |

This assessment of MARG property mineral reserves is based on the use of an NSR-adjusted revenue factor. As noted in Appendices II and III, determination of this factor is based upon a number of assumptions, one of which is metal prices. This study considered a conservative metal pricing scenario; however, it is important to note that application of current metal prices to the global diluted tons and grade increases the global diluted reserve NSR by 31.7% to $65.84/ton. A similar increase is seen when current (November 12, 1990) metal prices are applied to 'D' horizon reserves (Figure 26 and Table IX). At a $40/ton cut-off grade use of current metal prices increases reserve tons by 20.2% and reserve grade by 21.8%. Copper replaces zinc as the principal revenue metal. "Present" metal prices and their NSR-adjusted equivalents are listed below.

| | $US / lb / oz Metals | | | | | |
|---|---|---|---|---|---|---|
| Revenue | Cu | Pb | Zn | Ag | Au | Exchange |
| Present Metal Prices | 1.30 | 0.45 | 0.58 | 4.20 | 384 | 0.86 |
| NSR-Adjusted Metal Prices | 0.77 | 0.16 | 0.23 | 1.51 | 141 | |

This important massive sulphide deposit warrants further work. Future surface and/or underground exploration programs should work toward the delineation of +6,000,000 tons of coherent reserves above an NSR cut-off grade of $40/ton. This work should focus on the down-pitch extension - parallel to the Footwall Fault - of the presently defined zone of mineral reserves.

TABLE IX

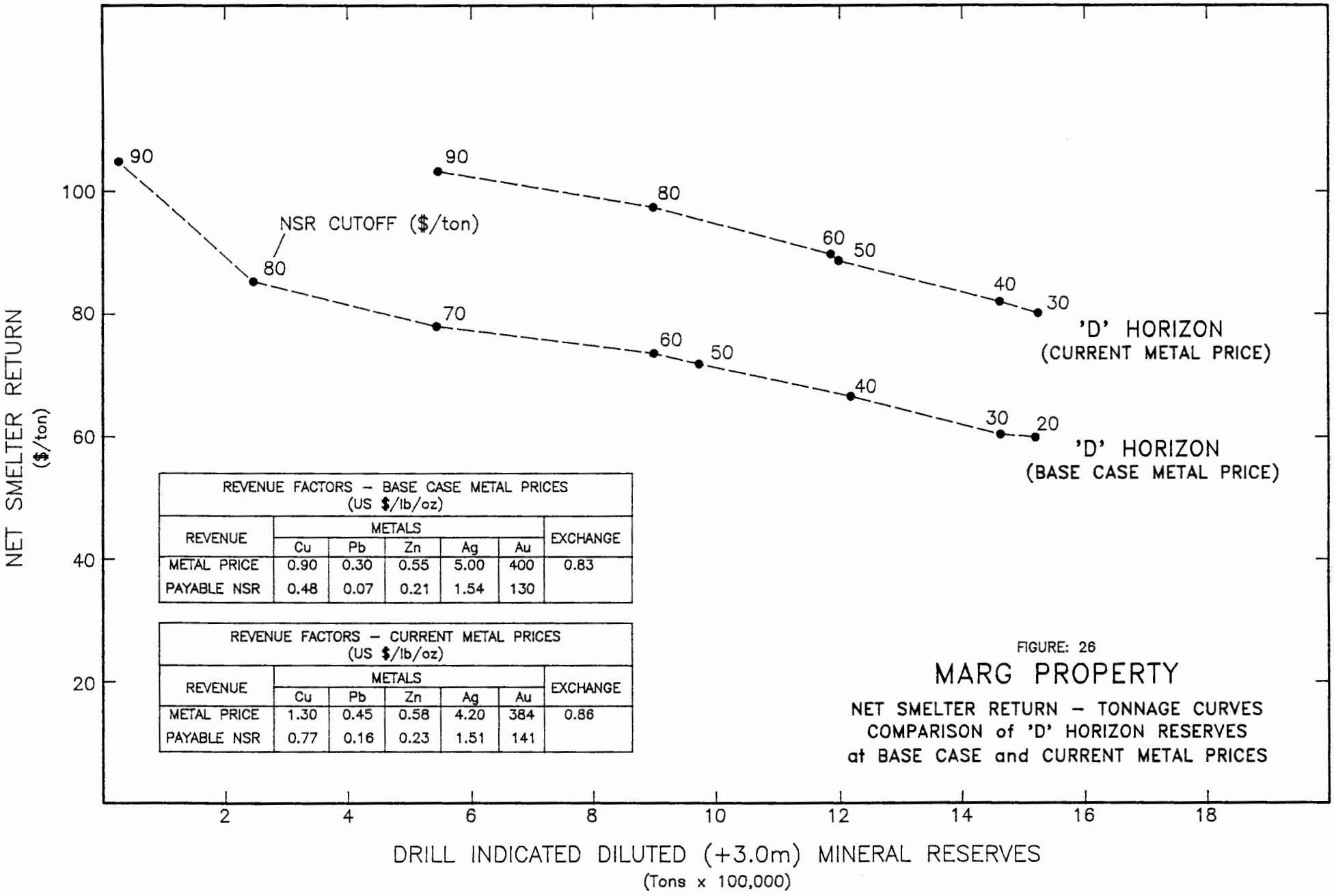
MARG PROPERTY

'D' SULPHIDE HORIZON

DILUTED (+3.0 m) MINERAL RESERVES AND CUT-OFF GRADE SUMMARY - CURRENT METAL PRICES

NOVEMBER, 1990

| Cut-off Grade NSR ($/ton) | Thickness (m) | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|
| | | | Cu | Pb | Zn | Ag | Au | |
| 20 | 5.8 | 1,523,064 | 2.08 | 2.54 | 5.01 | 1.63 | 0.024 | |
| | | | 37.24 | 9.43 | 26.81 | 2.87 | 4.00 | 80.36 |
| 30 | 5.8 | 1,523,064 | 2.08 | 2.54 | 5.01 | 1.63 | 0.024 | |
| | | | 37.24 | 9.43 | 26.81 | 2.87 | 4.00 | 80.36 |
| 40 | 6.1 | 1,464,403 | 2.13 | 2.52 | 5.17 | 1.64 | 0.025 | |
| | | | 38.18 | 9.38 | 27.66 | 2.87 | 4.09 | 82.18 |
| 50 | 6.1 | 1,218,004 | 2.31 | 2.77 | 5.66 | 1.76 | 0.027 | |
| | | | 41.32 | 10.32 | 30.28 | 3.08 | 4.40 | 89.41 |
| 60 | 6.3 | 1,191,148 | 2.33 | 2.79 | 5.71 | 1.76 | 0.027 | |
| | | | 41.67 | 10.39 | 30.53 | 3.09 | 4.44 | 90.13 |
| 70 | 7.4 | 901,177 | 2.56 | 3.04 | 6.22 | 1.85 | 0.029 | |
| | | | 45.84 | 11.31 | 33.26 | 3.25 | 4.76 | 98.42 |
| 80 | 7.4 | 901,177 | 2.56 | 3.04 | 6.22 | 1.85 | 0.029 | |
| | | | 45.84 | 11.31 | 33.26 | 3.25 | 4.76 | 98.42 |
| 90 | 8.4 | 545,186 | 2.79 | 3.13 | 6.40 | 1.96 | 0.031 | |
| | | | 49.97 | 11.64 | 34.22 | 3.43 | 5.11 | 104.37 |




| REVENUE FACTORS – BASE CASE METAL PRICES (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

| REVENUE FACTORS – CURRENT METAL PRICES (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 1.30 | 0.45 | 0.58 | 4.20 | 384 | 0.86 |
| PAYABLE NSR | 0.77 | 0.16 | 0.23 | 1.51 | 141 | |

FIGURE: 26

# MARG PROPERTY

NET SMELTER RETURN – TONNAGE CURVES
COMPARISON of 'D' HORIZON RESERVES
at BASE CASE and CURRENT METAL PRICES

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FRANZEN, J.P. (1988c) — Addendum to November 18, 1988 Mineral Reserve Assessment, MARG Property, Mayo Mining District, Yukon Territory. Report for NDU Resources Ltd., pp. 8.

FRANZEN, J.P. (1989) — Addendum to November 18, 1988 Mineral Reserve Assessment Report, MARG Property, Mayo Mining District, Yukon Territory. Report for NDU Resources Ltd., pp. 20.

MacLELLAN, M.L. and CARNE, R.C. (1990) — Final Report 1990 Field Program, MARG Property, Yukon Territory; in preparation.

## CERTIFICATE

I, Jeffrey Paul Franzen, P.Eng., of 4990 Cedarcrest Avenue, North Vancouver, B.C. do hereby certify that:

1. I am a Consulting Mining Geologist registered with the Association of Professional Engineers of British Columbia since 1982.

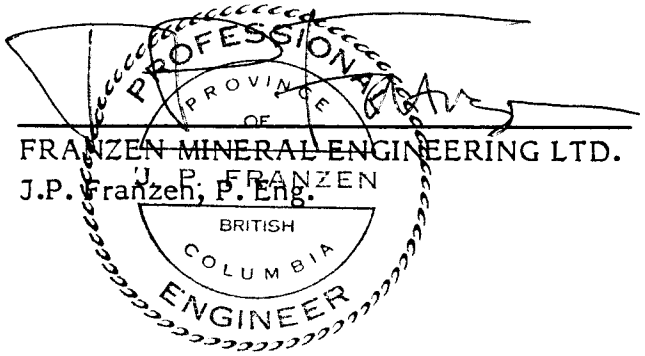
2. I am a graduate of the University of British Columbia with B.Sc. (1972) and Carleton University with M.Sc. (1974).

3. I have practiced my profession continuously since 1974. In Yukon: as Mine Geologist, Research Geologist and Chief Geologist, United Keno Hill Mines Limited, and Exploration Geologist, Cyprus Anvil Mining Corp. In British Columbia: Regional Geologist - Western Canada, Billiton Canada Ltd., Consultant - Franzen Mineral Engineering Ltd.

4. This report is based on a visit to the subject property on August 22 and 23, 1988; on the writer's 1988 reports on the subject property dated October 17, November 18 and December 12; on the writer's 1989 report dated October 16; and on the writer's evaluation of maps and data supplied by the MARG Joint Venture.

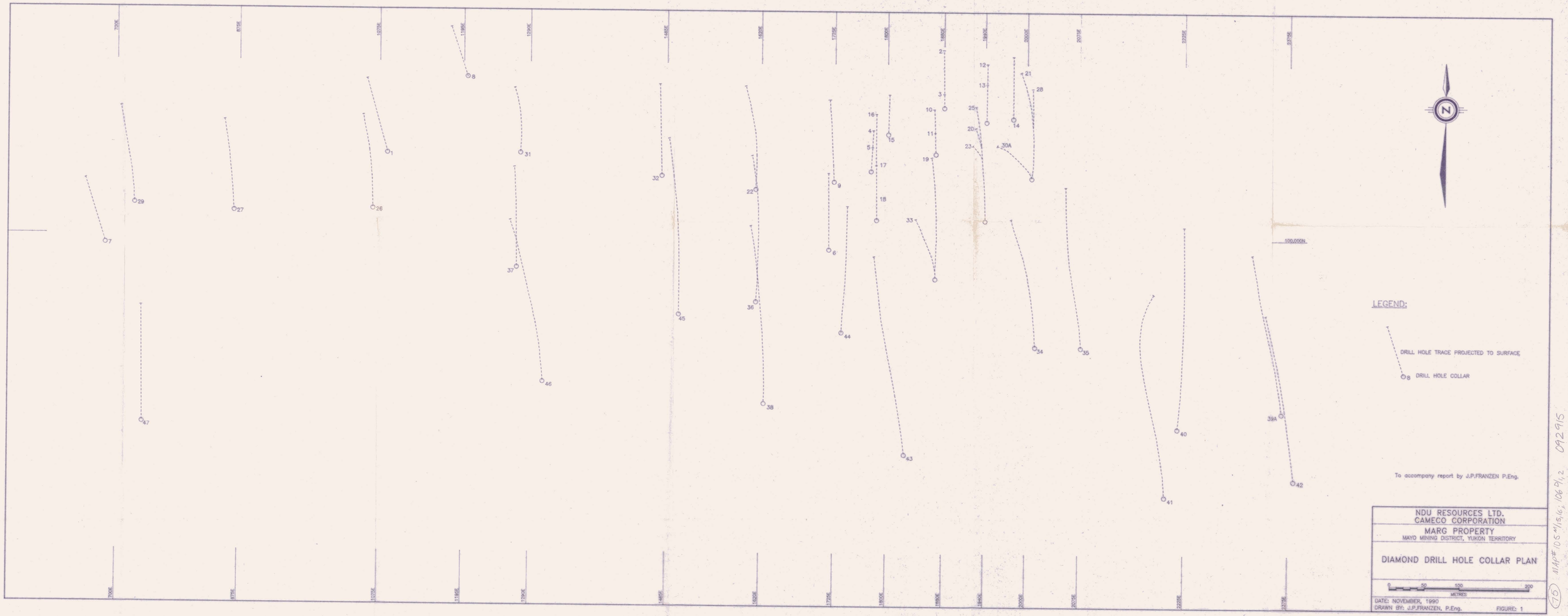
5. I have no interest, direct or indirect, in the MARG property or NDU Resources Ltd.

6. Permission is hereby granted to NDU Resources Ltd. to use this report in support of any Prospectus, Statement of Material Facts or Filing Statement to be submitted to the Superintendent of Brokers and the Vancouver Stock Exchange.

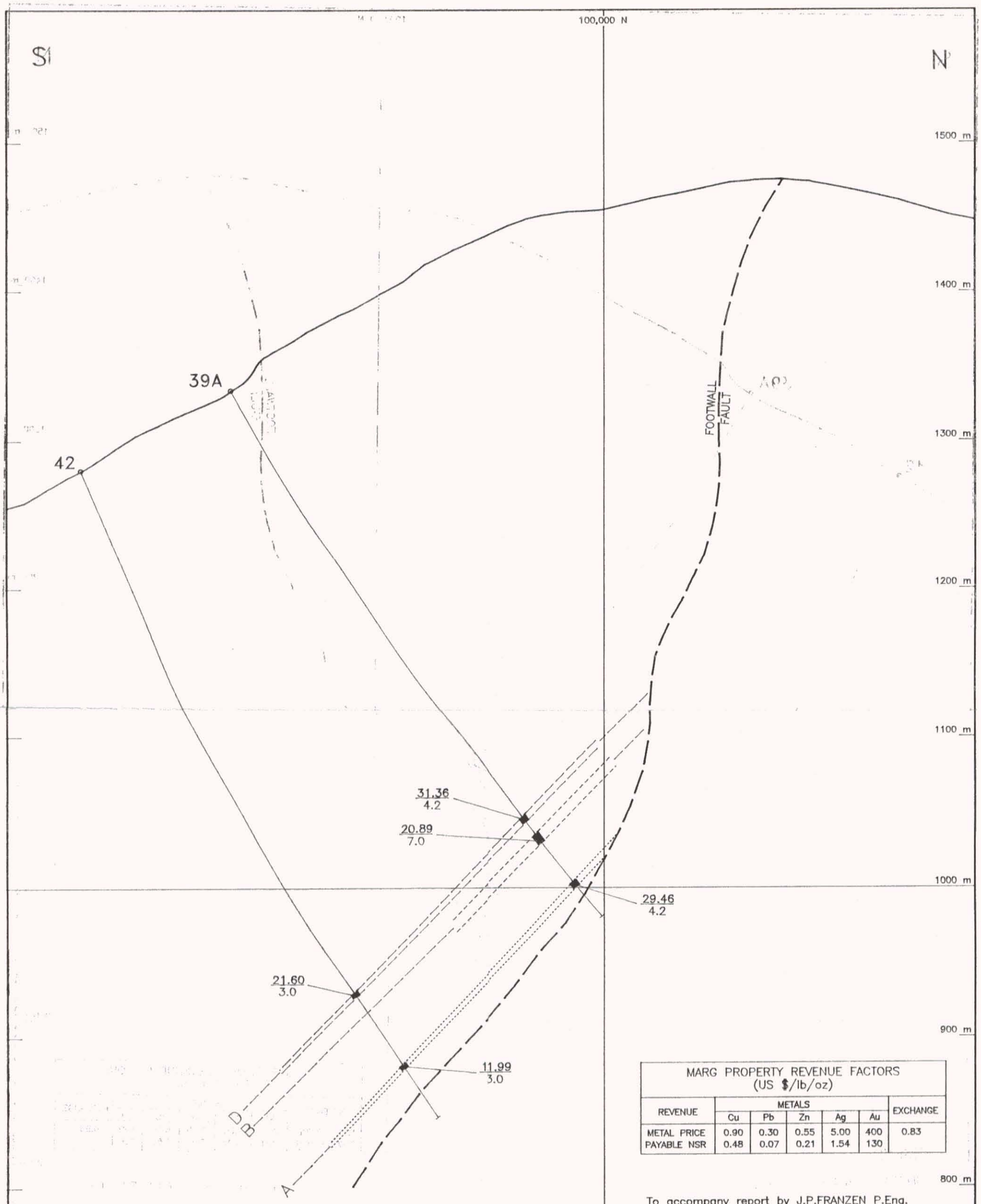



FRANZEN MINERAL ENGINEERING LTD.
J.P. Franzen, P. Eng.

North Vancouver, B.C.
December 4, 1990




(15) 114A#105 11/15/16, 106 9/12 092915




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

21.60 / 3.0 DILUTED (+3.0m) DRILLHOLE INTERCEPT NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

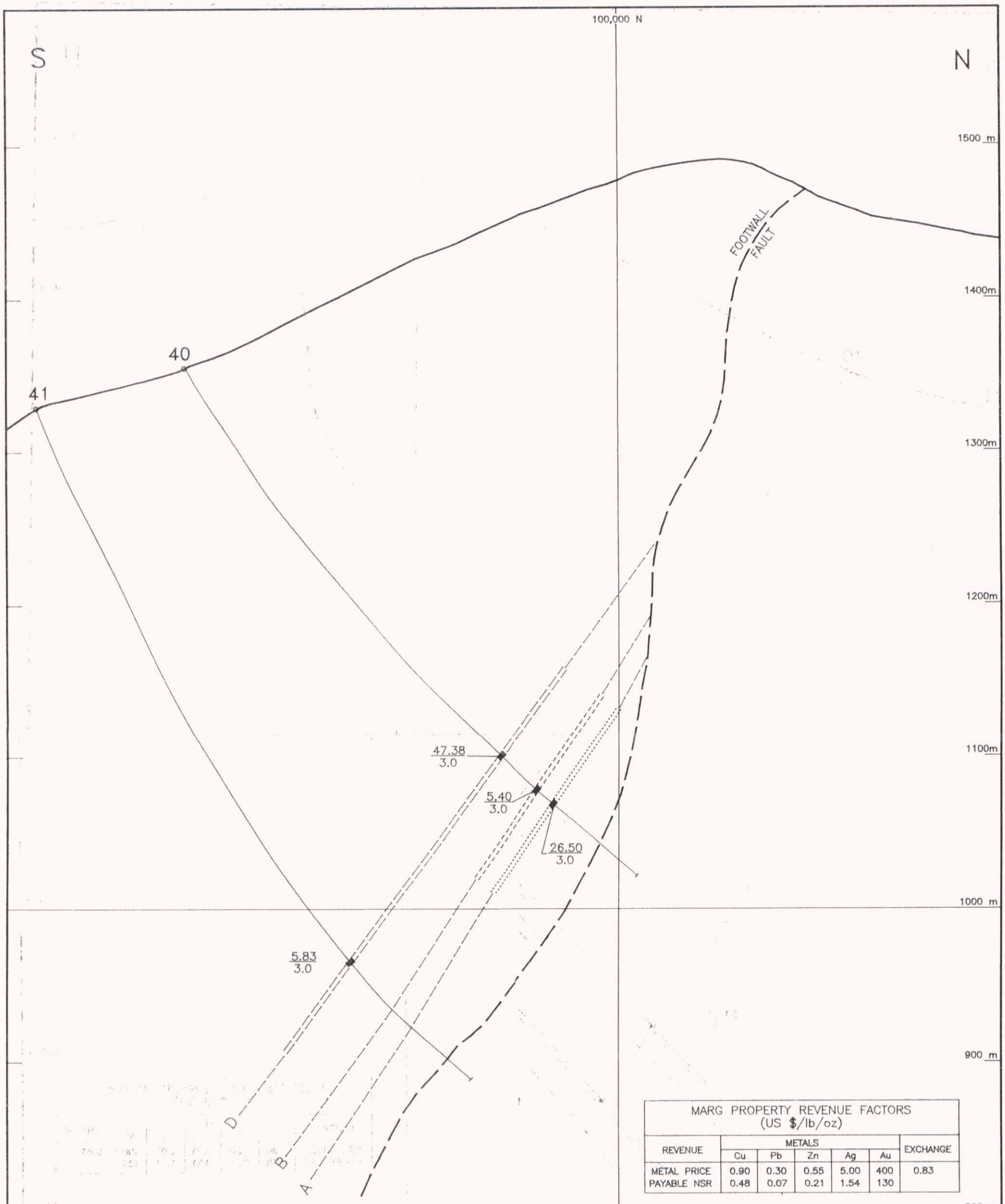
## DRILL SECTION 2375E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 2

MAP# 105 M/15/16; 106 D/1,2 092915 (74)




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A .....

B - - - - - - - -

C = = = = = =

D ‖ = = = = = =

5.83 / 3.0 DILUTED (+3.0m) DRILLHOLE INTERCEPT NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

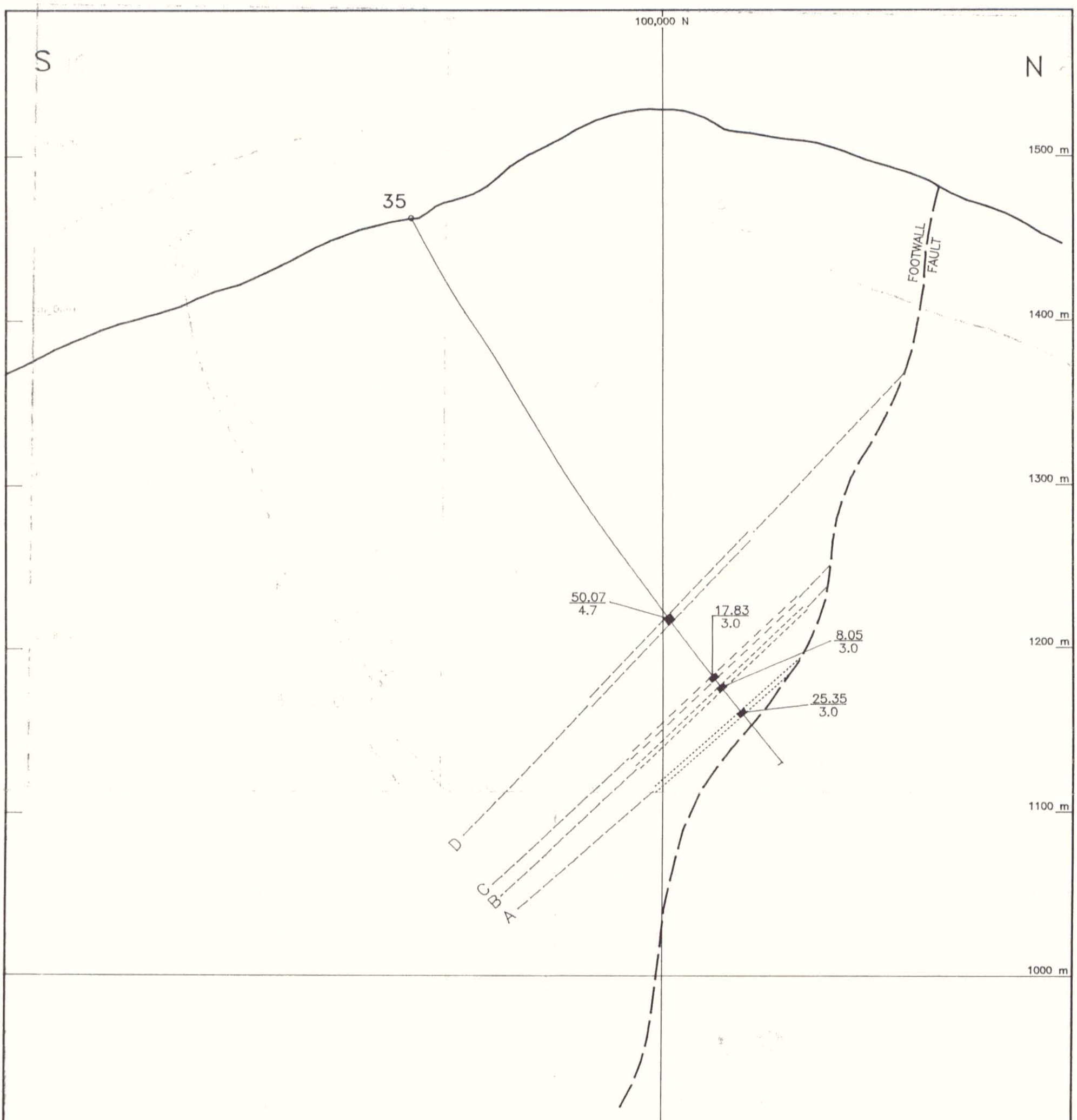
## DRILL SECTION 2225E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 3

092915
MAP # 105 M/15,16; 106 D/1,2
74A




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

25.35 / 3.0 DILUTED (+3.0m) DRILLHOLE INTERCEPT NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

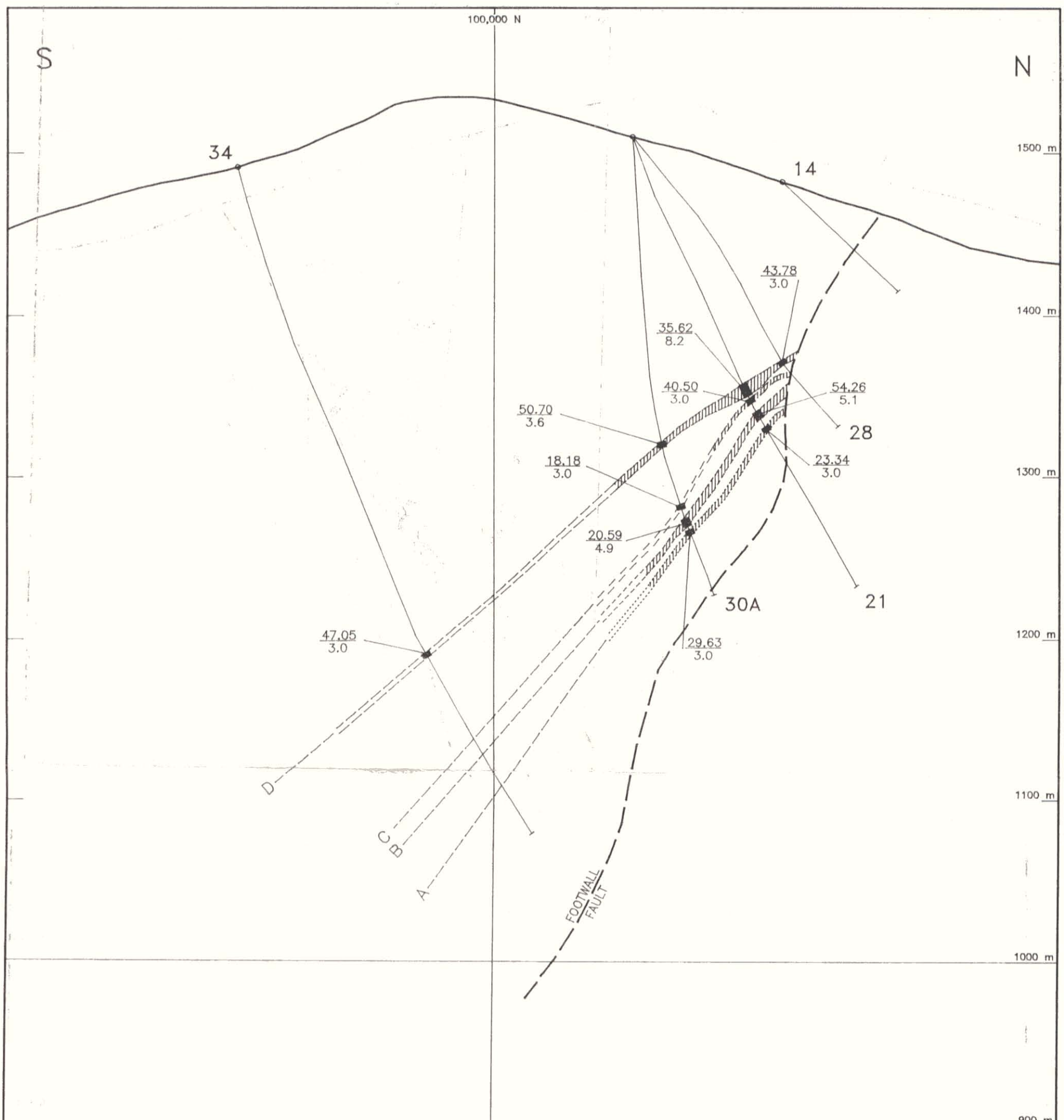
# DRILL SECTION 2075E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 4

092915
MAP #105M/15,16; 106D/1,2
74B




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

ZONE OF DILUTED MINERAL RESERVE BLOCKS

54.26 / 5.1 DILUTED (+3.0m) DRILLHOLE INTERCEPT NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

MARG PROPERTY
MAYO MINING DIVISION, YUKON TERRITORY

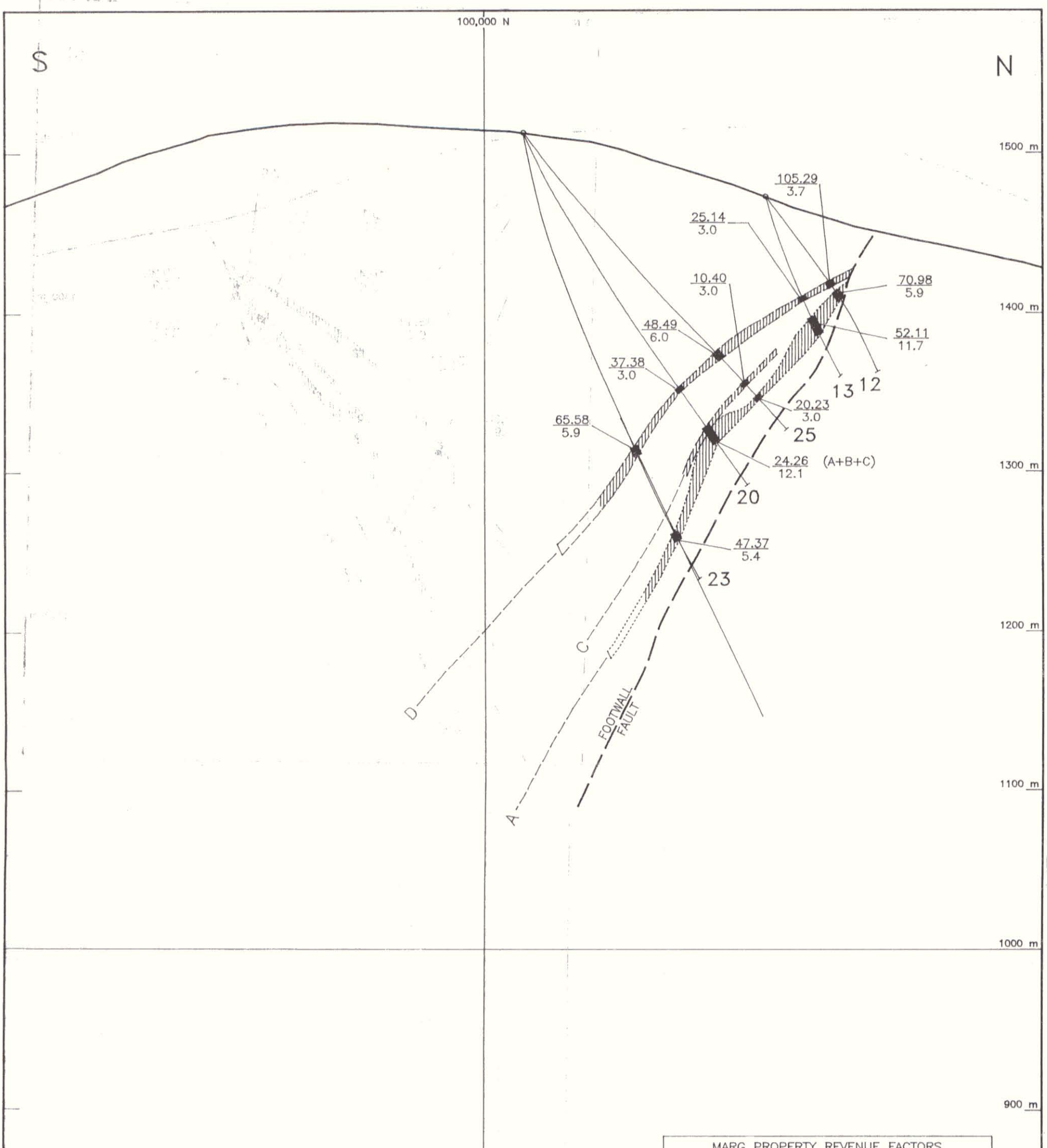
# DRILL SECTION 2000E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 5

(73) MAP# 105 M/15,16; 106 P/1,2 092915




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

ZONE OF DILUTED MINERAL RESERVE BLOCKS

65.58 / 5.9 DILUTED (+3.0m) DRILLHOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

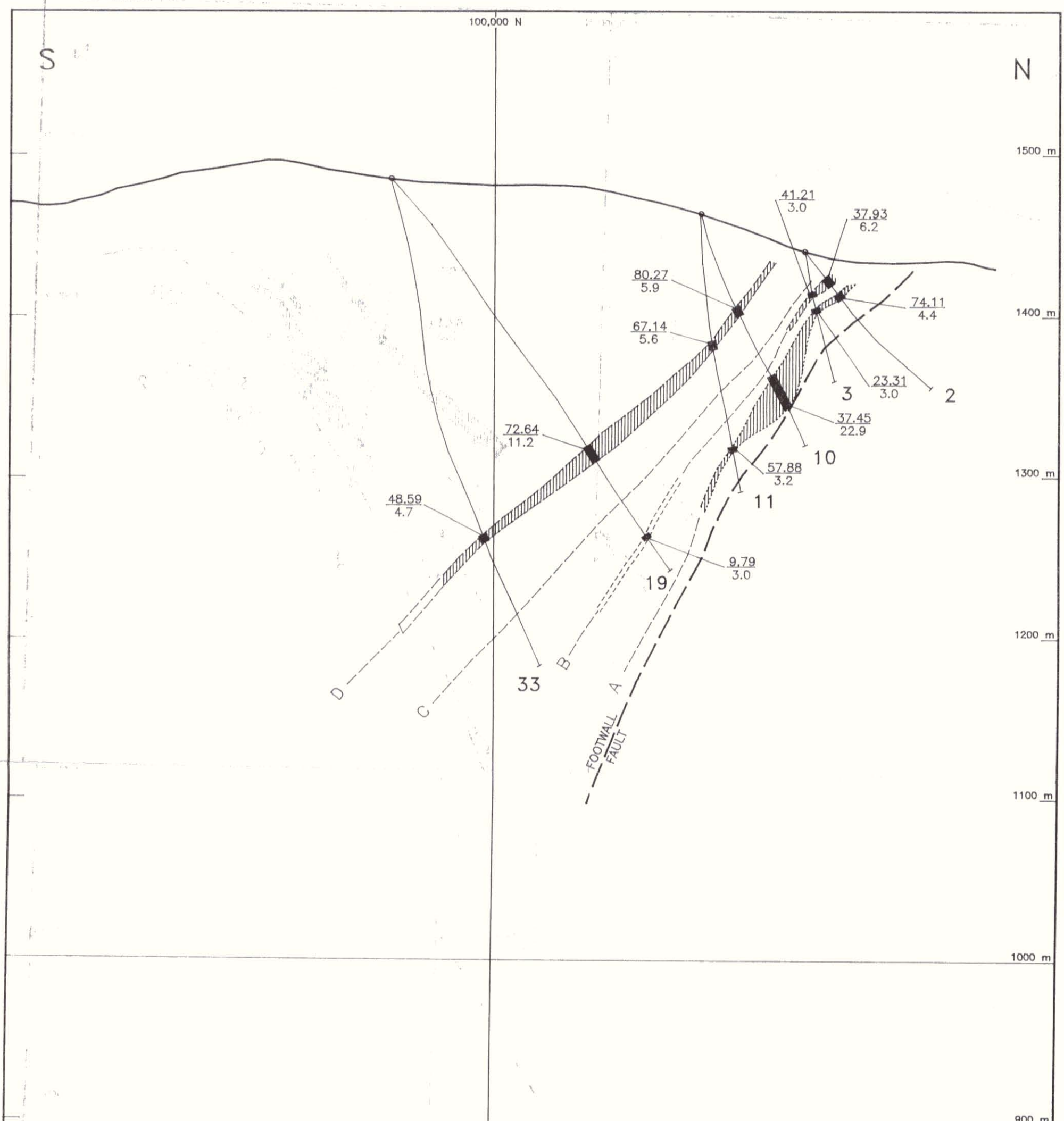
# DRILL SECTION 1940E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 6

MAP# 105 M/15,16; 106 D/1,2 092915
73A




LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

ZONE OF DILUTED MINERAL RESERVE BLOCKS

57.88 / 3.2 DILUTED (+3.0m) DRILLHOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION

MARG PROPERTY
MAYO MINING DIVISION, YUKON TERRITORY

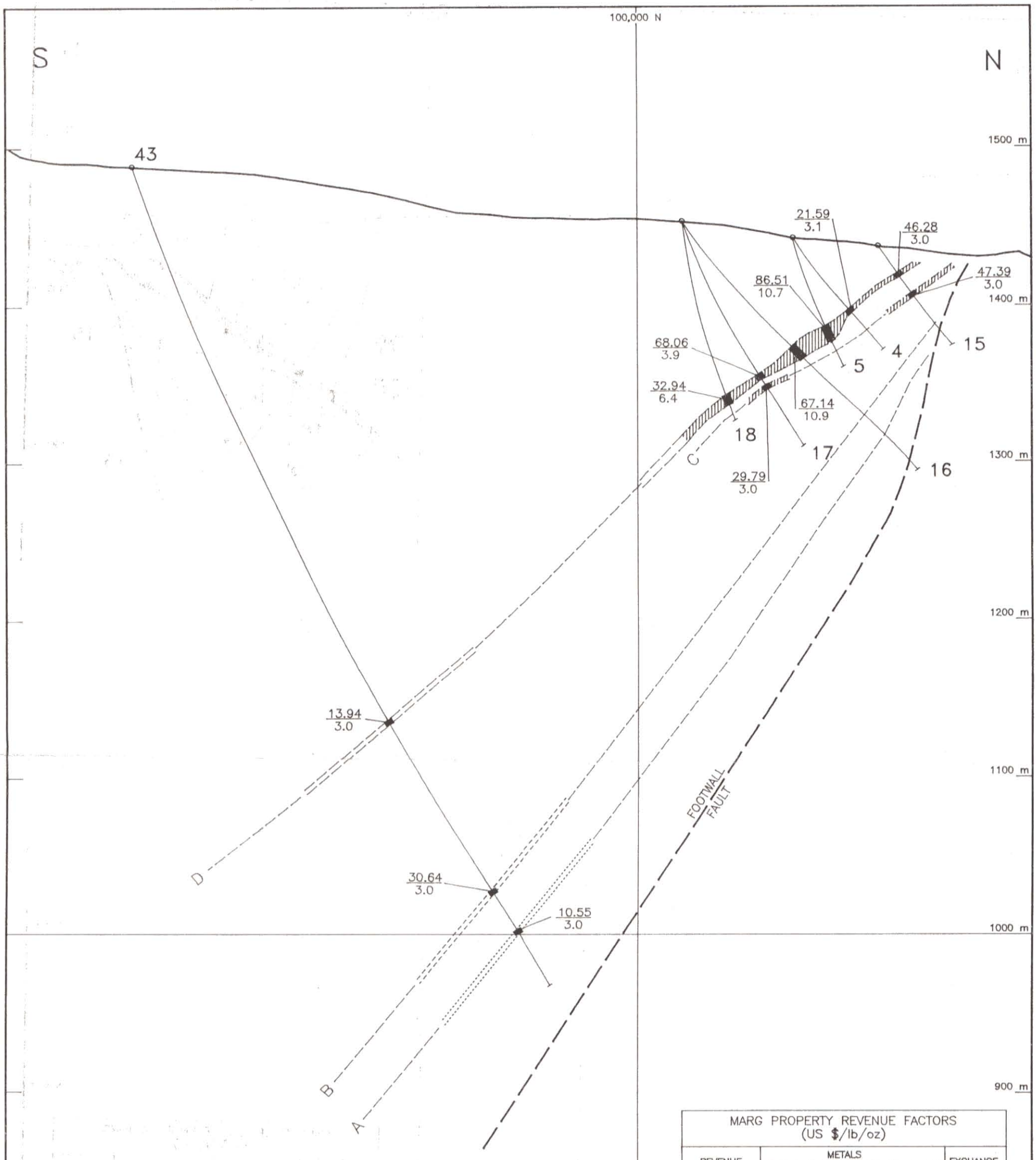
# DRILL SECTION 1880E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 7

MAP # 105 M/15,16; 106 D/12 092915
73B




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

ZONE OF DILUTED MINERAL RESERVE BLOCKS

32.94 / 6.4 DILUTED (+3.0m) DRILLHOLE INTERCEPT NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

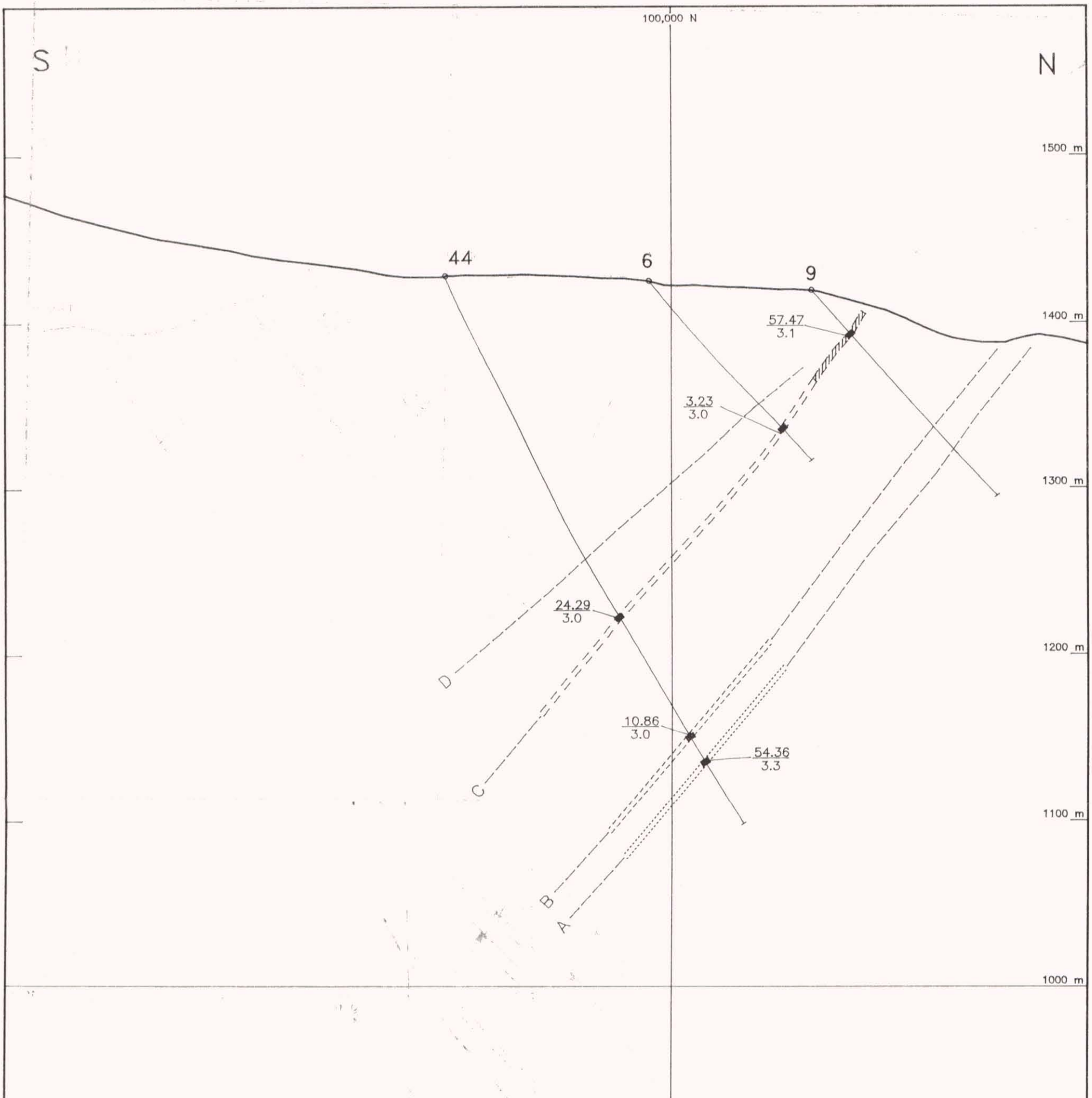
## DRILL SECTION 1800E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 8

092915
MAP #105 M/15, 16; 106 D/12
730




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

ZONE OF DILUTED MINERAL RESERVE BLOCKS

57.47 / 3.1 DILUTED (+3.0m) DRILLHOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

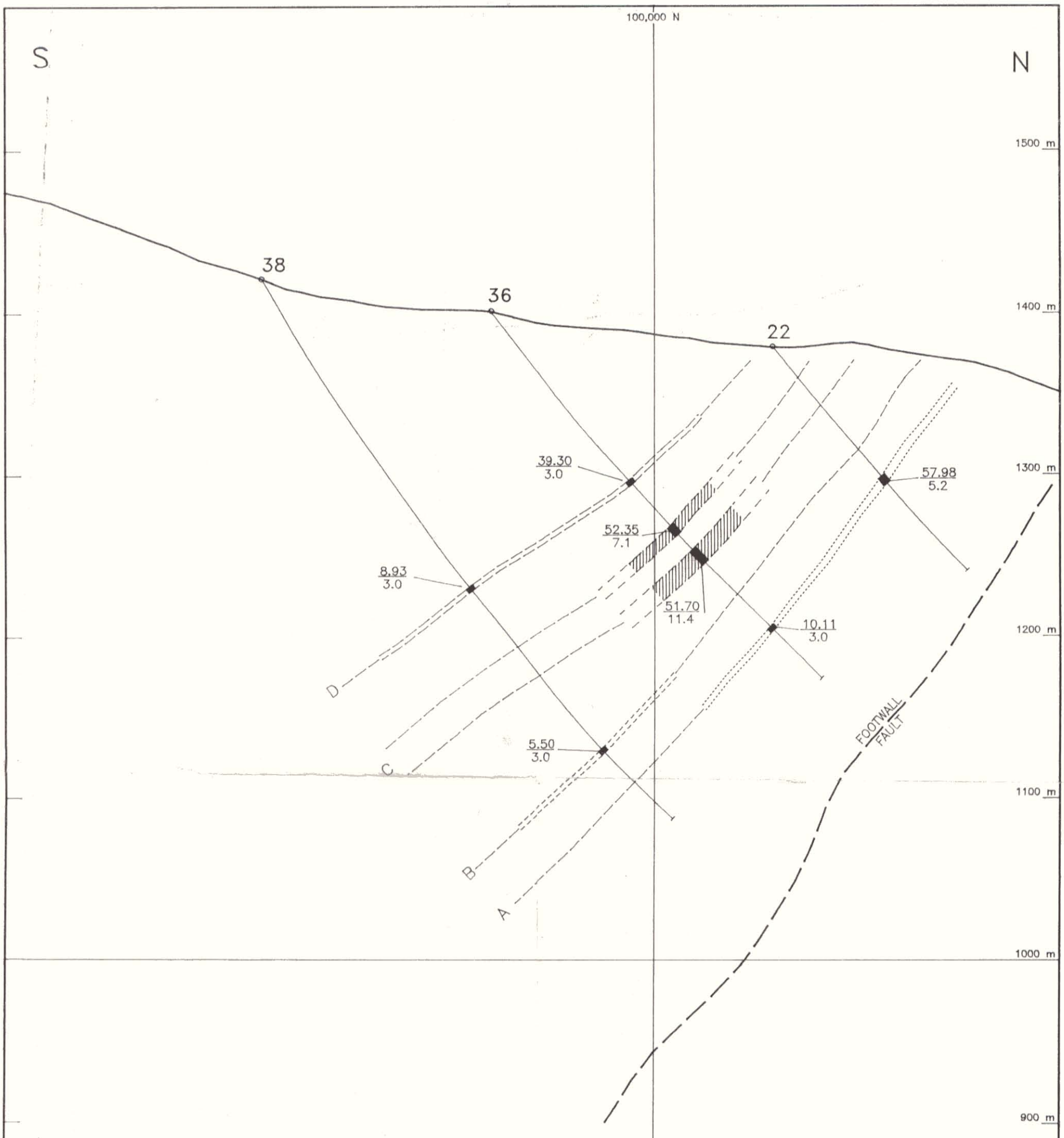
# DRILL SECTION 1725E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 9

092915
M/15,16;106 D/12
MAP #105
73D




LEGEND:

SULPHIDE HORIZON (projected) ———————

SULPHIDE HORIZON (defined)

- A ::::::::::::::::::::::::
- B ============
- C = = = = = = =
- D =======

ZONE OF DILUTED MINERAL RESERVE BLOCKS

51.70 / 11.4 — DILUTED (+3.0m) DRILLHOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

MARG PROPERTY REVENUE FACTORS
(US $/lb/oz)

| REVENUE | METALS | | | | | EXCHANGE |
|---|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION

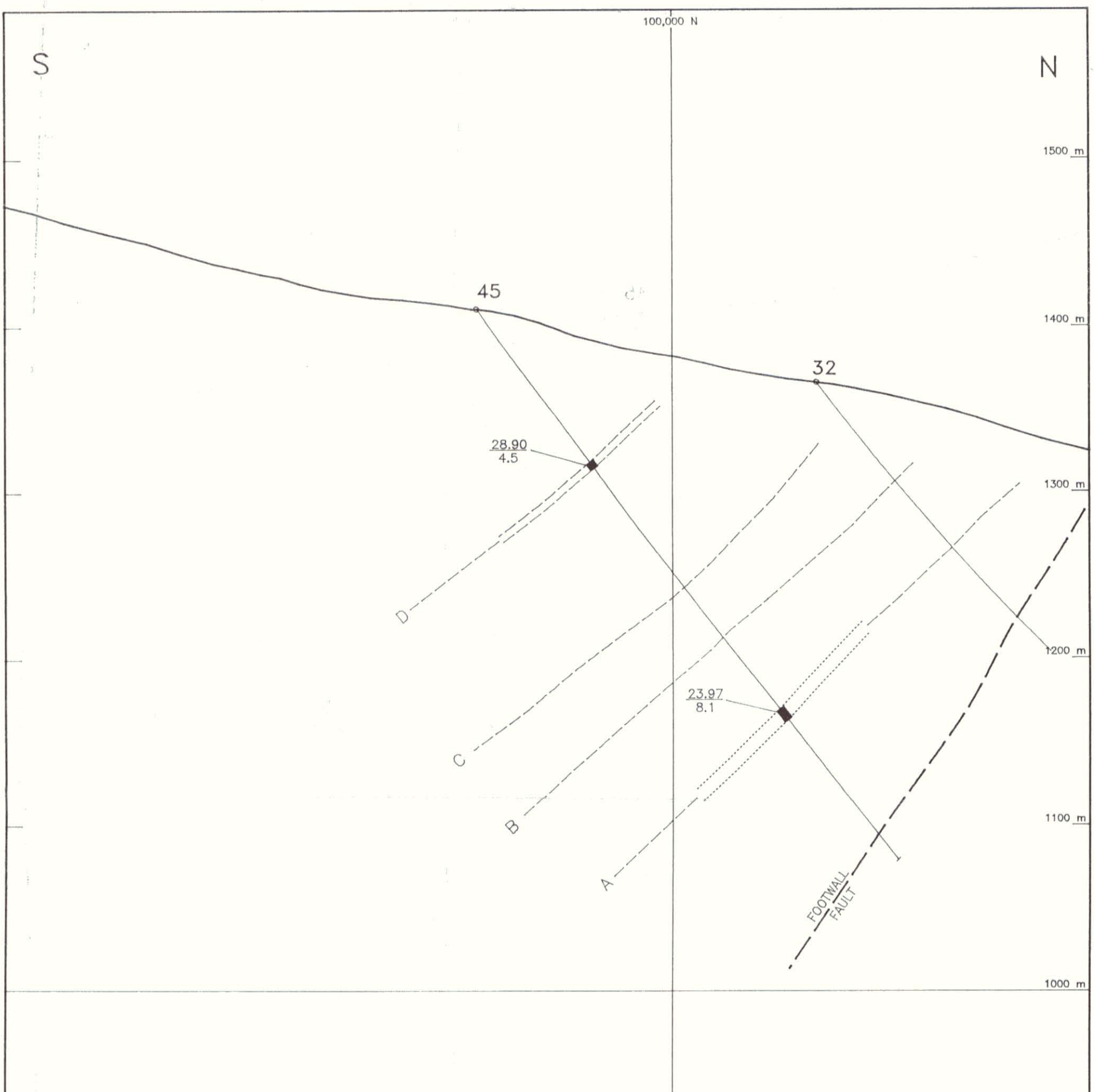
MARG PROPERTY
MAYO MINING DIVISION, YUKON TERRITORY

# DRILL SECTION 1620E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng. FIGURE: 10

092915
(72) MAP# 105M/15,16; 106D/1,2




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

23.97 / 8.1 DILUTED (+3.0m) DRILLHOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

MARG PROPERTY
MAYO MINING DIVISION, YUKON TERRITORY

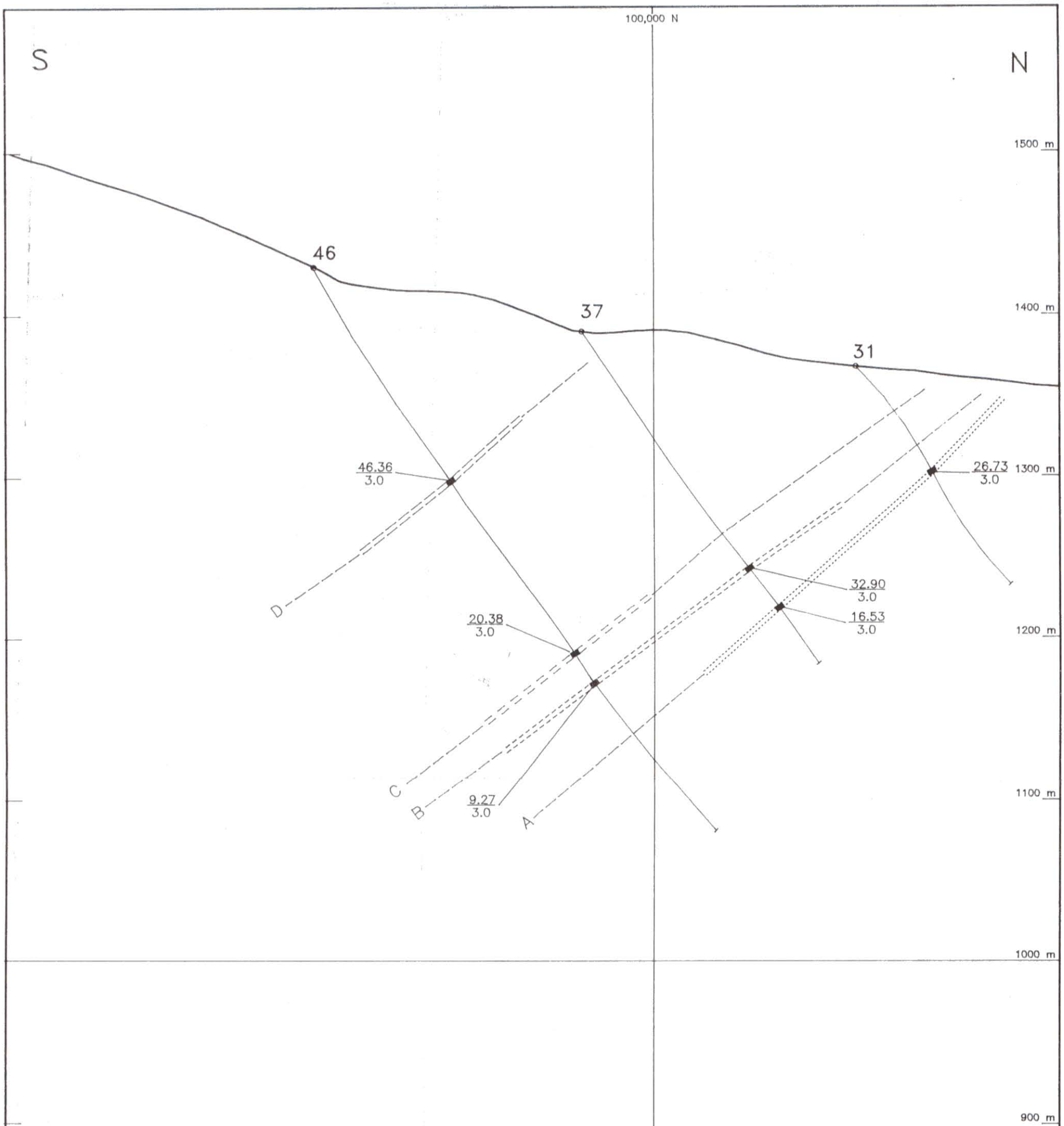
# DRILL SECTION 1485E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 11

MAP# 105 M/15,16; 106 D/1,2 092915
72A




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

46.36 / 3.0 DILUTED (+3.0m) DRILLHOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

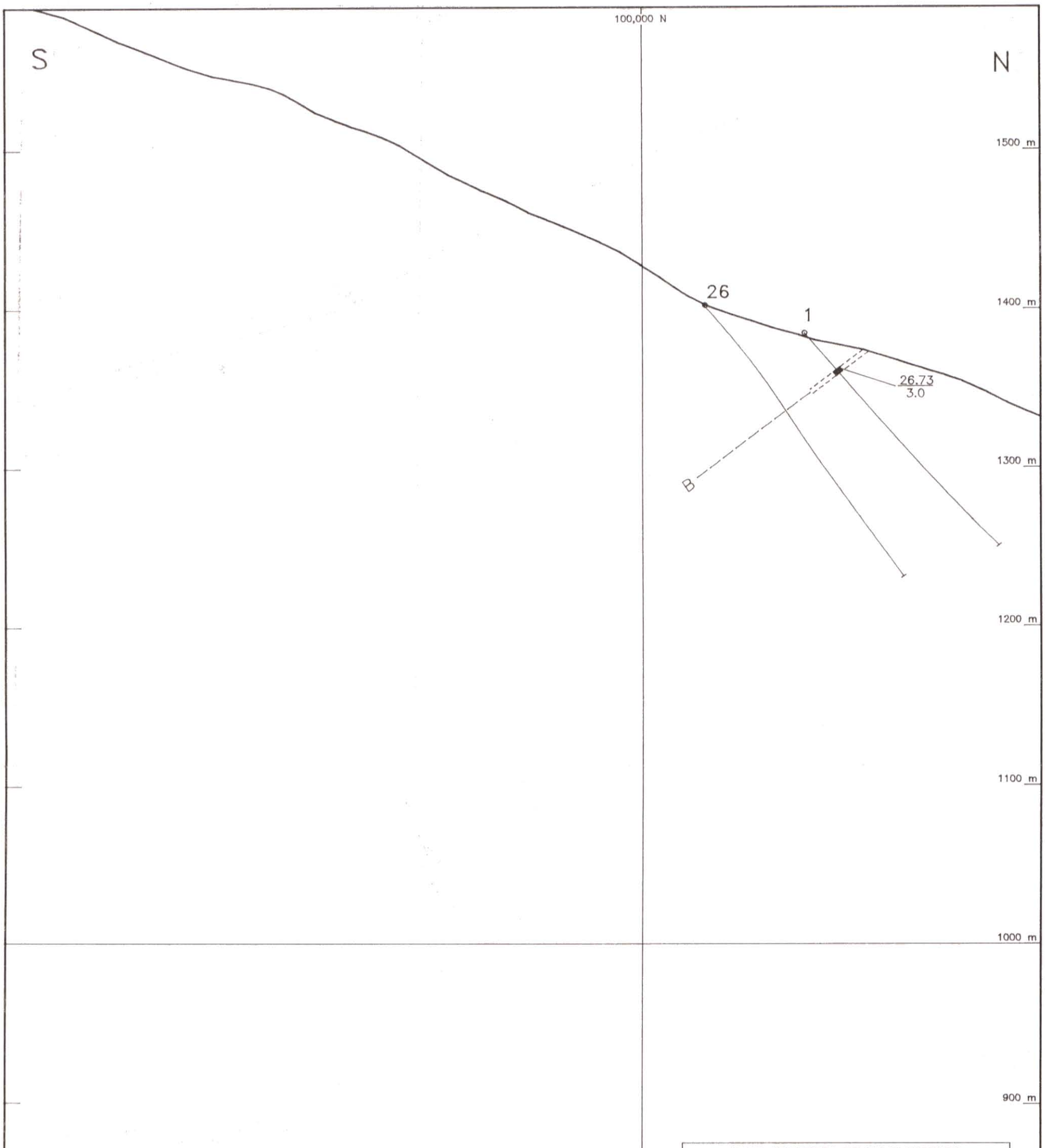
# DRILL SECTION 1290E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

FIGURE: 12

MAP #105 M 15, 16 W 106 D 4-2 092915
72 B




| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | |
|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

To accompany report by J.P.FRANZEN P.Eng.

LEGEND:

SULPHIDE HORIZON (projected)

SULPHIDE HORIZON (defined)

A

B

C

D

26.73 / 3.0 DILUTED (+3.0m) DRILLHOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

NDU RESOURCES LTD.
CAMECO CORPORATION

# MARG PROPERTY

MAYO MINING DIVISION, YUKON TERRITORY

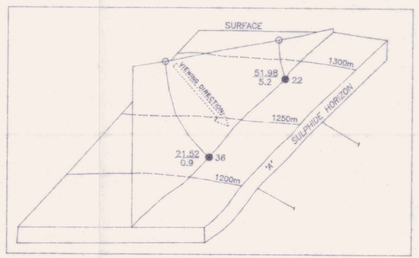
# DRILL SECTION 1075E

0 50 100 200
METRES

DATE: NOVEMBER, 1990
REVISED: J.P.FRANZEN, P.Eng.

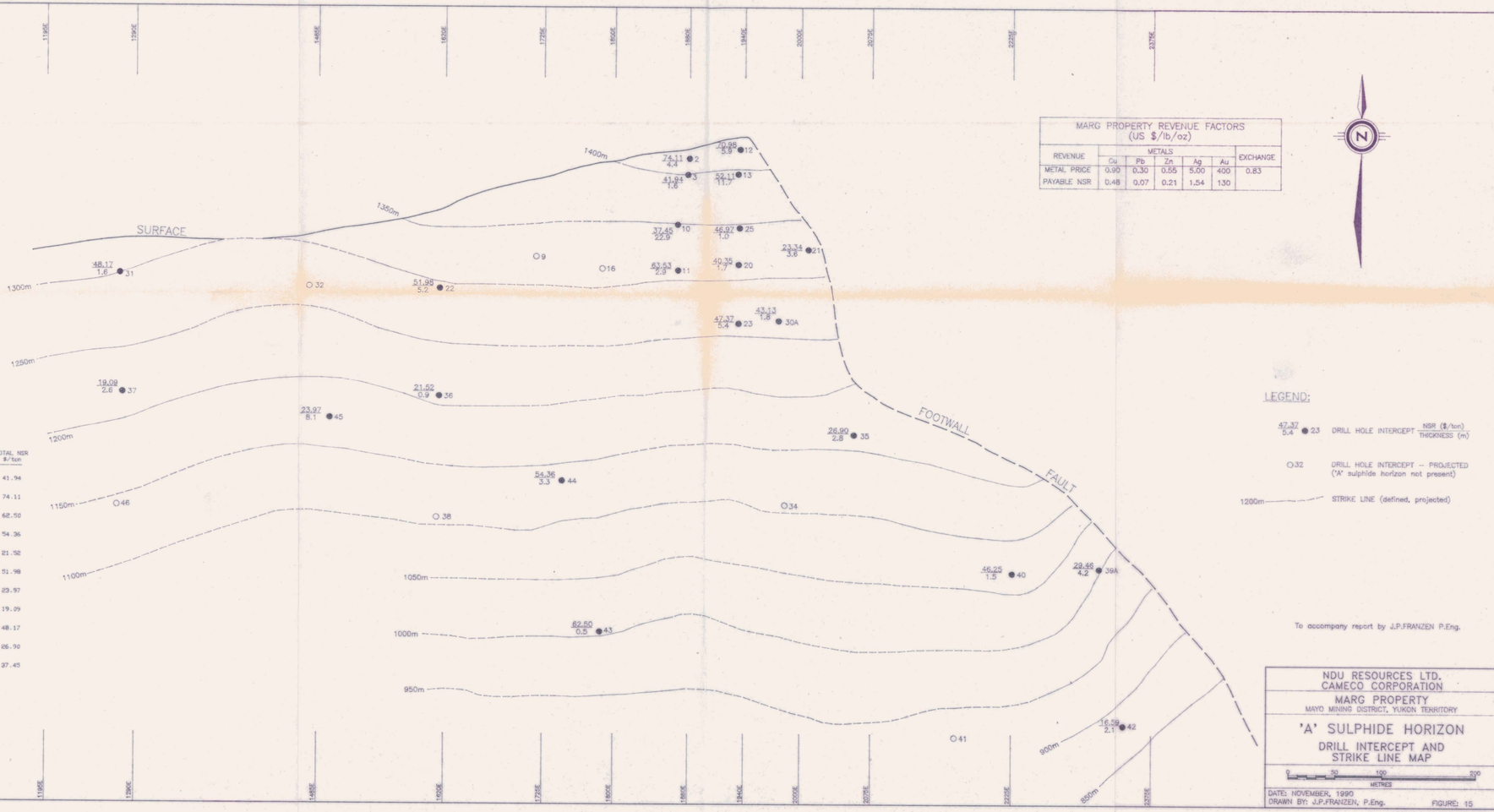
FIGURE: 13

MAP# 105 M/15,16; 106 D/1,2 092915
72 C




## MARG PROPERTY REVENUE FACTORS (US $/lb/oz)

| REVENUE | METALS | | | | | EXCHANGE |
|---|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |




## 'A' SULPHIDE HORIZON DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (M) | % x $/ton NSR Cu | Pb | Zn | OPT x $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 90-42 | 2.1 | 0.49<br>5.67 | 0.78<br>1.92 | 1.45<br>7.34 | 0.63<br>1.17 | 0.007<br>1.10 | 16.59 |
| 90-39 | 4.2 | 0.95<br>10.99 | 1.36<br>2.09 | 2.47<br>12.50 | 1.14<br>2.12 | 0.010<br>1.57 | 29.46 |
| 90-40 | 1.5 | 1.80<br>20.82 | 1.84<br>3.10 | 3.55<br>17.96 | 1.51<br>2.80 | 0.010<br>1.57 | 46.25 |
| 88-30 | 1.8 | 1.24<br>14.34 | 2.02<br>3.41 | 3.87<br>19.58 | 1.95<br>2.50 | 0.021<br>3.29 | 43.13 |
| 88-21 | 3.6 | 0.75<br>8.67 | 1.02<br>1.72 | 2.02<br>10.22 | 0.96<br>1.78 | 0.006<br>0.94 | 25.34 |
| 88-25 | 1.0 | 1.45<br>16.77 | 1.99<br>3.20 | 4.11<br>20.80 | 1.65<br>3.06 | 0.020<br>3.13 | 46.97 |
| 88-12 | 5.9 | 2.03<br>23.48 | 3.31<br>5.38 | 5.95<br>29.60 | 3.09<br>5.73 | 0.042<br>6.58 | 70.98 |
| 88-13 | 11.7 | 1.41<br>16.31 | 2.52<br>4.25 | 4.45<br>22.52 | 2.25<br>4.17 | 0.031<br>4.86 | 52.11 |
| 88-20 | 1.7 | 1.12<br>12.95 | 1.75<br>2.95 | 3.36<br>17.03 | 1.90<br>3.53 | 0.025<br>3.90 | 40.35 |
| 88-23 | 5.4 | 1.24<br>14.34 | 2.07<br>3.49 | 3.95<br>19.99 | 1.94<br>3.62 | 0.028<br>5.95 | 47.37 |
| 88-11 | 2.9 | 1.52<br>17.58 | 3.17<br>5.35 | 5.57<br>28.19 | 2.47<br>4.58 | 0.050<br>7.83 | 63.53 |

| DRILL HOLE | THICKNESS (M) | % x $/ton NSR Cu | Pb | Zn | OPT x $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 88- 3 | 1.6 | 1.33<br>15.38 | 1.84<br>3.10 | 3.84<br>19.43 | 1.49<br>2.76 | 0.008<br>1.25 | 41.94 |
| 88- 2 | 4.4 | 3.99<br>46.15 | 1.74<br>2.93 | 3.44<br>17.41 | 1.66<br>3.08 | 0.029<br>4.54 | 74.11 |
| 90-43 | 0.5 | 2.19<br>25.23 | 2.62<br>4.42 | 5.30<br>26.90 | 1.79<br>3.32 | 0.016<br>2.51 | 62.50 |
| 90-44 | 3.3 | 1.61<br>18.62 | 2.50<br>4.25 | 4.85<br>24.54 | 1.53<br>2.88 | 0.026<br>4.07 | 54.36 |
| 89-36 | 0.9 | 0.87<br>10.06 | 0.72<br>1.21 | 1.63<br>8.25 | 0.74<br>1.37 | 0.004<br>0.63 | 21.52 |
| 88-22 | 5.2 | 1.62<br>18.74 | 2.25<br>3.80 | 4.59<br>23.23 | 1.58<br>2.93 | 0.021<br>3.29 | 51.98 |
| 90-45 | 8.1 | 0.34<br>3.93 | 1.48<br>2.50 | 2.95<br>14.92 | 0.82<br>1.52 | 0.007<br>1.10 | 23.97 |
| 89-37 | 2.6 | 0.27<br>3.12 | 0.82<br>1.38 | 2.37<br>11.99 | 0.55<br>1.02 | 0.010<br>1.57 | 19.09 |
| 88-31 | 1.6 | 0.58<br>6.71 | 2.77<br>4.67 | 5.30<br>26.82 | 1.49<br>2.76 | 0.046<br>7.20 | 48.17 |
| 89-35 | 2.8 | 0.73<br>8.44 | 1.86<br>3.13 | 3.45<br>17.45 | 0.94<br>1.74 | 0.014<br>2.19 | 26.90 |
| 88-10 | 22.9 | 0.94<br>10.87 | 1.79<br>3.02 | 3.19<br>16.14 | 1.38<br>2.56 | 0.031<br>4.86 | 37.45 |

LEGEND:

47.37 / 5.4 ● 23 — DRILL HOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

○32 — DRILL HOLE INTERCEPT -- PROJECTED ('A' sulphide horizon not present)

1200m ——— STRIKE LINE (defined, projected)

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION

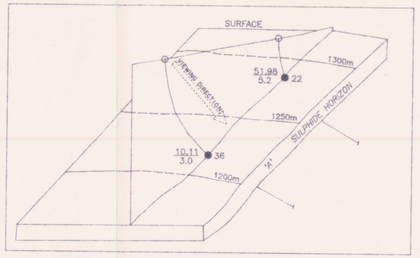
MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY

# 'A' SULPHIDE HORIZON
## DRILL INTERCEPT AND STRIKE LINE MAP

0 50 100 200
METRES

DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng.
FIGURE: 15

MAP# 105 41 15 16; 106 61 1,2 092915




'A' SULPHIDE HORIZON
MINERAL RESERVE BLOCKS
DRILL INDICATED - DILUTED (+3.0m)

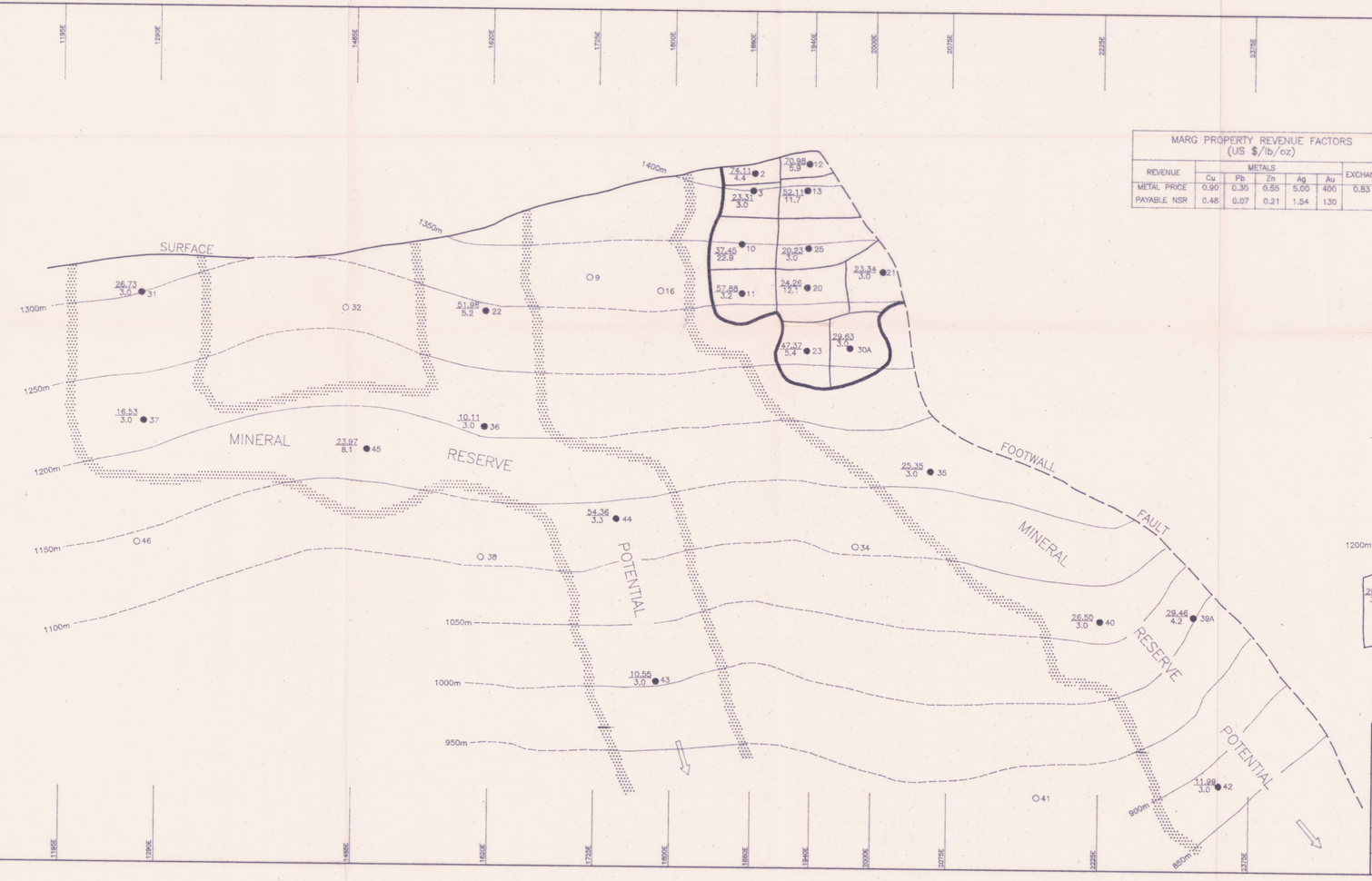
| BLOCK | TONS | % / $/ton NSR Cu | Pb | Zn | OPT / $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| A30A | 40511 | 0.86 | 1.37 | 2.68 | 0.93 | 0.015 | |
| | | 9.95 | 2.31 | 13.26 | 1.76 | 8.35 | 29.63 |
| A21 | 36775 | 0.75 | 1.02 | 2.02 | 0.96 | 0.006 | |
| | | 8.67 | 1.72 | 10.02 | 1.78 | 0.94 | 23.34 |
| A25 | 49716 | 0.62 | 0.84 | 1.77 | 0.69 | 0.009 | |
| | | 7.17 | 1.42 | 8.96 | 1.08 | 1.41 | 20.23 |
| A12 | 31425 | 2.03 | 3.31 | 5.85 | 3.09 | 0.042 | |
| | | 23.48 | 5.58 | 29.60 | 5.73 | 6.58 | 70.98 |
| A13 | 132698 | 1.41 | 2.52 | 4.45 | 2.25 | 0.031 | |
| | | 16.31 | 4.25 | 22.52 | 4.17 | 4.86 | 52.11 |
| A20 | 172109 | 0.68 | 1.13 | 2.15 | 0.93 | 0.012 | |
| | | 7.87 | 1.91 | 10.88 | 1.73 | 1.88 | 24.26 |
| A23 | 79402 | 1.24 | 2.07 | 3.95 | 1.94 | 0.038 | |
| | | 14.34 | 3.49 | 19.99 | 3.60 | 5.95 | 47.37 |
| A11 | 45292 | 1.29 | 2.92 | 5.05 | 2.24 | 0.046 | |
| | | 16.28 | 4.89 | 25.55 | 4.16 | 7.20 | 57.88 |
| A 3 | 23245 | 0.75 | 1.03 | 2.09 | 0.83 | 0.025 | |
| | | 8.67 | 1.74 | 10.58 | 1.54 | 0.78 | 23.31 |
| A 2 | 21089 | 3.99 | 1.74 | 3.44 | 1.66 | 0.029 | |
| | | 46.15 | 2.93 | 17.41 | 3.08 | 4.54 | 74.11 |
| A10 | 309464 | 0.94 | 1.79 | 3.19 | 1.38 | 0.031 | |
| | | 10.87 | 3.02 | 16.14 | 2.56 | 4.86 | 37.45 |
| TOTAL | 941716 | 1.08 | 1.78 | 3.25 | 1.49 | 0.03 | |
| | | 12.47 | 3.01 | 16.46 | 2.76 | 4.02 | 38.72 |

'A' SULPHIDE HORIZON
DILUTED (+3.0m) DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (m) | % / $/ton NSR Cu | Pb | Zn | OPT / $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 90-42 | 3.0 | 0.35 | 0.55 | 1.04 | 0.44 | 0.006 | |
| | | 4.05 | 0.93 | 5.26 | 0.82 | 0.94 | 11.99 |
| 90-39 | 4.2 | 0.95 | 1.36 | 2.47 | 1.14 | 0.010 | |
| | | 10.99 | 2.29 | 12.50 | 2.12 | 1.57 | 29.46 |
| 90-40 | 3.0 | 1.04 | 1.03 | 1.97 | 0.90 | 0.007 | |
| | | 12.03 | 1.74 | 9.97 | 1.67 | 1.10 | 26.50 |
| 90-43 | 3.0 | 0.37 | 0.44 | 0.89 | 0.36 | 0.003 | |
| | | 4.28 | 0.74 | 4.50 | 0.66 | 0.47 | 10.55 |
| 90-44 | 3.3 | 1.61 | 2.52 | 4.85 | 1.55 | 0.026 | |
| | | 18.62 | 4.25 | 24.54 | 2.88 | 4.07 | 54.36 |
| 89-36 | 3.0 | 0.39 | 0.36 | 0.75 | 0.39 | 0.003 | |
| | | 4.51 | 0.61 | 3.80 | 0.72 | 0.47 | 10.11 |
| 88-22 | 5.2 | 1.62 | 2.25 | 4.59 | 1.58 | 0.021 | |
| | | 18.74 | 3.80 | 23.23 | 2.93 | 3.29 | 51.98 |
| 90-45 | 8.1 | 0.34 | 1.48 | 2.95 | 0.82 | 0.007 | |
| | | 3.93 | 2.50 | 14.93 | 1.52 | 1.10 | 23.97 |
| 89-37 | 3.0 | 0.23 | 0.71 | 2.05 | 0.48 | 0.009 | |
| | | 2.66 | 1.20 | 10.37 | 0.89 | 1.41 | 16.53 |
| 88-31 | 3.0 | 0.32 | 1.54 | 2.96 | 0.83 | 0.025 | |
| | | 3.70 | 2.60 | 14.98 | 1.54 | 3.92 | 26.73 |
| 89-35 | 3.0 | 0.69 | 1.19 | 2.31 | 0.88 | 0.013 | |
| | | 7.98 | 2.01 | 11.69 | 1.63 | 2.04 | 25.35 |

MARG PROPERTY REVENUE FACTORS
(US $/lb/oz)

| REVENUE | METALS Cu | Pb | Zn | Ag | Au | EXCHANGE |
|---|---|---|---|---|---|---|
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |




LEGEND:

29.63 / 3.0 ● 30A — DILUTED (+3.0m) NSR ($/ton) / DRILL HOLE INTERCEPT THICKNESS (m)

O34 — DRILL HOLE INTERCEPT – PROJECTED ('A' sulphide horizon not present)

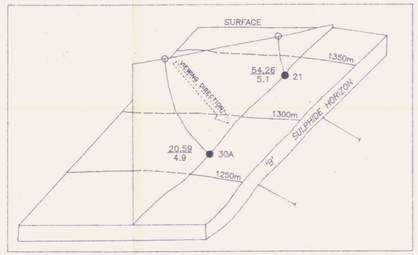
1200m —— STRIKE LINE (defined, projected)

29.63 / 3.0 ● 30A — DILUTED (+3.0m) MINERAL RESERVE BLOCK

To accompany report by J.P.FRANZEN P.Eng.

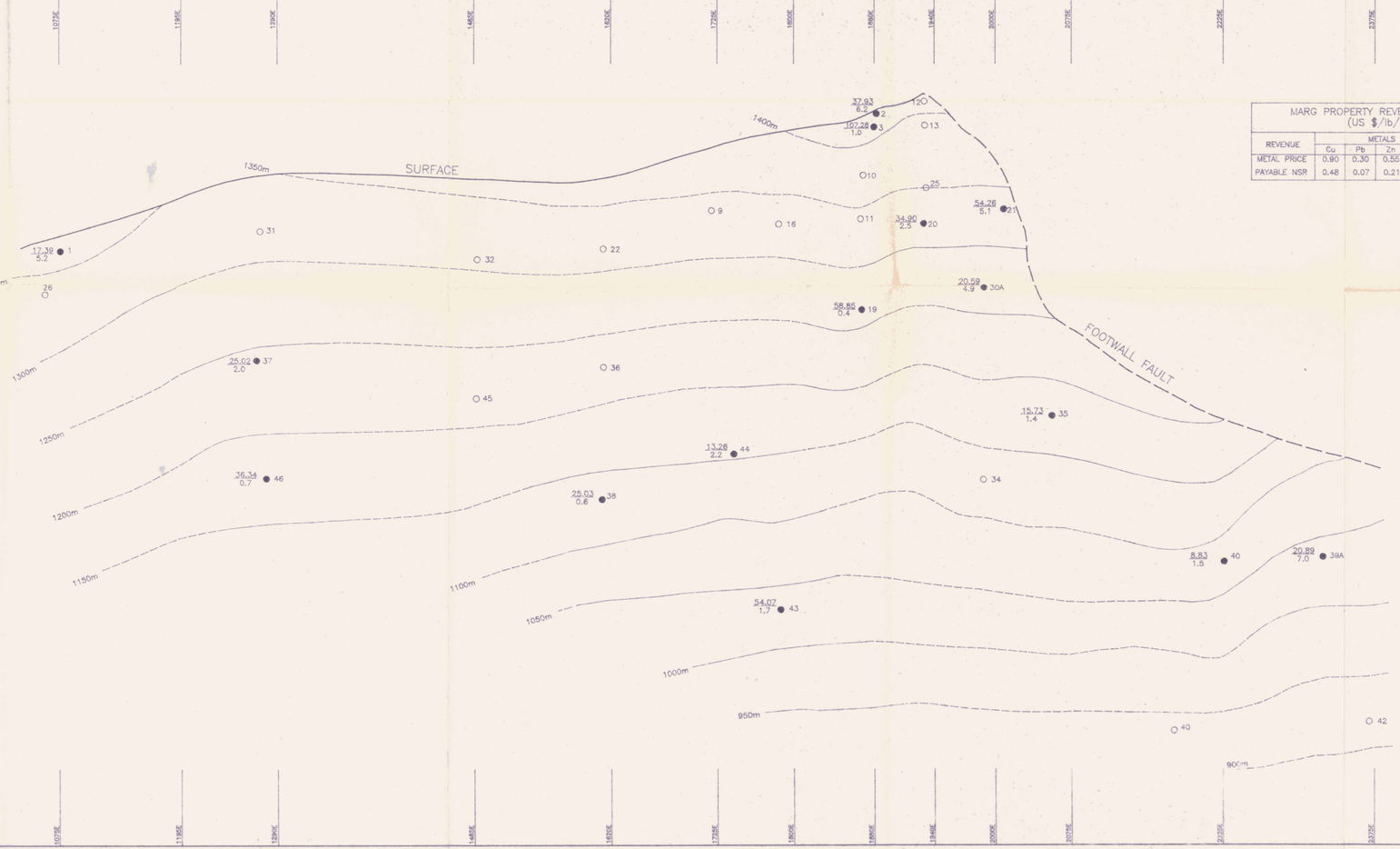
NDU RESOURCES LTD.
CAMECO CORPORATION
MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY
'A' SULPHIDE HORIZON
DILUTED MINERAL RESERVE BLOCKS
and
STRIKE LINE MAP
0 50 100 200
METRES
DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng.
FIGURE: 16

MAPS 105M/15/16; 106D/1,2 092P/15




'B' SULPHIDE HORIZON
DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (M) | % Cu | $/ton NSR Pb | $/ton NSR Zn | OPT Ag | $/ton NSR Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 90-39A | 7.0 | 0.61 | 0.94 | 1.74 | 0.76 | 0.013 | |
| | | 7.86 | 1.59 | 8.80 | 1.41 | 0.04 | 20.89 |
| 90-40 | 1.5 | 0.22 | 0.44 | 0.84 | 0.36 | 0.004 | |
| | | 2.54 | 0.74 | 4.25 | 0.67 | 0.63 | 8.83 |
| 89-35 | 1.4 | 0.58 | 0.65 | 1.27 | 0.47 | 0.004 | |
| | | 6.71 | 1.10 | 6.43 | 0.87 | 0.63 | 15.73 |
| 88-30A | 4.9 | 0.57 | 0.96 | 1.84 | 0.81 | 0.010 | |
| | | 6.59 | 1.68 | 9.31 | 1.50 | 1.57 | 20.59 |
| 88-21 | 5.1 | 1.50 | 2.32 | 4.84 | 1.97 | 0.031 | |
| | | 17.35 | 3.91 | 24.49 | 3.66 | 4.86 | 54.26 |
| 88-20 | 2.5 | 0.93 | 1.77 | 3.23 | 1.41 | 0.014 | |
| | | 10.76 | 2.99 | 16.34 | 2.62 | 2.19 | 34.90 |
| 88- 2 | 6.2 | 0.26 | 5.77 | 0.02 | 9.30 | 0.050 | |
| | | 3.01 | 9.73 | 0.10 | 17.26 | 7.83 | 37.93 |
| 88- 3 | 1.0 | 5.41 | 3.05 | 6.42 | 2.97 | 0.010 | |
| | | 62.57 | 5.14 | 32.49 | 5.51 | 1.57 | 107.28 |
| 90-44 | 2.2 | 0.22 | 0.81 | 1.23 | 0.50 | 0.014 | |
| | | 2.54 | 1.37 | 6.22 | 0.93 | 0.19 | 13.26 |
| 90-46 | 0.7 | 0.79 | 1.84 | 3.86 | 1.11 | 0.016 | |
| | | 9.14 | 3.10 | 19.53 | 2.06 | 2.51 | 36.34 |
| 88- 1 | 5.2 | 0.71 | 0.47 | 1.47 | 0.34 | 0.002 | |
| | | 8.21 | 0.79 | 7.44 | 0.63 | 0.31 | 17.39 |
| 89-37 | 2.0 | 0.73 | 1.06 | 2.47 | 0.73 | 0.006 | |
| | | 8.44 | 1.79 | 12.50 | 1.35 | 0.94 | 25.02 |
| 90-43 | 1.7 | 1.42 | 0.86 | 4.71 | 0.66 | 0.033 | |
| | | 16.42 | 4.82 | 23.83 | 3.82 | 5.17 | 54.07 |
| 88-19 | 0.4 | 1.26 | 2.00 | 4.26 | 2.09 | 0.012 | |
| | | 18.04 | 3.37 | 31.68 | 3.88 | 1.88 | 58.85 |
| 89-38 | 0.6 | 0.41 | 1.57 | 3.15 | 0.75 | 0.302 | |
| | | 4.74 | 2.65 | 15.94 | 1.39 | 0.31 | 25.03 |




MARG PROPERTY REVENUE FACTORS
(US $/lb/oz)

| REVENUE | METALS | | | | | EXCHANGE |
|---|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

LEGEND:

52.26 / 5.1 ● 21 — DRILL HOLE INTERCEPT NSR ($/ton) / THICKNESS (m)

○36 — DRILL HOLE INTERCEPT – PROJECTED ('B' sulphide horizon not present)

1200m —— STRIKE LINE (defined, projected)

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION

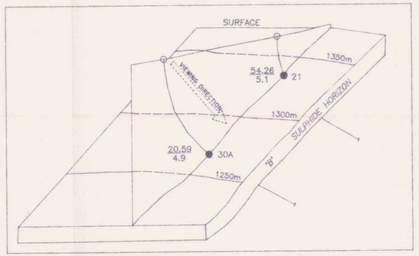
MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY

'B' SULPHIDE HORIZON
DRILL INTERCEPT AND
STRIKE LINE MAP

0 50 100 200
METRES

DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng.
FIGURE: 17

(69) MAPS\105\16\106 01\2 092915

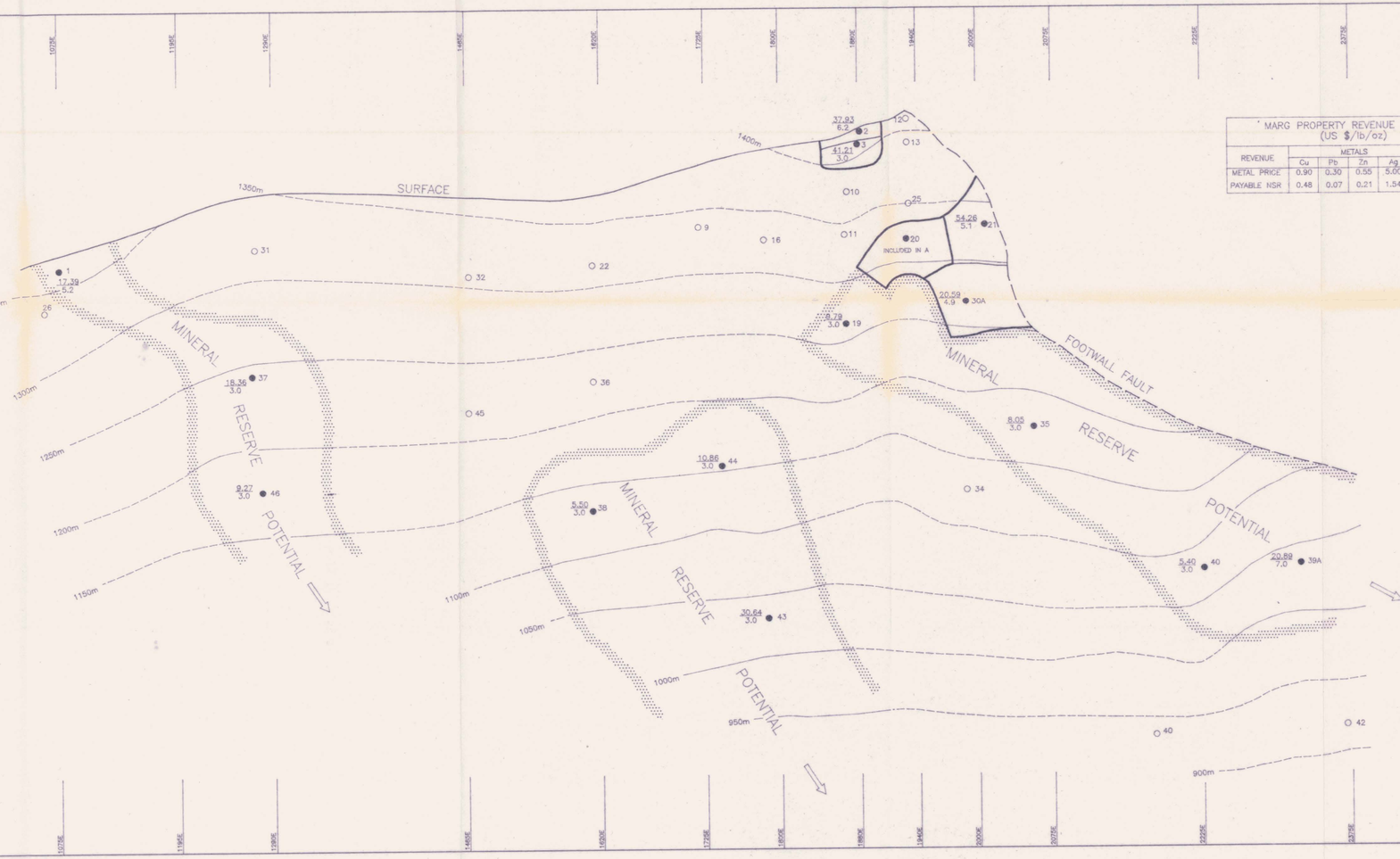



'B' SULPHIDE HORIZON
MINERAL RESERVE BLOCKS
DRILL INDICATED + DILUTED (+3.0m)

| RESERVE BLOCK | TONS | % , $/ton NSR Cu | Pb | Zn | OPT , $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| B30A | 101301 | 0.57<br>6.59 | 0.96<br>1.62 | 1.84<br>9.31 | 0.81<br>1.50 | 0.019<br>1.57 | 20.59 |
| B21 | 87078 | 1.58<br>17.25 | 2.32<br>3.91 | 4.84<br>24.49 | 1.97<br>3.66 | 0.031<br>4.86 | 54.26 |
| B 2 | 12772 | 0.26<br>3.01 | 5.77<br>9.73 | 0.02<br>0.10 | 9.30<br>17.26 | 0.050<br>7.83 | 37.93 |
| B 3 | 16726 | 2.08<br>24.06 | 1.15<br>1.94 | 2.38<br>12.04 | 1.20<br>2.23 | 0.026<br>0.94 | 41.21 |
| TOTAL | 217876 | 1.04<br>12.02 | 1.80<br>3.04 | 2.97<br>15.05 | 1.80<br>3.34 | 0.020<br>3.20 | 36.65 |

'B' SULPHIDE HORIZON
DILUTED (+3.0m) DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (M) | % , $/ton NSR Cu | Pb | Zn | OPT , $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 90-39 | 7.0 | 0.61<br>7.06 | 0.94<br>1.59 | 1.74<br>8.80 | 0.76<br>1.41 | 0.013<br>2.04 | 20.89 |
| 90-40 | 3.0 | 0.13<br>1.50 | 0.25<br>0.42 | 0.52<br>2.63 | 0.20<br>0.37 | 0.003<br>0.47 | 5.40 |
| 89-35 | 3.0 | 0.29<br>3.35 | 0.32<br>0.54 | 0.64<br>3.24 | 0.24<br>0.45 | 0.007<br>0.47 | 8.05 |
| 90-44 | 3.0 | 0.19<br>2.20 | 0.65<br>1.10 | 1.00<br>5.06 | 0.42<br>0.78 | 0.011<br>1.72 | 10.86 |
| 90-46 | 3.0 | 0.20<br>2.31 | 0.47<br>0.79 | 0.96<br>4.86 | 0.28<br>0.52 | 0.005<br>0.78 | 9.27 |
| 88- 1 | 5.2 | 0.71<br>8.21 | 0.47<br>0.79 | 1.47<br>7.44 | 0.34<br>0.63 | 0.002<br>0.31 | 17.39 |
| 89-37 | 3.0 | 0.52<br>6.01 | 0.80<br>1.35 | 1.82<br>9.21 | 0.54<br>1.00 | 0.005<br>0.78 | 18.36 |
| 90-43 | 3.0 | 0.80<br>9.25 | 1.62<br>2.73 | 2.67<br>13.51 | 1.17<br>2.17 | 0.019<br>2.98 | 30.64 |
| 88-19 | 3.0 | 0.26<br>3.01 | 0.33<br>0.56 | 1.04<br>5.26 | 0.35<br>0.65 | 0.002<br>0.31 | 9.79 |
| 89-38 | 3.0 | 0.09<br>1.04 | 0.32<br>0.54 | 0.65<br>3.29 | 0.17<br>0.32 | 0.002<br>0.31 | 5.50 |




'MARG PROPERTY REVENUE FACTORS
(US $/lb/oz)

| REVENUE | METALS Cu | Pb | Zn | Ag | Au | EXCHANGE |
|---|---|---|---|---|---|---|
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

LEGEND:

- 54.26 / 5.1 ● 21 — DILUTED (+3.0m) NSR ($/ton) / DRILL HOLE INTERCEPT THICKNESS (m)
- ○36 — DRILL HOLE INTERCEPT – PROJECTED ('B' sulphide horizon not present)
- 1200m — STRIKE LINE (defined, projected)
- 20.59 / 4.9 ● 30A — DILUTED (+3.0m) MINERAL RESERVE BLOCK

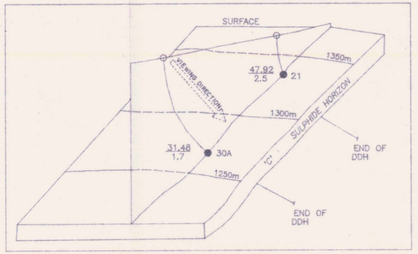
To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION
MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY
'B' SULPHIDE HORIZON
DILUTED MINERAL RESERVE BLOCKS
and
STRIKE LINE MAP

0 50 100 200
METRES

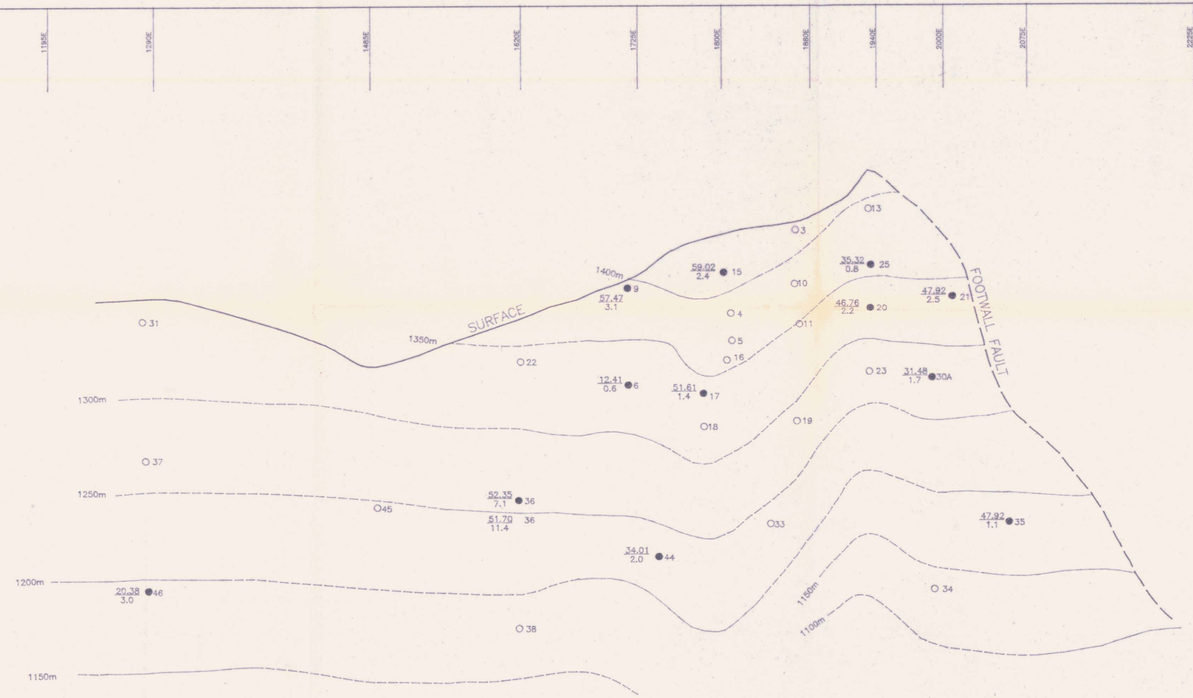
DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng. FIGURE: 18

092915 MAP#105-41-15-16; 106-D-1,2




'C' SULPHIDE HORIZON
DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (M) | % , $/ton NSR Cu | Pb | Zn | OPT , $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 89-35 | 1.1 | 2.15<br>24.87 | 1.51<br>2.55 | 3.15<br>15.94 | 1.28<br>2.37 | 0.014<br>2.19 | 47.92 |
| 88-30 | 1.7 | 0.89<br>10.29 | 1.45<br>2.45 | 2.74<br>13.87 | 1.19<br>2.21 | 0.017<br>2.66 | 31.48 |
| 88-21 | 2.5 | 1.46<br>16.89 | 2.10<br>3.54 | 4.10<br>20.75 | 1.78<br>3.30 | 0.022<br>3.43 | 47.92 |
| 88-20 | 2.2 | 1.26<br>14.57 | 2.10<br>3.54 | 4.04<br>20.44 | 1.55<br>2.88 | 0.034<br>5.33 | 46.76 |
| 88-25 | 0.8 | 0.34<br>10.87 | 1.75<br>2.95 | 3.36<br>17.00 | 1.24<br>2.30 | 0.014<br>2.19 | 35.32 |
| 88-17 | 1.4 | 2.28<br>26.37 | 1.35<br>2.28 | 3.72<br>18.82 | 0.88<br>1.63 | 0.016<br>2.51 | 51.61 |
| 88-15 | 2.4 | 1.65<br>19.08 | 2.66<br>4.49 | 5.20<br>26.31 | 2.22<br>4.12 | 0.032<br>5.01 | 59.02 |
| 89-44 | 2.0 | 0.29<br>3.35 | 1.79<br>3.02 | 2.57<br>13.00 | 2.23<br>4.14 | 0.067<br>10.49 | 34.01 |
| 88- 6 | 0.6 | 0.16<br>1.85 | 0.92<br>1.55 | 1.08<br>5.48 | 0.69<br>1.28 | 0.008<br>1.25 | 12.41 |
| 88- 9 | 3.1 | 2.28<br>26.37 | 4.56<br>7.69 | 2.88<br>14.57 | 2.40<br>4.45 | 0.028<br>4.39 | 57.47 |
| 89-36 | 7.1 | 1.15<br>13.30 | 2.43<br>4.10 | 4.36<br>22.06 | 1.88<br>3.49 | 0.060<br>9.40 | 52.35 |
| 89-36 | 11.4 | 1.47<br>17.00 | 2.27<br>3.83 | 4.15<br>21.00 | 1.94<br>3.60 | 0.040<br>6.27 | 51.70 |
| 90-46 | 3.0 | 0.67<br>7.75 | 0.82<br>1.38 | 1.89<br>9.56 | 0.57<br>1.06 | 0.004<br>0.63 | 20.38 |




MARG PROPERTY REVENUE FACTORS
(US $/lb/oz)

| REVENUE | METALS | | | | | EXCHANGE |
|---|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

LEGEND:

31.48 / 1.7 ● 30A DRILL HOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

○37 DRILL HOLE INTERCEPT — PROJECTED ('C' sulphide horizon not present)

1200m STRIKE LINE (defined, projected)

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION

MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY

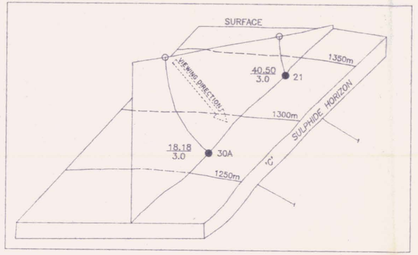
'C' SULPHIDE HORIZON

DRILL INTERCEPT AND
STRIKE LINE MAP

0 50 100 200
METRES

DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng. FIGURE: 19

(67) MAP #105M/5&6; 106P/1,2 09295




'C' SULPHIDE HORIZON
MINERAL RESERVE BLOCKS
DRILL INDICATED + DILUTED (+3.0m)

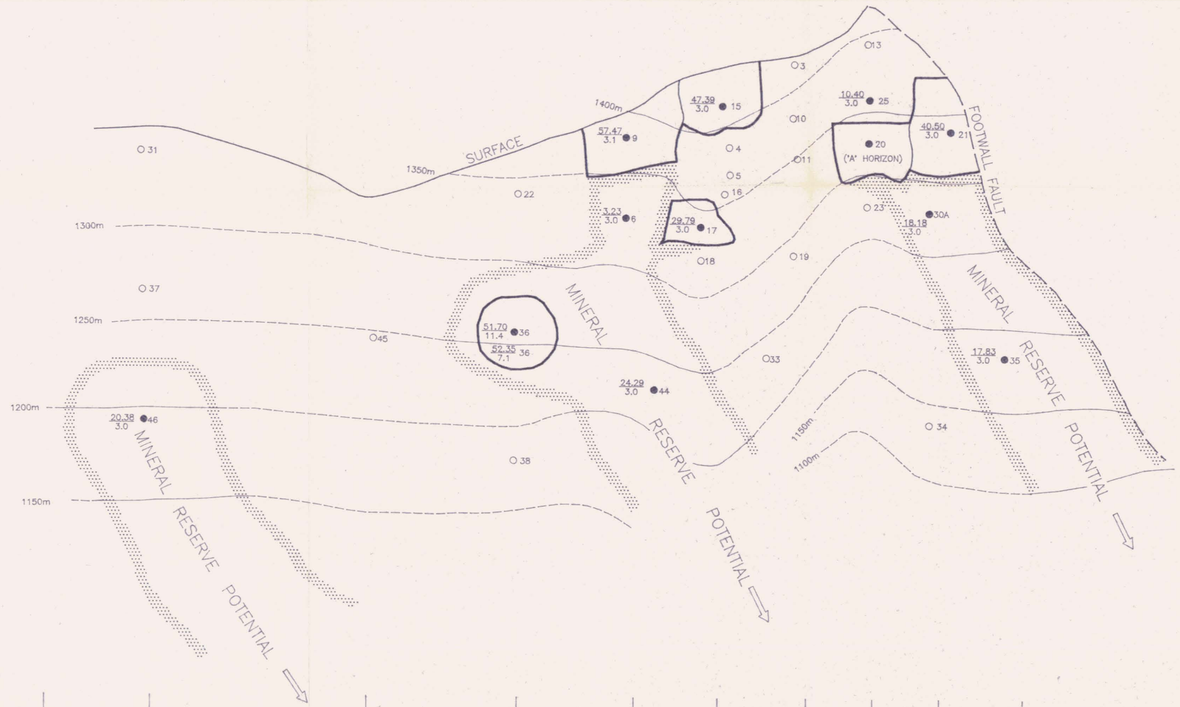
| RESERVE BLOCK | TONS | % , $/ton NSR Cu | Pb | Zn | OPT , $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| C21 | 59673 | 1.23<br>14.23 | 1.77<br>2.99 | 3.46<br>17.51 | 1.51<br>2.80 | 0.019<br>2.98 | 40.50 |
| C17 | 21693 | 1.23<br>14.23 | 0.85<br>1.43 | 2.16<br>10.93 | 0.54<br>1.02 | 0.014<br>2.19 | 29.79 |
| C15 | 47651 | 1.32<br>15.27 | 2.13<br>3.59 | 4.18<br>21.15 | 1.78<br>3.30 | 0.026<br>4.07 | 47.39 |
| C 9 | 68497 | 2.28<br>26.27 | 4.56<br>7.69 | 2.88<br>14.57 | 2.40<br>4.45 | 0.028<br>4.29 | 57.47 |
| C36 | 97217 | 1.15<br>13.30 | 2.43<br>4.10 | 4.36<br>22.06 | 1.88<br>3.49 | 0.060<br>9.40 | 52.35 |
| C36A | 183120 | 1.47<br>17.00 | 2.27<br>3.83 | 4.15<br>21.00 | 1.94<br>3.60 | 0.040<br>6.27 | 51.70 |
| TOTAL | 471852 | 1.45<br>16.83 | 2.46<br>4.16 | 3.85<br>19.48 | 1.85<br>3.44 | 0.037<br>5.84 | 49.74 |

'C' SULPHIDE HORIZON
MINERAL RESERVE BLOCKS
DILUTED (+3.0m) DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (M) | % , $/ton NSR Cu | Pb | Zn | OPT , $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 89-35 | 3.0 | 0.79<br>9.14 | 0.96<br>0.94 | 1.17<br>5.92 | 0.48<br>0.89 | 0.006<br>0.94 | 17.83 |
| 88-30 | 3.0 | 0.51<br>5.90 | 0.83<br>1.40 | 1.56<br>7.89 | 0.68<br>1.26 | 0.011<br>1.78 | 18.18 |
| 88-25 | 3.0 | 0.29<br>3.35 | 0.48<br>0.81 | 0.93<br>4.71 | 0.42<br>0.74 | 0.005<br>0.78 | 10.40 |
| 89-44 | 3.0 | 0.82<br>2.54 | 1.27<br>2.14 | 1.82<br>9.21 | 1.55<br>2.88 | 0.048<br>7.52 | 24.29 |
| 88- 6 | 3.0 | 0.06<br>0.69 | 0.19<br>0.32 | 0.29<br>1.47 | 0.15<br>0.28 | 0.003<br>0.47 | 3.23 |
| 90-46 | 3.0 | 0.67<br>7.75 | 0.82<br>1.38 | 1.89<br>9.56 | 0.57<br>1.06 | 0.004<br>0.63 | 20.38 |

MARG PROPERTY REVENUE FACTORS
(US $/lb/oz)

| REVENUE | METALS Cu | Pb | Zn | Ag | Au | EXCHANGE |
|---|---|---|---|---|---|---|
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |




LEGEND:

57.47 / 3.1 ● 9 — DILUTED (+3.0m) NSR ($/ton) / DRILL HOLE INTERCEPT THICKNESS (m)

○34 — DRILL HOLE INTERCEPT – PROJECTED ('C' sulphide horizon not present)

1200m —— STRIKE LINE (defined, projected)

40.50 / 3.0 ● 21 — DILUTED (+3.0m) MINERAL RESERVE BLOCK

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
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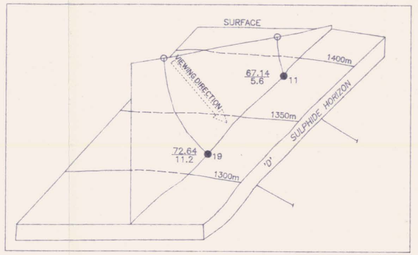
MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY

'C' SULPHIDE HORIZON
DILUTED MINERAL RESERVE BLOCKS
and
STRIKE LINE MAP

0 50 100 200
METRES

DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng.
FIGURE: 20

(66) 092P15 MAP # 105 11/15/16; 106 P1/2




'D' SULPHIDE HORIZON
DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (M) | % Cu | % Pb | % Zn | $/ton NSR | OPT Ag | OPT Au | $/ton NSR | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|
| 90-42 | 0.9 | 1.72 | 1.48 | 2.94 | 1.56 | 0.029 | 0.829 | 44.70 |
| | | 19.89 | 2.50 | 14.88 | 2.89 | 4.54 | | | |
| 90-39 | 4.2 | 0.99 | 1.49 | 2.64 | 1.38 | 0.013 | 0.264 | 31.36 |
| | | 11.45 | 2.51 | 13.36 | 2.00 | 2.04 | | | |
| 90-41 | 1.5 | 0.35 | 0.30 | 0.61 | 0.15 | 0.004 | 0.062 | 8.55 |
| | | 4.05 | 0.51 | 3.09 | 0.28 | 0.62 | | | |
| 90-40 | 2.5 | 2.13 | 2.27 | 3.61 | 1.57 | 0.041 | 0.648 | 56.07 |
| | | 24.64 | 3.83 | 18.27 | 2.91 | 6.42 | | | |
| 89-35 | 4.7 | 1.46 | 3.74 | 5.16 | 1.34 | 0.035 | 0.548 | 57.07 |
| | | 16.89 | 6.31 | 25.91 | 2.49 | 5.48 | | | |
| 89-34 | 2.3 | 1.77 | 3.02 | 5.50 | 1.86 | 0.018 | 0.282 | 59.63 |
| | | 20.47 | 5.06 | 27.83 | 3.45 | 2.82 | | | |
| 88-30 | 3.6 | 1.05 | 2.85 | 5.21 | 1.70 | 0.027 | 0.423 | 50.70 |
| | | 12.14 | 4.81 | 26.36 | 3.15 | 4.23 | | | |
| 88-21 | 8.2 | 1.31 | 1.31 | 8.70 | 1.14 | 0.016 | 0.251 | 35.65 |
| | | 15.15 | 2.21 | 13.66 | 2.12 | 2.51 | | | |
| 88-20 | 1.9 | 2.26 | 2.95 | 5.62 | 2.42 | 0.024 | 0.376 | 67.80 |
| | | 26.14 | 4.98 | 28.44 | 4.49 | 3.76 | | | |
| 88-23 | 5.9 | 1.91 | 3.27 | 6.49 | 2.20 | 0.028 | 0.439 | 68.58 |
| | | 22.09 | 5.18 | 32.84 | 4.08 | 4.39 | | | |
| 88-26 | 2.1 | 1.74 | 1.87 | 3.97 | 1.91 | 0.034 | 0.533 | 52.24 |
| | | 20.13 | 3.15 | 20.09 | 3.54 | 5.33 | | | |
| 88-25 | 6.0 | 1.98 | 1.82 | 3.46 | 1.47 | 0.023 | 0.360 | 48.49 |
| | | 22.90 | 2.86 | 17.20 | 2.73 | 3.60 | | | |
| 88-13 | 2.6 | 1.33 | 0.98 | 1.93 | 0.88 | 0.002 | 0.031 | 28.75 |
| | | 15.38 | 1.63 | 9.77 | 1.63 | 0.31 | | | |
| 88-12 | 3.7 | 3.14 | 4.84 | 9.81 | 3.18 | 0.053 | 0.830 | 105.29 |
| | | 36.32 | 8.16 | 46.60 | 5.90 | 8.30 | | | |

| DRILL HOLE | THICKNESS (M) | % Cu | % Pb | % Zn | $/ton NSR | OPT Ag | OPT Au | $/ton NSR | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|
| 88-39 | 4.7 | 1.57 | 2.19 | 4.29 | 1.96 | 0.016 | 0.251 | 48.59 |
| | | 18.16 | 3.69 | 21.71 | 2.52 | 2.51 | | | |
| 88-19 | 11.8 | 2.55 | 2.71 | 6.26 | 1.86 | 0.022 | 0.345 | 72.64 |
| | | 29.49 | 4.57 | 31.68 | 3.45 | 3.45 | | | |
| 88-11 | 5.6 | 2.04 | 3.05 | 5.87 | 1.16 | 0.027 | 0.423 | 67.14 |
| | | 25.91 | 5.14 | 29.76 | 2.15 | 4.23 | | | |
| 88-10 | 5.9 | 2.92 | 3.33 | 5.92 | 1.81 | 0.048 | 0.752 | 80.27 |
| | | 33.77 | 5.62 | 30.01 | 3.36 | 7.52 | | | |
| 90-43 | 1.9 | 0.85 | 0.79 | 1.58 | 0.73 | 0.010 | 0.157 | 62.08 |
| | | 9.83 | 1.33 | 8.00 | 1.35 | 1.57 | | | |
| 88-18 | 6.4 | 1.20 | 1.21 | 2.79 | 0.72 | 0.010 | 0.157 | 32.94 |
| | | 13.88 | 2.04 | 14.12 | 1.34 | 1.57 | | | |
| 88-17 | 3.9 | 2.15 | 2.98 | 6.14 | 1.80 | 0.024 | 0.376 | 68.06 |
| | | 24.87 | 5.03 | 31.07 | 3.34 | 3.76 | | | |
| 88-16 | 10.9 | 2.54 | 2.48 | 5.31 | 1.76 | 0.032 | 0.502 | 67.14 |
| | | 29.38 | 4.18 | 26.87 | 3.27 | 5.45 | | | |
| 88- 5 | 10.7 | 3.32 | 3.68 | 6.59 | 2.08 | 0.036 | 0.564 | 86.51 |
| | | 38.40 | 6.21 | 33.35 | 3.86 | 4.70 | | | |
| 88- 4 | 3.1 | 0.14 | 6.18 | 0.02 | 2.81 | 0.027 | 0.423 | 21.59 |
| | | 1.62 | 10.42 | 0.10 | 5.21 | 4.23 | | | |
| 88-15 | 1.7 | 3.35 | 2.32 | 4.64 | 2.36 | 0.033 | 0.517 | 76.02 |
| | | 38.75 | 4.25 | 23.48 | 4.38 | 5.17 | | | |
| 89-38 | 2.2 | 0.92 | 0.02 | 0.04 | 0.08 | 0.003 | 0.047 | 11.50 |
| | | 10.64 | 0.03 | 0.20 | 0.15 | 0.47 | | | |
| 89-36 | 1.9 | 1.45 | 3.65 | 4.67 | 2.60 | 0.056 | 0.878 | 60.15 |
| | | 16.77 | 6.16 | 23.63 | 4.82 | 8.77 | | | |
| 90-45 | 4.5 | 1.79 | 0.42 | 1.19 | 0.37 | 0.005 | 0.078 | 28.90 |
| | | 20.70 | 0.71 | 6.02 | 0.69 | 0.78 | | | |
| 90-46 | 1.6 | 3.00 | 2.74 | 7.18 | 2.05 | 0.022 | 0.345 | 82.90 |
| | | 34.70 | 4.62 | 36.33 | 3.80 | 3.45 | | | |

| MARG PROPERTY REVENUE FACTORS (US $/lb/oz) | | | | | | | |
|---|---|---|---|---|---|---|---|
| REVENUE | METALS | | | | | EXCHANGE |
| | Cu | Pb | Zn | Ag | Au | |
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

LEGEND:

59.63 / 2.3 ● 34 DRILL HOLE INTERCEPT — NSR ($/ton) / THICKNESS (m)

O44 DRILL HOLE INTERCEPT – PROJECTED ('D' sulphide horizon not present)

1200m STRIKE LINE (defined, projected)

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION

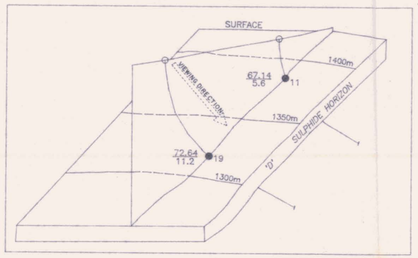
MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY

'D' SULPHIDE HORIZON
DRILL INTERCEPT AND
STRIKE LINE MAP

0 50 100 200
METRES

DATE: NOVEMBER, 1990
DRAWN BY: J.P.FRANZEN, P.Eng.
FIGURE: 21

(65) 092 N/5 MAP#105 M15,16 / 106 P1,2




'D' SULPHIDE HORIZON
MINERAL RESERVE BLOCKS
DRILL INDICATED + DILUTED (+3.0m)

| BLOCK | TONS | % , $/ton NSR Cu | Pb | Zn | OPT , $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| D30A | 72917 | 1.05<br>12.14 | 0.89<br>4.81 | 3.01<br>65.36 | 1.76<br>3.15 | 0.027<br>4.23 | 50.76 |
| D21 | 131139 | 1.31<br>15.15 | 1.31<br>2.21 | 2.70<br>13.66 | 1.14<br>2.12 | 0.016<br>2.51 | 35.65 |
| D28 | 26856 | 1.45<br>16.77 | 1.90<br>3.20 | 3.69<br>18.37 | 1.58<br>2.93 | 0.016<br>2.51 | 43.78 |
| D23 | 106525 | 1.91<br>22.09 | 3.07<br>5.18 | 6.49<br>32.84 | 2.20<br>4.08 | 0.028<br>4.39 | 68.58 |
| D20 | 34956 | 1.24<br>14.34 | 1.33<br>2.24 | 2.83<br>14.32 | 1.38<br>2.56 | 0.025<br>3.92 | 37.38 |
| D25 | 82716 | 1.98<br>22.90 | 1.22<br>2.06 | 3.43<br>17.20 | 1.47<br>2.73 | 0.023<br>3.60 | 48.49 |
| D13 | 36373 | 1.16<br>13.42 | 0.85<br>1.43 | 1.69<br>8.55 | 0.77<br>1.43 | 0.002<br>0.31 | 25.14 |
| D12 | 30589 | 3.14<br>36.32 | 4.84<br>8.16 | 9.21<br>46.60 | 3.18<br>5.90 | 0.053<br>8.30 | 105.29 |
| D33 | 105959 | 1.57<br>18.16 | 2.19<br>3.69 | 4.29<br>21.71 | 1.96<br>3.52 | 0.016<br>2.51 | 48.59 |
| D19 | 300406 | 2.35<br>29.49 | 2.71<br>4.57 | 6.26<br>31.68 | 1.86<br>3.45 | 0.022<br>3.45 | 72.64 |
| D11 | 124162 | 2.24<br>25.91 | 3.05<br>5.14 | 5.87<br>29.70 | 1.16<br>2.15 | 0.027<br>4.23 | 67.14 |
| D10 | 129577 | 2.92<br>33.77 | 3.33<br>5.62 | 5.93<br>30.01 | 1.81<br>3.36 | 0.048<br>7.52 | 80.27 |
| D18 | 80304 | 1.20<br>13.88 | 1.21<br>2.04 | 2.79<br>14.12 | 0.72<br>1.34 | 0.010<br>1.57 | 32.94 |
| D17 | 36611 | 2.15<br>24.87 | 2.98<br>5.03 | 6.14<br>31.07 | 1.80<br>3.34 | 0.024<br>3.76 | 68.06 |
| D16 | 88691 | 2.54<br>29.38 | 2.48<br>4.18 | 5.31<br>26.87 | 1.76<br>3.27 | 0.022<br>3.45 | 67.14 |
| D 5 | 84615 | 3.32<br>38.40 | 3.68<br>6.21 | 6.59<br>33.35 | 2.08<br>3.86 | 0.030<br>4.70 | 86.51 |
| D 4 | 22288 | 0.14<br>1.62 | 6.18<br>10.42 | 0.02<br>0.10 | 2.81<br>5.21 | 0.027<br>4.23 | 21.59 |
| D15 | 28379 | 2.05<br>23.71 | 1.61<br>2.72 | 2.78<br>14.07 | 1.43<br>2.65 | 0.020<br>3.13 | 46.28 |
| TOTAL | 1523064 | 2.08<br>24.05 | 2.54<br>4.28 | 5.01<br>25.37 | 1.63<br>3.03 | 0.024<br>3.82 | 60.55 |

'D' SULPHIDE HORIZON
DILUTED (+3.0m) DRILLHOLE INTERCEPTS

| DRILL HOLE | THICKNESS (M) | % , $/ton NSR Cu | Pb | Zn | OPT , $/ton NSR Ag | Au | TOTAL NSR $/ton |
|---|---|---|---|---|---|---|---|
| 90-42 | 3.0 | 0.56<br>6.48 | 0.64<br>1.08 | 2.18<br>11.09 | 0.61<br>1.13 | 0.012<br>1.88 | 21.60 |
| 90-39 | 4.2 | 0.99<br>11.45 | 1.49<br>2.51 | 2.64<br>13.36 | 1.08<br>2.00 | 0.013<br>2.04 | 31.36 |
| 90-41 | 3.0 | 0.24<br>2.78 | 0.20<br>0.34 | 0.40<br>2.02 | 0.12<br>0.22 | 0.003<br>0.47 | 5.83 |
| 90-40 | 3.0 | 1.79<br>20.70 | 1.90<br>3.20 | 3.04<br>15.38 | 1.32<br>2.45 | 0.026<br>5.64 | 47.38 |
| 89-35 | 4.7 | 1.46<br>16.89 | 3.74<br>6.31 | 5.12<br>25.91 | 1.34<br>2.49 | 0.025<br>5.48 | 57.07 |
| 90-43 | 3.0 | 0.54<br>6.25 | 0.50<br>0.84 | 1.00<br>5.06 | 0.46<br>0.85 | 0.006<br>0.94 | 13.94 |
| 89-38 | 3.0 | 0.78<br>8.10 | 0.02<br>0.03 | 0.04<br>0.20 | 0.07<br>0.13 | 0.003<br>0.47 | 8.93 |
| 89-36 | 3.0 | 0.94<br>10.87 | 2.33<br>3.93 | 2.99<br>15.13 | 1.67<br>3.10 | 0.040<br>6.27 | 39.30 |
| 90-45 | 4.5 | 1.79<br>20.79 | 0.42<br>0.71 | 1.19<br>6.02 | 0.37<br>0.69 | 0.005<br>0.78 | 29.90 |
| 90-46 | 3.0 | 1.73<br>20.01 | 1.48<br>2.50 | 3.90<br>19.73 | 1.18<br>2.08 | 0.013<br>2.04 | 46.36 |




MARG PROPERTY REVENUE FACTORS
(US $/lb/oz)

| REVENUE | METALS Cu | Pb | Zn | Ag | Au | EXCHANGE |
|---|---|---|---|---|---|---|
| METAL PRICE | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |
| PAYABLE NSR | 0.48 | 0.07 | 0.21 | 1.54 | 130 | |

LEGEND:

48.49 / 6.0 ● 25 — DILUTED (+3.0m) DRILL HOLE INTERCEPT; NSR ($/ton) / THICKNESS (m)

O 44 — DRILL HOLE INTERCEPT – PROJECTED ('D' sulphide horizon not present)

1200m — STRIKE LINE (defined, projected)

37.38 / 3.0 ● 20 — DILUTED (+3.0m) MINERAL RESERVE BLOCK

To accompany report by J.P.FRANZEN P.Eng.

NDU RESOURCES LTD.
CAMECO CORPORATION
MARG PROPERTY
MAYO MINING DISTRICT, YUKON TERRITORY
'D' SULPHIDE HORIZON
DILUTED MINERAL RESERVE BLOCKS
and
STRIKE LINE MAP

0 50 100 200
METRES

DATE: NOVEMBER, 1990.
DRAWN BY: J.P.FRANZEN, P.Eng.
FIGURE: 22

092915 (64) MAP# 105 11/16 | 06 P1/2

# APPENDIX I

## DIAMOND DRILL HOLE

## SURVEY SUMMARY

MARG PROPERTY

DIAMOND DRILL HOLE SURVEY SUMMARY

| Hole | Drill Section | Survey Grid Coordinates (m) N | Survey Grid Coordinates (m) E | Elevation (m) | Collar Dip (°) | Azimuth (Astronomic) | Depth (m) |
|---|---|---|---|---|---|---|---|
| 88-1 | 1075E | 100,113.73 | 99,091.78 | 1,373.08 | -50 | 343 | 182.0 |
| 88-2 | 1880E | 100,187.63 | 99,883.13 | 1,438.28 | -50 | 359 | 113.1 |
| 88-3 | 1880E | 100,187.63 | 99,883.13 | 1,438.28 | -80 | 359 | 81.4 |
| 88-4 | 1800E | 100,093.56 | 99,790.14 | 1,438.89 | -50 | 003 | 91.1 |
| 88-5 | 1800E | 100,093.56 | 99,790.14 | 1,438.89 | -70 | 003 | 87.5 |
| 88-6 | 1725E | 99,989.28 | 99,720.70 | 1,416.85 | -50 | 000 | 145.4 |
| 88-7 | 700E | 99,985.42 | 98,701.92 | 1,324.91 | -50 | 343 | 139.3 |
| 88-8 | 1195E | 100,223.01 | 99,197.19 | 1,357.35 | -50 | 340 | 124.1 |
| 88-9 | 1725E | 100,084.26 | 99,727.85 | 1,412.85 | -50 | 354 | 163.7 |
| 88-10 | 1880E | 100,124.41 | 99,884.59 | 1,464.07 | -70 | 358 | 156.1 |
| 88-11 | 1880E | 100,124.41 | 99,884.59 | 1,464.07 | -85 | 358 | 172.8 |
| 88-12 | 1940E | 100,165.96 | 99,943.19 | 1,461.80 | -50 | 358 | 134.7 |
| 88-13 | 1940E | 100,165.96 | 99,943.19 | 1,461.80 | -70 | 358 | 124.1 |
| 88-14 | 2000E | 100,171.05 | 99,993.89 | 1,470.18 | -50 | 358 | 153.9 |
| 88-15 | 1800E | 100,147.64 | 99,807.95 | 1,432.44 | -55 | 355 | 96.6 |
| 88-16 | 1800E | 100,026.88 | 99,800.17 | 1,445.94 | -50 | 358 | 213.7 |
| 88-17 | 1800E | 100,026.88 | 99,800.17 | 1,445.94 | -65 | 358 | 160.0 |
| 88-18 | 1800E | 100,026.88 | 99,800.17 | 1,445.94 | -80 | 358 | 131.7 |
| 88-19 | 1880E | 99,942.18 | 99,877.59 | 1,480.48 | -50 | 358 | 288.3 |
| 88-20 | 1940E | 100,024.01 | 99,940.80 | 1,509.00 | -60 | 358 | 259.7 |
| 88-21 | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -67 | 358 | 306.3 |
| 88-22 | 1620E | 100,070.07 | 99,612.85 | 1,380.09 | -50 | 358 | 203.3 |
| 88-23 | 1940E | 100,024.01 | 99,940.80 | 1,509.00 | -75 | 358 | 294.7 |
| 88-24 | 1485E | 100,134.00 | 99,983.00 | 1,360.00 | -50 | 358 | 54.9 |

DIAMOND DRILL HOLE SURVEY SUMMARY

| Hole | Drill Section | Survey Grid Coordinates (m) N | Survey Grid Coordinates (m) E | Elevation (m) | Collar Dip (°) | Azimuth (Astronomic) | Depth (m) |
|---|---|---|---|---|---|---|---|
| 88-25 | 1940E | 100,024.01 | 99,940.80 | 1,509.00 | -48 | 358 | 248.7 |
| 88-26 | 1075E | 100,034.22 | 99,073.09 | 1,399.42 | -50 | 358 | 215.5 |
| 88-27 | 875E | 100,033.81 | 98,877.01 | 1,355.94 | -50 | 358 | 189.0 |
| 88-28 | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -50 | 358 | 213.7 |
| 88-29 | 700E | 100,039.52 | 98,744.00 | 1,326.40 | -50 | 358 | 212.4 |
| 88-30 | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -88 | 358 | 126.8 |
| 88-30A | 2000E | 100,083.32 | 100,009.26 | 1,495.90 | -88 | 358 | 281.9 |
| 88-31 | 1290E | 100,120.48 | 99,289.10 | 1,363.79 | -50 | 358 | 160.9 |
| 88-32 | 485E | 100,085.09 | 99,485.70 | 1,362.25 | -50 | 358 | 204.8 |
| 88-33 | 1880E | 99,942.18 | 99,877.59 | 1,480.48 | -80 | 358 | 305.4 |
| 89-34 | 2000E | 99,848.68 | 100,021.19 | 1,478.00 | -71 | 358 | 443.8 |
| 89-35 | 2075E | 99,845.19 | 100,089.08 | 1,449.91 | -60 | 354 | 400.5 |
| 89-36 | 1620E | 99,907.24 | 99,618.26 | 1,396.00 | -52 | 358 | 304.5 |
| 89-37 | 1290E | 99,951.87 | 99,292.78 | 1,392.23 | -57 | 358 | 247.8 |
| 89-38 | 1620E | 99,762.87 | 99,629.80 | 1,419.50 | -58 | 360 | 422.1 |
| 90-39 | 2375E | 99,750 | 100,360 | 1,332 | -60 | 002 | 111.3 |
| 90-39A | 2375E | 99,751 | 100,364 | 1,332 | -60 | 355 | 434.0 |
| 90-40 | 2225E | 99,725 | 100,217 | 1,315 | -60 | 005 | 445.3 |
| 90-41 | 2225E | 99,630 | 100,206 | 1,327 | -70 | 360 | 524.0 |
| 90-42 | 2375E | 99,660 | 100,376 | 1,283 | -70 | 008 | 497.4 |
| 90-43 | 1800E | 99,690 | 99,826 | 1,485 | -70 | 001 | 582.8 |
| 90-44 | 1725E | 99,865 | 99,375 | 1,428 | -65 | 359 | 378.7 |
| 90-45 | 1485E | 99,890 | 99,503 | 1,392 | -55 | 360 | 411.2 |
| 90-46 | 1290E | 99,790 | 99,310 | 1,445 | -60 | 360 | 431.3 |
| 90-47 | 700E | 99,730 | 98,730 | 1,365 | -60 | 360 | 303.6 |
| TOTAL DRILLING (metres) | | | | | | | 11,975.8 |

# APPENDIX II

## CALCULATION OF CONCEPTUAL METALLURGICAL BALANCE

1. **Assumptions**

| Product | % Wt | Assays % Cu | % Pb | % Zn | opt Ag | opt Au | % Distribution Cu | % Pb | % Zn | % Ag | % Au |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Head** | 100.00 | 1.6 | 2.2 | 4.1 | 1.6 | 0.026 | 100 | 100 | 100 | 100 | 100 |
| **Cu Conc** | | 27.0 | | | | | 80 | 6 | 4 | 30 | 50 |
| **Pb Conc** | | | 55.0 | | | | 8 | 80 | 8 | 25 | 10 |
| **Zn Conc** | | | | 53.0 | | | 7 | 9 | 83 | 15 | 10 |
| **Tails** | | | | | | | 5 | 5 | 5 | 30 | 30 |

2. **Calculation lbs contained copper in products**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Head** | 100 | tons | x | $\frac{1.6}{100}$ | x | 2,000 $\frac{lb}{ton}$ | = | **3,200 lbs** |
| Cu Conc | $\frac{80}{100}$ | x | 3,200 lbs | | | | = | 2,560 lbs |
| Pb Conc | $\frac{8}{100}$ | x | 3,200 lbs | | | | = | 256 lbs |
| Zn Conc | $\frac{7}{100}$ | x | 3,200 lbs | | | | = | 224 lbs |
| Tails | $\frac{5}{100}$ | x | 3,200 lbs | | | | = | 160 lbs |
| **Total copper in products** | | | | | | | = | **3,200 lbs** |

3. **Calculation weight of copper conc**

Weight copper conc = y tons

$$y \text{ tons} \times \frac{27}{100} \times 2{,}000 \frac{\text{lb}}{\text{ton}} = 2{,}560 \text{ lbs copper}$$

**y = 4.74 tons**

4. **Calculation lbs contained lead in products**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Head** | 100 | tons | x | $\frac{2.2}{100}$ | x 2,000 $\frac{\text{lb}}{\text{ton}}$ | = | **4,400 lbs** |
| Cu Conc | $\frac{6}{100}$ | x | 4,400 lbs | | | = | 264 lbs |
| Pb Conc | $\frac{80}{100}$ | x | 4,400 lbs | | | = | 3,520 lbs |
| Zn Conc | $\frac{9}{100}$ | x | 4,400 lbs | | | = | 396 lbs |
| Tails | $\frac{5}{100}$ | x | 4,400 lbs | | | = | 220 lbs |
| **Total lead in products** | | | | | | = | **4,400 lbs** |

5. **Calculation weight of lead conc**

Weight lead conc = z tons

$$z \text{ tons} \times \frac{55}{100} \times 2{,}000 \frac{\text{lb}}{\text{ton}} = 3{,}520 \text{ lbs lead}$$

**z = 3.20 tons**

6. **Calculation lbs contained zinc in products**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Head** | 100 | tons | x | $\frac{4.1}{100}$ | x | 2,000 $\frac{lb}{ton}$ | = | **8,200 lbs** |
| Cu Conc | $\frac{4}{100}$ | x | 8,200 lbs | | | | = | 328 lbs |
| Pb Conc | $\frac{8}{100}$ | x | 8,200 lbs | | | | = | 656 lbs |
| Zn Conc | $\frac{83}{100}$ | x | 8,200 lbs | | | | = | 6,806 lbs |
| Tails | $\frac{5}{100}$ | x | 8,200 lbs | | | | = | 410 lbs |
| **Total zinc in products** | | | | | | | = | **8,200 lbs** |

7. **Calculation of weight of zinc conc.**

Weight of zinc conc = a tons

a tons x $\frac{53}{100}$ x 2,000 $\frac{lb}{ton}$ = 6,806 lbs zinc

**a = 6.42 tons**

8. **Calculation ounces contained silver in products**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Head** | **1.60** | **opt** | **x** | **100 tons** | = | **160 ounces** |
| Cu Conc | $\frac{30}{100}$ | x | 160 ounces | | = | 48 ounces |
| Pb Conc | $\frac{25}{100}$ | x | 160 ounces | | = | 40 ounces |
| Zn Conc | $\frac{15}{100}$ | x | 160 ounces | | = | 24 ounces |
| Tails | $\frac{30}{100}$ | x | 160 ounces | | = | 48 ounces |
| **Total silver in products** | | | | | = | **160 ounces** |

9. **Calculation ounces contained gold in products**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Head** | **0.026** | **opt** | **x** | **100 tons** | = | **2.60 ounces** |
| Cu Conc | $\frac{50}{100}$ | x | 2.60 ounces | | = | 1.30 ounces |
| Pb Conc | $\frac{10}{100}$ | x | 2.60 ounces | | = | 0.26 ounces |
| Zn Conc | $\frac{10}{100}$ | x | 2.60 ounces | | = | 0.26 ounces |
| Tails | $\frac{30}{100}$ | x | 2.60 ounces | | = | 0.78 ounces |
| **Total gold in products** | | | | | = | **2.60 ounces** |

**10. Calculation copper assays (%) in products**

Cu conc 4.74 tons x $\frac{a}{100}$ x 2,000 $\frac{lb}{ton}$ = 2,560 lbs copper

a = **27.0**

Pb conc 3.20 tons x $\frac{b}{100}$ x 2,000 $\frac{lb}{ton}$ = 256 lbs copper

b = **4.0**

Zn conc 6.42 tons x $\frac{c}{100}$ x 2,000 $\frac{lb}{ton}$ = 224 lbs copper

c = **1.7**

Tails 85.64 tons x $\frac{d}{100}$ x 2,000 $\frac{lb}{ton}$ = 160 lbs copper

d = **0.09**

**11. Calculation lead assays (%) in products**

Cu conc 4.74 tons x $\frac{a}{100}$ x 2,000 $\frac{lb}{ton}$ = 264 lbs lead

a = **2.8**

Pb conc 3.20 tons x $\frac{b}{100}$ x 2,000 $\frac{lb}{ton}$ = 3,520 lbs lead

b = **55.0**

Zn conc 6.42 tons x $\frac{c}{100}$ x 2,000 $\frac{lb}{ton}$ = 396 lbs lead

c = **3.1**

Tails 85.64 tons x $\frac{d}{100}$ x 2,000 $\frac{lb}{ton}$ = 220 lbs lead

d = **0.13**

**12. Calculation zinc assays (%) in products**

Cu conc 4.74 tons x $\frac{a}{100}$ x 2,000 $\frac{lb}{ton}$ = 328 lbs zinc

a = **3.5**

Pb conc 3.20 tons x $\frac{b}{100}$ x 2,000 $\frac{lb}{ton}$ = 656 lbs zinc

b = **10.3**

Zn conc 6.42 tons x $\frac{c}{100}$ x 2,000 $\frac{lb}{ton}$ = 6,806 lbs zinc

c = **53.0**

Tails 85.64 tons x $\frac{d}{100}$ x 2,000 $\frac{lb}{ton}$ = 410 lbs zinc

d = **0.24**

**13. Calculation silver assays (opt) in products**

| | | | | | |
|---|---|---|---|---|---|
| Cu conc | 4.74 tons | x | a opt | = | 48 ounces |
| **a = 10.1** | | | | | |
| Pb conc | 3.20 tons | x | b opt | = | 40 ounces |
| **b = 12.5** | | | | | |
| Zn conc | 6.42 tons | x | c opt | = | 24 ounces |
| **c = 3.7** | | | | | |
| Tails | 85.64 tons | x | d opt | = | 48 ounces |
| **d = 0.56** | | | | | |

**14. Calculation gold assays (opt) in products**

| | | | | | |
|---|---|---|---|---|---|
| Cu conc. | 4.74 tons | x | a opt | = | 1.30 ounces |
| **a = 0.27** | | | | | |
| Pb conc. | 3.20 tons | x | b opt | = | 0.26 ounces |
| **b = 0.08** | | | | | |
| Zn conc. | 8.64 tons | x | c opt | = | 0.26 ounces |
| **c = 0.04** | | | | | |
| Tails | 85.64 tons | x | d opt | = | 0.78 ounces |
| **d = 0.009** | | | | | |

15. Calculated conceptual metallurgical balance

| Product | % Wt | Assays % Cu | % Pb | % Zn | opt Ag | opt Au | % Distribution Cu | % Pb | % Zn | % Ag | % Au |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Head | 100.00 | 1.6 | 2.2 | 4.1 | 1.6 | 0.026 | 100 | 100 | 100 | 100 | 100 |
| Cu Conc | 4.74 | 27.0 | 2.8 | 3.5 | 10.1 | 0.27 | 80 | 6 | 4 | 30 | 50 |
| Pb Conc | 3.20 | 4.0 | 55.0 | 10.3 | 12.5 | 0.08 | 8 | 80 | 8 | 25 | 10 |
| Zn Conc | 6.42 | 1.7 | 3.1 | 53.0 | 3.7 | 0.04 | 7 | 9 | 83 | 15 | 10 |
| Tails | 85.64 | 0.09 | 0.13 | 0.24 | 0.56 | 0.009 | 5 | 5 | 5 | 30 | 30 |

# APPENDIX III

## CALCULATION OF CONCEPTUAL NET SMELTER RETURN

1. **Calculated conceptual metallurgical balance**

| | | Assays | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | % | | | opt | | % Distribution | | | | |
| Product | Wt | Cu | Pb | Zn | Ag | Au | Cu | Pb | Zn | Ag | Au |
| Head | 100.00 | 1.6 | 2.2 | 4.1 | 1.6 | 0.026 | 100 | 100 | 100 | 100 | 100 |
| Cu Conc | 4.74 | 27.0 | 2.8 | 3.5 | 10.1 | 0.27 | 80 | 6 | 4 | 30 | 50 |
| Pb Conc | 3.20 | 4.0 | 55.0 | 10.3 | 12.5 | 0.08 | 8 | 80 | 8 | 25 | 10 |
| Zn Conc | 6.42 | 1.7 | 3.1 | 53.0 | 3.7 | 0.04 | 7 | 9 | 83 | 15 | 10 |
| Tails | 85.64 | 0.09 | 0.13 | 0.24 | 0.56 | 0.009 | 5 | 5 | 5 | 30 | 30 |

2. **Concentrate treatment charges**

| | |
|---|---|
| Copper conc | $US 0.25/payable lb copper |
| Lead conc | $175/ton |
| Zinc conc | $220/ton |

Assume no treatment charge penalties.

3. **Concentrate transportation charges**

$75/ton

4. **Base case metal prices and exchange rate**

| | Metal | | | | | |
|---|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au | Exchange |
| $US/lb/oz | 0.90 | 0.30 | 0.55 | 5.00 | 400 | 0.83 |

5. Revenue calculation - copper concentrate

| % Wt | Assays % Cu | % Pb | % Zn | opt Ag | opt Au |
|---|---|---|---|---|---|
| 4.74 | 27.0 | 2.8 | 3.5 | 10.1 | 0.27 |

**Copper payment**

Deduct 1 unit

$$\frac{27.0 - 1.0}{100} \times 2{,}000 \frac{\text{lb}}{\text{ton}} \times \frac{\$US\ 0.90}{0.83} = \$\ 564$$

% Total Revenue: **76.7**

**Lead payment** = $ 0 — **0.0**

None

**Zinc payment**

None = $ 0 — **0.0**

**Silver payment**

Pay for 95% with minimum deduction 1.0 ounces

$$(10.1 - 1)\ \text{oz} \times \frac{\$US\ 5.00}{0.83} = \$\ 55$$

7.5

**Gold payment**

Pay for 95% with minimum deduction 0.029 ounces

$$(0.270 - 0.029)\ \text{oz} \times \frac{\$US\ 400}{0.83} = \$\ 116$$

15.8

**Total payment** = $ 735 / ton — 100.0%

6. Revenue calculation - lead concentrate

| | Assays | | | | |
|---|---|---|---|---|---|
| % | % | | | opt | |
| Wt | Cu | Pb | Zn | Ag | Au |
| 3.20 | 4.0 | 55.0 | 10.3 | 12.5 | 0.08 |

**Copper payment** — % Total Revenue

Pay for 40% of the contained copper (minimum deduction is 10 pounds) at quoted price less $0.20 per pound.

$$\frac{4.0}{100} \times 2{,}000 \frac{\text{lb}}{\text{ton}} \times \frac{40}{100} \times \frac{(\$US\ 0.90 - 0.17)}{0.83} = \$\ 28 \quad \mathbf{6.6}$$

**Lead payment**

Pay for 92% of the contained lead (minimum deduction is 20 pounds) at quoted price less $0.12 per pound.

$$\frac{55.0}{100} \times 2{,}000 \frac{\text{lb}}{\text{ton}} \times \frac{92}{100} \times \frac{(\$US\ 0.30 - 0.10)}{0.83} = \$244 \quad \mathbf{57.9}$$

**Zinc payment**

Pay for 60% of the contained zinc (minimum deduction is 20 pounds) at quoted price less $0.15 per pound.

$$\frac{10.3}{100} \times 2{,}000 \frac{\text{lb}}{\text{ton}} \times \frac{60}{100} \times \frac{(\$US\ 0.55 - 0.13)}{0.83} = \$\ 63 \quad \mathbf{14.9}$$

**Silver payment**

Deduct 0.2 troy ounces of silver for each unit of contained copper and pay for 93% of the balance (minimum deduction is 1.0 troy ounce) at 97% of quoted price.

$$(12.5 - 0.8 - 1.0)\ \text{oz} \times \frac{97}{100} \times \frac{\$US\ 5.00}{0.83} = \$\ 63 \quad \mathbf{14.9}$$

| | | % Total Revenue |
|---|---|---|
| **Gold payment** | | |
| Pay for 93% of the contained gold (minimum deduction is 0.03 troy ounces) at 98% of quoted price. | | |
| $(0.08 - 0.03)\ oz \times \frac{98}{100} \times \frac{\$US\ 400}{0.83}$ | = $ 24 | 5.7 |
| **Total payment** | = $422/ton | 100.0% |

**7. Revenue calculation - zinc concentrate**

| | Assays | | | | |
|---|---|---|---|---|---|
| | % | | | opt | |
| % Wt | Cu | Pb | Zn | Ag | Au |
| 6.42 | 1.7 | 3.1 | 53.0 | 3.7 | 0.04 |

| | | % Total Revenue |
|---|---|---|
| **Copper payment** | | |
| None | = $ 0 | 0.0 |
| **Lead payment** | | |
| Pay for 80% of the contained lead (minimum deduction is 20 pounds) at quoted price less $0.12 per pound. | | |
| $((\frac{3.1}{100} \times 2{,}000\ \frac{lb}{ton}) - 20\ lbs) \times \frac{\$US\ 0.30 - 0.10}{0.83}$ | = $ 10 | 1.6 |
| **Zinc payment** | | |
| Pay for 85% of the contained zinc. | | |
| $\frac{53.0}{100} \times 2{,}000\ \frac{lb}{ton} \times \frac{85}{100} \times \frac{\$US\ 0.55}{0.83}$ | = $597 | 96.6 |

| | | % Total Revenue |
|---|---|---|
| **Silver payment** | | |
| Deduct 0.2 troy ounces of silver for each unit of contained copper and pay for 93% of the contained silver (minimum deduction is 1.5 troy ounces at 97% of quoted price. | | |
| $(3.7 - 0.3 - 1.5)$ oz x $\frac{97}{100}$ x $\frac{\$US\ 5.00}{0.83}$ | = $ 11 | 1.8 |
| **Gold payment** | | |
| None | = 0 | 0 |
| **Total payment** | = $\frac{\$618}{ton}$ | 100.0% |

8. **Calculation Net Smelter Return - copper concentrate**

| | | |
|---|---|---|
| Total smelter payment | = | $ 735 |
| Treatment and refinery charge | = | (159) |
| Transportation | = | ( 75) |
| **Net Smelter Return** | = | $\frac{\$\ 501}{ton}$ |

9. **Calculation Net Smelter Return - lead concentrate**

| | | |
|---|---|---|
| Total smelter payment | = | $ 422 |
| Treatment and refinery charge | = | (175) |
| Transportation | = | ( 75) |
| **Net Smelter Return** | = | $\frac{\$\ 172}{ton}$ |

10. **Calculation Net Smelter Return - zinc concentrate**

| | | |
|---|---|---|
| Total smelter payment | = | $ 618 |
| Treatment and refinery charge | = | (220) |
| Transportation | = | ( 75) |
| **Net Smelter Return** | = | $\frac{\$\ 323}{ton}$ |

11. Calculation Net Smelter Return for copper concentrate - individual metals

| Metal | $ Total Revenue | NSR $/ton | 4.74 tons NSR $ |
|---|---|---|---|
| Cu | 76.7 | 384 | 1,821 |
| Pb | 0.0 | 0 | 0 |
| Zn | 0.0 | 0 | 0 |
| Ag | 7.5 | 38 | 178 |
| Au | 15.8 | 79 | 375 |
| Total | 100.0 | $ 501 / ton | $ 2,374 |

12. Calculation Net Smelter Return for lead concentrate - individual metals

| Metal | $ Total Revenue | NSR $/ton | 3.20 tons NSR $ |
|---|---|---|---|
| Cu | 6.6 | 11 | 36 |
| Pb | 57.9 | 99 | 319 |
| Zn | 14.9 | 26 | 82 |
| Ag | 14.9 | 26 | 82 |
| Au | 5.7 | 10 | 31 |
| Total | 100.0 | $ 172 / ton | $ 550 |

13. Calculation Net Smelter Return for zinc concentrate - individual metals

| Metal | $ Total Revenue | NSR $/ton | 6.42 tons NSR $ |
|---|---|---|---|
| Cu | 0.0 | 0 | 0 |
| Pb | 1.6 | 5 | 33 |
| Zn | 96.6 | 312 | 2,003 |
| Ag | 1.8 | 6 | 37 |
| Au | 0.0 | 0 | 0 |
| Total | 100.0 | $ 323 / ton | $ 2,073 |

14. Calculation Net Smelter Return from 100 tons millfeed at head grade - individual metals

| Metal | Cu Conc 4.74 tons NSR $ | Pb Conc 3.20 tons NSR $ | Zn Conc 6.42 tons NSR $ | Total NSR $ |
|---|---|---|---|---|
| Cu | 1,821 | 36 | 0 | 1,857 |
| Pb | 0 | 319 | 33 | 352 |
| Zn | 0 | 82 | 2,003 | 2,085 |
| Ag | 178 | 82 | 37 | 297 |
| Au | 375 | 31 | 0 | 406 |
| Total | $ 2,374 | $ 550 | $ 2,073 | $4,997 |

15. Calculation of gross metal values from 100 tons millfeed at head grade - individual metals

| Metal | Contained lbs - oz | $ Gross Metal Value |
|---|---|---|
| Cu | 3,200 | 3,470 |
| Pb | 4,400 | 1,590 |
| Zn | 8,200 | 5,434 |
| Ag | 160 | 964 |
| Au | 2.6 | 1,253 |
| **Total** | | **$12,711** |

16. Comparison of Net Smelter Return and gross metal values for 100 tons millfeed at head grade - individual metals

| | 100 tons millfeed | | |
|---|---|---|---|
| Metal | NSR ($) | Gross Metal Value ($) | Payable (%) |
| Cu | 1,857 | 3,470 | 53.5 |
| Pb | 352 | 1,590 | 22.1 |
| Zn | 2,085 | 5,434 | 38.4 |
| Ag | 297 | 964 | 30.8 |
| Au | 406 | 1,253 | 32.4 |
| **Total** | **$ 4,997** | **$ 12,711** | **39.3%** |

**17. Calculation of Net Smelter Return adjusted metal prices - all metals**

| Metal | Base Case Price $US/lb/oz | Payable % | NSR Adjusted Price $US/unit |
|---|---|---|---|
| Cu | 0.90 | 53.5 | 0.48 |
| Pb | 0.30 | 22.1 | 0.07 |
| Zn | 0.55 | 38.4 | 0.21 |
| Ag | 5.00 | 30.8 | 1.54 |
| Au | 400 | 32.4 | 130 |

**18. Net Smelter Return (NSR) - adjusted metal prices**

| | Metal | | | | |
|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au |
| $US/lb/oz | 0.48 | 0.07 | 0.21 | 1.54 | 130 |

**19. Calculation of payable Net Smelter Return for head grade**

| | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR |
|---|---|---|---|---|---|---|
| | Cu | Pb | Zn | Ag | Au | $/ton |
| Head Grade | 1.6 | 2.2 | 4.1 | 1.6 | 0.026 | |
| Payable NSR | 18.51 | 3.71 | 20.75 | 2.97 | 4.07 | 50.00 |

# APPENDIX IV

## 'A' SULPHIDE HORIZON

## TONS, GRADE AND NSR CALCULATION SUMMARY

MARG PROPERTY

'A' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR | | | opt, $/ton NSR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Cu | Pb | Zn | Ag | Au |
| A30A | 88-30 | 243.3 | 245.1 | 1.8 | 3,646 | 6,563 | 3.64 | 26,332 | 1.24 | 2.02 | 3.87 | 1.35 | 0.021 |
| | | | | | | | | | 14.34 | 3.41 | 19.58 | 2.50 | 3.29 |
| A21 | 88-21 | 190.6 | 194.2 | 3.6 | 2,896 | 10,426 | 3.20 | 36,775 | 0.75 | 1.02 | 2.02 | 0.96 | 0.006 |
| | | | | | | | | | 8.67 | 1.72 | 10.22 | 1.78 | 0.94 |
| A25 | 88-25 | 221.0 | 222.0 | 1.0 | 4,271 | 4,271 | 4.25 | 20,009 | 1.45 | 1.90 | 4.11 | 1.65 | 0.020 |
| | | | | | | | | | 16.77 | 3.20 | 20.80 | 3.06 | 3.13 |
| A12 | 88-12 | 73.9 | 79.8 | 5.9 | 1,208 | 7,127 | 4.00 | 31,425 | 2.03 | 3.31 | 5.85 | 3.09 | 0.042 |
| | | | | | | | | | 23.48 | 5.58 | 29.60 | 5.73 | 6.58 |
| A13 | 88-13 | 82.3 | 94.0 | 11.7 | 2,729 | 31,929 | 3.77 | 132,688 | 1.41 | 2.52 | 4.45 | 2.25 | 0.031 |
| | | | | | | | | | 16.31 | 4.25 | 22.52 | 4.17 | 4.86 |
| A20 | 88-20 | 231.7 | 233.4 | 1.7 | 3,708 | 6,304 | 4.25 | 29,531 | 1.12 | 1.75 | 3.36 | 1.90 | 0.025 |
| | | | | | | | | | 12.95 | 2.95 | 17.00 | 3.53 | 3.92 |
| A23 | 88-23 | 263.8 | 269.2 | 5.4 | 3,438 | 18,565 | 3.88 | 79,402 | 1.24 | 2.07 | 3.95 | 1.94 | 0.038 |
| | | | | | | | | | 14.34 | 3.49 | 19.99 | 3.60 | 5.95 |
| A11 | 88-11 | 150.0 | 152.9 | 2.9 | 3,109 | 9,016 | 4.25 | 42,238 | 1.52 | 3.17 | 5.57 | 2.47 | 0.050 |
| | | | | | | | | | 17.58 | 5.35 | 28.19 | 4.58 | 7.83 |
| A3 | 88-3 | 40.2 | 41.8 | 1.6 | 1,969 | 3,150 | 4.25 | 14,759 | 1.33 | 1.84 | 3.84 | 1.49 | 0.008 |
| | | | | | | | | | 15.38 | 3.10 | 19.43 | 2.76 | 1.25 |
| A2 | 88-2 | 28.2 | 32.6 | 4.4 | 1,188 | 5,227 | 3.66 | 21,089 | 3.99 | 1.74 | 3.44 | 1.66 | 0.029 |
| | | | | | | | | | 46.15 | 2.93 | 17.41 | 3.08 | 4.54 |
| A10 | 88-10 | 110.7 | 133.6 | 22.9 | 3,396 | 77,768 | 3.61 | 309,464 | 0.94 | 1.79 | 3.19 | 1.38 | 0.031 |
| | | | | | | | | | 10.87 | 3.02 | 16.14 | 2.56 | 4.86 |
| Total | | | | 5.7 (m) | 31,558 | 180,347 | 3.74 | 743,712 (tons) | 1.25 | 2.06 | 3.76 | 1.75 | 0.031 |
| Average | | | | | | | | | 14.47 | 3.48 | 19.03 | 3.24 | 4.80 |

MARG PROPERTY

'A' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 90-42 | 453.4 | 455.5 | 2.1 | 3.35 | 0.49 | 0.78 | 1.45 | 0.63 | 0.007 | |
| | | | | | 5.67 | 1.32 | 7.34 | 1.17 | 1.10 | 16.59 |
| 90-39 | 403.0 | 407.2 | 4.2 | 3.96 | 0.95 | 1.36 | 2.47 | 1.14 | 0.010 | |
| | | | | | 10.99 | 2.29 | 12.50 | 2.12 | 1.57 | 29.46 |
| 90-40 | 375.1 | 376.6 | 1.5 | 3.48 | 1.80 | 1.84 | 3.55 | 1.51 | 0.010 | |
| | | | | | 20.82 | 3.10 | 17.96 | 2.80 | 1.57 | 46.25 |
| 90-43 | 544.0 | 544.5 | 0.5 | 4.25 | 2.19 | 2.62 | 5.32 | 1.79 | 0.016 | |
| | | | | | 25.33 | 4.42 | 26.92 | 3.32 | 2.51 | 62.50 |
| 90-44 | 329.5 | 332.8 | 3.3 | 4.25 | 1.61 | 2.52 | 4.85 | 1.55 | 0.026 | |
| | | | | | 18.62 | 4.25 | 24.54 | 2.88 | 4.07 | 54.36 |
| 89-36 | 259.5 | 260.4 | 0.9 | 3.53 | 0.87 | 0.72 | 1.63 | 0.74 | 0.004 | |
| | | | | | 10.06 | 1.21 | 8.25 | 1.37 | 0.63 | 21.52 |
| 88-22 | 107.7 | 112.9 | 5.2 | 3.78 | 1.62 | 2.25 | 4.59 | 1.58 | 0.021 | |
| | | | | | 18.74 | 3.80 | 23.23 | 2.93 | 3.29 | 51.98 |
| 90-45 | 301.6 | 309.7 | 8.1 | 3.26 | 0.34 | 1.48 | 2.95 | 0.82 | 0.007 | |
| | | | | | 3.93 | 2.50 | 14.93 | 1.52 | 1.10 | 23.97 |
| 89-37 | 203.1 | 205.7 | 2.6 | 3.00 | 0.27 | 0.82 | 2.37 | 0.55 | 0.010 | |
| | | | | | 3.12 | 1.38 | 11.99 | 1.02 | 1.57 | 19.09 |
| 88-31 | 74.6 | 76.2 | 1.6 | 3.89 | 0.58 | 2.77 | 5.30 | 1.49 | 0.046 | |
| | | | | | 6.71 | 4.67 | 26.82 | 2.76 | 7.20 | 48.17 |
| 89-35 | 362.2 | 365.0 | 2.8 | 3.19 | 0.73 | 1.26 | 2.45 | 0.94 | 0.014 | |
| | | | | | 8.44 | 2.13 | 12.40 | 1.74 | 2.19 | 26.90 |

MARG PROPERTY

'A' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Cu | Pb | Zn | Ag | Au | |
| A30A | 88-30 | 242.9 | 245.9 | 3.0 | 3,646 | 10,938 | 3.36 | 40,511 | 0.86 | 1.37 | 2.62 | 0.95 | 0.015 | |
| | | | | | | | | | 9.95 | 2.31 | 13.26 | 1.76 | 2.35 | 29.63 |
| A21 | 88-21 | 190.6 | 194.2 | 3.6 | 2,896 | 10,426 | 3.20 | 36,775 | 0.75 | 1.02 | 2.02 | 0.96 | 0.006 | |
| | | | | | | | | | 8.67 | 1.72 | 10.22 | 1.78 | 0.94 | 23.34 |
| A25 | 88-25 | 219.0 | 222.0 | 3.0 | 4,271 | 12,813 | 3.52 | 49,716 | 0.62 | 0.84 | 1.77 | 0.69 | 0.009 | |
| | | | | | | | | | 7.17 | 1.42 | 8.96 | 1.28 | 1.41 | 20.23 |
| A12 | 88-12 | 73.9 | 79.8 | 5.9 | 1,208 | 7,127 | 4.00 | 31,425 | 2.03 | 3.31 | 5.85 | 3.09 | 0.042 | |
| | | | | | | | | | 23.48 | 5.58 | 29.60 | 5.73 | 6.58 | 70.98 |
| A13 | 88-13 | 82.3 | 94.0 | 11.7 | 2,729 | 31,929 | 3.77 | 132,688 | 1.41 | 2.52 | 4.45 | 2.25 | 0.031 | |
| | | | | | | | | | 16.31 | 4.25 | 22.52 | 4.17 | 4.86 | 52.11 |
| A20 | 88-20 | 221.3 | 233.4 | 12.1 | 3,708 | 44,867 | 3.48 | 172,109 | 0.68 | 1.13 | 2.15 | 0.93 | 0.012 | |
| | | | | | | | | | 7.87 | 1.91 | 10.88 | 1.73 | 1.88 | 24.26 |
| A23 | 88-23 | 263.8 | 269.2 | 5.4 | 3,438 | 18,565 | 3.88 | 79,402 | 1.24 | 2.07 | 3.95 | 1.94 | 0.038 | |
| | | | | | | | | | 14.34 | 3.49 | 19.99 | 3.60 | 5.95 | 47.37 |
| A11 | 88-11 | 149.7 | 152.9 | 3.2 | 3,109 | 9,949 | 4.13 | 45,292 | 1.39 | 2.90 | 5.05 | 2.24 | 0.046 | |
| | | | | | | | | | 16.08 | 4.89 | 25.55 | 4.16 | 7.20 | 57.88 |
| A3 | 88-3 | 38.8 | 41.8 | 3.0 | 1,969 | 5,907 | 3.57 | 23,245 | 0.75 | 1.03 | 2.09 | 0.83 | 0.005 | |
| | | | | | | | | | 8.67 | 1.74 | 10.58 | 1.54 | 0.78 | 23.31 |
| A2 | 88-2 | 28.2 | 32.6 | 4.4 | 1,188 | 5,227 | 3.66 | 21,089 | 3.99 | 1.74 | 3.44 | 1.66 | 0.029 | |
| | | | | | | | | | 46.15 | 2.93 | 17.41 | 3.08 | 4.54 | 74.11 |
| A10 | 88-10 | 110.7 | 133.6 | 22.9 | 3,396 | 77,768 | 3.61 | 309,464 | 0.94 | 1.79 | 3.19 | 1.38 | 0.031 | |
| | | | | | | | | | 10.87 | 3.02 | 16.14 | 2.56 | 4.86 | 37.45 |
| Total | | | | 7.5 | 31,558 | 235,516 | 3.63 | 941,716 | 1.08 | 1.78 | 3.25 | 1.49 | 0.026 | |
| Average | | | | (m) | | | | (tons) | 12.47 | 3.01 | 16.46 | 2.76 | 4.02 | $ 38.72 / ton |

MARG PROPERTY

'A' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 90-42 | 452.5 | 455.5 | 3.0 | 3.19 | 0.35 | 0.55 | 1.04 | 0.44 | 0.006 | |
| | | | | | 4.05 | 0.93 | 5.26 | 0.82 | 0.94 | 11.99 |
| 90-39 | 403.0 | 407.2 | 4.2 | 3.96 | 0.95 | 1.36 | 2.47 | 1.14 | 0.010 | |
| | | | | | 10.99 | 2.29 | 12.50 | 2.12 | 1.57 | 29.46 |
| 90-40 | 373.6 | 376.6 | 3.0 | 3.26 | 1.04 | 1.03 | 1.97 | 0.90 | 0.007 | |
| | | | | | 12.03 | 1.74 | 9.97 | 1.67 | 1.10 | 26.50 |
| 90-43 | 541.5 | 544.5 | 3.0 | 3.04 | 0.37 | 0.44 | 0.89 | 0.30 | 0.003 | |
| | | | | | 4.28 | 0.74 | 4.50 | 0.56 | 0.47 | 10.55 |
| 90-44 | 329.5 | 332.8 | 3.3 | 4.25 | 1.61 | 2.52 | 4.85 | 1.55 | 0.026 | |
| | | | | | 18.62 | 4.25 | 24.54 | 2.88 | 4.07 | 54.36 |
| 89-36 | 257.4 | 260.4 | 3.0 | 3.12 | 0.39 | 0.36 | 0.75 | 0.39 | 0.003 | |
| | | | | | 4.51 | 0.61 | 3.80 | 0.72 | 0.47 | 10.11 |
| 89-22 | 107.7 | 112.9 | 5.2 | 3.78 | 1.62 | 2.25 | 4.59 | 1.58 | 0.021 | |
| | | | | | 18.74 | 3.80 | 23.23 | 2.93 | 3.29 | 51.98 |
| 90-45 | 301.6 | 309.7 | 8.1 | 3.26 | 0.34 | 1.48 | 2.95 | 0.82 | 0.007 | |
| | | | | | 3.93 | 2.50 | 14.93 | 1.52 | 1.10 | 23.97 |
| 89-37 | 202.7 | 205.7 | 3.0 | 2.97 | 0.23 | 0.71 | 2.05 | 0.48 | 0.009 | |
| | | | | | 2.66 | 1.20 | 10.37 | 0.89 | 1.41 | 16.53 |
| 88-31 | 73.2 | 76.2 | 3.0 | 3.38 | 0.32 | 1.54 | 2.96 | 0.83 | 0.025 | |
| | | | | | 3.70 | 2.60 | 14.98 | 1.54 | 3.92 | 26.73 |
| 89-35 | 362.0 | 365.0 | 3.0 | 3.18 | 0.69 | 1.19 | 2.31 | 0.88 | 0.013 | |
| | | | | | 7.98 | 2.01 | 11.69 | 1.63 | 2.04 | 25.35 |

# APPENDIX V

## 'B' SULPHIDE HORIZON

## TONS, GRADE AND NSR CALCULATION SUMMARY

MARG PROPERTY

'B' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR Cu | Pb | Zn | opt, $/ton NSR Ag | Au | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B30A | 88-30 | 234.7 | 239.6 | 4.9 | 5,500 | 26,950 | 3.41 | 101,301 | 0.57<br>6.59 | 0.96<br>1.62 | 1.84<br>9.31 | 0.81<br>1.50 | 0.010<br>1.57 | 20.59 |
| B21 | 88-21 | 182.4 | 187.5 | 5.1 | 3,688 | 18,809 | 4.20 | 87,078 | 1.50<br>17.35 | 2.32<br>3.91 | 4.84<br>24.49 | 1.97<br>3.66 | 0.031<br>4.86 | 54.26 |
| B20 | 88-20 | 226.7 | 229.2 | 2.5 | 4,271 | 10,678 | 3.35 | 39,429 | 0.93<br>10.76 | 1.77<br>2.99 | 3.23<br>16.34 | 1.41<br>2.62 | 0.014<br>2.19 | 34.90 |
| B2 | 88-2 | 18.9 | 25.1 | 6.2 | 625 | 3,875 | 2.99 | 12,772 | 0.26<br>3.01 | 5.77<br>9.73 | 0.02<br>0.10 | 9.30<br>17.26 | 0.050<br>7.83 | 37.93 |
| B3 | 88-3 | 28.4 | 29.4 | 1.0 | 1,542 | 1,542 | 4.25 | 7,224 | 5.41<br>62.57 | 3.05<br>5.14 | 6.42<br>32.49 | 2.97<br>5.51 | 0.010<br>1.57 | 107.28 |
| Total<br>Average | | | | 4.0<br>(m) | 15,626 | 61,853 | 3.63 | 247,803<br>(tons) | 1.08<br>12.48 | 1.88<br>3.16 | 3.16<br>15.97 | 1.81<br>3.37 | 0.020<br>3.14 | $ 38.12<br>ton |

MARG PROPERTY

'B' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 90-39 | 363.6 | 370.6 | 7.0 | 3.21 | 0.61<br>7.06 | 0.94<br>1.59 | 1.74<br>8.80 | 0.76<br>1.41 | 0.013<br>2.04 | 20.89 |
| 90-40 | 359.4 | 360.9 | 1.5 | 3.28 | 0.22<br>2.54 | 0.44<br>0.74 | 0.84<br>4.25 | 0.36<br>0.67 | 0.004<br>0.63 | 8.83 |
| 89-35 | 343.2 | 344.6 | 1.4 | 3.25 | 0.58<br>6.71 | 0.65<br>1.10 | 1.27<br>6.43 | 0.47<br>0.87 | 0.004<br>0.63 | 15.73 |
| 90-44 | 312.0 | 314.2 | 2.2 | 3.21 | 0.22<br>2.54 | 0.81<br>1.37 | 1.23<br>6.22 | 0.50<br>0.93 | 0.014<br>2.19 | 13.26 |
| 90-46 | 311.1 | 311.8 | 0.7 | 3.75 | 0.79<br>9.14 | 1.84<br>3.10 | 3.86<br>19.53 | 1.11<br>2.06 | 0.016<br>2.51 | 36.34 |
| 88-1 | 29.0 | 34.2 | 5.2 | 3.53 | 0.71<br>8.21 | 0.47<br>0.79 | 1.47<br>7.44 | 0.34<br>0.63 | 0.002<br>0.31 | 17.39 |
| 89-37 | 174.0 | 176.0 | 2.0 | 3.17 | 0.73<br>8.44 | 1.06<br>1.79 | 2.47<br>12.50 | 0.73<br>1.35 | 0.006<br>0.94 | 25.02 |
| 90-43 | 516.1 | 517.8 | 1.7 | 3.75 | 1.42<br>16.42 | 2.86<br>4.82 | 4.71<br>23.83 | 2.06<br>3.82 | 0.033<br>5.17 | 54.07 |
| 88-19 | 262.0 | 262.4 | 0.4 | 4.25 | 1.56<br>18.04 | 2.00<br>3.37 | 6.26<br>31.68 | 2.09<br>3.88 | 0.012<br>1.88 | 58.85 |
| 89-38 | 362.2 | 362.8 | 0.6 | 2.93 | 0.41<br>4.74 | 1.57<br>2.65 | 3.15<br>15.94 | 0.75<br>1.39 | 0.002<br>0.31 | 25.03 |

MARG PROPERTY

'B' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Cu | Pb | Zn | Ag | Au | |
| B30A | 88-30 | 234.7 | 239.6 | 4.9 | 5,500 | 26,950 | 3.41 | 101,301 | 0.57<br>6.59 | 0.96<br>1.62 | 1.84<br>9.31 | 0.81<br>1.50 | 0.010<br>1.57 | 20.59 |
| B21 | 88-21 | 182.4 | 187.5 | 5.1 | 3,688 | 18,809 | 4.20 | 87,078 | 1.50<br>17.35 | 2.32<br>3.91 | 4.84<br>24.49 | 1.97<br>3.66 | 0.031<br>4.86 | 54.26 |
| B2 | 88-2 | 18.9 | 25.1 | 6.2 | 625 | 3,875 | 2.99 | 12,772 | 0.26<br>3.01 | 5.77<br>9.73 | 0.02<br>0.10 | 9.30<br>17.26 | 0.050<br>7.83 | 37.93 |
| B3 | 88-3 | 26.4 | 29.4 | 3.0 | 1,542 | 4,626 | 3.28 | 16,726 | 2.08<br>24.06 | 1.15<br>1.94 | 2.38<br>12.04 | 1.20<br>2.23 | 0.006<br>0.94 | 41.21 |
| Total<br>Average | | | | 4.8<br>(m) | 11,355 | 54,260 | 3.64 | 217,876<br>(tons) | 1.04<br>12.02 | 1.80<br>3.04 | 2.97<br>15.05 | 1.80<br>3.34 | 0.020<br>3.20 | $ 36.65<br>ton |

MARG PROPERTY

'B' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 90-39 | 363.6 | 370.6 | 7.0 | 3.21 | 0.61 | 0.94 | 1.74 | 0.76 | 0.013 | |
| | | | | | 7.06 | 1.59 | 8.80 | 1.41 | 2.04 | 20.89 |
| 90-40 | 357.9 | 360.9 | 3.0 | 3.09 | 0.13 | 0.25 | 0.52 | 0.20 | 0.003 | |
| | | | | | 1.50 | 0.42 | 2.63 | 0.37 | 0.47 | 5.40 |
| 89-35 | 341.6 | 344.6 | 3.0 | 3.01 | 0.29 | 0.32 | 0.64 | 0.24 | 0.003 | |
| | | | | | 3.35 | 0.54 | 3.24 | 0.45 | 0.47 | 8.05 |
| 90-44 | 312.0 | 315.0 | 3.0 | 3.13 | 0.19 | 0.65 | 1.00 | 0.42 | 0.011 | |
| | | | | | 2.20 | 1.10 | 5.06 | 0.78 | 1.72 | 10.86 |
| 90-46 | 310.0 | 313.0 | 3.0 | 3.06 | 0.20 | 0.47 | 0.96 | 0.28 | 0.005 | |
| | | | | | 2.31 | 0.79 | 4.86 | 0.52 | 0.78 | 9.27 |
| 88-1 | 29.0 | 34.2 | 5.2 | 3.53 | 0.71 | 0.47 | 1.47 | 0.34 | 0.002 | |
| | | | | | 8.21 | 0.79 | 7.44 | 0.63 | 0.31 | 17.39 |
| 89-37 | 173.1 | 176.1 | 3.0 | 3.09 | 0.52 | 0.80 | 1.82 | 0.54 | 0.005 | |
| | | | | | 6.01 | 1.35 | 9.21 | 1.00 | 0.78 | 18.36 |
| 90-43 | 516.1 | 519.1 | 3.0 | 3.34 | 0.80 | 1.62 | 2.67 | 1.17 | 0.019 | |
| | | | | | 9.25 | 2.73 | 13.51 | 2.17 | 2.98 | 30.64 |
| 88-19 | 255.8 | 258.8 | 3.0 | 3.04 | 0.26 | 0.33 | 1.04 | 0.35 | 0.002 | |
| | | | | | 3.01 | 0.56 | 5.26 | 0.65 | 0.31 | 9.79 |
| 89-38 | 361.3 | 364.3 | 3.0 | 3.05 | 0.09 | 0.32 | 0.65 | 0.17 | 0.002 | |
| | | | | | 1.04 | 0.54 | 3.29 | 0.32 | 0.31 | 5.50 |

# APPENDIX VI

## 'C' SULPHIDE HORIZON

## TONS, GRADE AND NSR CALCULATION SUMMARY

MARG PROPERTY

'C' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Cu | Pb | Zn | Ag | Au | |
| C21 | 88-21 | 171.7 | 174.2 | 2.5 | 4,500 | 11,250 | 4.25 | 52,704 | 1.46 | 2.10 | 4.10 | 1.78 | 0.022 | |
| | | | | | | | | | 16.89 | 3.54 | 20.75 | 3.30 | 3.45 | 47.92 |
| C20 | 88-20 | 221.3 | 223.5 | 2.2 | 3,417 | 7,517 | 3.61 | 29,914 | 1.26 | 2.10 | 4.04 | 1.55 | 0.034 | |
| | | | | | | | | | 14.57 | 3.54 | 20.44 | 2.88 | 5.33 | 46.76 |
| C17 | 88-17 | 116.9 | 118.3 | 1.4 | 2,000 | 2,800 | 3.82 | 11,790 | 2.28 | 1.35 | 3.72 | 0.88 | 0.016 | |
| | | | | | | | | | 26.37 | 2.28 | 18.82 | 1.63 | 2.51 | 51.61 |
| C15 | 88-15 | 58.8 | 61.2 | 2.4 | 3,792 | 9,101 | 4.05 | 40,629 | 1.65 | 2.66 | 5.20 | 2.22 | 0.032 | |
| | | | | | | | | | 19.08 | 4.49 | 26.31 | 4.12 | 5.01 | 59.02 |
| C9 | 88-9 | 32.6 | 35.7 | 3.1 | 4,813 | 14,920 | 3.80 | 62,497 | 2.28 | 4.56 | 2.88 | 2.40 | 0.028 | |
| | | | | | | | | | 26.37 | 7.69 | 14.57 | 4.45 | 4.39 | 57.47 |
| C36 | 89-36 | 170.1 | 177.2 | 7.1 | 3,708 | 26,327 | 3.35 | 97,217 | 1.15 | 2.43 | 4.36 | 1.88 | 0.060 | |
| | | | | | | | | | 13.30 | 4.10 | 22.06 | 3.49 | 9.40 | 52.35 |
| C36A | 89-36 | 188.9 | 200.3 | 11.4 | 3,708 | 42,271 | 3.93 | 183,120 | 1.47 | 2.27 | 4.15 | 1.94 | 0.040 | |
| | | | | | | | | | 17.00 | 3.83 | 21.00 | 3.60 | 6.27 | 51.70 |
| Total | | | | 4.4 | 25,938 | 114,186 | 3.80 | 477,972 | 1.53 | 2.58 | 4.09 | 1.94 | 0.039 | |
| Average | | | | (m) | | | | (tons) | 17.72 | 4.36 | 20.71 | 3.61 | 6.09 | $ 52.48 / ton |

MARG PROPERTY

'C' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 89-35 | 334.9 | 336.0 | 1.1 | 3.00 | 2.15 | 1.51 | 3.15 | 1.28 | 0.014 | |
| | | | | | 24.87 | 2.55 | 15.94 | 2.37 | 2.19 | 47.92 |
| 88-30 | 229.7 | 231.4 | 1.7 | 4.25 | 0.89 | 1.45 | 2.74 | 1.19 | 0.017 | |
| | | | | | 10.29 | 2.45 | 13.87 | 2.21 | 2.66 | 31.48 |
| 88-20 | 221.3 | 223.5 | 2.2 | 3.61 | 1.26 | 2.10 | 4.04 | 1.55 | 0.034 | |
| | | | | | 14.57 | 3.54 | 20.44 | 2.88 | 5.33 | 46.76 |
| 88-25 | 208.9 | 209.7 | 0.8 | 4.20 | 0.94 | 1.75 | 3.36 | 1.24 | 0.014 | |
| | | | | | 10.87 | 2.95 | 17.00 | 2.30 | 2.19 | 35.32 |
| 89-44 | 234.1 | 236.1 | 2.0 | 3.55 | 0.29 | 1.79 | 2.57 | 2.23 | 0.067 | |
| | | | | | 3.35 | 3.02 | 13.00 | 4.14 | 10.49 | 34.01 |
| 88-6 | 120.6 | 121.2 | 0.6 | 3.08 | 0.16 | 0.92 | 1.28 | 0.69 | 0.008 | |
| | | | | | 1.85 | 1.55 | 6.48 | 1.28 | 1.25 | 12.41 |
| 90-46 | 288.8 | 291.8 | 3.0 | 2.93 | 0.67 | 0.82 | 1.89 | 0.57 | 0.004 | |
| | | | | | 7.75 | 1.38 | 9.56 | 1.06 | 0.63 | 20.38 |

MARG PROPERTY

'C' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR Cu | Pb | Zn | opt, $/ton NSR Ag | Au | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C21 | 88-21 | 171.2 | 174.2 | 3.0 | 4,500 | 13,500 | 4.01 | 59,673 | 1.23 | 1.77 | 3.46 | 1.51 | 0.019 | |
| | | | | | | | | | 14.23 | 2.99 | 17.51 | 2.80 | 2.98 | 40.50 |
| C17 | 88-17 | 115.3 | 118.3 | 3.0 | 2,000 | 6,000 | 3.28 | 21,693 | 1.23 | 0.85 | 2.16 | 0.54 | 0.014 | |
| | | | | | | | | | 14.23 | 1.43 | 10.93 | 1.00 | 2.19 | 29.79 |
| C15 | 88-15 | 58.2 | 61.2 | 3.0 | 3,792 | 11,376 | 3.80 | 47,651 | 1.32 | 2.13 | 4.18 | 1.78 | 0.026 | |
| | | | | | | | | | 15.27 | 3.59 | 21.15 | 3.30 | 4.07 | 47.39 |
| C9 | 88-9 | 32.6 | 35.7 | 3.1 | 4,813 | 14,920 | 3.80 | 62,497 | 2.28 | 4.56 | 2.88 | 2.40 | 0.028 | |
| | | | | | | | | | 26.37 | 7.69 | 14.57 | 4.45 | 4.39 | 57.47 |
| C36 | 89-36 | 170.1 | 177.2 | 7.1 | 3,708 | 26,327 | 3.35 | 97,217 | 1.15 | 2.43 | 4.36 | 1.88 | 0.060 | |
| | | | | | | | | | 13.30 | 4.10 | 22.06 | 3.49 | 9.40 | 52.35 |
| C36A | 89-36 | 188.9 | 200.3 | 11.4 | 3,708 | 42,271 | 3.93 | 183,120 | 1.47 | 2.27 | 4.15 | 1.94 | 0.040 | |
| | | | | | | | | | 17.00 | 3.83 | 21.00 | 3.60 | 6.27 | 51.70 |
| Total | | | | 5.1 | 22,521 | 114,394 | 3.74 | 471,852 | 1.45 | 2.46 | 3.85 | 1.85 | 0.037 | |
| Average | | | | (m) | | | | (tons) | 16.83 | 4.16 | 19.48 | 3.44 | 5.84 | $ 49.74 / ton |

MARG PROPERTY

'C' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 89-35 | 333.0 | 336.0 | 3.0 | 2.94 | 0.79 | 0.56 | 1.17 | 0.48 | 0.006 | |
| | | | | | 9.14 | 0.94 | 5.92 | 0.89 | 0.94 | 17.83 |
| 88-30 | 229.7 | 232.7 | 3.0 | 3.62 | 0.51 | 0.83 | 1.56 | 0.68 | 0.011 | |
| | | | | | 5.90 | 1.40 | 7.89 | 1.26 | 1.72 | 18.18 |
| 88-25 | 208.9 | 211.9 | 3.0 | 3.17 | 0.29 | 0.48 | 0.93 | 0.40 | 0.005 | |
| | | | | | 3.35 | 0.81 | 4.71 | 0.74 | 0.78 | 10.40 |
| 89-44 | 234.1 | 237.1 | 3.0 | 3.33 | 0.22 | 1.27 | 1.82 | 1.55 | 0.048 | |
| | | | | | 2.54 | 2.14 | 9.21 | 2.88 | 7.52 | 24.29 |
| 88-6 | 118.2 | 121.2 | 3.0 | 2.88 | 0.06 | 0.19 | 0.29 | 0.15 | 0.003 | |
| | | | | | 0.69 | 0.32 | 1.47 | 0.28 | 0.47 | 3.23 |
| 90-46 | 288.8 | 291.8 | 3.0 | 2.93 | 0.67 | 0.82 | 1.89 | 0.57 | 0.004 | |
| | | | | | 7.75 | 1.38 | 9.56 | 1.06 | 0.63 | 20.38 |

# APPENDIX VII

## 'D' SULPHIDE HORIZON

## TONS, GRADE AND NSR CALCULATION SUMMARY

MARG PROPERTY

'D' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR Cu | Pb | Zn | opt, $/ton NSR Ag | Au | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D30a | 88-30 | 188.6 | 192.2 | 3.6 | 4,375 | 15,750 | 4.20 | 72,917 | 1.05 | 2.85 | 5.21 | 1.70 | 0.027 | |
| | | | | | | | | | 12.14 | 4.81 | 26.36 | 3.15 | 4.23 | 50.70 |
| D21 | 88-21 | 156.6 | 164.8 | 8.2 | 3,438 | 28,192 | 4.22 | 131,139 | 1.31 | 1.31 | 2.70 | 1.14 | 0.016 | |
| | | | | | | | | | 15.15 | 2.21 | 13.66 | 2.12 | 2.51 | 35.65 |
| D28 | 88-28 | 156.9 | 158.8 | 1.9 | 2,417 | 4,592 | 3.69 | 18,679 | 2.26 | 2.95 | 5.62 | 2.42 | 0.024 | |
| | | | | | | | | | 26.14 | 4.98 | 28.44 | 4.49 | 3.76 | 67.80 |
| D23 | 88-23 | 209.2 | 215.1 | 5.9 | 3,854 | 22,739 | 4.25 | 106,525 | 1.91 | 3.07 | 6.49 | 2.20 | 0.028 | |
| | | | | | | | | | 22.09 | 5.18 | 32.84 | 4.08 | 4.39 | 68.58 |
| D20 | 88-20 | 187.2 | 189.3 | 2.1 | 3,146 | 6,607 | 3.40 | 24,760 | 1.74 | 1.87 | 3.97 | 1.91 | 0.034 | |
| | | | | | | | | | 20.13 | 3.15 | 20.09 | 3.54 | 5.33 | 52.24 |
| D25 | 88-25 | 181.5 | 187.5 | 6.0 | 3,344 | 20,064 | 3.74 | 82,716 | 1.98 | 1.22 | 3.40 | 1.47 | 0.023 | |
| | | | | | | | | | 22.90 | 2.06 | 17.20 | 2.73 | 3.60 | 48.49 |
| D13 | 88-13 | 65.9 | 68.5 | 2.6 | 3,313 | 8,614 | 3.40 | 32,283 | 1.33 | 0.98 | 1.93 | 0.88 | 0.002 | |
| | | | | | | | | | 15.38 | 1.65 | 9.77 | 1.63 | 0.31 | 28.75 |
| D12 | 88-12 | 65.0 | 68.7 | 3.7 | 1,875 | 6,938 | 4.00 | 30,589 | 3.14 | 4.84 | 9.21 | 3.18 | 0.053 | |
| | | | | | | | | | 36.32 | 8.16 | 46.60 | 5.90 | 8.30 | 105.29 |
| D33 | 88-33 | 222.5 | 227.2 | 4.7 | 5,354 | 25,164 | 3.82 | 105,959 | 1.57 | 2.19 | 4.29 | 1.36 | 0.016 | |
| | | | | | | | | | 18.16 | 3.69 | 21.71 | 2.52 | 2.51 | 48.59 |
| D19 | 88-19 | 203.7 | 214.9 | 11.2 | 5,906 | 66,147 | 4.12 | 300,406 | 2.55 | 2.71 | 6.26 | 1.86 | 0.022 | |
| | | | | | | | | | 29.49 | 4.57 | 31.68 | 3.45 | 3.45 | 72.64 |
| D11 | 88-11 | 82.2 | 87.8 | 5.6 | 4,812 | 26,947 | 4.18 | 124,162 | 2.24 | 3.05 | 5.87 | 1.16 | 0.027 | |
| | | | | | | | | | 25.91 | 5.14 | 29.70 | 2.15 | 4.23 | 67.14 |
| D10 | 88-10 | 62.7 | 68.6 | 5.9 | 4,688 | 27,659 | 4.25 | 129,577 | 2.92 | 3.33 | 5.93 | 1.81 | 0.048 | |
| | | | | | | | | | 33.77 | 5.62 | 30.01 | 3.36 | 7.52 | 80.27 |
| D18 | 88-18 | 114.3 | 120.7 | 6.4 | 3,271 | 20,934 | 3.48 | 80,304 | 1.20 | 1.21 | 2.79 | 0.72 | 0.010 | |
| | | | | | | | | | 13.88 | 2.04 | 14.12 | 1.34 | 1.57 | 32.94 |
| D17 | 88-17 | 108.0 | 111.9 | 3.9 | 2,167 | 8,451 | 3.93 | 36,611 | 2.15 | 2.98 | 6.14 | 1.80 | 0.024 | |
| | | | | | | | | | 24.87 | 5.03 | 31.07 | 3.34 | 3.76 | 68.06 |
| D16 | 88-16 | 104.0 | 114.9 | 10.9 | 1,979 | 21,571 | 3.73 | 88,691 | 2.54 | 2.48 | 5.31 | 1.76 | 0.022 | |
| | | | | | | | | | 29.38 | 4.18 | 26.87 | 3.27 | 3.45 | 67.14 |
| D5 | 88-5 | 64.1 | 74.8 | 10.7 | 1,688 | 18,062 | 4.25 | 84,615 | 3.32 | 3.68 | 6.59 | 2.08 | 0.030 | |
| | | | | | | | | | 38.40 | 6.21 | 33.35 | 3.86 | 4.70 | 86.51 |
| D4 | 88-4 | 65.2 | 68.3 | 3.1 | 2,104 | 6,522 | 3.10 | 22,288 | 0.14 | 6.18 | 0.02 | 2.82 | 0.027 | |
| | | | | | | | | | 1.62 | 10.42 | 0.10 | 5.21 | 4.23 | 21.59 |
| D15 | 88-15 | 39.5 | 41.2 | 1.7 | 2,438 | 4,145 | 4.07 | 18,594 | 3.35 | 2.52 | 4.64 | 2.36 | 0.033 | |
| | | | | | | | | | 38.75 | 4.25 | 23.48 | 4.38 | 5.17 | 76.02 |
| Total | | | | 5.6 | 60,169 | 339,097 | 3.99 | 1,490,817 | 2.13 | 2.59 | 5.13 | 1.67 | 0.025 | |
| Average | | | | (m) | | | | (tons) | 24.64 | 4.38 | 25.97 | 3.10 | 3.91 | $ 61.99 / ton |

MARG PROPERTY

'D' SULPHIDE HORIZON

UNDILUTED DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 90-42 | 397.9 | 398.8 | 0.9 | 3.78 | 1.72 | 1.48 | 2.94 | 1.56 | 0.029 | |
| | | | | | 19.89 | 2.50 | 14.88 | 2.89 | 4.54 | 44.70 |
| 90-39 | 349.9 | 354.1 | 4.2 | 3.64 | 0.99 | 1.49 | 2.64 | 1.08 | 0.013 | |
| | | | | | 11.45 | 2.51 | 13.36 | 2.00 | 2.04 | 31.36 |
| 90-41 | 407.2 | 408.7 | 1.5 | 3.00 | 0.35 | 0.30 | 0.61 | 0.15 | 0.004 | |
| | | | | | 4.05 | 0.51 | 3.09 | 0.28 | 0.63 | 8.55 |
| 90-40 | 327.5 | 330.0 | 2.5 | 3.87 | 2.13 | 2.27 | 3.61 | 1.57 | 0.041 | |
| | | | | | 24.64 | 3.83 | 18.27 | 2.91 | 6.42 | 56.07 |
| 89-35 | 292.5 | 297.2 | 4.7 | 4.10 | 1.46 | 3.74 | 5.12 | 1.34 | 0.035 | |
| | | | | | 16.89 | 6.31 | 25.91 | 2.49 | 5.48 | 57.07 |
| 89-34 | 320.2 | 322.5 | 2.3 | 4.25 | 1.77 | 3.00 | 5.50 | 1.86 | 0.018 | |
| | | | | | 20.47 | 5.06 | 27.83 | 3.45 | 2.82 | 59.63 |
| 90-43 | 389.8 | 391.7 | 1.9 | 3.25 | 0.85 | 0.79 | 1.58 | 0.73 | 0.010 | |
| | | | | | 9.83 | 1.33 | 8.00 | 1.35 | 1.57 | 22.08 |
| 89-38 | 235.5 | 237.7 | 2.2 | 3.10 | 0.92 | 0.02 | 0.04 | 0.08 | 0.003 | |
| | | | | | 10.64 | 0.03 | 0.20 | 0.15 | 0.47 | 11.50 |
| 89-36 | 139.5 | 141.4 | 1.9 | 4.25 | 1.45 | 3.65 | 4.67 | 2.60 | 0.056 | |
| | | | | | 16.77 | 6.16 | 23.63 | 4.82 | 8.77 | 60.15 |
| 90-45 | 111.1 | 115.6 | 4.5 | 3.41 | 1.79 | 0.42 | 1.19 | 0.37 | 0.005 | |
| | | | | | 20.70 | 0.71 | 6.02 | 0.69 | 0.78 | 28.90 |
| 90-46 | 154.9 | 156.5 | 1.6 | 4.25 | 3.00 | 2.74 | 7.18 | 2.05 | 0.022 | |
| | | | | | 34.70 | 4.62 | 36.33 | 3.80 | 3.45 | 82.90 |

MARG PROPERTY

'D' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL INDICATED MINERAL RESERVE BLOCKS

| Block | Drill Hole | From (m) | To (m) | Thickness (m) | Area (m2) | Volume (m3) | Specific Gravity | Tons | %, $/ton NSR Cu | Pb | Zn | opt, $/ton NSR Ag | Au | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D30A | 88-30 | 188.6 | 192.2 | 3.6 | 4,375 | 15,750 | 4.20 | 72,917 | 1.05 | 2.85 | 5.21 | 1.70 | 0.027 | |
| | | | | | | | | | 12.14 | 4.81 | 26.36 | 3.15 | 4.23 | 50.70 |
| D21 | 88-21 | 156.6 | 164.8 | 8.2 | 3,438 | 28,192 | 4.22 | 131,139 | 1.31 | 1.31 | 2.70 | 1.14 | 0.016 | |
| | | | | | | | | | 15.15 | 2.21 | 13.66 | 2.12 | 2.51 | 35.65 |
| D28 | 88-28 | 156.9 | 159.9 | 3.0 | 2,417 | 7,251 | 3.36 | 26,856 | 1.45 | 1.90 | 3.63 | 1.58 | 0.016 | |
| | | | | | | | | | 16.77 | 3.20 | 18.37 | 2.93 | 2.51 | 43.78 |
| D23 | 88-23 | 209.2 | 215.1 | 5.9 | 3,854 | 22,739 | 4.25 | 106,525 | 1.91 | 3.07 | 6.49 | 2.20 | 0.028 | |
| | | | | | | | | | 22.09 | 5.18 | 32.84 | 4.08 | 4.39 | 68.58 |
| D20 | 88-20 | 187.2 | 190.2 | 3.0 | 3,146 | 9,438 | 3.36 | 34,956 | 1.24 | 1.33 | 2.83 | 1.38 | 0.025 | |
| | | | | | | | | | 14.34 | 2.24 | 14.32 | 2.56 | 3.92 | 37.38 |
| D25 | 88-25 | 181.5 | 187.5 | 6.0 | 3,344 | 20,064 | 3.74 | 82,716 | 1.98 | 1.22 | 3.40 | 1.47 | 0.023 | |
| | | | | | | | | | 22.90 | 2.06 | 17.20 | 2.73 | 3.60 | 48.49 |
| D13 | 88-13 | 65.5 | 68.5 | 3.0 | 3,313 | 9,939 | 3.32 | 36,373 | 1.16 | 0.85 | 1.69 | 0.77 | 0.002 | |
| | | | | | | | | | 13.42 | 1.43 | 8.55 | 1.43 | 0.31 | 25.14 |
| D12 | 88-12 | 65.0 | 68.7 | 3.7 | 1,875 | 6,938 | 4.00 | 30,589 | 3.14 | 4.84 | 9.21 | 3.18 | 0.053 | |
| | | | | | | | | | 36.32 | 8.16 | 46.60 | 5.90 | 8.30 | 105.29 |
| D33 | 88-33 | 222.5 | 227.2 | 4.7 | 5,354 | 25,164 | 3.82 | 105,959 | 1.57 | 2.19 | 4.29 | 1.36 | 0.016 | |
| | | | | | | | | | 18.16 | 3.69 | 21.71 | 2.52 | 2.51 | 48.59 |
| D19 | 88-19 | 203.7 | 214.9 | 11.2 | 5,906 | 66,147 | 4.12 | 300,406 | 2.55 | 2.71 | 6.26 | 1.86 | 0.022 | |
| | | | | | | | | | 29.49 | 4.57 | 31.68 | 3.45 | 3.45 | 72.64 |
| D11 | 88-11 | 82.2 | 87.8 | 5.6 | 4,812 | 26,947 | 4.18 | 124,162 | 2.24 | 3.05 | 5.87 | 1.16 | 0.027 | |
| | | | | | | | | | 25.91 | 5.14 | 29.70 | 2.15 | 4.23 | 67.14 |
| D10 | 88-10 | 62.7 | 68.6 | 5.9 | 4,688 | 27,659 | 4.25 | 129,577 | 2.92 | 3.33 | 5.93 | 1.81 | 0.048 | |
| | | | | | | | | | 33.77 | 5.62 | 30.01 | 3.36 | 7.52 | 80.27 |
| D18 | 88-18 | 114.3 | 120.7 | 6.4 | 3,271 | 20,934 | 3.48 | 80,304 | 1.20 | 1.21 | 2.79 | 0.72 | 0.010 | |
| | | | | | | | | | 13.88 | 2.04 | 14.12 | 1.34 | 1.57 | 32.94 |
| D17 | 88-17 | 108.0 | 111.9 | 3.9 | 2,167 | 8,451 | 3.93 | 36,611 | 2.15 | 2.98 | 6.14 | 1.80 | 0.024 | |
| | | | | | | | | | 24.87 | 5.03 | 31.07 | 3.34 | 3.76 | 68.06 |
| D16 | 88-16 | 104.0 | 114.9 | 10.9 | 1,979 | 21,571 | 3.73 | 88,691 | 2.54 | 2.48 | 5.31 | 1.76 | 0.022 | |
| | | | | | | | | | 29.38 | 4.18 | 26.87 | 3.27 | 3.45 | 67.14 |
| D5 | 88-5 | 64.1 | 74.8 | 10.7 | 1,688 | 18,062 | 4.25 | 84,615 | 3.32 | 3.68 | 6.59 | 2.08 | 0.030 | |
| | | | | | | | | | 38.40 | 6.21 | 33.35 | 3.86 | 4.70 | 86.51 |
| D4 | 88-4 | 65.2 | 68.3 | 3.1 | 2,104 | 6,522 | 3.10 | 22,288 | 0.14 | 6.18 | 0.02 | 2.81 | 0.027 | |
| | | | | | | | | | 1.62 | 10.42 | 0.10 | 5.21 | 4.23 | 21.59 |
| D15 | 88-15 | 38.2 | 41.2 | 3.0 | 2,438 | 7,324 | 3.52 | 28,379 | 2.05 | 1.61 | 2.78 | 1.43 | 0.020 | |
| | | | | | | | | | 23.71 | 2.72 | 14.07 | 2.65 | 3.13 | 46.28 |
| Total | | | | 5.8 | 60,169 | 349,082 | 3.96 | 1,523,064 | 2.08 | 2.54 | 5.01 | 1.63 | 0.024 | |
| Average | | | | (m) | | | | (tons) | 24.05 | 4.28 | 25.37 | 3.03 | 3.82 | $ 60.55 / ton |

MARG PROPERTY

'D' SULPHIDE HORIZON

DILUTED (+3.0 m) DRILL HOLE SUMMARY

NOVEMBER, 1990

DRILL HOLE INTERCEPTS

| Drill Hole | From (m) | To (m) | Thickness (m) | Specific Gravity | %, $/ton NSR | | | opt, $/ton NSR | | Total NSR $/ton |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Cu | Pb | Zn | Ag | Au | |
| 90-42 | 396.5 | 399.5 | 3.0 | 3.24 | 0.56 | 0.64 | 2.18 | 0.61 | 0.012 | |
| | | | | | 6.48 | 1.08 | 11.03 | 1.13 | 1.88 | 21.60 |
| 90-39 | 349.9 | 354.1 | 4.2 | 3.64 | 0.99 | 1.49 | 2.64 | 1.08 | 0.013 | |
| | | | | | 11.45 | 2.51 | 13.36 | 2.00 | 2.04 | 31.36 |
| 90-41 | 405.7 | 408.7 | 3.0 | 2.90 | 0.24 | 0.20 | 0.40 | 0.12 | 0.003 | |
| | | | | | 2.78 | 0.34 | 2.02 | 0.22 | 0.47 | 5.83 |
| 90-40 | 327.5 | 330.5 | 3.0 | 3.81 | 1.79 | 1.90 | 3.04 | 1.32 | 0.036 | |
| | | | | | 20.70 | 3.20 | 15.38 | 2.45 | 5.64 | 47.38 |
| 89-35 | 292.5 | 297.2 | 4.7 | 4.10 | 1.46 | 3.74 | 5.12 | 1.34 | 0.035 | |
| | | | | | 16.89 | 6.31 | 25.91 | 2.49 | 5.48 | 57.07 |
| 89-34 | 320.2 | 323.2 | 3.0 | 4.07 | 1.42 | 2.34 | 4.30 | 1.47 | 0.014 | |
| | | | | | 16.42 | 3.95 | 21.76 | 2.73 | 2.19 | 47.05 |
| 90-43 | 388.7 | 391.7 | 3.0 | 3.09 | 0.54 | 0.50 | 1.00 | 0.46 | 0.006 | |
| | | | | | 6.25 | 0.84 | 5.06 | 0.85 | 0.94 | 13.94 |
| 89-38 | 234.7 | 237.7 | 3.0 | 3.14 | 0.70 | 0.02 | 0.04 | 0.07 | 0.003 | |
| | | | | | 8.10 | 0.03 | 0.20 | 0.13 | 0.47 | 8.93 |
| 89-36 | 139.5 | 142.5 | 3.0 | 3.79 | 0.94 | 2.33 | 2.99 | 1.67 | 0.040 | |
| | | | | | 10.87 | 3.93 | 15.13 | 3.10 | 6.27 | 39.30 |
| 90-45 | 111.1 | 115.6 | 4.5 | 3.41 | 1.79 | 0.42 | 1.19 | 0.37 | 0.005 | |
| | | | | | 20.70 | 0.71 | 6.02 | 0.69 | 0.78 | 28.90 |
| 90-46 | 154.3 | 157.3 | 3.0 | 3.57 | 1.73 | 1.48 | 3.90 | 1.12 | 0.013 | |
| | | | | | 20.01 | 2.50 | 19.73 | 2.08 | 2.04 | 46.36 |

092915

# APPENDIX D

## WATER QUALITY INVESTIGATIONS OF THE MARG CLAIMS

## JUNE, 1990 AND AUGUST, 1990

BY J.E. GIBSON

# WATER QUALITY INVESTIGATION
# OF
# THE MARG CLAIMS

JUNE 1990

Prepared for

ARCHER,CATHRO & ASSOCIATES(1981)LIMITED

Prepared by

J.E. GIBSON

August 1990

TABLE OF CONTENTS


| | Page |
|---|---|
| Table of Contents | i |
| List of Figures | iii |
| List of Tables | iv |
| 1.0 Introduction | 1 |
| 2.0 Study Area | 1 |
| 2.1 Area Description | 3 |
| 2.2 Watershed Measurements | 3 |
| 2.3 Sample Stations | 4 |
| 3.0 Methods | 7 |
| 4.0 Field Measurements | 8 |
| 5.0 Results | 8 |
| 5.1 Field Measurements | 8 |
| 5.2 Chemical Analysis | 12 |
| 5.2.1 Alkalinity | 12 |
| 5.2.2 pH | 12 |
| 5.2.3 Conductivity | 17 |
| 5.2.4 Suspended Solids | 17 |
| 5.2.5 Aluminum | 17 |
| 5.2.6 Antimony | 17 |
| 5.2.7 Arsenic | 17 |
| 5.2.8 Barium | 17 |
| 5.2.9 Beryllium | 18 |
| 5.2.10 Boron | 18 |
| 5.2.11 Cadmium | 18 |
| 5.2.12 Calcium | 18 |
| 5.2.13 Chromium | 19 |
| 5.2.14 Cobalt | 19 |
| 5.2.15 Copper | 19 |
| 5.2.16 Iron | 19 |
| 5.2.17 Lead | 20 |
| 5.2.18 Magnesium | 20 |
| 5.2.19 Manganese | 20 |
| 5.2.20 Mercury | 20 |
| 5.2.21 Molybdenum | 20 |
| 5.2.22 Nickel | 21 |
| 5.2.23 Phosphorus | 21 |
| 5.2.24 Potassium | 21 |
| 5.2.25 Selenium | 21 |
| 5.2.26 Silicon | 21 |
| 5.2.27 Silver | 21 |
| 5.2.28 Sodium | 21 |
| 5.2.29 Strontium | 22 |
| 5.2.30 Thorium | 22 |
| 5.2.31 Titanium | 22 |
| 5.2.32 Uranium | 22 |
| 5.2.33 Vanadium | 22 |
| 5.2.34 Zinc | 22 |
| 5.2.35 Zirconium | 23 |
| 5.2.36 Turbidity | 23 |
| 5.2.37 Total Solids | 23 |
| 5.2.38 Nitrite | 23 |

5.2.39 Nitrate 23
5.2.40 Sulfate 24
5.2.41 Total Phosphate 24
5.2.42 Ammonia 24
5.2.43 Total Cyanide 24
5.2.44 Hardness 24

6.0 Summary 24

7.0 Recommendations 25

References

Appendix 1

# LIST OF FIGURES


| | Page |
|---|---|
| Figure 1. Location of the Marg Property. | 2 |
| Figure 2. Sample station locations. | 6 |

# LIST OF TABLES

Page

Table 1. Field measurements of pH, conductivity and water temperature. Marg Claims. June 26,1990 9

Table 2. Creek discharge values. Marg Claims. June 26,1990 10

Table 3. Design flood values for streams at the Marg Claims. 11

Table 4. Water quality data for Marg Claims. 13

## 1.0 INTRODUCTION

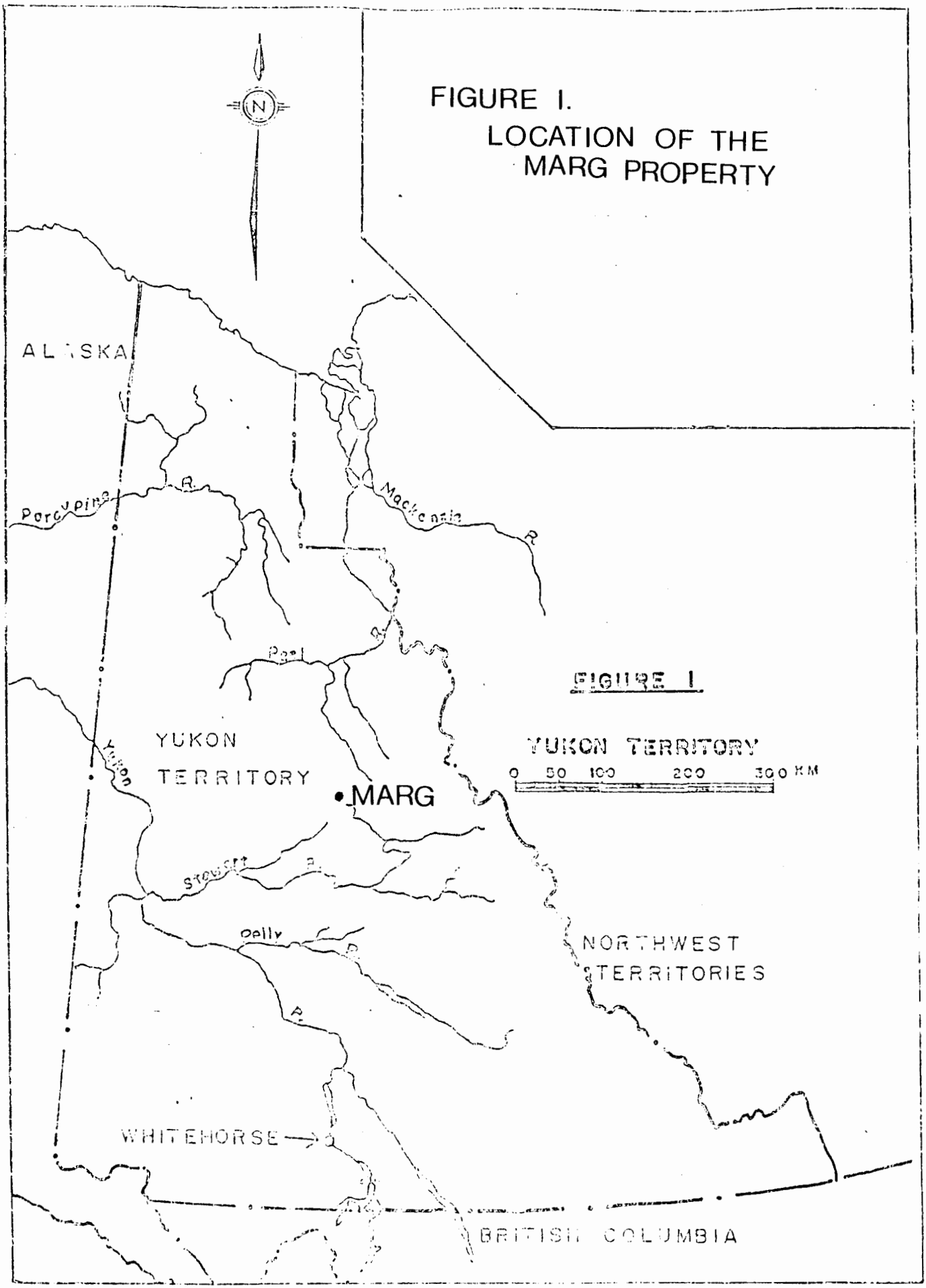
John Gibson was contracted by Archer Cathro & Associates (1981) Limited to conduct a water quality survey of the streams and rivers in the area of the Marg mineral property. The survey was conducted on June 25,1990.

The purpose of the survey was to continue a baseline water quality survey of the lead and zinc deposit. Previous water quality data had been collected in September,1988 and July,1989 by Norecol Environmental Consultants Ltd.

## 2.0 Study Area

The Marg mineral property is located in the Patterson Range of mountains 45 air kilometers east north east of Keno City,Yukon at Latitude 64 01' ,Longitude 134 28' (Figure 1).

All surface waters around the property are tributaries to the Keno Ladue River which is a tributary to the Stewart River approximately 18 air kilometers to the south east. The mineralized zone is drained on the north side by Marg,Cansup and Copp creeks which enter Lasha Creek prior to the Keno Ladue River. On the south side the zone is drained by two unnamed tributaries to the Keno Ladue River which have been


FIGURE I.
LOCATION OF THE
MARG PROPERTY
N
ALASKA
Porcupine R.
Mackenzie R.
Peel
YUKON
TERRITORY
MARG
Stewart R.
Pelly R.
NORTHWEST
TERRITORIES
WHITEHORSE
BRITISH COLUMBIA
FIGURE 1
YUKON TERRITORY
0 50 100 200 300 KM

designated KLT-1 and KLT-2(Figure 2).

## 2.1 Area Description

The Fattersom Mountain range in the study area runs south west to north east and are generally steep sloped above 4000 Ft elevation. The maximum elevation in the area is 6340 Ft with the Keno Ladue River at 2000 Ft elevation.

Area vegetation above 4000 ft elevation is generally balsam fir and black spruce upper growth with dwarf birch,alder and sphagnum moss under growth. Below 4000 ft elevation black and white spruce dominate with similar under growth. North facing slopes appear to be well drained given the lack of consistent soil layers and underlying talus.South facing slopes at higher elevations are drained similar to the north facing slopes but at lower elevations below the slope toe have thick soil layers, heavier vegetation cover and poor drainage. The Keno Ladue River valley is characterized as a low gradient,older stream channel with continuous meanders,oxbows and high silty clay stream banks.

## 2.2 Watershed Measurements

Watershed measurements have been calculated for tributary creeks draining the mineralized zone.

1. Copp Creek above CO2

   Channel length- 5.84 km

   Channel slope- 11.5 %

   Watershed area- 11.9 sq.km

2. KLT-1 above sample station

Channel length- 3.37 km

Channel slope- 17.6 %

Watershed area- 6.23 sq.km

3. KLT-2 above sample station

Channel length- 2.54 km

Channel slope- 23.0 %

Watershed area- 3.83 sq.km

4. Lasha Creek above L-1

Channel length- 16.38 km

Channel slope - 3.3 %

Watershed area- 53.9 sq.km

Estimated peak flows for 2,5,10,20,50 and 100 year return periods along with the mean annual flood values for each station are listed in Table 3. The values were calculated using equations outlined in Design Flood Estimating Guidelines for the Yukon Territory .

## 2.3 Sample Stations

The mineralized zone is located at the north east end of this section

of the Patterson Range at approximately 4500 ft elevation.The ore body appears to be situated in a saddle between two peaks. Diamond drilling is underway on the south facing slope to determine the extent of the ore reserves. Stations are located to sample all creek flows that drain the known ore body on both the north and south sides (Figure 2).

Stations are also located downstream on Lasha Creek and the Keno Ladue River to determine downstream effect should the property be developed further . One station is located on the Keno Ladue River upstream of any likely development that will serve as a water quality background. A total of nine stations were sampled on June 26,1990. Seven of the stations were established in 1988 by Norecol. Two addition stations were added during this survey.Station locations and descriptions are:

CO-2. Copp Creek at the mouth.This creek intercepts Marg and Cansup creek flows which drain the north face of the mineral zone. Sample station is located 10 meters upstream of the mouth.

M-1. Marg Creek at approximately 4000 ft elevation.

CA-1. Cansup Creek upstream of a gossan on the right bank.

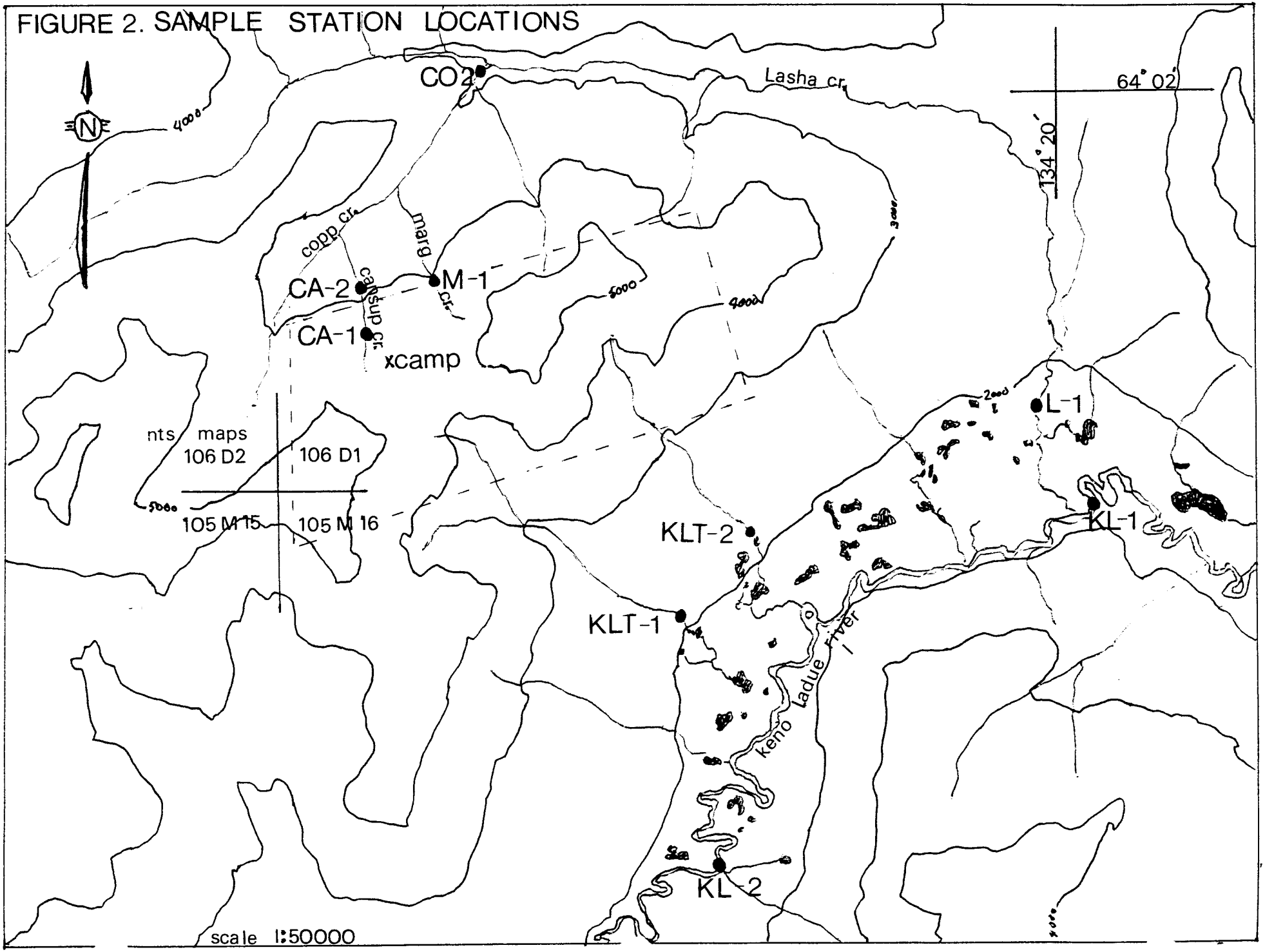
CA-2. Cansup Creek downstream of the gossan. This station is located approximately 100 meters upstream of a drill water sump.The station was established in July,1989 to determine the ground water influence of the gossan.

L-1. Lasha Creek approximately 1000 meters upstream of the mouth.

KL-1. Keno Ladue River downstream of Lasha Creek.This is the downstream station in the study area.

KLT-2. Tributary to Keno Ladue River draining the south face of the mineral zone.Station is at the toe of the mountain slope.

KLT-1. Tributary to Keno Ladue River draining the south face of the mineral zone just upstream of KLT-2.Station is at the toe of


FIGURE 2. SAMPLE STATION LOCATIONS
CO2
Lasha cr.
64° 02'
134° 20'
N
4000
copp cr.
marg cr.
CA-2
M-1
CA-1
campsup cr.
xcamp
5000
4000
3000
2000
L-1
nts maps
106 D2
106 D1
105 M 15
105 M 16
KLT-2
KL-1
KLT-1
keno
Ladue river
KL-2
scale 1:50000

the mountain slope just uphill of a new beaver dam.

KL-2. Keno Ladue River approximately 1 km upstream of KLT-1. This is the upstream station of the study area which will provide background water quality in the Keno Ladue River should the area be developed.

All sample stations are marked with numerous pieces of red flagging tape. Stations CA-1 and CA-2 were sampled on foot from the Marg campsite. All other stations were accessed by helicopter.

## 3.0 METHODS

Water quality samples were taken at each station using acid washed Nalgene sample bottles supplied by Quanta Trace Laboratories of Vancouver.A 1 liter sample was taken for total cyanide analysis. This bottle came supplied with the NaOH preservative. A 1 liter sample was taken for"ion" analysis (ammonia,sulfate,nitrate,nitrite and total phosphorus). This bottle was filled completely , sealed tightly and kept as close to 4 degrees Celsius as field conditions allowed. Another 1 liter bottle was taken for "routine" analysis (lab pH,alkalinity,turbidity,lab conductivity,total solids,suspended solids and hardness). One 100 ml sample was taken for each total and dissolved metals. The sample for dissolved metals was first filtered using a Nalgene hand vacuum pump with 45 micron filters. Both metal samples were then preserved with 0.5 ml of $HNO_3$.

Except for the cyanide sample bottle,all bottles were rinsed three times with sample water prior to filling. In the case of the dissolved metals sample the rinse was done with filtered water.Filled bottles were then capped and marked with sample station and required analysis.

The information above was recorded in a field note book along with date,time,field measurement results and general observations. Photographs of each station were also taken but didn't turn out.

## 4.0 FIELD MEASUREMENTS

Field measurements for pH, conductivity, water temperature along with streamflow volume were taken at each sample station. Conductivity was taken using a Hanna Instruments DiST 3 ATC meter,pH using a Hanna Instruments pHep meter and temperature using a standard water thermometer registering in degrees Celsius.The above measurements are listed by station in Table 1. Stream flow volume was measured using a Price velocity meter and cross sectional area calculations.Stream flow by station is listed in Table 2.

Field measurements were also taken of the gossan on Cansup Creek between stations CA-1 and CA-2. Two small spring flows totaling 3 liters per second estimated volume were noted within the gossan. A third spring 10 meters upstream of the gossan was also measured for comparison as it was unoxidized. The third spring has a estimated flow of less than 1 liter per second. Conductivity and pH measurements are listed in Table 1.

## 5.0 Results

### 5.1 Field Measurements.

Field measurements results for pH, conductivity and temperature are listed in Table 1. With the exception of pH at stations KLT-1 and M-1,

TABLE 1. FIELD MEASUREMENTS OF pH, CONDUCTIVITY AND WATER TEMPERATURE. MARG CLAIMS--JUNE 26, 1990

| STATION | pH(R.U.) | COND (us/cm) | TEMP (Celsius) |
|---|---|---|---|
| CO-2 | 7.8 | 130 | 3.5 |
| KL-1 | 7.8 | 180 | 9.0 |
| KLT-1 | 8.3 | 250 | 3.5 |
| CA-2 | 7.9 | 70 | 4.0 |
| CA-1 | 7.9 | 90 | 5.0 |
| M-1 | 8.1 | 42 | 2.0 |
| KLT-2 | 8.2 | 280 | 3.0 |
| KL-2 | 7.8 | 160 | 8.0 |
| L-1 | 8.0 | 155 | 6.0 |
| GOSSAN SPRING | 7.9 | 30 | |
| SPRING-U/S GOSSAN | 8.1 | 40 | |

TABLE 2. CREEK DISCHARGE VOLUMES...MARG CLAIMS.
JUNE 26,1990

| STATION | TIME | DISCHARGE FLOWS | | |
|---|---|---|---|---|
| | | CMS | CFS | IGPM |
| CD-2 | 0930 | 0.353 | 12.50 | 4662 |
| KLT-1 | 1125 | 0.059 | 2.08 | 780 |
| CA-2 | 1310 | 0.028 | 0.97 | 363 |
| M-1 | 1440 | 0.012 | 0.42 | 158 |
| KLT-2 | 1600 | 0.007 | 0.24 | 91 |
| L-1 | 1705 | 0.755 | 26.70 | 9972 |
| KL-1 | 1110 | TOO DEEP TO WADE | | |
| KL-2 | 1630 | TOO DEEP TO WADE | | |

TABLE 3.DESIGN FLOOD VALUES FOR STREAMS AT THE MARG CLAIMS.

| STATION | VALUES FOR RETURN PERIODS IN CUBIC METRES PER SECOND | | | | | | |
|---|---|---|---|---|---|---|---|
| | MEAN ANNUAL | 1:2 YR | 1:5 YR | 1:10 YR | 1:20 YR | 1:50 YR | 1:100 YR |
| CO-2 | 1.41 | 1.02 | 1.99 | 0.82 | 3.77 | 5.19 | 6.42 |
| KLT-1 | 0.74 | 0.53 | 1.06 | 1.49 | 1.99 | 2.75 | 3.40 |
| KLT-2 | 0.45 | 0.33 | 0.64 | 0.90 | 1.20 | 1.66 | 2.05 |
| L-1 | 5.01 | 4.25 | 6.80 | 8.70 | 10.66 | 13.39 | 15.54 |

all measurements are consistent with follow up laboratory measurements.Field measurements results for stream flow are listed in Table 2.

5.2 Chemical Analysis.

Chemical analysis for all samples was done by Quanta Trace Laboratories Inc. of Vancouver. Water quality results are presented in Table 4. Analytical results for water samples taken by Norecol in September,1988 and July,1989 are attached as Appendix 1. Unless otherwise stated, analysis results from the three samplings too date are consistent. All discussion is based on extractable analysis results.

5.2.1 Alkalinity

Alkalinity is a measure of surface water's ability to neutralize acid. In aquatic systems, alkalinity usually results from the geology and geochemistry of the rocks and soils in the area. The best waters for aquatic life are those with a pH value between 7 and 8 and with a total alkalinity of 100 mg/l as $CaCO_3$ or more (Environment Canada,1976). The alkalinity serves as a buffer preventing sudden pH changes. Alkalinity results range from a high of 149 mg/l as $CaCO_3$ at KLT-2 to a low of 17 mg/l at M-1. All stations with the exception of KLT-2 have an alkalinity of less than 60 mg/l, and are therefore classed as "soft" water. The low alkalinity results indicated a reduced buffer capacity against pH changes. With the exception of KLT-1, the three sample events have consistent results.

5.2.2 pH

pH values range from a high of 8.4 at KLT-2 to a low of 7.4 at M-1.

Table 4. Water Quality Data for Marg Claims.

| Samole type | | Water | Water | Water | Water | Water |
|---|---|---|---|---|---|---|
| Identification | | CA-1 | CA-1 | CA-2 | CA-2 | CO-2 |
| Trace Metals Method used | | Dissolved | Extractable | Dissolved | Extractable | Dissolved |
| Aluminum | Al | 0.084 | 0.126 | 0.113 | 0.123 | 0.098 |
| Antimony | Sb | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Arsenic | As | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Barium | Ba | 0.049 | 0.051 | 0.056 | 0.057 | 0.035 |
| Beryllium | Be | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Boron | B | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Cadmium | Cd | < 0.0003 | < 0.0003 | 0.0006 | 0.0006 | < 0.0003 |
| Calcium | Ca | 17.0 | 17.3 | 13.5 | 13.5 | 20.9 |
| Chromium | Cr | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Cobalt | Co | < 0.001 | < 0.001 | 0.002 | 0.002 | < 0.001 |
| Copper | Cu | 0.001 | < 0.001 | 0.034 | 0.035 | 0.005 |
| Iron | Fe | 0.039 | 0.058 | 0.216 | 0.258 | 0.023 |
| Lead | Pb | < 0.004 | < 0.004 | < 0.004 | 0.005 | < 0.004 |
| Magnesium | Mg | 2.98 | 3.05 | 2.82 | 2.86 | 5.12 |
| anganese | Mn | 0.013 | 0.016 | 0.014 | 0.014 | 0.004 |
| Mercury | Hg | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Molybdenum | Mo | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 |
| Nickel | Ni | < 0.001 | 0.001 | 0.001 | 0.002 | 0.003 |
| Phosphorus | P | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Potassium | K | 0.19 | 0.20 | 0.20 | 0.20 | 0.17 |
| Selenium | Se | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Silicon | Si | 1.8 | 1.8 | 2.2 | 2.2 | 2.0 |
| Silver | Ag | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Sodium | Na | 0.28 | 0.29 | 0.34 | 0.36 | 0.27 |
| Strontium | Sr | 0.057 | 0.059 | 0.048 | 0.048 | 0.067 |
| Thorium | Th | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Titanium | Ti | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Uranium | U | < 0.02 | 0.02 | < 0.02 | 0.02 | < 0.02 |
| Vanadium | V | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Zinc | Zn | 0.014 | 0.017 | 0.135 | 0.138 | 0.029 |
| Zirconium | Zr | < 0.001 | < 0.001 | 0.002 | < 0.001 | < 0.001 |
| Conductivity | uS/cm | 102. | - | 82. | - | 132. |
| Turbidity | FTU | < 5. | - | < 5. | - | < 5. |
| Total Solids | | 89. | - | 71. | - | 114. |
| Suspended Solids | | < 5. | - | < 5. | - | < 5. |
| oH | | 7.8 | - | 7.5 | - | 7.7 |
| Bicarbonate | CaCO3 | 42. | - | 27. | - | 38. |
| Nitrite | NO2-N | < 0.1 | - | < 0.5 | - | < 0.5 |
| Nitrate | NO3-N | 0.07 | - | 0.06 | - | 0.10 |
| Fate | SO4 | 11.5 | - | 12.5 | - | 36.5 |
| nosphate | PO4-P | 0.008 | - | < 0.005 | - | < 0.005 |
| Ammonia | NH3-N | < 0.05 | - | < 0.05 | - | < 0.05 |
| Total Cyanide | CN | < 0.005 | - | < 0.005 | - | < 0.005 |
| Hardness as | CaCO3 | 54.7 | 55.8 | 45.4 | 45.5 | 73.6 |
| Results in | | mg/l | mg/l | mg/l | mg/l | mg/l |

Table 4 (cont). Water Quality Data for Marg Claims.

| Samole tvoe / Identification | | Water CO-2 | Water KL-1 | Water KL-1 | Water KL-2 | Water KL-2 |
|---|---|---|---|---|---|---|
| Trace Metals Method used | | Extractable | Dissolved | Extractable | Dissolved | Extractable |
| Aluminum | Al | 0.111 | 0.152 | 0.202 | 0.128 | 0.199 |
| Antimony | Sb | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Arsenic | As | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Barium | Ba | 0.037 | 0.053 | 0.058 | 0.054 | 0.058 |
| Beryllium | Be | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Boron | B | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Cadmium | Cd | < 0.0003 | < 0.0003 | < 0.0003 | < 0.0003 | < 0.0003 |
| Calcium | Ca | 20.9 | 27.6 | 27.9 | 26.9 | 27.0 |
| Chromium | Cr | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Cobalt | Co | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 |
| Copper | Cu | 0.003 | 0.007 | 0.007 | 0.002 | 0.002 |
| Iron | Fe | 0.066 | 0.126 | 0.318 | 0.107 | 0.302 |
| Lead | Pb | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 |
| Magnesium | Mg | 5.18 | 7.29 | 7.29 | 7.04 | 7.05 |
| Manganese | Mn | 0.004 | 0.022 | 0.032 | 0.017 | 0.028 |
| Mercury | Hg | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Molybdenum | Mo | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 |
| Nickel | Ni | 0.004 | 0.005 | 0.005 | 0.005 | 0.005 |
| Phosphorus | P | < 0.02 | 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Potassium | K | 0.19 | 0.58 | 0.51 | 0.54 | 0.55 |
| Selenium | Se | 0.01 | < 0.01 | 0.01 | 0.01 | < 0.01 |
| Silicon | Si | 2.1 | 3.0 | 3.1 | 3.2 | 3.2 |
| Silver | Ag | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Sodium | Na | 0.27 | 0.97 | 0.99 | 1.04 | 1.07 |
| Strontium | Sr | 0.067 | 0.085 | 0.084 | 0.086 | 0.086 |
| Thorium | Th | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Titanium | Ti | < 0.001 | < 0.001 | 0.002 | < 0.001 | 0.002 |
| Uranium | U | < 0.02 | 0.02 | 0.02 | 0.02 | < 0.02 |
| Vanadium | V | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Zinc | Zn | 0.031 | 0.007 | 0.009 | 0.006 | 0.006 |
| Zirconium | Zr | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Conductivity | uS/cm | - | 176. | - | 174. | - |
| Turbidity | FTU | - | < 5. | - | 9. | - |
| Total Solids | | - | 152. | - | 182. | - |
| Suspended Solids | | - | 6. | - | 10. | - |
| pH | | - | 7.8 | - | 7.8 | - |
| Bicarbonate | CaCO3 | - | 50. | - | 53. | - |
| Nitrite | NO2-N | - | < 0.5 | - | < 0.5 | - |
| Nitrate | NO3-N | - | 0.07 | - | 0.09 | - |
| Sulfate | SO4 | - | 51.3 | - | 51.1 | - |
| Phosphate | PO4-P | - | < 0.005 | - | 0.006 | - |
| Ammonia | NH3-N | - | < 0.05 | - | < 0.05 | - |
| Total Cyanide | CN | - | < 0.005 | - | < 0.005 | - |
| Hardness as | CaCO3 | 73.6 | 98.9 | 98.9 | 96.2 | 96.4 |
| Results in | | mg/l | mg/l | mg/l | mg/l | mg/l |

Table 4 (cont). Water Quality Data for Marg Claims.

| Sample type | | Water | Water | Water | Water | Water |
|---|---|---|---|---|---|---|
| Identification | | KLT-1 | KLT-1 | KLT-2 | KLT-2 | L-1 |
| Trace Metals Method used | | Dissolved | Extractable | Dissolved | Extractable | Dissolved |
| Aluminum | Al | 0.133 | 0.134 | 0.135 | 0.180 | 0.113 |
| Antimony | Sb | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Arsenic | As | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Barium | Ba | 0.031 | 0.031 | 0.065 | 0.070 | 0.044 |
| Beryllium | Be | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Boron | B | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Cadmium | Cd | < 0.0003 | < 0.0003 | < 0.0003 | < 0.0003 | 0.0006 |
| Calcium | Ca | 39.4 | 39.6 | 49.5 | 49.8 | 25.0 |
| Chromium | Cr | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Cobalt | Co | 0.001 | 0.002 | 0.002 | 0.003 | 0.001 |
| Copper | Cu | 0.001 | < 0.001 | < 0.001 | < 0.001 | 0.002 |
| Iron | Fe | 0.010 | 0.017 | < 0.05 | 0.097 | 0.043 |
| Lead | Pb | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 |
| Magnesium | Mg | 11.0 | 11.1 | 14.3 | 14.3 | 7.20 |
| Manganese | Mn | < 0.001 | < 0.001 | < 0.001 | 0.005 | 0.006 |
| Mercury | Hg | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Molybdenum | Mo | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 |
| Nickel | Ni | 0.001 | 0.001 | 0.002 | 0.002 | 0.005 |
| Phosphorus | P | 0.02 | < 0.02 | 0.02 | 0.02 | < 0.02 |
| Potassium | K | 0.23 | 0.23 | 0.30 | 0.29 | 0.18 |
| Selenium | Se | 0.01 | < 0.01 | 0.01 | 0.01 | < 0.01 |
| Silicon | Si | 2.3 | 2.4 | 2.9 | 2.9 | 2.1 |
| Silver | Ag | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Sodium | Na | 0.18 | 0.19 | 0.36 | 0.39 | 0.24 |
| Strontium | Sr | 0.140 | 0.142 | 0.132 | 0.131 | 0.079 |
| Thorium | Th | < 0.02 | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Titanium | Ti | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Uranium | U | < 0.02 | 0.02 | < 0.02 | 0.02 | 0.02 |
| Vanadium | V | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Zinc | Zn | 0.001 | 0.003 | 0.001 | < 0.001 | 0.033 |
| Zirconium | Zr | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Conductivity | uS/cm | 257. | - | 332. | - | 173. |
| Turbidity | FTU | < 5. | - | < 5. | - | < 5. |
| Total Solids | | 187. | - | 149. | - | 53. |
| Suspended Solids | | < 5. | - | < 5. | - | < 5. |
| pH | | 7.7 | - | 8.4 | - | 8.0 |
| Bicarbonate | CaCO3 | 44. | - | 149. | - | 46. |
| Nitrite | NO2-N | < 0.5 | - | < 0.5 | - | < 0.5 |
| Nitrate | NO3-N | 0.16 | - | 0.45 | - | 0.08 |
| Sulfate | SO4 | 56.2 | - | 52.2 | - | 48.2 |
| Total Phosphate | PO4-P | < 0.005 | - | < 0.005 | - | < 0.005 |
| Ammonia | NH3-N | < 0.05 | - | < 0.05 | - | < 0.05 |
| Total Cyanide | CN | < 0.005 | - | < 0.005 | - | < 0.005 |
| Hardness as | CaCO3 | 144. | 145. | 182. | 184. | 92.0 |
| Results in | | mg/l | mg/l | mg/l | mg/l | mg/l |

Table 4 (cont). Water Quality Data for Marg Claims.

| Sample type | | Water | Water | Water |
|---|---|---|---|---|
| Identification | | L-1 | M-1 | M-1 |
| **Trace Metals** | | | | |
| Method used | | Extractable | Dissolved | Extractable |
| Aluminum | Al | 0.145 | 0.048 | 0.054 |
| Antimony | Sb | < 0.05 | < 0.05 | < 0.05 |
| Arsenic | As | < 0.05 | < 0.05 | < 0.05 |
| Barium | Ba | 0.045 | 0.044 | 0.045 |
| Beryllium | Be | < 0.0005 | < 0.0005 | < 0.0005 |
| Boron | B | < 0.1 | < 0.1 | < 0.1 |
| Cadmium | Cd | < 0.0003 | < 0.0003 | < 0.0003 |
| Calcium | Ca | 25.0 | 8.74 | 8.84 |
| Chromium | Cr | < 0.001 | < 0.001 | < 0.001 |
| Cobalt | Co | 0.001 | < 0.001 | < 0.001 |
| Copper | Cu | 0.005 | < 0.001 | < 0.001 |
| Iron | Fe | 0.079 | 0.009 | 0.021 |
| Lead | Pb | < 0.004 | < 0.004 | < 0.004 |
| Magnesium | Mg | 7.21 | 1.96 | 1.98 |
| Manganese | Mn | 0.009 | 0.001 | 0.001 |
| Mercury | Hg | < 0.1 | < 0.1 | < 0.1 |
| Molybdenum | Mo | < 0.005 | < 0.005 | < 0.005 |
| Nickel | Ni | 0.005 | < 0.001 | < 0.001 |
| Phosphorus | P | < 0.02 | 0.02 | < 0.02 |
| Potassium | K | 0.19 | 0.14 | 0.13 |
| Selenium | Se | < 0.01 | < 0.01 | < 0.01 |
| Silicon | Si | 2.2 | 2.6 | 2.5 |
| Silver | Ag | < 0.001 | < 0.001 | < 0.001 |
| Sodium | Na | 0.24 | 0.17 | 0.16 |
| Strontium | Sr | 0.078 | 0.024 | 0.025 |
| Thorium | Th | < 0.02 | < 0.02 | < 0.02 |
| Titanium | Ti | < 0.001 | < 0.001 | < 0.001 |
| Uranium | U | 0.03 | < 0.02 | < 0.02 |
| Vanadium | V | < 0.0005 | < 0.0005 | < 0.0005 |
| Zinc | Zn | 0.036 | 0.005 | 0.005 |
| Zirconium | Zr | < 0.001 | < 0.001 | < 0.001 |
| Conductivity | uS/cm | - | 59. | - |
| Turbidity | FTU | - | < 5. | - |
| Total Solids | mg/l | - | 157. | - |
| Suspended Solids | | - | < 5. | - |
| pH | | - | 7.4 | - |
| Bicarbonate | CaCO3 | - | 17. | - |
| Nitrite | NO2-N | - | < 0.5 | - |
| Nitrate | NO3-N | - | 0.08 | - |
| Sulfate | SO4 | - | 12.3 | - |
| T. Phosphate | PO4-P | - | < 0.005 | - |
| Ammonia | NH3-N | - | < 0.05 | - |
| Total Cyanide | CN | - | < 0.005 | - |
| Hardness as | CaCO3 | 92.0 | 29.9 | 30.0 |
| Results in | | mg/l | mg/l | mg/l |

These results are consistent with previous measurements.

5.2.3 Conductivity

Conductivity ranges from a high of 332 us/cm at KLT-2 to a low of 59 us/cm at M-1.Results are consistent through the three sample events and show a higher conductivity value in surface waters to the south of the deposit than in waters draining the north side of the deposit.

5.2.4 Suspended Solids

Suspended solids range from a high of 6 and 10 mg/l at KL-1 and KL-2 respectively to a low of < 5 mg/l at all other stations.

5.2.5 Aluminum

Aluminosilicate minerals are abundant in most geologic materials and readily mobilize from soil and sediments by natural weathering. In the study area, weathering of the country rock (quartzite and phyllite) are likely the source of aluminum. Results range from a high of 0.202 mg/l at KL-1 to a low of 0.054 mg/l at M-1.

5.2.6 Antimony

Antimony levels at all stations are below the detection limit of 0.05 mg/l.

5.2.7 Arsenic

Arsenic levels at all stations are below the detection limit of 0.05 mg/l.

5.2.8 Barium

Barium compounds are used in drilling muds and in the processing of diesel fuels. Although a common element in the earth's crust, it is

usually not found in concentrations above 1.0 mg/l. The concentrations of sulfate and carbonate ions limit the levels of barium in water by causing it to precipitate. Barium concentrations range from a high of 0.07 mg/l at KLT-2 to a low of 0.037 mg/l at CD-2. Previous sample results from July 23, 1989 are slightly higher with stations KL-2 and CA-2 having concentrations of 0.10 mg/l.

5.2.9 Beryllium

Concentrations of Beryllium were below the detection limit of 0.0005 mg/l at all stations.

5.2.10 Boron

Boron concentration in surface waters average 0.1 mg/l (NAQUADAT,1985). Levels in the study area are below the detection limit of 0.1 mg/l at all stations.

5.2.11 Cadmium

Cadmium levels are below detection limits (0.0003 mg/l) at all stations except CA-2. CA-2 levels are 0.0006 mg/l which is slightly high given the soft (hardness of 45.4 mg/l as $CaCO_3$) water in Cansup Creek. Norecol results for July 23, 1989 confirm this result with a concentration of 0.0009 mg/l.

5.2.12 Calcium

Calcium is one of the more abundant cations in surface and ground waters. It is readily soluble in water and enters the environment through weathering of rocks, especially limestone. Concentrations of calcium in surface waters reflects the proximity of calcium rich geologic formations. Calcium levels range from a high of 49.8 mg/l at KLT-2 to a low of 8.84 mg/l at M-1. Calcium levels are higher in

surface waters draining the south side of the deposit.

5.2.13 Chromium

Chromium levels at all stations were below the detection limit of 0.001 mg/l.

5.2.14 Cobalt

Cobalt concentrations in surface waters is generally low (< 0.001 mg/l). Levels in the study area range from a high of 0.003 mg/l at KLT-2 to a low of < 0.001 mg/l at M-1 and CA-1.

5.2.15 Copper

Copper is a common metallic element in the earth's crust. Concentrations range from a high of 0.035 mg/l at CA-2 to a low of < 0.001 mg/l at CA-1,KLT-1 and KLT-2. A majority of the copper is in dissolved form. Levels at CA-2 likely originate from the gossan between the two Cansup Creek stations. Norecol results for July 23, 1989 show a similar increase in copper downstream of the gossan with a high of 0.07 mg/l at CA-2. A smaller portion of this is in dissolved form.

5.2.16 Iron

Iron is the fourth most abundant element in the earth's crust. It is released into the environment from weathering of sulfide ores(pyrites,FeS2). Levels in surface waters are usually less than 0.05 mg/l. In the study area levels range from a high of 0.318 mg/l at KL-1 to a low of 0.017 mg/l at KLT-1. Station CA-2 also has elevated iron levels (0.258 mg/l). Norecol sample results for July 23, 1989 show increased iron levels at KL-1 and CA-2, twice those recorded this sampling, 0.70 mg/l and 0.56 mg/l respectively. These

levels exceed the guidelines for freshwater (<0.002 mg/l) with a soft or medium hardness (CCREM). The iron may be weathered by ground water from the pyrites, sphalerite and chalcopyrite associated with the mineralized zone given the high percentage of iron in a dissolved form at CA-2 and to a lesser degree at KL-1. Iron is also present upstream of the study area at KL-2 in concentrations of 0.302 mg/l (0.107 mg/l dissolved).

5.2.17 Lead

Lead is at or below detection limits of 0.004 mg/l at all stations.

5.2.18 Magnesium

Magnesium is a common constituent of natural waters and levels in the study area are low for Canadian surface waters (NAQUADAT,1985). Levels range from a high of 14.2 mg/l at KLT-2 to a low of 1.98 mg/l at M-1. Levels are higher in surface water draining the south side of the mineralized zone.

5.2.19 Manganese

Concentrations of manganese in surface water are generally less than 0.2 mg/l. Levels range from a high of 0.032 mg/l at KL-1 to a low of < 0.001 mg/l at KLT-1.

5.2.20 Mercury

Mercury levels at all stations are below the detection limit of 0.1 mg/l.

5.2.21 Molybdenum

Molybdenum levels are below detection limits of 0.005 mg/l at all stations.

5.2.22 Nickel

Nickel concentrations in Canadian surface waters are generally < 0.001 to 0.003 mg/l (NAQUADAT,1985). Levels at all stations were low with a high of 0.005 mg/l at KL-1,KL-2 and L-1 and a low of <0.001 at M-1.

5.2.23 Phosphorus

Phosphorus levels are at or below the detection limit of 0.002 mg/l at all stations.

5.2.24 Potassium

Potassium levels are low,ranging from 0.55 mg/l at KL-2 to 0.13 mg/l at M-1.

5.2.25 Selenium

Selenium concentrations are at or below detection limits of 0.01 mg/l at all stations.

5.2.26 Silicon

Silicon is the second most abundant element in the earth's crust. The major sources of silicon in water are feldspars,micas and clay minerals. Surface water concentrations generally range from 0.3 to 25.4 mg/l. Levels in the study area are low,ranging from a high of 2.5 mg/l at M-1 to a low of 1.9 mg/l at CA-1.

5.2.27 Silver

Silver was not detected at any of the sample stations.

5.2.28 Sodium

Sodium is the sixth most abundant element in the earth's crust. Water

in contact with igneous rocks provides a natural source of sodium,although weathering of salt deposits is the major source. Sodium levels in Canadian surface waters vary greatly,ranging from below 0.01 mg/l to more than 1000 mg/l (NAQUADAT,1985). Concentrations in the study area range from a high of 1.07 mg/l at KL-2 to a low of 0.16 mg/l at M-1.

5.2.29 Strontium

Strontium is fairly soluble in water and levels in the study area range from a high of 0.142 mg/l at KLT-1 to a low of 0.025 mg/l at M-1

5.2.30 Thorium

Thorium concentrations at all stations were below the detection limit of 0.02 mg/l.

5.2.31 Titanium

Titanium levels at all stations are near or below the detection limit of 0.001 mg/l.

5.2.32 Uranium

Uranium levels at all stations are near or below the detection limit of 0.02 mg/l with a high of 0.03 mg/l at L-1.

5.2.33 Vanadium

Vanadium levels at all stations are below the detection limit of 0.0005 mg/l.

5.2.34 Zinc

Zinc is usually present in surface waters in trace amounts of <0.05

mg/l. Levels in the study area range from a high of 0.138 mg/l at CA-2 to a low of <0.001 mg/l at KLT-2. As reported by Norecol in their letter of September 13,1989, the levels at CA-2 are almost a magnitude higher than recommended for protection of aquatic life. As levels upstream at CA-1 are low (0.017 mg/l) and the majority of the zinc at CA-2 is dissolved (0.135 of 0.138 mg/l), it appears the zinc originates in ground water springs surfacing at the gossan,likely from a chalcopyrite source.

5.2.35 Zirconium

Zirconium concentrations are near or below the detection limit of 0.001 mg/l at all stations.

5.2.36 Turbidity

Turbidity values are low at all stations with the exception of KL-2 which has a value of 9 FTU.

5.2.37 Total Solids

Total dissolved solids range from a high of 187 mg/l at KLT-1 to a low of 53 mg/l at L-1.



in contact with igneous rocks provides a natural source of sodium,although weathering of salt deposits is the major source. Sodium levels in Canadian surface waters vary greatly,ranging from below 0.01 mg/l to more than 1000 mg/l (NAQUADAT,1985). Concentrations in the study area range from a high of 1.07 mg/l at KL-2 to a low of 0.16 mg/l at H-1.

5.2.29 Strontium

Strontium is fairly soluble in water and levels in the study area

5.2.40 Sulfate

Sulfate concentrations in Canadian surface waters range from below detection limits to several hundred milligrams per liter (NAQUADAT,1985).Levels ranged from a high of 56.2 mg/l at KLT-1 to a low of 11.5 mg/l at CA-1.

5.2.41 Total Phosphate

Total Phosphate levels are low, ranging from a high of 0.008 mg/l at CA-1 to below detection limits at most stations.

5.2.42 Ammonia

Ammonia was not detected at any station.

5.2.43 Total Cyanide

Total cyanide was not detected at any station.

5.2.44 Hardness

Hardness is an important modifying factor for influencing the form and toxicity of some heavy metals. Surface waters draining the north side of the deposit have hardness classifications of soft to moderately soft. Surface waters draining the south side have classifications of moderately soft to hard.

6.0 Summary

A number of anomalies are apparent from the water quality data:

1. Surface waters draining the south side of the deposit have consistently higher values for conductivity,calcium and hardness than

waters draining the north side of the deposit.

2. Cansup Creek at station CA-2 has consistently higher values for copper,iron, and zinc than the upstream Cansup station CA-1. As a majority of the metals are in dissolved form, the source is likely ground water dissolution of the major associated minerals of pyrrite, sphalerite, chalcopyrite and galena. The elevated levels of zinc and iron at CA-2 exceed the recommended concentrations for protection of aquatic life as established by the Canadian Council of Resource and Environment Ministers,1987. It should be noted that iron levels are also elevated at stations KL-1 and KL-2.

3. Magnesium levels are higher in waters draining the south side of the deposit. Levels are not above those normally found in Canadian surface waters.

4. Surface waters in the study area generally have low alkalinity and hardness values. Alkalinity and hardness are important in buffering against sudden pH changes, neutralizing acid and modifying the toxicity of some heavy metals to aquatic life.The streams draining the area have a limited buffering buffering capacity and acid neutralizing potential should acid mine drainage occur.

## 7.0 Recommendations

The three sample events to date provide a generally consistent view of water quality for surface waters draining the Marg deposit. Anomalies and possible areas of concern should development proceed have been identified. Further sampling at low flow conditions would provide a

more complete picture of seasonal variations in overall water quality and specifically in the anomalies.

If development is to proceed,more water quality data would be necessary for areas of site specific development ( millsite,tailings stockpiles, tailing impoundments and minesite).

Stations such as M-1,L-1 and CA-1 should have their sample intervals changed to annually, as no anomalies are apparent at these sites. Analysis for a number of parameters that have concentrations below the detection limits could also be discontinued.

Prior to development, a survey of benthic and fish populations should be done. Changes in both populations can then be monitored during and after development to assess impacts.

# REFERENCES


Canadian Council of Resource and Environment Ministers ( CCREM ) 1987. **Canadian Water Quality Guidelines**. Task Force of Water Quality Guidelines.

Environment Canada. 1976. **Pollution Sampling Handbook**. Fisheries and marine Services and Environment Protection Service, Laboratory Services. Vancouver, British Columbia.

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NAQUADAT. 1976. **National Water Quality Data Bank**. Water Quality Branch,Inland Waters Directorate, Environment Canada, Ottawa.

NAQUADAT. 1985. **National Water Quality Data Bank**. Water Quality Branch, Inland Waters Directorate, Environment Canada, Ottawa.

# APPENDIX 1

Norecol
Environmental
Consultants Ltd.

Suite 700
1090 West Pender Street
Vancouver, B.C.
Canada V6E 2N7
Telephone: (604) 682-2291
Fax: (604) 682-8323

September 13, 1989
File: 1-081-04.01

Archer, Cathro & Associates (1981) Ltd.
P.O. Box 4127
3125 Third Avenue
Whitehorse, Yukon
Y1A 3S9

**Attention: Mr. Doug Eaton**

Dear Mr. Eaton;

**RE: WATER QUALITY RESULTS FOR THE MARG PROPERTY - JULY 1989**

The accompanying tables list water quality results for our July trip to the Marg property; Figure 1 shows sample locations.

The July 1989 water quality appeared similar to the September 1988 quality for most streams sampled both times. However, at site CA-1, the concentrations of iron, manganese, and zinc were substantially higher in July than in September. All of the manganese and zinc and most of the iron were present as dissolved metals which implies a significant groundwater contribution. The groundwater input is even more apparent downstream of site CA-1, as described below.

Two additional samples were collected in 1989: CA-2 and KL-1 (Figure 1).

CA-2 is on Cansup Creek below CA-1. It receives groundwater input from a gossan, and iron staining was apparent on the stream bed. Metals levels in general were higher at this site than CA-1. The zinc concentration was particularly elevated, being almost an order of magnitude higher than the Canadian Council of Resource and Environment Ministers guideline (0.03 mg/L) for the protection of aquatic life. Physical parameters (pH, alkalinity, hardness, conductance, solids), as expected, were similar at the two sites. These results tend to confirm the hypothesis that the 1988 sample was unrepresentative.

Norecol



KL-1 is on Ladue River. The concentration of suspended solids was higher at this site than at the other sample sites on the property. Total concentrations of aluminum and iron also were somewhat higher, probably because of their presence in the suspended material.

I trust this information meets your immediate requirements. These data will be added to the water quality data base and will form an important part of the water quality assessment for the property when an environmental evaluation is required for mine permits.

If you have any questions about this report, please give me a call.

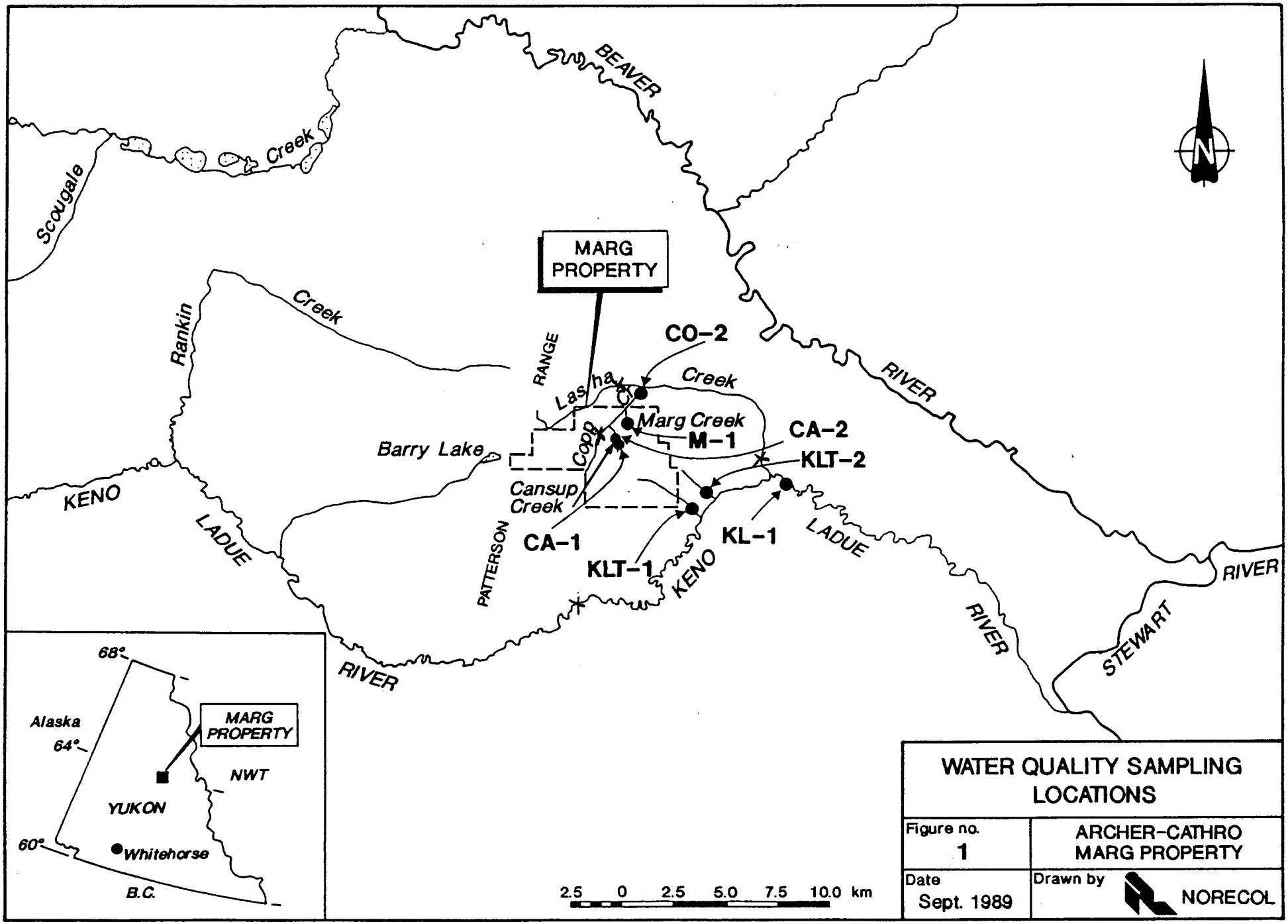
Yours truly,

**NORECOL ENVIRONMENTAL CONSULTANTS LTD.**

Bruce S. Ott, Ph.D.
Project Manager

BSO/sip

Enclosure


BEAVER
Creek
Scougale
MARG PROPERTY
Rankin
Creek
RANGE
CO-2
Las
Creek
Marg Creek
CA-2
M-1
KLT-2
Barry Lake
Copp
Cansup Creek
KENO
LADUE
PATTERSON
CA-1
KLT-1
KL-1
KENO
LADUE
RIVER
RIVER
RIVER
STEWART
N
68°
Alaska
64°
MARG PROPERTY
NWT
YUKON
60°
Whitehorse
B.C.
2.5 0 2.5 5.0 7.5 10.0 km
WATER QUALITY SAMPLING LOCATIONS
Figure no. 1
ARCHER-CATHRO MARG PROPERTY
Date Sept. 1989
Drawn by NORECOL

**ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY**
**SITE: CA-1**

| ANALYTICAL PARAMETER | SEPT.15/88 | JULY 23/89 |
|---|---|---|
| pH | 7.8 | 7.5 |
| Alkalinity (mg $CaCO_3$/L) | 55 | 46 |
| Turbidity (NTU) | 0.4 | 0.7 |
| Conductance (µmhos/cm) | 114 | 93 |
| Total Solids (mg/L) | 86 | 66 |
| Suspended Solids (mg/L) | <1 | 1 |
| EDTA-Hardness (mg $CaCO_3$/L) | 71 | 55 |
| Sulfate (mg/L) | 14 | 11 |
| Ammonia (mg N/L) | <0.005 | <0.005 |
| Nitrate (mg N/L) | <0.005 | 0.017 |
| Nitrite (mg N/L) | <0.002 | <0.002 |
| Total Phosphorus (mg P/L) | 0.005 | 0.006 |
| Total Cyanide (mg/L) | <0.001 | <0.001 |
| **TOTAL EXTRACTABLE METALS:(mg/L)** | | |
| Ag | <0.0002 | 0.0003 |
| Al | <0.01 | 0.026 |
| As | <0.001 | <0.001 |
| Ba | 0.042 | 0.09 |
| Cd | <0.0002 | 0.0002 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | <0.0005 | 0.0019 |
| Fe | 0.006 | 0.12 |
| Total Hg (µg/L) | <0.05 | <0.05 |
| Mn | <0.001 | 0.04 |
| Mo | <0.005 | <0.005 |
| Ni | <0.002 | <0.002 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | |
| Zn | 0.0006 | 0.015 |
| **DISSOLVED METALS: (mg/L)** | | |
| Ag | <0.0002 | <0.0001 |
| Al | <0.01 | 0.011 |
| As | <0.001 | <0.001 |
| Ba | 0.034 | 0.08 |
| Cd | <0.0002 | <0.0002 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | <0.0005 | 0.0018 |
| Fe | 0.006 | 0.07 |
| Mn | <0.001 | 0.04 |
| Mo | <0.005 | <0.005 |
| Ni | <0.002 | <0.002 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | <0.001 |
| Zn | 0.0006 | 0.015 |

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: CA-2

| ANALYTICAL PARAMETER | JULY 23/89 |
|---|---|
| pH | 7.4 |
| Alkalinity (mg $CaCO_3$/L) | 33 |
| Turbidity (NTU) | 0.8 |
| Conductance (µmhos/cm) | 84 |
| Total Solids (mg/L) | 65 |
| Suspended Solids (mg/L) | 2 |
| EDTA-Hardness (mg $CaCO_3$/L) | 46 |
| Sulfate (mg/L) | 16 |
| Ammonia (mg N/L) | <0.005 |
| Nitrate (mg N/L) | 0.024 |
| Nitrite (mg N/L) | <0.002 |
| Total Phosphorus (mg P/L) | 0.003 |
| Total Cyanide (mg/L) | <0.001 |
| **TOTAL EXTRACTABLE METALS: (mg/L)** | |
| Ag | 0.0002 |
| Al | 0.09 |
| As | 0.001 |
| Ba | 0.10 |
| Cd | 0.0009 |
| Co | 0.001 |
| Cr | <0.001 |
| Cu | 0.07 |
| Fe | 0.56 |
| Total Hg (µg/L) | <0.05 |
| Mn | 0.04 |
| Mo | <0.005 |
| Ni | <0.002 |
| Pb | 0.008 |
| Sb | <0.002 |
| Se | <0.001 |
| Zn | 0.24 |
| **DISSOLVED METALS: (mg/L)** | |
| Ag | <0.0001 |
| Al | 0.05 |
| As | <0.001 |
| Ba | 0.09 |
| Cd | 0.0006 |
| Co | <0.001 |
| Cr | <0.001 |
| Cu | 0.032 |
| Fe | 0.28 |
| Mn | 0.04 |
| Mo | <0.005 |
| Ni | <0.002 |
| Pb | 0.003 |
| Sb | <0.002 |
| Se | <0.001 |
| Zn | 0.22 |

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: CO-2

| ANALYTICAL PARAMETER | SEPT.15/88 | JULY 23/89 |
|---|---|---|
| pH | 7.4 | 7.6 |
| Alkalinity (mg $CaCO_3$/L) | 43 | 52 |
| Turbidity (NTU) | 0.4 | 0.2 |
| Conductance (µmhos/cm) | 143 | 157 |
| Total Solids (mg/L) | 124 | 123 |
| Suspended Solids (mg/L) | <1 | <1 |
| EDTA-Hardness (mg $CaCO_3$/L) | 88 | 91 |
| Sulfate (mg/L) | 41 | 40 |
| Ammonia (mg N/L) | <0.005 | <0.005 |
| Nitrate (mg N/L) | 0.039 | 0.055 |
| Nitrite (mg N/L) | <0.002Q | <0.002 |
| Total Phosphorus (mg P/L) | 0.008 | <0.003 |
| Total Cyanide (mg/L) | <0.001 | <0.001 |
| **TOTAL EXTRACTABLE METALS: (mg/L)** | | |
| Ag | <0.0002 | 0.0001 |
| Al | 0.017 | 0.014 |
| As | <0.001 | <0.001 |
| Ba | 0.027 | 0.06 |
| Cd | 0.0003 | 0.0003 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | 0.0019 | 0.0017 |
| Fe | 0.037 | 0.042 |
| Total Hg (µg/L) | <0.05 | <0.05 |
| Mn | 0.0089 | 0.0061 |
| Mo | <0.005 | <0.005 |
| Ni | 0.003 | 0.003 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | <0.001 |
| Zn | 0.015 | 0.016 |
| **DISSOLVED METALS: (mg/L)** | | |
| Ag | <0.0002 | <0.0001 |
| Al | 0.013 | 0.011 |
| As | <0.001 | <0.001 |
| Ba | 0.024 | 0.06 |
| Cd | <0.0002 | <0.0002 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | 0.0015 | 0.0006 |
| Fe | 0.027 | 0.028 |
| Mn | 0.0087 | 0.0055 |
| Mo | <0.005 | <0.005 |
| Ni | 0.003 | 0.003 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | <0.001 |
| Zn | 0.015 | 0.016 |

ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY
SITE: KL-1

| ANALYTICAL PARAMETER | JULY 23/89 |
|---|---|
| pH | 7.9 |
| Alkalinity (mg $CaCO_3$/L) | 54 |
| Turbidity (NTU) | 18 |
| Conductance (µmhos/cm) | 203 |
| Total Solids (mg/L) | 177 |
| Suspended Solids (mg/L) | 16 |
| EDTA-Hardness (mg $CaCO_3$/L) | 118 |
| Sulfate (mg/L) | 42 |
| Ammonia (mg N/L) | <0.005 |
| Nitrate (mg N/L) | 0.031 |
| Nitrite (mg N/L) | <0.002 |
| Total Phosphorus (mg P/L) | 0.053 |
| Total Cyanide (mg/L) | <0.001 |
| **TOTAL EXTRACTABLE METALS: (mg/L)** | |
| Ag | 0.0001 |
| Al | 0.16 |
| As | <0.001 |
| Ba | 0.10 |
| Cd | <0.0002 |
| Co | <0.001 |
| Cr | <0.001 |
| Cu | 0.0016 |
| Fe | 0.70 |
| Total Hg (µg/L) | <0.05 |
| Mn | 0.04 |
| Mo | <0.005 |
| Ni | 0.004 |
| Pb | <0.001 |
| Sb | 0.002 |
| Se | <0.001 |
| Zn | 0.0073 |
| **DISSOLVED METALS: (mg/L)** | |
| Ag | <0.0001 |
| Al | 0.034 |
| As | <0.001 |
| Ba | 0.09 |
| Cd | <0.0002 |
| Co | <0.001 |
| Cr | <0.001 |
| Cu | 0.0005 |
| Fe | 0.13 |
| Mn | 0.027 |
| Mo | <0.005 |
| Ni | 0.003 |
| Pb | <0.001 |
| Sb | <0.002 |
| Se | <0.001 |
| Zn | 0.0025 |

**ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY**
**SITE: KLT-1**

| ANALYTICAL PARAMETER | SEPT.15/88 | JULY 23/89 |
|---|---|---|
| pH | 7.8 | 8.1 |
| Alkalinity (mg $CaCO_3$/L) | 108 | 110 |
| Turbidity (NTU) | 0.6 | 0.3 |
| Conductance (µmhos/cm) | 241 | 248 |
| Total Solids (mg/L) | 194 | 186 |
| Suspended Solids (mg/L) | <1 | 1 |
| EDTA-Hardness (mg $CaCO_3$/L) | 154 | 158 |
| Sulfate (mg/L) | 41 | 45 |
| Ammonia (mg N/L) | <0.005 | <0.005 |
| Nitrate (mg N/L) | 0.100 | 0.091 |
| Nitrite (mg N/L) | <0.002 | <0.002 |
| Total Phosphorus (mg P/L) | 0.020 | <0.003 |
| Total Cyanide (mg/L) | <0.001 | <0.001 |
| **TOTAL EXTRACTABLE METALS: (mg/L)** | | |
| Ag | <0.0002 | 0.0001 |
| Al | <0.01 | 0.014 |
| As | <0.001 | <0.001 |
| Ba | 0.026 | 0.06 |
| Cd | <0.0002 | <0.0002 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | 0.0007 | <0.0005 |
| Fe | 0.09 | 0.028 |
| Total Hg (µg/L) | <0.05 | <0.05 |
| Mn | 0.0092 | 0.0011 |
| Mo | <0.005 | <0.005 |
| Ni | <0.002 | <0.002 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | <0.001 |
| Zn | 0.0010 | <0.0005 |
| **DISSOLVED METALS: (mg/L)** | | |
| Ag | <0.0002 | <0.0001 |
| Al | <0.01 | <0.01 |
| As | <0.001 | <0.001 |
| Ba | 0.023 | 0.05 |
| Cd | <0.0002 | <0.0002 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | <0.0005 | <0.0005 |
| Fe | 0.05 | 0.008 |
| Mn | 0.0084 | <0.001 |
| Mo | <0.005 | <0.005 |
| Ni | <0.002 | <0.002 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | <0.001 |
| Zn | 0.0009 | <0.0005 |

**ANALYTICAL RESULTS FOR WATER SAMPLES FROM ARCHER CATHRO MARG PROPERTY**
**SITE: M1**

| ANALYTICAL PARAMETER | SEPT.15/88 | JULY 23/89 |
|---|---|---|
| pH | 7.4 | 7.4 |
| Alkalinity (mg $CaCO_3$/L) | 20 | 19 |
| Turbidity (NTU) | 0.4 | 0.3 |
| Conductance (µmhos/cm) | 50 | 57 |
| Total Solids (mg/L) | 44 | 43 |
| Suspended Solids (mg/L) | <1 | 1 |
| EDTA-Hardness (mg $CaCO_3$/L) | 28 | 30 |
| Sulfate (mg/L) | 11 | 12 |
| Ammonia (mg N/L) | <0.005 | <0.005 |
| Nitrate (mg N/L) | 0.041 | 0.072 |
| Nitrite (mg N/L) | <0.002 | <0.002 |
| Total Phosphorus (mg P/L) | 0.015 | 0.006 |
| Total Cyanide (mg/L) | <0.001 | <0.001 |
| **TOTAL EXTRACTABLE METALS: (mg/L)** | | |
| Ag | <0.0002 | <0.0001 |
| Al | <0.01 | 0.012 |
| As | <0.001 | <0.001 |
| Ba | 0.046 | 0.07 |
| Cd | <0.0002 | <0.0002 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | 0.0005 | <0.0005 |
| Fe | 0.014 | 0.016 |
| Total Hg (µg/L) | <0.05 | <0.05 |
| Mn | 0.0012 | 0.0010 |
| Mo | <0.005 | <0.005 |
| Ni | <0.002 | <0.002 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | <0.001 |
| Zn | 0.0011 | 0.0010 |
| **DISSOLVED METALS: (mg/L)** | | |
| Ag | <0.0002 | <0.0001 |
| Al | <0.01 | <0.01 |
| As | <0.001 | <0.001 |
| Ba | 0.030 | 0.07 |
| Cd | <0.0002 | <0.0002 |
| Co | <0.001 | <0.001 |
| Cr | <0.001 | <0.001 |
| Cu | <0.0005 | <0.0005 |
| Fe | 0.010 | 0.005 |
| Mn | 0.0012 | <0.001 |
| Mo | <0.005 | <0.005 |
| Ni | <0.002 | <0.002 |
| Pb | <0.001 | <0.001 |
| Sb | <0.002 | <0.002 |
| Se | <0.001 | <0.001 |
| Zn | 0.0011 | 0.0010 |

# WATER QUALITY INVESTIGATION
# OF
# THE MARG CLAIMS

AUGUST 1990

Prepared for

ARCHER,CATHRO & ASSOCIATES(1981)LIMITED

Prepared by

J.E.GIBSON

October 1990

# TABLE of CONTENTS


| | Page |
|---|---|
| Table of Contents | i |
| List of Figures | iii |
| List of Tables | iv |
| 1.0 **Introduction** | 1 |
| 2.0 **Study Area** | 1 |
| 2.1 Sample Stations | 3 |
| 3.0 **Methods** | 5 |
| 4.0 **Field Measurements** | 6 |
| 5.0 **Results** | 6 |
| 5.1 Field Measurements | 6 |
| 5.2 Chemical Analysis | 9 |
| Alkalinity | 9 |
| pH | 9 |
| Conductivity | 9 |
| Turbidity | 16 |
| Total Solids | 16 |
| Suspended Solids | 16 |
| Nitrite | 16 |
| Nitrate | 16 |
| Sulfate | 17 |
| Total Phosphate | 17 |
| Ammonia | 17 |
| Total Hardness | 17 |
| Aluminum | 17 |
| Antimony | 18 |
| Arsenic | 18 |
| Barium | 18 |
| Beryllium | 18 |
| Bismuth | 18 |
| Cadmium | 18 |
| Calcium | 18 |
| Chromium | 19 |
| Cobalt | 19 |
| Copper | 19 |
| Iron | 19 |
| Lead | 19 |
| Lithium | 20 |
| Magnesium | 20 |
| Manganese | 20 |
| Molybdenum | 20 |
| Nickel | 20 |
| Phosphorus | 20 |
| Potassium | 20 |
| Selenium | 21 |
| Silicon | 21 |

Silver 21
Sodium 21
Strontium 21
Thorium 21
Titanium 21
Uranium 21
Vanadium 22
Zinc 22
Zirconium 22

6.0 Summary 22

7.0 Recommendations 24

References

# LIST of FIGURES

Page

Figure 1. Location of the Marg Property. 2

Figure 2. Sample Station Locations. 4

## LIST of TABLES

Page

Table 1. Field Measurement of pH, Conductivity, and Water Temperature. Marg Claims - August 21,1990. 7

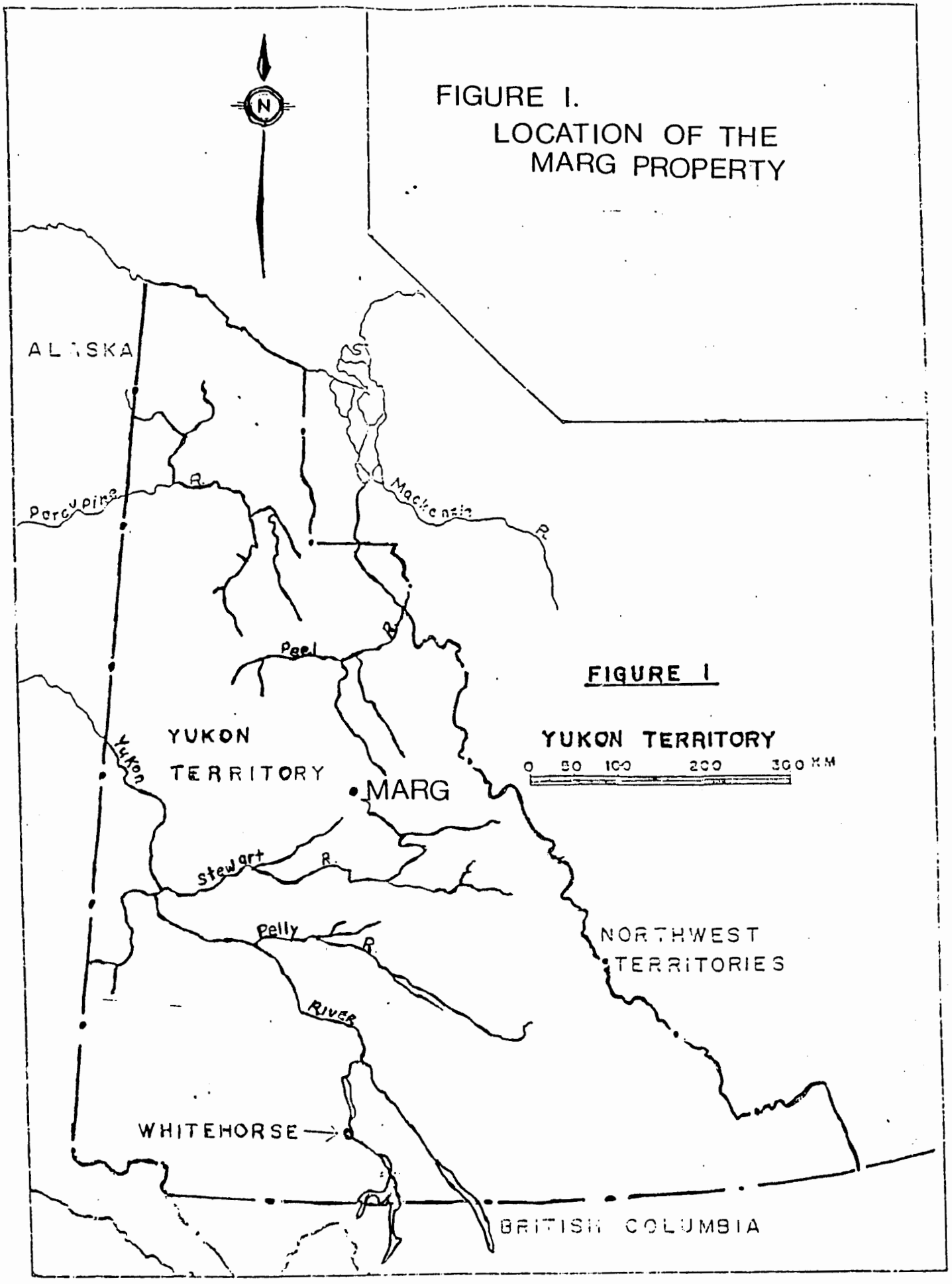
Table 2. Creek Discharge Volumes. Marg Claims - August 21,1990. 8

## 1.0 Introduction

John Gibson was contracted by Archer Cathro & Associates (1981) Limited to conduct a water quality survey of surface waters draining the Marg mineral property.
Initial surveys were conducted by Norecol Environmental Consultants Ltd in September,1988 and July 1989. A third survey was done by J. Gibson in June, 1990. This report covers the fourth sample event done on August 21,1990.

## 2.0 Study Area

The Marg mineral property is located in the Patterson Range of mountains 45 air kilometers east north east of Keno City, Yukon at Latitude 64 01', Longitude 134 28'.
All surface waters draining the lead zinc mineral property are tributaries to the Keno Ladue River which is a tributary to the Stewart River approximately 18 air kilometers to the south east. The mineralized zone is drained on the north side by Marg, Cansup and Copp creeks which enter Lasha Creek prior to the Keno Ladue River. On the south side the area is drained by two unnamed tributaries to the Keno Ladue River which have been designated KLT 1 and KLT 2 ( Figure 2 ). For more information on the study area (area description and watershed measurements) please consult the previous report for the June,1990 sampling.


FIGURE I.
LOCATION OF THE
MARG PROPERTY
N
ALASKA
Porcupine R.
Mackenzie R.
Peel R.
YUKON
TERRITORY
Yukon
MARG
Stewart R.
Pelly R.
RIVER
WHITEHORSE
NORTHWEST
TERRITORIES
BRITISH COLUMBIA
FIGURE 1
YUKON TERRITORY
0 50 100 200 300 KM

## 2.1 Sample Stations

The mineralized zone is located at the north east end of a range of the Patterson mountains. The ore body is presently being drilled to establish ore reserves. Sample stations are located on all creeks that drain the known ore body on both the north and south sides (Figure 2). Stations have also been located downstream on Lasha Creek and the Keno Ladue River to determine downstream effect and one station is located on the Keno Ladue River upstream of any likely activity as a water quality background.

Stations on Marg Creek (M-1), Lasha Creek (L-1) and one on Cansup Creek (CA-1) were not sampled in August as previous sample results have shown no anomalies were apparent at these sites or downstream sites were close enough to characterize local water quality. Sample station locations and descriptions for the August survey are:

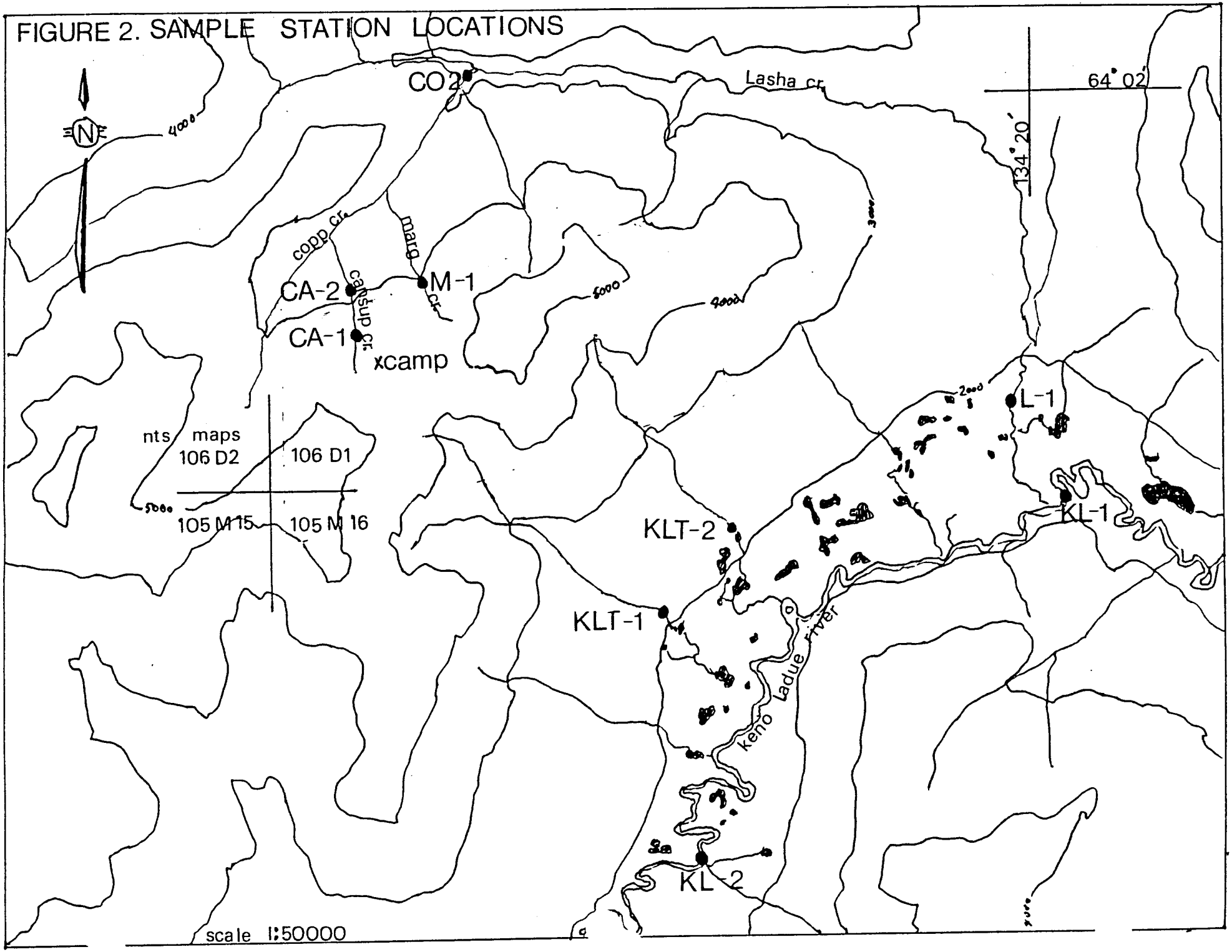
CO-2 Copp creek at the mouth. This station includes flows from Marg and Cansup Creek which drain the property's north face.

CA-2 Cansup Creek downstream of the gossan. This station is located 100 meters upstream of a drill water sump.

KL-1 Keno Ladue River downstream of Lasha Creek. This is the down stream station in the study area.

KLT-1 Tributary to the Keno Ladue River draining the south face of the property. Located at the toe of the mountain slope.

KLT-2 Tributary to the Keno Ladue River also draining the south face


FIGURE 2. SAMPLE STATION LOCATIONS
CO2
Lasha cr.
64° 02'
134° 20'
N
4000
copp cr.
marg cr.
CA-2
M-1
5000
4000
CA-1
campup cr.
xcamp
3000
2000
L-1
nts maps
106 D2
106 D1
5000
105 M15
105 M 16
KL-1
KLT-2
KLT-1
Keno Ladue River
KL-2
scale 1:50000

of the property downstream of KLT-1. Again located at the toe of the mountain slope.

KL-2 Keno Ladue River approximately 1 kilometer upstream of KLT-1. This is the upstream station in the study area for background water quality.

Station CA-2 was sampled on foot from the Marg campsite. All other stations were accessed by helicopter.

## 3.0 **Methods**

Water samples for laboratory analysis were taken at each station using new Nalgene bottles supplied by Quanta Trace Laboratories of Burnaby. A 1 liter sample was taken for total cyanide analysis. This bottle came supplied with the NaOH preservative. A 1 liter sample was taken for "ions" analysis ( ammonia, sulfate, nitrate, nitrite and total phosphate phosphorus). This bottle was filled completely, sealed and kept at 4 degrees Celsius. Another 1 liter bottle was taken for "routine" analysis ( lab pH, alkalinity, turbidity, lab conductivity, total solids, suspended solids and hardness). One 100 ml sample was taken for each extractable and dissolved metals. The sample for dissolved metals was first filtered using a hand vacuum pump with 45 micron filters. Both metal samples were then preserved with $HNO_3$. Except for the cyanide sample, all bottles were rinsed three times with sample water prior to filling. In the case of dissolved metals, the bottle was rinsed with filtered water. Filled bottles were then capped and marked with sample station and the required analysis. All information was then recorded in a field note book along with the date, time, field measurement results and any observations.

## 4.0 **Field Measurements**

Field measurements for pH, conductivity, water temperature along with streamflow volume were taken at each sample stations. Field measurements were also taken of the gossan spring flow upstream of CA-2. Conductivity was taken using a Hanna Instruments DiST 3 ATC meter, pH using a Hanna Instruments pHep meter and water temperature using a standard water thermometer registering in degrees Celsius. The above measurement results are listed by station in Table 1. Stream flow volume was measured using a Price velocity meter and cross sectional area calculations. Streamflow volumes are listed by station in Table 2.

## 5.0 **Results**

### 5.1 Field Measurements.

Field measurement results for pH, conductivity and water temperature are listed in Table 1. Conductivity results are very consistent with previous measurements of June,1990 and with repeat lab measurements. All stations show a less than 7% variation between field and lab measurements with the exception of KLT-2 which has a 19% variation. Values for pH vary a maximum of 3/10 Relative Units over the June values and only 2/10 between lab and field measurements in August. Water temperature either remained the same or dropped one degree from the June results.

Field measurements for streamflow volume are listed in Table 2. Of the stations sampled in August, higher flow volumes were measured at

TABLE 1. FIELD MEASUREMENTS OF pH, CONDUCTIVITY AND WATER TEMPERATURE. MARG CLAIMS--AUGUST 21, 1990

| STATION | pH(R.U.) | COND (us/cm) | TEMP (Celsius) |
|---|---|---|---|
| CO-2 | 7.8 | 130 | 4.5 |
| KL-1 | 7.6 | 180 | 9.0 |
| KLT-1 | 8.2 | 220 | 4.0 |
| CA-2 | 7.8 | 110 | 5.0 |
| CA-1 | 8.2 | 130 | 6.0 |
| M-1 | not sampled | - | - |
| KLT-2 | 8.3 | 280 | 4.0 |
| KL-2 | 7.6 | 170 | 9.0 |
| L-1 | not sampled | - | - |
| GOSSAN SPRING | 7.8 | 40 | 4.0 |
| SPRING-U/S GOSSAN | not sampled | - | |

TABLE 2. CREEK DISCHARGE VOLUMES...MARG CLAIMS.
AUGUST 21,1990

| STATION | TIME | DISCHARGE FLOWS | | |
|---|---|---|---|---|
| | | CMS | CFS | IGPM |
| CO-2 | 1310 | 0.68 | 24.01 | 8981 |
| KLT-1 | 1440 | 0.126 | 4.45 | 1664 |
| CA-2 | 1220 | 0.031 | 1.09 | 409.4 |
| M-1 | not sampled | - | - | - |
| KLT-2 | 1340 | 0.0065 | 0.23 | 85.8 |
| L-1 | not sampled | - | - | - |
| KL-1 | 1605 | TOO DEEP TO WADE | | |
| KL-2 | 1544 | TOO DEEP TO WADE | | |

stations CO-2 (+48%), CA-2 (+10%), and KLT-1 (+53%) when compared to June,1990 results. The only volume decrease was at KLT-2 (-7%). Stations on the Keno Ladue River were again to deep to wade and no measurements were attempted. Visually, flow in the Keno Ladue was up substantially over that observed in June. The decrease at KLT-2 has no explanation given the large increases at other stations.

## 5.2 Chemical Analysis

Laboratory analysis for all water samples was done by Quanta Trace Laboratories of Burnaby, B.C. Water quality results are presented in Table 3. All discussion is based on extractable values with reference to dissolved values where applicable.

### Alkalinity

Alkalinity is a measure of surface waters ability to neutralize acid and also serves a a buffer preventing sudden pH changes. Alkalinity results range from a high of 145 mg/l as CaCO3 at KLT-2 to a low of 39 mg/l as CaCO3 at CO-2. All stations but KLT-2 have an alkalinity of less than 60 mg/l and are therefore classed as "soft" water. The low values indicate a reduced buffering capacity against sudden pH changes. Results are consistent with the previous sampling.

### pH

pH values range from a high of 8.2 relative units at KLT-2 to a low of 7.6 at KL-2, CA-2 and CO-2.

### Conductivity

Conductivity ranges from a high of 345 us/cm at KLT-2 to a low of 109 us/cm at CA-2. Results are consistent with previous samples and again

Table 3. Water Quality Data for Marg Claims, August 21,1990.

| Sample type | water | water | water | water |
|---|---|---|---|---|
| Identification | KL1 Marg | KL1 Marg | KL2 Marg | KL2 Marg |
| **Alkalinity-CaCO3** | | | | |
| Total | 53. | - | 51. | - |
| Results in | mg/l | | mg/l | |
| **Physical Tests** | | | | |
| pH | 7.7 | - | 7.6 | - |
| Conduct. uS/cm | 194. | - | 177. | - |
| Turbidity FTU | 4. | - | 32. | - |
| Tot. Solids mg/l | 199. | - | 205. | - |
| Sus. Solids mg/l | 62. | - | 55. | - |
| **Anions By IEC** | | | | |
| Nitrite NO2-N | < 0.5 | - | < 0.5 | - |
| Nitrate NO3-N | 0.13 | - | 0.12 | - |
| Sulfate SO4 | 37.8 | - | 40.1 | - |
| Results in | mg/l | | mg/l | |
| **Colorimetric** | | | | |
| Total PO4-P | 0.082 | - | 0.085 | - |
| Results in | mg/l | | mg/l | |
| **Ions By SIE** | | | | |
| Ammonia NH3-N | < 0.05 | - | < 0.05 | - |
| Results in | mg/l | | mg/l | |
| **Total Hardness** | | | | |
| as CaCO3 mg/l | 95.8 | | 97.7 | |

Table 3. Water Quality Data for Marg Claims, August 21,1990.

| Sample type | water | water | water | water |
|---|---|---|---|---|
| Identification | KLT1 | KLT1 | KLT2 | KLT2 |
| | Marg | Marg | Marg | Marg |
| Alkalinity-CaCO3 | | | | |
| Total | 94. | - | 145. | - |
| Results in | mg/l | | mg/l | |
| Physical Tests | | | | |
| pH | 8.0 | - | 8.2 | - |
| Conduct. uS/cm | 237. | - | 345. | - |
| Turbidity FTU | 1. | - | 4. | - |
| Tot. Solids mg/l | 177. | - | 256. | - |
| Sus. Solids mg/l | 6. | - | 12. | - |
| Anions By IEC | | | | |
| Nitrite NO2-N | < 0.5 | - | < 0.5 | - |
| Nitrate NO3-N | 0.44 | - | 0.31 | - |
| Sulfate SO4 | 40.5 | - | 44.4 | - |
| Results in | mg/l | | mg/l | |
| Colorimetric | | | | |
| Total PO4-P | 0.012 | - | < 0.005 | - |
| Results in | mg/l | | mg/l | |
| Ions By SIE | | | | |
| Ammonia NH3-N | < 0.05 | - | < 0.05 | - |
| Results in | mg/l | | mg/l | |
| Total Hardness | | | | |
| as CaCO3 mg/l | 130. | | 185. | |

Table 3. Water Quality Data for Marg Claims, August 21,1990.

| Sample type | water | water | water | water |
|---|---|---|---|---|
| Identification | CO2 Marg | CO2 Marg | CA2 Marg | CA2 Marg |
| **Alkalinity-CaCO3** | | | | |
| Total | 39. | - | 40. | - |
| Results in | mg/l | | mg/l | |
| **Physical Tests** | | | | |
| pH | 7.6 | - | 7.6 | - |
| Conduct. uS/cm | 143. | - | 109. | - |
| Turbidity FTU | 2. | - | 9. | - |
| Tot. Solids mg/l | 118. | - | 98. | - |
| Sus. Solids mg/l | < 5. | - | 19. | - |
| **Anions By IEC** | | | | |
| Nitrite NO2-N | < 0.5 | - | < 0.5 | - |
| Nitrate NO3-N | 0.20 | - | < 0.05 | - |
| Sulfate SO4 | 35.0 | - | 16.3 | - |
| Results in | mg/l | | mg/l | |
| **Colorimetric** | | | | |
| Total PO4-P | < 0.005 | - | < 0.005 | - |
| Results in | mg/l | | mg/l | |
| **Ions By SIE** | | | | |
| Ammonia NH3-N | < 0.05 | - | < 0.05 | - |
| Results in | mg/l | | mg/l | |
| **Total Hardness** | | | | |
| as CaCO3 mg/l | 71.5 | | 57.4 | |

Table 3. Water Quality Data for Marg Claims, August 21,1990.

| Sample type | | water | water | water | water |
|---|---|---|---|---|---|
| Identification | | KL1 Marg | KL1 Marg | KL2 Marg | KL2 Marg |
| Method used | | dissolved filt. 0.45u 1% HNO3 | extractable 1% HNO3 | dissolved filt. 0.45u 1% HNO3 | extractable 1% HNO3 |
| Aluminum | Al | 0.115 | 0.491 | 0.123 | 0.456 |
| Antimony | Sb | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Arsenic | As | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Barium | Ba | 0.054 | 0.082 | 0.055 | 0.078 |
| Beryllium | Be | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Bismuth | Bi | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Cadmium | Cd | < 0.0003 | < 0.0003 | < 0.0003 | < 0.0003 |
| Calcium | Ca | 26.0 | 26.1 | 25.4 | 26.6 |
| Chromium | Cr | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Cobalt | Co | < 0.001 | 0.001 | < 0.001 | < 0.001 |
| Copper | Cu | < 0.001 | 0.002 | < 0.001 | 0.001 |
| Iron | Fe | 0.112 | 1.22 | 0.096 | 1.05 |
| Lead | Pb | < 0.004 | < 0.004 | < 0.004 | < 0.004 |
| Lithium | Li | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Magnesium | Mg | 7.27 | 7.44 | 7.12 | 7.36 |
| Manganese | Mn | 0.028 | 0.103 | 0.028 | 0.092 |
| Molybdenum | Mo | < 0.005 | < 0.005 | < 0.005 | < 0.005 |
| Nickel | Ni | 0.005 | 0.007 | 0.005 | 0.006 |
| Phosphorus | P | < 0.02 | 0.05 | < 0.02 | 0.03 |
| Potassium | K | 0.57 | 0.61 | 0.56 | 0.61 |
| Selenium | Se | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Silicon | Si | 3.5 | 3.8 | 3.7 | 3.7 |
| Silver | Ag | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Sodium | Na | 1.10 | 1.09 | 1.03 | 1.11 |
| Strontium | Sr | 0.087 | 0.088 | 0.083 | 0.089 |
| Thorium | Th | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Titanium | Ti | < 0.001 | 0.006 | < 0.001 | 0.005 |
| Uranium | U | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Vanadium | V | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Zinc | Zn | 0.006 | 0.017 | 0.004 | 0.016 |
| Zirconium | Zr | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Results in | | mg/l | mg/l | mg/l | mg/l |

Table 3. Water Quality Data for Marg Claims, August 21,1990.

| Sample type | | water | water | water | water |
|---|---|---|---|---|---|
| Identification | | KLT1 Marg | KLT1 Marg | KLT2 Marg | KLT2 Marg |
| Method used | | dissolved filt. 0.45u 1% HNO3 | extractable 1% HNO3 | dissolved filt. 0.45u 1% HNO3 | extractable 1% HNO3 |
| Aluminum | Al | 0.124 | 0.151 | 0.138 | 0.247 |
| Antimony | Sb | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Arsenic | As | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Barium | Ba | 0.029 | 0.030 | 0.069 | 0.074 |
| Beryllium | Be | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Bismuth | Bi | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Cadmium | Cd | < 0.0003 | < 0.0003 | < 0.0003 | < 0.0003 |
| Calcium | Ca | 33.5 | 34.9 | 47.0 | 49.5 |
| Chromium | Cr | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Cobalt | Co | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Copper | Cu | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Iron | Fe | < 0.005 | 0.062 | < 0.05 | 0.188 |
| Lead | Pb | < 0.004 | < 0.004 | < 0.004 | < 0.004 |
| Lithium | Li | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Magnesium | Mg | 9.82 | 10.3 | 14.0 | 14.6 |
| Manganese | Mn | 0.002 | 0.007 | < 0.001 | 0.012 |
| Molybdenum | Mo | < 0.005 | < 0.005 | < 0.005 | < 0.005 |
| Nickel | Ni | < 0.001 | < 0.001 | 0.002 | 0.003 |
| Phosphorus | P | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Potassium | K | 0.12 | 0.16 | 0.26 | 0.27 |
| Selenium | Se | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Silicon | Si | 2.1 | 2.3 | 2.8 | 3.0 |
| Silver | Ag | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Sodium | Na | 0.31 | 0.35 | 0.53 | 0.57 |
| Strontium | Sr | 0.119 | 0.126 | 0.124 | 0.132 |
| Thorium | Th | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Titanium | Ti | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Uranium | U | < 0.02 | < 0.02 | < 0.02 | < 0.02 |
| Vanadium | V | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 |
| Zinc | Zn | 0.002 | 0.005 | 0.002 | 0.004 |
| Zirconium | Zr | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Results in | | mg/l | mg/l | mg/l | mg/l |

Table 3. Water Quality Data for Marg Claims, August 21,1990.

| Sample type | | water | | water | | water | | water | |
|---|---|---|---|---|---|---|---|---|---|
| Identification | | C02 Marg | | C02 Marg | | CA2 Marg | | CA2 Marg | |
| Method used | | dissolved filt. 0.45u 1% HNO3 | | extractable 1% HNO3 | | dissolved filt. 0.45u 1% HNO3 | | extractable 1% HNO3 | |
| Aluminum | Al | | 0.112 | | 0.135 | | 0.120 | | 0.294 |
| Antimony | Sb | < | 0.05 | < | 0.05 | < | 0.05 | < | 0.05 |
| Arsenic | As | < | 0.05 | < | 0.05 | < | 0.05 | < | 0.05 |
| Barium | Ba | | 0.037 | | 0.038 | | 0.061 | | 0.071 |
| Beryllium | Be | < | 0.0005 | < | 0.0005 | < | 0.0005 | < | 0.0005 |
| Bismuth | Bi | < | 0.01 | < | 0.01 | < | 0.01 | < | 0.01 |
| Cadmium | Cd | | 0.0004 | | 0.0004 | | 0.0004 | | 0.0007 |
| Calcium | Ca | | 19.6 | | 19.6 | | 15.6 | | 16.3 |
| Chromium | Cr | < | 0.001 | < | 0.001 | < | 0.001 | < | 0.001 |
| Cobalt | Co | < | 0.001 | < | 0.001 | < | 0.001 | < | 0.001 |
| Copper | Cu | < | 0.001 | < | 0.001 | | 0.025 | | 0.041 |
| Iron | Fe | | 0.025 | | 0.089 | | 0.198 | | 0.637 |
| Lead | Pb | < | 0.004 | < | 0.004 | < | 0.004 | < | 0.004 |
| Lithium | Li | < | 0.05 | < | 0.05 | < | 0.05 | < | 0.05 |
| Magnesium | Mg | | 5.30 | | 5.31 | | 3.45 | | 3.80 |
| Manganese | Mn | | 0.006 | | 0.008 | | 0.014 | | 0.029 |
| Molybdenum | Mo | < | 0.005 | < | 0.005 | < | 0.005 | < | 0.005 |
| Nickel | Ni | | 0.003 | | 0.004 | < | 0.001 | < | 0.001 |
| Phosphorus | P | < | 0.02 | < | 0.02 | < | 0.02 | < | 0.02 |
| Potassium | K | | 0.12 | | 0.14 | | 0.12 | | 0.19 |
| Selenium | Se | < | 0.01 | < | 0.01 | < | 0.01 | < | 0.01 |
| Silicon | Si | | 2.2 | | 2.4 | | 2.4 | | 2.5 |
| Silver | Ag | < | 0.001 | < | 0.001 | < | 0.001 | < | 0.001 |
| Sodium | Na | | 0.35 | | 0.39 | | 0.37 | | 0.43 |
| Strontium | Sr | | 0.062 | | 0.063 | | 0.055 | | 0.057 |
| Thorium | Th | < | 0.02 | < | 0.02 | < | 0.02 | < | 0.02 |
| Titanium | Ti | < | 0.001 | < | 0.001 | < | 0.001 | | 0.004 |
| Uranium | U | < | 0.02 | < | 0.02 | < | 0.02 | < | 0.02 |
| Vanadium | V | < | 0.0005 | < | 0.0005 | < | 0.0005 | < | 0.0005 |
| Zinc | Zn | | 0.032 | | 0.032 | | 0.111 | | 0.128 |
| Zirconium | Zr | < | 0.001 | < | 0.001 | < | 0.001 | < | 0.001 |
| Results in | | | mg/l | | mg/l | | mg/l | | mg/l |

indicate a higher conductivity value in surface waters draining the south side of the property.

Turbidity

Turbidity values are again low at most stations with the exception of CA-2 (9 FTU) and KL-2 (32 FTU).

Total Solids

Total solids values range from a high of 256 mg/l at KLT-2 to a low of 98 mg/l at CA-2. Values have increased at all stations over the June sampling except at KLT-1. Increases range from a high of 42% at KLT-2 to a low of 3% at CO-2. The increase is likely due to increased streamflow although station KLT-2 appears to be an exception with decreased flow and increased total solid values.

Suspended Solids

Suspended solid levels range from a high of 62 mg/l at KL-1 to a low of <5 mg/l at CO-2. Significant increases over June,1990 results are noted at KL-1 (6 to 62 mg/l) and KL-2 (10 to 55 mg/l). Other stations show marginal increases or remained the same. The increases are the result of increased flow from precipitation runoff.

Nitrite

All stations again showed nitrite levels of <0.5 mg/l.

Nitrate

Nitrates are commonly found in most surface waters at levels of 1.0 mg/l or less. Levels range from a high of 0.44 mg/l at KLT-1 to a low of <0.05 mg/l at CA-2. Marginal increases are noted at KL-1 (0.07 to 0.13),KL-2 (0.9 to 0.12 mg/l), and KLT-1 (0.16 to 0.44 mg/l). All

other stations decreased slightly from the previous sampling.

Sulfate

Sulfate levels at all stations remain low with a high of 44.4 mg/l at KLT-2 to 16.3 mg/l at CA-2. Sulfate levels have decreased at most stations since June.

Total Phosphate

Total phosphate phosphorus levels remain low at all stations. Concentrations range from a high of 0.085 mg/l at KL-2 to <0.005 mg/l at KLT-2, CA-2 and CO-2. Small increases in phosphorus levels are noted at KL-1, KL-2 and KLT-1.

Ammonia

Ammonia was again not detected at any station.

Total Hardness

Hardness is an important modifying factor for influencing the form and toxicity of some heavy metals. As noted in the June results, these results confirm that surface waters draining the north side of the property have a hardness class of "soft" to "moderately soft". Surface waters draining the south side of the property have a classification of "moderately soft" to "hard".

Aluminum

Aluminosilicate minerals in the study area are likely mobilized from the quartzite and phyllite country rocks by natural weathering. Levels range from a high of 0.491 mg/l at KL-1 to a low of 0.135 mg/l at CO-2. Increases over the June results are noted at all stations with KL-1 and KL-2 showing the largest increases.

Antimony

Antimony was again not detected at any sample station.

Arsenic

Arsenic was not detected at any station as in June,1990.

Barium

Barium is generally not found above concentrations of 1.0 mg/l in surface waters. Levels remain low with a range of 0.082 mg/l at KL-1 to 0.030 mg/l at KLT-1. Barium levels have increased marginally over the previous sampling.

Beryllium

Levels of Beryllium were again below detection limits at all stations.

Bismuth

Bismuth levels were below the detection limit of 0.01 mg/l at all stations.

Cadmium

Cadmium was again detected at station CA-2 (0.0007 mg/l) and CO-2 (0.0004 mg/l). Levels are the same as the June sampling results remaining slightly elevated in Cansup Creek given the "soft" water.

Calcium

Calcium levels range from a high of 49.5 mg/l at KLT-2 to a low of 16.3 mg/l at CA-2. Results are very similiar to previous sample and again indicate higher levels in surface waters draining the south side of the deposit.

Chromium

Chromium concentrations were again below detection limit at all stations.

Cobalt

Cobalt concentrations were below detection limit at all stations. The June sample results show trace amounts of cobalt at most stations to a maximum of 0.003 mg/l at KLT-2.

Copper

Copper concentrations range from a high of 0.041 at CA-2 to a low of <0.001 mg/l at CO-2, KLT-1 and KLT-2. In the June sampling, a slightly lower level of copper was found at CA-2 (0.035 mg/l) with it still detected downstream at CO-2. A majority of the copper was in dissolved form in June. In August, copper was not detected downstream at CO-2 and less of the copper at CA-2 was in a dissolved form.

Iron

Iron concentrations range from a high of 1.22 mg/l at KL-1 to a low of 0.089 mg/l at CO-2. There is a substantial increase in iron levels at all stations ranging from 200% at KLT-2 to 380% at KL-1. The upstream Keno Ladue station (KL-2) also show substantial increases (350%) are occurring in the watershed upstream of the property.
These levels exceed the guidelines for freshwater (<0.002 mg/l) with a "soft" to "medium" hardness(CCREM). A lower percentage of the iron is in dissolved form than in previous results.

Lead

Lead levels were again below the detection limit at all stations.

Lithium

Lithium levels were below detection limits at all stations.

Magnesium

Magnesium levels remain low for Canadian surface waters (NAQUADAT, 1985). Concentrations range from a high of 14.6 mg/l at KLT-2 to a low of 2.86 mg/l at CA-2. Levels are higher in surface waters draining the south side of the deposit.

Manganese

Manganese levels range from a high of 0.103 mg/l at KL-1 to a low of 0.007 mg/l at KLT-1. Levels are slightly higher than the June sample results.

Molybdenum

Molybdenum levels are again below detection limits at all stations.

Nickel

Nickel levels range from a high of 0.007 mg/l at KL-1 to <0.001 mg/l at CA-2. These results are consistent with previous data.

Phosphorus

Phosphorus levels range from a high of 0.05 mg/l at KL-1 to below detection limits at most other stations.

Potassium

Potassium concentrations range from a high of 0.61 mg/l at KL-1 and KL-2 to a low of 0.14 mg/l at CO-2. These results are consistent with previous data.

Selenium

Selenium levels are below detection limits at all stations.

Silicon

Silicon levels range from a high of 3.8 mg/l at KL-1 to a low of 2.3 mg/l at KLT-1. Levels are consistent with previous data and are low in respect to Canadian surface waters.

Silver

Silver levels are again below the detection limits at all stations.

Sodium

Sodium levels range from a high of 1.11 mg/l at KL-2 to a low of 0.35 mg/l at KLT-1. This is consistent with previous data.

Strontium

Strontium levels range from a high of 0.132 mg/l at KLT-2 to a low of 0.057 mg/l at CA-2. Results are consistent with previous data.

Thorium

Thorium levels are again below the detection limits at all stations.

Titanium

Titanium levels above detection limits were found to a maximum of 0.006 mg/l at KL-1. In June, all stations were below the detection limit.

Uranium

Uranium levels are below detection limits at all stations.

Vanadium

Vanadium levels at all stations were below the detection limits.

Zinc

Zinc levels in the area range from a high of 0.128 mg/l again a CA-2 to a low of 0.004 mg/l at KLT-2. Again, levels at CA-2 are almost a magnitude higher than recommended for protection of aquatic life. A majority of the zinc is again in dissolved form, likely originating from the gossan spring upstream of CA-2.

Zirconium

Zirconium levels are below detection limits at all stations.

## 6.0 Summary

A number of the water quality anomalies apparent in the June data are still evident at the increased streamflow volumes of the August sampling. The anomalies are:

1. Surface waters draining the south side of the deposit have continued higher values for conductivity, calcium and hardness.

   South side draining also has consistently higher levels of magnesium although it continues within the range normally found in Canadian surface waters.

2. Zinc concentrations in Cansup creek at Station CA-2 continue above the recommended concentrations for protection of aquatic life as established by the Canadian Council of Resources and Environment Ministers,1987 (CCREM). Although streamflow volume has increased

(+10%) over the June sampling, the level of extractable zinc has decreased slightly. Approximately the same percentage zinc remains in dissolved form as in June,1990. Zinc levels at the downstream station on Copp Creek (CO-2) remain the same with only the dissolved fraction evident.

3. Iron levels again exceed the concentrations recommended for freshwater with a soft to medium hardness classification. A large increase in iron levels has occurred at all stations over the June sampling. The iron increase is not limited to the property drainage as the upstream station on the Keno Ladue River (KL-2) shows the same increase.

4. Low to moderate increases in non metal concentrations of total solids, suspended solids, nitrates and phosphorus are evident at individual sites.

5. Marginal increases in heavy metal concentrations of aluminum, barium, copper and manganese have occurred since the June sampling. All levels remain with ranges normal to Canadian surface waters.

6. Decreases in concentrations of sulfates and cobalt are noted at most stations from the previous sampling.

7. Surface waters in the study area continue to have low alkalinity and hardness values. Alkalinity and hardness are important in buffering against sudden pH changes, neutralizing acid and modifying the toxicity of some heavy metals to aquatic life. Streams in the study area have a limited buffering capacity and acid neutralizing potential.

## 7.0 Recommendations

The four sample events to date (September/88, July/89, June and August/1990) provide consistent data for surface waters draining the Marg property during summer and fall seasons. A further sample event at low flow (April or May) is necessary to complete the annual picture.

Further water quality and water quantity data should be collected at the present sample sites. Further sample sites may become necessary if development continues.

Stations M-1 and L-1 should remain at a once annual sample interval. Further sampling at station CA-1 is unnecessary.

A survey of benthic and fish populations should also be started. A meeting was held October 21,1990 with Al Von Finster, Technical Officer/Habitat for Fisheries and Oceans. Mr Von Finster indicated little data on the Keno Ladue River had been collected to his knowledge but that tributaries to the Stewart River were generally considered as suitable for Chinook salmon spawning areas. Fisheries and Oceans invites formal contact early in the new year outlining the proposed development. This would enable Fisheries and Oceans to review the submission and make any study recommendations in time for implementation in the 1991 field season.

A meeting was also held with Jack Nickel, Regional Manager of Lands, DINA. Mr Nickel also recommended a preliminary proposal be sent to the Regional Environmental Review Committee (DINA) who can then establish the requirements for the Environmental Assessment and Review Process. Enclosed are flow charts outlining the environmental assessment process for the Yukon Territory.

# REFERENCES

Canadian Council of Resource and Environment Minister (CCREM). 1987. **Canadian Water Quality Guidelines**. Task Force of Water Quality Guidelines.

Environment Canada. 1976. **Pollution Sampling Handbook**. Fisheries and Marine Services and Environment Protection Service, Laboratory Services. Vancouver, British Columbia.

Gibson,J. 1990. **Water Quality Investigation of the Marg Claims**.

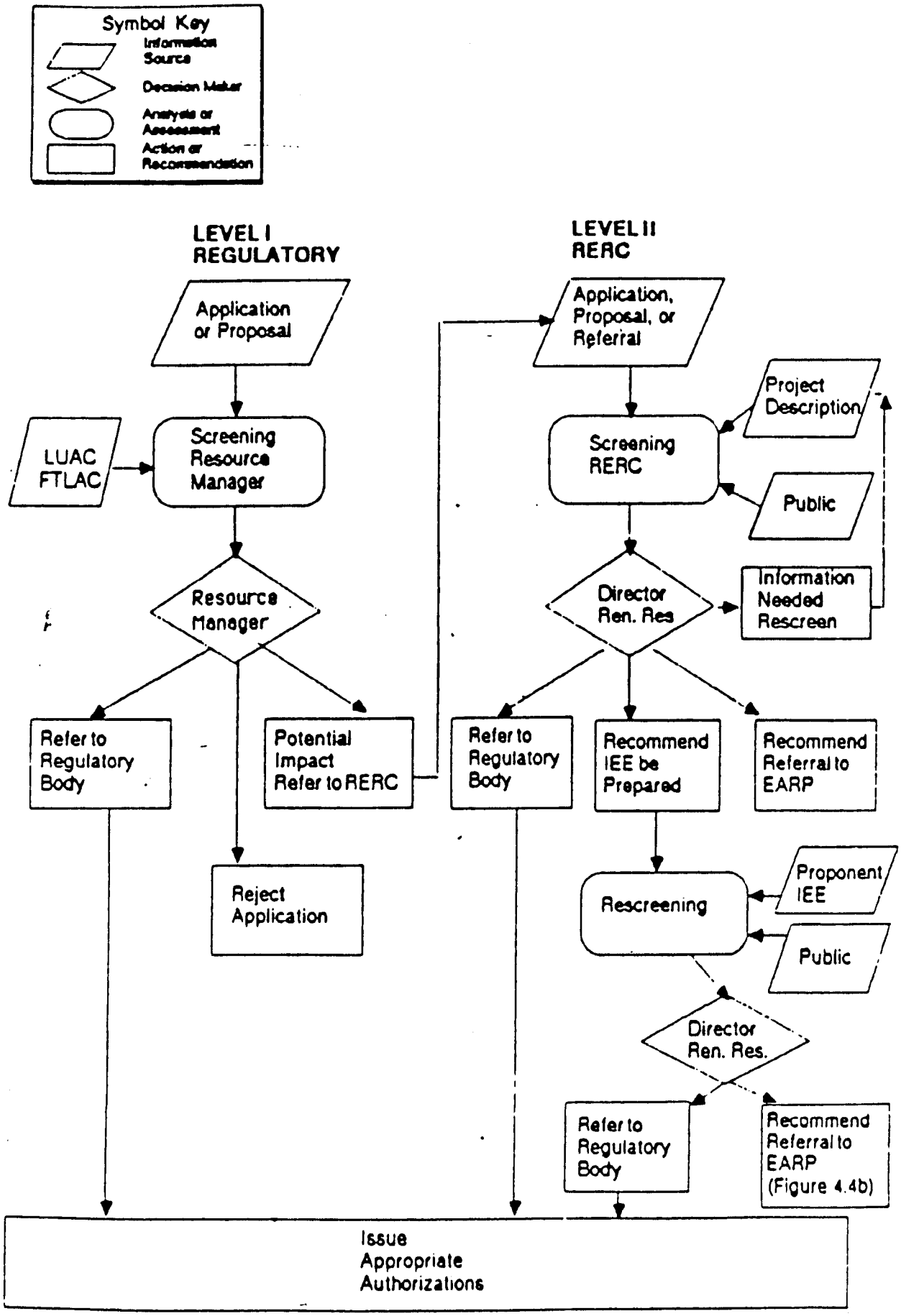
NAQUADAT. 1976. **National Water Quality Data Bank**. Water Quality Branch, Inland Waters Directorate, Environment Canada, Ottawa.

NAQUADAT. 1985. **National Water Quality Data Bank**. Water Quality Branch, Inland Waters Directorate, Environment Canada, Ottawa.

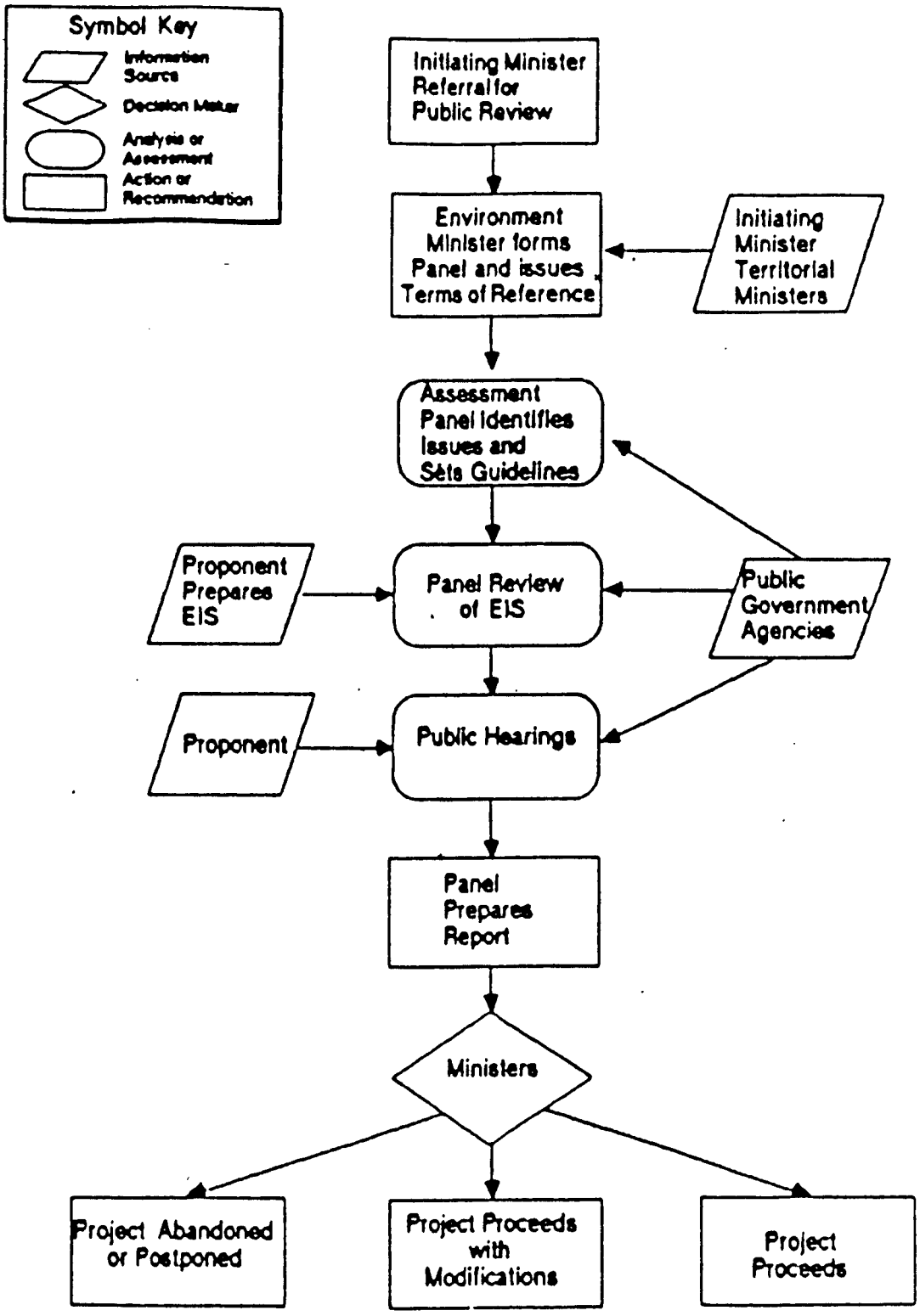
## ABBREVIATIONS

| | |
|---|---|
| CEPA | Canadian Environmental Protection Act |
| COGLA | Canada Oil and Gas Lands Administration |
| CTS | Community and Transportation Services |
| CWS | Canadian Wildlife Service (DOE) |
| CYI | Council for Yukon Indians |
| DFO | Department of Fisheries and Oceans |
| DIAND | Department of Indian Affairs and Northern Development |
| DOE | Department of the Environment |
| DPW | Public Works Canada |
| EARP | Environmental Assessment and Review Process |
| EDA | Economic Development Agreement |
| EIRB | Environmental Impact Review Board (Inuvialuit) |
| EIS | Environmental Impact Statement |
| EISC | Environmental Impact Screening Committee (Inuvialuit) |
| EMR | Department of Energy, Mines and Resources |
| EPS | Environmental Protection Service |
| FEARO | Federal Environmental Assessment and Review Office |
| FTLAC | Federal Territorial Lands Advisory Committee |
| IFA | Inuvialuit Final Agreement |
| ILA | Inuvialuit Lands Administration |
| ISR | Inuvialuit Settlement Region |
| LARC | Land Application Review Committee (YTG) |
| LUAC | Land Use Advisory Committee (DIAND) |
| MOT | Transport Canada |
| NAP | Northern Affairs Program |
| NEB | National Energy Board |
| RTAP | Regional Transportation Access Program |
| YFN | Yukon First Nations |
| YLCFA | Yukon Land Claim Framework Agreement |
| YPMA | Yukon Placer Mining Act |
| YTG | Yukon Territorial Government |
| YTWB | Yukon Territory Water Board |

ENVIRONMENTAL ASSESSMENT AND REVIEW SCHEMATIC: INITIAL ASSESSMENT



# ENVIRONMENTAL ASSESSMENT AND REVIEW SCHEMATIC: PANEL REVIEW



# APPENDIX E

# ASSAY CERTIFICATES,

# 1990 DRILL CORE SAMPLES

# Chemex Labs Ltd.

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TO: ARCHER CATHRO & ASSOC. (1981) LTD.

P.O. BOX 4127
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Project : MARG
Comments:


Invoice Date: 7-JUL-90
Invoice No. : I-9017465
P.O. Number : NONE

## CERTIFICATE OF ANALYSIS A9017465

| SAMPLE DESCRIPTION | PREP CODE | | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1776A | 208 | 294 | 0.002 | 0.02 | < 0.01 | < 0.01 | 0.09 | | | | | |
| 1777A | 208 | 294 | 0.002 | 0.07 | 0.08 | 0.12 | 0.22 | | | | | |
| 1778A | 208 | 294 | 0.018 | 0.62 | 0.73 | 1.08 | 3.69 | | | | | |
| 1779A | 208 | 294 | 0.006 | 0.02 | 0.01 | 0.03 | 0.04 | | | | | |
| 1780A | 208 | 294 | 0.010 | 0.27 | 0.15 | 0.27 | 0.50 | | | | | |
| 1781A | 208 | 294 | 0.002 | 0.02 | 0.01 | 0.04 | 0.06 | | | | | |
| 1782A | 208 | 294 | 0.012 | 1.02 | 1.02 | 1.48 | 2.61 | | | | | |
| 1783A | 208 | 294 | 0.006 | 0.05 | 0.04 | 0.06 | 0.14 | | | | | |
| 1784A | 208 | 294 | 0.010 | 0.87 | 0.47 | 1.46 | 2.52 | | | | | |
| 1785A | 208 | 294 | 0.016 | 1.17 | 1.20 | 1.56 | 2.78 | | | | | |
| 1786A | 208 | 294 | 0.020 | 1.94 | 1.80 | 2.16 | 4.07 | | | | | |
| 1787A | 208 | 294 | 0.002 | 0.04 | 0.01 | 0.03 | 0.04 | | | | | |
| 1788A | 208 | 294 | < 0.002 | 0.03 | < 0.01 | < 0.01 | 0.03 | | | | | |
| 1789A | 208 | 294 | < 0.002 | 0.05 | < 0.01 | < 0.01 | 0.07 | | | | | |
| 1790A | 208 | 294 | < 0.002 | 0.05 | < 0.01 | < 0.01 | 0.10 | | | | | |
| 1791A | 208 | 294 | 0.002 | 0.05 | 0.02 | 0.04 | 0.14 | | | | | |
| 1792A | 208 | 294 | 0.014 | 0.66 | 0.49 | 1.00 | 1.67 | | | | | |
| 1793A | 208 | 294 | 0.008 | 0.20 | 0.12 | 0.25 | 0.45 | | | | | |
| 1794A | 208 | 294 | 0.026 | 2.12 | 1.88 | 2.44 | 4.75 | | | | | |
| 1795A | 208 | 294 | 0.016 | 0.94 | 0.93 | 1.12 | 1.92 | | | | | |
| 1796A | 208 | 294 | 0.004 | 0.20 | 0.25 | 0.25 | 0.49 | | | | | |
| 1797A | 208 | 294 | 0.018 | 1.22 | 0.72 | 1.36 | 2.65 | | | | | |
| 1798A | 208 | 294 | 0.002 | 0.06 | 0.03 | 0.07 | 0.12 | | | | | |
| 1799A | 208 | 294 | < 0.002 | 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1800A | 208 | 294 | 0.006 | 1.45 | 1.50 | 1.14 | 2.16 | | | | | |
| 1851A | 208 | 294 | 0.002 | 0.04 | 0.01 | 0.01 | 0.14 | | | | | |
| 1852A | 208 | 294 | 0.002 | 0.05 | 0.01 | < 0.01 | 0.13 | | | | | |
| 1853A | 208 | 294 | < 0.002 | 0.59 | 0.29 | 0.62 | 1.11 | | | | | |
| 1854A | 208 | 294 | 0.002 | 0.04 | 0.01 | 0.01 | 0.15 | | | | | |
| 1855A | 208 | 294 | 0.002 | 0.03 | < 0.01 | < 0.01 | 0.10 | | | | | |
| 1856A | 208 | 294 | 0.002 | 0.04 | 0.03 | 0.01 | 0.11 | | | | | |
| 1857A | 208 | 294 | 0.008 | 1.19 | 0.82 | 1.32 | 2.57 | | | | | |
| 1858A | 208 | 294 | 0.002 | 0.46 | 0.36 | 0.47 | 0.86 | | | | | |
| 1859A | 208 | 294 | 0.018 | 1.71 | 1.54 | 2.16 | 3.84 | | | | | |
| 1860A | 208 | 294 | < 0.002 | 0.06 | 0.04 | 0.08 | 0.14 | | | | | |

CERTIFICATION: B. Travers

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Project : MARG
Comments:


Invoice Date: 11-JUL-90
Invoice No. : I-9018125
P.O. Number :

## CERTIFICATE OF ANALYSIS A9018125

| SAMPLE DESCRIPTION | PREP CODE | | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1861A | 208 | 294 | 0.002 | 0.04 | 0.01 | 0.01 | 0.12 | | | | | |
| 1862A | 208 | 294 | 0.002 | 0.05 | 0.03 | 0.02 | 0.13 | | | | | |
| 1863A | 208 | 294 | 0.020 | 0.68 | 0.60 | 0.99 | 1.89 | | | | | |
| 1864A | 208 | 294 | 0.031 | 2.68 | 1.35 | 4.89 | 7.04 | | | | | |
| 1865A | 208 | 294 | 0.062 | 0.84 | 3.68 | 0.18 | 0.87 | | | | | |
| 1866A | 208 | 294 | 0.010 | 0.07 | 0.09 | 0.07 | 0.18 | | | | | |
| 1867A | 208 | 294 | 0.002 | 0.04 | 0.03 | 0.01 | 0.01 | | | | | |
| 1868A | 208 | 294 | 0.004 | 0.07 | 0.01 | 0.03 | 0.02 | | | | | |
| 1869A | 208 | 294 | < 0.002 | 0.03 | 0.03 | 0.06 | 0.20 | | | | | |
| 1870A | 208 | 294 | 0.004 | 0.36 | 0.22 | 0.44 | 0.84 | | | | | |
| 1871A | 208 | 294 | < 0.002 | 0.03 | 0.02 | 0.04 | 0.07 | | | | | |
| 1872A | 208 | 294 | 0.005 | 0.51 | 0.40 | 0.69 | 1.18 | | | | | |
| 1873A | 208 | 294 | < 0.002 | 0.01 | < 0.01 | 0.02 | 0.02 | | | | | |
| 1874A | 208 | 294 | 0.008 | 0.68 | 0.63 | 0.59 | 1.04 | | | | | |
| 1875A | 208 | 294 | 0.002 | 0.10 | 0.11 | 0.03 | 0.06 | | | | | |
| 1876A | 208 | 294 | 0.015 | 2.44 | 3.49 | 3.05 | 6.00 | | | | | |
| 1877A | 208 | 294 | 0.006 | 0.90 | 0.70 | 1.05 | 1.96 | | | | | |
| 1878A | 208 | 294 | 0.004 | 0.05 | 0.04 | 0.08 | 0.21 | | | | | |
| 1879A | 208 | 294 | 0.005 | 0.62 | 0.52 | 0.63 | 1.30 | | | | | |
| 1880A | 208 | 294 | 0.002 | 0.14 | 0.14 | 0.23 | 0.44 | | | | | |
| 1881A | 208 | 294 | 0.004 | 0.45 | 0.38 | 0.60 | 1.05 | | | | | |
| 1882A | 208 | 294 | 0.004 | 0.05 | 0.04 | 0.07 | 0.13 | | | | | |

CERTIFICATION: B. Stewart

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PHONE: 604-984-0221

To: ARCHER CATHRO & ASSOC. (1981) LTD.

P.O. BOX 4127
WHITEHORSE, YT
Y1A 3S9

Project : MARG
Comments:


Invoice Date: 28-JUL-90
Invoice No. : I-9018968
P.O. Number :

## CERTIFICATE OF ANALYSIS A9018968

| SAMPLE DESCRIPTION | PREP CODE | | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1883 A | 208 | 294 | < 0.002 | < 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1884 A | 208 | 294 | < 0.002 | 0.07 | 0.07 | 0.08 | 0.15 | | | | | |
| 1885 A | 208 | 294 | < 0.002 | 0.09 | 0.13 | 0.09 | 0.18 | | | | | |
| 1886 A | 208 | 294 | 0.004 | 0.15 | 0.35 | 0.30 | 0.61 | | | | | |
| 1887 A | 208 | 294 | 0.006 | 0.04 | 0.02 | 0.08 | 0.11 | | | | | |
| 1888 A | 208 | 294 | 0.006 | 0.19 | 0.13 | 0.22 | 0.43 | | | | | |
| 1889 A | 208 | 294 | < 0.002 | 0.01 | 0.02 | 0.02 | 0.05 | | | | | |
| 1890 A | 208 | 294 | 0.002 | 0.03 | 0.07 | 0.05 | 0.12 | | | | | |

CERTIFICATION: W. Van Brunschwig

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Y1A 3S9

Project : MARG
Comments:


Invoice Date: 2-AUG-90
Invoice No. : I-9019820
P.O. Number :

## CERTIFICATE OF ANALYSIS A9019820

| SAMPLE DESCRIPTION | PREP CODE | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|---|
| 1891A | 208 294 | 0.002 | 0.03 | 0.01 | 0.02 | 0.05 |
| 1892A | 208 294 | < 0.002 | 0.03 | 0.02 | 0.02 | 0.05 |
| 1893A | 208 294 | < 0.002 | 0.07 | 0.13 | 0.07 | 0.22 |

CERTIFICATION: W. Glen Bamber

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Y1A 3S9

Project : MARG
Comments:

Page Number : 1
Total Pages : 1
Invoice Date: 9-AUG-90
Invoice No. : I-9020001
P.O. Number :

## CERTIFICATE OF ANALYSIS A9020001

| SAMPLE DESCRIPTION | PREP CODE | | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1894A | 208 | 294 | < 0.002 | 0.02 | 0.01 | 0.03 | 0.09 | | | | | |
| 1895A | 208 | 294 | < 0.002 | 0.02 | 0.01 | 0.01 | 0.09 | | | | | |
| 1896A | 208 | 294 | 0.006 | 0.23 | 0.05 | 0.40 | 0.74 | | | | | |
| 1897A | 208 | 294 | 0.010 | 0.77 | 0.71 | 0.65 | 1.20 | | | | | |
| 1898A | 208 | 294 | 0.045 | 2.25 | 2.60 | 2.20 | 4.46 | | | | | |
| 1899A | 208 | 294 | 0.004 | 0.24 | 0.10 | 0.27 | 0.50 | | | | | |
| 1900A | 208 | 294 | 0.004 | 0.04 | 0.03 | 0.09 | 0.13 | | | | | |
| 1901A | 208 | 294 | 0.004 | 0.04 | 0.05 | 0.12 | 0.18 | | | | | |
| 1902A | 208 | 294 | < 0.002 | 0.12 | 0.09 | 0.13 | 0.08 | | | | | |
| 1903A | 208 | 294 | < 0.002 | < 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1904A | 208 | 294 | < 0.002 | < 0.01 | 0.01 | 0.01 | 0.09 | | | | | |
| 1905A | 208 | 294 | 0.008 | 0.91 | 0.69 | 1.18 | 2.26 | | | | | |
| 1906A | 208 | 294 | 0.002 | 0.07 | 0.07 | 0.15 | 0.24 | | | | | |
| 1907A | 208 | 294 | 0.010 | 0.76 | 0.62 | 0.84 | 1.48 | | | | | |
| 1908A | 208 | 294 | 0.002 | 0.06 | 0.06 | 0.10 | 0.17 | | | | | |
| 1909A | 208 | 294 | 0.002 | 0.05 | 0.04 | 0.08 | 0.14 | | | | | |

CERTIFICATION: W. Stan Armanini

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Project : MARG
Comments:

Page Number : 1
Total Pages : 1
Invoice Date: 23-AUG-90
Invoice No. : I-9020800
P.O. Number :

## CERTIFICATE OF ANALYSIS A9020800

| SAMPLE DESCRIPTION | PREP CODE | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1933 A | 208 294 | 0.002 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | | | | |
| 1934 A | 208 294 | 0.008 | 0.22 | 0.18 | 0.32 | 0.65 | | | | | |
| 1935 A | 208 294 | 0.010 | 0.07 | 0.05 | 0.08 | 0.13 | | | | | |
| 1936 A | 208 294 | 0.002 | 0.05 | 0.01 | 0.04 | 0.07 | | | | | |
| 1937 A | 208 294 | 0.002 | 0.07 | 0.02 | 0.05 | 0.04 | | | | | |
| 1938 A | 208 294 | < 0.002 | 0.14 | 0.01 | 0.15 | 0.24 | | | | | |
| 1939 A | 208 294 | < 0.002 | < 0.01 | < 0.01 | < 0.01 | 0.25 | | | | | |
| 1940 A | 208 294 | 0.218 | 5.72 | 0.73 | 4.48 | 6.58 | | | | | |
| 1941 A | 208 294 | 0.014 | 0.22 | 0.05 | 0.19 | 0.32 | | | | | |
| 1942 A | 208 294 | 0.020 | 2.22 | 0.28 | 1.86 | 2.48 | | | | | |
| 1943 A | 208 294 | 0.010 | 0.22 | 0.07 | 0.23 | 0.32 | | | | | |
| 1944 A | 208 294 | 0.002 | 0.12 | 0.02 | 0.11 | 0.16 | | | | | |
| 1945 A | 208 294 | < 0.002 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | | | | |
| 1946 A | 208 294 | < 0.002 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | | | | |
| 1947 A | 208 294 | < 0.002 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | | | | |
| 1948 A | 208 294 | < 0.002 | 0.01 | < 0.01 | < 0.01 | < 0.01 | | | | | |

CERTIFICATION: W. Dan Bracewell

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Project : MARG
Comments:


Invoice Date: 22-AUG-90
Invoice No. : I-9020821
P.O. Number :

## CERTIFICATE OF ANALYSIS A9020821

| SAMPLE DESCRIPTION | PREP CODE | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1910A | 208 294 | 0.002 | 0.03 | 0.01 | 0.02 | 0.05 | | | | | |
| 1911A | 208 294 | 0.002 | 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1912A | 208 294 | 0.017 | 1.00 | 0.92 | 0.99 | 1.96 | | | | | |
| 1913A | 208 294 | 0.004 | 0.05 | 0.11 | 0.06 | 0.12 | | | | | |
| 1914A | 208 294 | 0.012 | 1.21 | 1.56 | 1.37 | 2.76 | | | | | |
| 1915A | 208 294 | 0.004 | 0.10 | 0.07 | 0.08 | 0.17 | | | | | |
| 1916A | 208 294 | 0.002 | 0.03 | 0.02 | 0.04 | 0.09 | | | | | |
| 1917A | 208 294 | 0.002 | 0.02 | 0.02 | 0.05 | 0.14 | | | | | |
| 1918A | 208 294 | < 0.002 | 0.05 | 0.03 | 0.05 | 0.08 | | | | | |
| 1919A | 208 294 | < 0.002 | < 0.01 | < 0.01 | 0.01 | 0.02 | | | | | |
| 1920A | 208 294 | < 0.002 | < 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1921A | 208 294 | < 0.002 | 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1922A | 208 294 | < 0.002 | 0.02 | < 0.01 | < 0.01 | 0.01 | | | | | |
| 1923A | 208 294 | 0.008 | 0.04 | 0.03 | 0.03 | 0.13 | | | | | |
| 1924A | 208 294 | 0.040 | 3.34 | 2.31 | 4.29 | 6.55 | | | | | |
| 1925A | 208 294 | 0.006 | 0.12 | 0.09 | 0.08 | 0.17 | | | | | |
| 1926A | 208 294 | 0.045 | 2.56 | 1.76 | 3.80 | 6.52 | | | | | |
| 1927A | 208 294 | < 0.002 | 0.02 | 0.02 | 0.05 | 0.16 | | | | | |
| 1928A | 208 294 | 0.004 | 0.50 | 0.47 | 0.68 | 1.40 | | | | | |
| 1929A | 208 294 | 0.002 | 0.02 | 0.02 | 0.02 | 0.02 | | | | | |
| 1930A | 208 294 | < 0.002 | 0.05 | 0.05 | 0.07 | 0.10 | | | | | |
| 1931A | 208 294 | 0.016 | 1.79 | 2.19 | 2.62 | 5.32 | | | | | |
| 1932A | 208 294 | < 0.002 | 0.05 | 0.16 | 0.08 | 0.22 | | | | | |

CERTIFICATION: W. Blenkinsopini

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Y1A 3S9

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Comments:

Page Number : 1
Total Pages : 1
Invoice Date: 21-AUG-90
Invoice No. : I-9020874
P.O. Number : NONE

## CERTIFICATE OF ANALYSIS A9020874

| SAMPLE DESCRIPTION | PREP CODE | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1949 A | 209 294 | < 0.002 | 0.01 | < 0.01 | 0.01 | < 0.01 | | | | | |
| 1950 A | 209 294 | < 0.002 | 0.01 | < 0.01 | 0.02 | < 0.01 | | | | | |
| 1951 A | 209 294 | < 0.002 | < 0.01 | < 0.01 | 0.01 | < 0.01 | | | | | |
| 1952 A | 209 294 | < 0.002 | < 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1953 A | 209 294 | < 0.002 | 0.04 | < 0.01 | 0.01 | 0.07 | | | | | |
| 1954 A | 209 294 | 0.027 | 0.60 | 0.11 | 1.01 | 1.34 | | | | | |
| 1955 A | 209 294 | 0.004 | 0.03 | 0.01 | 0.01 | 0.12 | | | | | |
| 1956 A | 209 294 | 0.012 | 1.14 | 0.77 | 1.84 | 2.96 | | | | | |
| 1957 A | 209 294 | 0.004 | 0.19 | 0.12 | 0.20 | 0.37 | | | | | |
| 1958 A | 209 294 | 0.006 | 0.44 | 0.37 | 0.47 | 0.89 | | | | | |
| 1959 A | 209 294 | < 0.002 | 0.01 | < 0.01 | 0.01 | 0.01 | | | | | |
| 1960 A | 209 294 | 0.002 | 0.38 | 0.28 | 0.36 | 0.69 | | | | | |
| 1961 A | 209 294 | 0.006 | 0.16 | 0.15 | 0.25 | 0.40 | | | | | |
| 1962 A | 209 294 | 0.004 | 0.06 | 0.04 | 0.13 | 0.19 | | | | | |
| 1963 A | 209 294 | 0.008 | 0.34 | 0.33 | 0.56 | 0.98 | | | | | |
| 1964 A | 209 294 | 0.031 | 1.75 | 1.61 | 2.96 | 5.45 | | | | | |
| 1965 A | 209 294 | 0.018 | 0.89 | 1.09 | 1.34 | 2.51 | | | | | |
| 1966 A | 209 294 | 0.028 | 1.90 | 2.00 | 3.08 | 6.16 | | | | | |
| 1967 A | 209 294 | < 0.002 | 0.06 | 0.08 | 0.09 | 0.21 | | | | | |
| 1968 A | 209 294 | 0.002 | 0.08 | 0.03 | 0.08 | 0.18 | | | | | |

CERTIFICATION: W. Don Armstrong

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Project : MARG
Comments:


Invoice Date: 22-AUG-90
Invoice No. : I-9021274
P.O. Number :

## CERTIFICATE OF ANALYSIS A9021274

| SAMPLE DESCRIPTION | PREP CODE | Au oz/T RUSH | Ag oz/T RUSH | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 658A | 236 295 | 0.004 | 0.22 | 0.16 | 0.34 | 0.54 | | | | | |
| 659A | 236 295 | 0.004 | 0.35 | 0.62 | 0.37 | 0.86 | | | | | |
| 660A | 236 295 | 0.002 | 0.22 | 0.10 | 0.33 | 0.65 | | | | | |
| 661A | 236 295 | < 0.002 | 0.04 | 0.05 | 0.04 | 0.11 | | | | | |
| 1969A | 236 295 | < 0.002 | < 0.01 | 0.01 | 0.01 | 0.04 | | | | | |
| 1970A | 236 295 | 0.004 | 0.25 | 1.89 | 0.29 | 0.78 | | | | | |
| 1971A | 236 295 | 0.002 | 0.10 | 2.17 | 0.06 | 0.16 | | | | | |
| 1972A | 236 295 | 0.004 | 0.20 | 2.44 | 0.15 | 0.84 | | | | | |
| 1973A | 236 295 | 0.006 | 0.12 | 1.85 | 0.04 | 0.28 | | | | | |
| 1974A | 236 295 | 0.006 | 0.76 | 2.53 | 1.01 | 4.14 | | | | | |
| 1975A | 236 295 | 0.010 | 0.73 | 0.54 | 0.85 | 1.38 | | | | | |

CERTIFICATION: W. Dan Armstrong

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Project : MARG
Comments:


Invoice Date: 26-AUG-90
Invoice No. : I-9021536
P.O. Number :

## CERTIFICATE OF ANALYSIS A9021536

| SAMPLE DESCRIPTION | PREP CODE | Au oz/T RUSH | Ag oz/T RUSH | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|---|
| 662A | 258 295 | 0.002 | 0.13 | 0.15 | 0.15 | 0.26 |
| 663A | 258 295 | < 0.002 | 0.04 | 0.01 | 0.06 | 0.10 |
| 664A | 258 295 | 0.010 | 1.55 | 1.01 | 3.55 | 6.18 |
| 665A | 258 295 | 0.006 | 0.79 | 0.41 | 1.03 | 2.46 |
| 666A | 258 295 | 0.020 | 2.71 | 0.94 | 5.55 | 10.50 |
| 667A | 258 295 | 0.004 | 0.25 | 0.35 | 0.38 | 0.75 |
| 668A | 258 295 | 0.002 | 0.29 | 0.12 | 0.72 | 1.43 |
| 669A | 258 295 | < 0.002 | 0.03 | 0.17 | 0.03 | 0.05 |
| 670A | 258 295 | 0.026 | 1.90 | 0.19 | 2.69 | 6.14 |

CERTIFICATION: W. Stentmanini

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Y1A 3S9

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Comments:

Page Number : 1
Total Pages : 1
Invoice Date: 09-SEP-90
Invoice No. : I-9022043
P.O. Number :

## CERTIFICATE OF ANALYSIS A9022043

| SAMPLE DESCRIPTION | PREP CODE | | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 671A | 208 | 294 | 0.002 | 0.03 | 0.03 | 0.04 | 0.13 | | | | | |
| 672A | 208 | 294 | < 0.002 | < 0.01 | 0.01 | < 0.01 | 0.09 | | | | | |
| 673A | 208 | 294 | < 0.002 | < 0.01 | 0.20 | 0.01 | 0.07 | | | | | |
| 674A | 208 | 294 | 0.004 | 0.41 | 0.69 | 0.39 | 1.46 | | | | | |
| 675A | 208 | 294 | < 0.002 | 0.04 | 0.02 | 0.03 | 0.07 | | | | | |
| 676A | 208 | 294 | 0.002 | 0.04 | 0.04 | 0.03 | 0.11 | | | | | |
| 677A | 208 | 294 | 0.022 | 1.95 | 3.05 | 3.13 | 7.18 | | | | | |
| 678A | 208 | 294 | 0.022 | 2.22 | 2.91 | 2.09 | 7.19 | | | | | |
| 679A | 208 | 294 | 0.004 | 0.06 | 0.40 | 0.04 | 0.12 | | | | | |
| 680A | 208 | 294 | 0.002 | 0.16 | 0.33 | 0.31 | 0.77 | | | | | |
| 681A | 208 | 294 | < 0.002 | < 0.01 | 0.01 | 0.01 | 0.06 | | | | | |
| 682A | 208 | 294 | < 0.002 | < 0.01 | 0.01 | 0.01 | 0.04 | | | | | |
| 683A | 208 | 294 | < 0.002 | < 0.01 | 0.10 | 0.04 | 0.12 | | | | | |
| 684A | 208 | 294 | 0.016 | 1.55 | 3.20 | 2.77 | 7.52 | | | | | |
| 685A | 208 | 294 | 0.002 | 0.03 | 0.06 | 0.07 | 0.35 | | | | | |

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Project : MARG
Comments:


Invoice Date: 11-SEP-90
Invoice No. : I-9022261
P.O. Number :

## CERTIFICATE OF ANALYSIS A9022261

| SAMPLE DESCRIPTION | PREP CODE | | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 686 A | 208 | 294 | 0.002 | 0.10 | 0.02 | 0.17 | 0.24 | | | | | |
| 687 A | 208 | 294 | < 0.002 | 0.01 | < 0.01 | 0.01 | 0.03 | | | | | |
| 688 A | 208 | 294 | 0.002 | 0.42 | 0.06 | 0.83 | 1.05 | | | | | |
| 689 A | 208 | 294 | < 0.002 | 0.05 | 0.01 | 0.08 | 0.11 | | | | | |
| 690 A | 208 | 294 | 0.006 | 1.12 | 1.33 | 1.46 | 3.46 | | | | | |
| 691 A | 208 | 294 | < 0.002 | 0.02 | < 0.01 | 0.02 | 0.04 | | | | | |
| 692 A | 208 | 294 | 0.004 | 0.58 | 0.66 | 0.98 | 2.18 | | | | | |
| 693 A | 208 | 294 | < 0.002 | 0.01 | < 0.01 | 0.02 | 0.04 | | | | | |
| 694 A | 208 | 294 | < 0.002 | < 0.01 | < 0.01 | 0.03 | 0.04 | | | | | |
| 695 A | 208 | 294 | 0.016 | 1.11 | 0.79 | 1.84 | 3.86 | | | | | |
| 696 A | 208 | 294 | 0.002 | 0.04 | 0.02 | 0.07 | 0.11 | | | | | |

CERTIFICATION: W. Glen Bmanini

092915

# APPENDIX F

## 1988, 1989 AND 1990 SUMMARY DRILL LOGS

# GUIDE TO DRILL LOGS

## ROCK NAMES

| Symbols | Rock Name |
|---|---|
| QMPH | quartz sericite phyllite |
| QMPH' | quartz sericite phyllite with quartz eyes |
| QGPH | quartz graphite phyllite |
| CLPH | chlorite phyllite |
| CARB | carbonate quartz chlorite phyllite |
| QZIT | quartzite |
| LIMS | limestone |
| MSSX | massive sulphides (SMSX - semi-massive sulphides) |
| QZVN | quartz vein |
| CASN | casing |

## ROCK DESCRIPTIONS

QMPH - Pale grey to pale green, 30-60% quartz, 30-50% sericite, 3-10% carbonate, variable amounts of chlorite and carbonaceous material.

QMPH' - A variety of the quartz sericite phyllite with 10-20% bluish quartz augens (quartz eyes), 2-3 mm across.

QGPH - Distinctive unit having sharp contacts with other units. Black with up to 50% quartz and 50% black carbonaceous material. Up to 10% visible pyrite crystals (up to 10 mm across).

CLPH - Pale green, chlorite schist. Thin bedded to massive, contains minor amounts of muscovite, quartz and carbonaceous and calcareous material.

CARB - Carbonate quartz chlorite phyllite. Pale green when fresh, weathers to a pale orange colour. 50-60% carbonate (ankerite?), up to 30% greenish sericite (frequently mistaken for chlorite?) and 20% quartz.

QZIT - Light grey, thin bedded to massive, contains minor amounts of sericite, chlorite, carbonaceous and calcareous material. Interbeds of QGPH can be common.

LIMS - Brecciated black, siliceous limestone with white quartz matrix.

MSSX - Massive pyrite with variable amounts of chalcopyrite, sphalerite and galena. Occasionally with a banded appearance.

QZVN - White bull quartz vein.

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M 88-1 — Page 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| COORDINATES 100, 173.73 N 99, 091.78 E | DEPTH | COLLAR | 76m | 181m | |
| ELEVATION 1,373.08(m) DATE STARTED 06/15/88 | DIP | -50° | -47° | -46° | |
| CORE SIZE HQ/NQ DATE COMPLETED 06/17/88 | AZIMUTH | 343° | — | — | |

FINAL DEPTH 181.97m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 2.94 | CASING | | | | | | | | |
| 2.94 | 23.50 | QGPH | | | | | | | | |
| 23.50 | 25.65 | QMPH | | | | | | | | |
| 25.65 | 26.0 | MSSX | Heavily disseminated, 80% sulphide | 1758 | 0.46 | 0.84 | 0.71 | 1.95 | 0.48 | .004 |
| 26.0 | 29.0 | QMPH | ~1m QGPH band within | 1002A | 3.00 | 0.07 | 0.03 | 0.10 | 0.03 | .002 |
| 29.0 | 31.6 | MSSX/QGPH | MSSX - upper 50 and lower 40cm thin bands within | 1759 | 2.13 | 0.48 | 0.23 | 1.04 | 0.16 | <.003 |
| 31.6 | 34.18 | QGPH/MSSX | MSSX - 32.90 - 33.45<br>QGPH - 32.2 - 32.9 | 1760 | 3.05 | 0.87 | 0.64 | 1.77 | 0.46 | <.003 |
| 34.18 | 36.70 | QMPH | | | | | | | | |
| 36.70 | 65.0 | QGPH | Scattered CARB bands<br>QMPH - 49.5 - 50.25 | | | | | | | |
| 65.0 | 69.19 | QMPH | | | | | | | | |
| 69.19 | 95.50 | QGPH | | | | | | | | |
| 95.50 | 100.82 | CARB | | | | | | | | |
| 100.82 | 103.45 | QMPH | | | | | | | | |
| 103.45 | 138.05 | QGPH | Quartz Vein and CARB 111.78 - 115.65 | | | | | | | |
| 138.05 | 154.80 | CARB | Bands of QMPH and chlorite Phyllite | | | | | | | |
| 154.80 | 181.97 | QGPH | occasional thin CARB bands | | | | | | | |
| | | EOH | | | | | | | | |
| 29.0 | 34.18 | B HORIZON | | | 5.18 | 0.71 | 0.47 | 1.47 | 0.34 | .002 |
| | | | | | | 2.65% Cu+Pb+Zn | | | | |

T B 1

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No. M88-2** — **Page 1 of 1**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 187.63 N | 99, 883.13 E | DEPTH | COLLAR | 113m | |
| ELEVATION | 1438.28 (m) | DATE STARTED 06/20/88 | DIP | -50° | -45° | |
| CORE SIZE | NQ | DATE COMPLETED 06/22/88 | AZIMUTH | 359° | — | |
| FINAL DEPTH | 113.08m | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 16.10 | CASING | | | | | | | | | |
| 16.10 | 17.37 | QMPH | | 1003 A | 1.27 | <0.01 | 0.12 | <0.01 | 0.39 | .004 | |
| 17.37 | 18.39 | FAULT | | | | | | | | | |
| 18.39 | 21.45 | MSSX | Highly oxidized, limonitic, Porous | 1751 | 3.05 | 0.27 | 7.87 | 0.02 | 4.75 | .044 | B |
| 21.45 | 25.09 | MSSX | Highly oxidized | 1752 | 3.14 | 0.26 | 3.74 | 0.02 | 13.71 | .055 | |
| 25.09 | 28.20 | QMPH | scattered green staining (malachite??) | 1753 | 3.11 | 0.08 | 0.41 | 0.04 | 0.20 | <.003 | |
| 28.20 | 29.57 | MSSX | 50-60% quartz gangue Porous | 1754 | 1.37 | 4.43 | 2.45 | 4.65 | 2.23 | .035 | |
| 29.57 | 31.09 | MSSX | Ditto | 1755 | 1.52 | 4.22 | 1.87 | 3.26 | 1.50 | .026 | A |
| 31.09 | 32.61 | SMSX/QGPH | 30-40% sulphide Bands | 1756 | 1.52 | 3.37 | 0.98 | 2.57 | 1.32 | .027 | |
| 32.61 | 34.14 | QGPH | occasional malachite? staining | 1757 | 1.53 | 0.40 | 0.23 | 0.12 | 0.03 | .006 | |
| 34.14 | 35.00 | QMPH | | | | | | | | | |
| 35.00 | 35.97 | QGPH | | | | | | | | | |
| 35.97 | 37.19 | QGPH | 5% malachite stain 3cm MSSX band | 59795 | 1.22 | 1.20 | 1.03 | 0.46 | 0.34 | .004 | |
| 37.19 | 38.71 | QGPH | Scattered 1-3 cm MSSX bands | 9796 | 1.52 | 3.48 | 1.22 | 1.37 | 0.51 | .010 | |
| 38.71 | 40.23 | QGPH | occasional 1-3cm MSSX bands | 9797 | 1.52 | 0.44 | 0.49 | 0.73 | 0.31 | .004 | |
| 40.23 | 41.75 | QGPH | ditto | 9798 | 1.52 | 0.33 | 0.53 | 0.98 | 0.37 | .006 | |
| 41.75 | 43.28 | QGPH | ditto | 9799 | 1.52 | 0.22 | 0.22 | 0.50 | 0.15 | .004 | |
| 43.28 | 49.07 | QMPH | QGPH - 43.28 - 43.98, 46.33 - 47.94 | | | | | | | | |
| 49.07 | 59.72 | QGPH | QZIT - 50.04 - 50.90, 52.20 - 53.75 | | | | | | | | |
| 59.72 | 75.20 | QZIT | | | | | | | | | |
| 75.20 | 82.70 | QMPH | 79.50 - 80.50 - QGPH with Pyrrhotite blebs | | | | | | | | |
| 82.70 | 93.25 | QZIT | | | | | | | | | |
| 93.25 | 97.23 | QGPH | Fault zones at: 96.25 - 95.95, 96.62 - 97.23 | | | | | | | | |
| 97.23 | 113.08 | QZIT | | | | | | | | | |
| 18.39 | 25.09 | B HORIZON | | | 6.19 | 0.26 | 5.77 | 0.02 | 9.30 | 0.05 | |
| | | | | | | 6.05% | Cu+Pb+Zn | | | | |
| 28.20 | 32.61 | A HORIZON | | | 4.42 | 3.99 | 1.74 | 3.44 | 1.66 | 0.029 | |
| | | | | | | 9.17% | Cu+Pb+Zn | | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M88-3 — Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 187.63 N 99, 883.13 E | DEPTH | COLLAR | 81m | | |
| ELEVATION | 1438.28 (m) DATE STARTED 06/22/88 | DIP | -80° | -75° | | |
| CORE SIZE | NQ DATE COMPLETED 06/23/88 | AZIMUTH | 359° | — | | |
| FINAL DEPTH | 81.38m | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 12.80 | CASING | | | | | | | | | |
| 12.80 | 20.42 | QMPH | | | | | | | | | |
| 20.42 | 21.95 | QMPH | scattered malachite stain. | S9800 | 1.53 | 0.10 | 0.09 | 0.09 | 0.16 | .004 | |
| 21.95 | 23.47 | QMPH | ditto | 9801 | 1.52 | 0.11 | 0.16 | 0.05 | 0.04 | .002 | |
| 23.47 | 25.00 | QMPH | ditto | 9802 | 1.53 | 0.69 | 0.21 | 0.29 | 0.30 | .008 | |
| 25.00 | 26.52 | QMPH | ditto | 9803 | 1.52 | 0.24 | 0.21 | 0.20 | 0.13 | .006 | |
| 26.52 | 27.73 | QMPH | ditto | S9804 | 1.52 | 0.61 | 0.25 | 0.52 | 0.42 | .004 | |
| 27.73 | 28.35 | QMPH | ditto | 1004A | 0.62 | 0.02 | 0.12 | 0.07 | <0.01 | .002 | |
| 28.35 | 29.41 | MSSX | Granular, vuggy, banded | S9967 | 1.07 | 5.41 | 3.05 | 6.72 | 2.97 | .010 | B |
| 29.41 | 34.00 | QMPH | | | | | | | | | |
| 34.00 | 35.05 | QMPH | | 1005A | 1.05 | 0.04 | 0.03 | 0.07 | 0.01 | <.002 | |
| 35.05 | 35.66 | MSSX | | 9968 | 0.61 | 1.10 | 1.70 | 3.47 | 1.15 | .040 | |
| 35.66 | 40.20 | QMPH/QGPH | QMPH to 38.71 | 1006 | 4.54 | 0.08 | 0.11 | 0.04 | 0.07 | .002 | |
| 40.20 | 41.75 | MSSX | 20-30% quartz gangue weak banding | 9969 | 1.52 | 1.33 | 1.84 | 3.84 | 1.49 | .024 | A |
| 41.75 | 45.42 | QGPH | | 1007 | 3.67 | 0.02 | 0.01 | 0.09 | <0.01 | .002 | |
| 45.42 | 46.78 | QGPH/MSSX | MSSX - 45.7 - 45.8<br>46.1 - 46.25 | 9970 | 1.37 | 1.10 | 1.00 | 2.09 | 0.92 | .008 | A |
| 46.78 | 50.00 | QGPH | | 1008 | 1.70 | 0.05 | 0.02 | 0.30 | 0.01 | .002 | |
| 50.00 | 57.15 | QMPH | QGPH 53.45 - 55.47 | | | | | | | | |
| 57.15 | 65.30 | QZIT | | | | | | | | | |
| 65.30 | 74.00 | QGPH | Fault 70.0 - 70.50 | | | | | | | | |
| 74.00 | 81.38 | QZIT | | | | | | | | | |
| 28.35 | 29.41 | B HORIZON | | | 1.07 | 5.41 | 3.05 | 6.72 | 2.97 | .010 | |
| | | | | | | 15.15% | Cu+Pb+Zn | | | | |
| 40.20 | 41.75 | A HORIZON | | | 1.55 | 1.33 | 1.84 | 3.84 | 1.49 | .024 | |
| | | | | | | 7.01% | Cu+Pb+Zn | | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M88-4 — Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 093.56 N | 99, 790.14 E | DEPTH | COLLAR | | |
| ELEVATION | 1438.89 (m) | DATE STARTED 06/23/88 | DIP | -50° | | |
| CORE SIZE | HQ/NQ/BQ | DATE COMPLETED 06/24/88 | AZIMUTH | 003° | | |
| FINAL DEPTH | 91.14m | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 9.14 | CASING | | | | | | | | |
| 9.14 | 20.50 | QGPH | CARB 10.60 - 13.90<br>chlorite Phyllite 17.50 - 20.50 | | | | | | | |
| 20.50 | 43.35 | QGPH | | | | | | | | |
| 43.35 | 55.63 | QMPH | | | | | | | | |
| 55.63 | 57.00 | QGPH | Highly broken, fault zone | S 9962 | 1.37 | <0.01 | 0.01 | 0.08 | 0.03 | .002 |
| 57.00 | 58.52 | QGPH | ditto | 9963 | 1.52 | <0.01 | <0.01 | 0.03 | 0.03 | .002 |
| 58.52 | 65.23 | CAVITY | Weathered sulphides/ fault zone? | | | | | | | |
| 65.23 | 66.75 | MSSX | 10cm Ferricrete, upper contact | 9964 | 1.52 | 0.20 | 9.07 | 0.02 | 3.85 | .008 |
| 66.75 | 68.28 | QMPH | 50-75% brown limonite | 9965 | 1.53 | 0.08 | 3.29 | 0.02 | 1.81 | .046 |
| 68.28 | 78.54 | QMPH | QGPH 75.57 - 76.54 | | | | | | | |
| 78.54 | 82.30 | QGPH | | | | | | | | |
| 82.30 | 84.0 | QMPH | | | | | | | | |
| 84.0 | 91.14 | QGPH | QMPH 89.76 - 90.95 | | | | | | | |
| 65.23 | 68.28 | EOH<br>D HORIZON | * oxidized | | 3.05 | 0.14 | 6.18 | 0.02 | 2.81 | .027* |
| | | | | | | 6.34% | Cu+Pb+Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-5 Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,093.56 N | 99,790.14 E | DEPTH | COLLAR | 87m | |
| ELEVATION | 1,438.89 (m) | DATE STARTED 06/25/88 | DIP | -70° | -66° | |
| CORE SIZE | NQ | DATE COMPLETED 06/26/88 | AZIMUTH | 003° | — | |
| FINAL DEPTH | 87.48 m | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 9.45 | CASING | | | | | | | | |
| 9.45 | 12.70 | QGPH | Occasional thin chloritic bands | | | | | | | |
| 12.70 | 25.10 | CARB | chlorite Phyllite - weak carbonate | | | | | | | |
| 25.10 | 49.00 | QGPH | | | | | | | | |
| 49.00 | 61.26 | QMPH | MSSX - 58.58 - 58.84 | | | | | | | |
| 61.26 | 62.79 | QGPH | QMPH to 61.80 | 59953 | 1.53 | 0.05 | 0.06 | 0.10 | 0.16 | .002 |
| 62.79 | 64.10 | QMPH | | 9954 | 1.31 | 0.63 | 0.97 | 1.32 | 0.47 | .004 |
| 64.10 | 66.14 | MSSX | Layered sulphides, occasional 2-4cm QMPH bands | 9955 | 2.04 | 4.99 | 3.75 | 5.82 | 3.10 | .042 |
| 66.14 | 67.66 | MSSX | Ditto | 9956 | 1.52 | 2.84 | 3.03 | 5.32 | 2.01 | .030 |
| 67.66 | 69.19 | MSSX | Ditto | 9957 | 1.53 | 2.49 | 4.42 | 7.14 | 2.13 | .028 |
| 69.19 | 70.71 | MSSX | Ditto | 9958 | 1.52 | 3.03 | 3.41 | 6.27 | 2.02 | .024 |
| 70.71 | 72.24 | MSSX | Ditto | 9959 | 1.53 | 2.79 | 4.37 | 7.92 | 1.77 | .030 |
| 72.24 | 74.77 | MSSX | Ditto | 9960 | 2.53 | 3.24 | 3.32 | 7.02 | 1.49 | .026 |
| 74.77 | 78.33 | QMPH | 2-3% disseminated Pyrite | 9961 | 2.96 | 0.32 | 0.20 | 0.30 | 0.11 | .012 |
| 78.33 | 79.86 | QMPH | | 9964 | 1.53 | 0.02 | 0.05 | 0.08 | 0.01 | .002 |
| 79.86 | 86.0 | QMPH | | | | | | | | |
| 86.0 | 87.48 | QGPH | | | | | | | | |
| | | EOH | | | | | | | | |
| 64.10 | 74.77 | D HORIZON | | | 10.67 | 3.32 | 3.68 | 6.59 | 2.08 | .030 |
| | | | | | | 13.59% | Cu+Pb | + Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-6 Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 99,989.28 N | 99,720.70 E | DEPTH | COLLAR | 145m | |
| ELEVATION | 1416.85 (m) | DATE STARTED 06/27/88 | DIP | -50° | -45° | |
| CORE SIZE | NQ | DATE COMPLETED 06/30/88 | AZIMUTH | 002° | — | |

FINAL DEPTH 145.39m

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 6.30 | CASING | |
| 6.30 | 11.50 | QMPH | |
| 11.50 | 36.42 | QGPH | CARB - 16.60 - 19.05<br>QMPH - 33.90 - 35.05 |
| 36.42 | 54.87 | CARB | chlorite phyllite and CARB<br>QGPH - 38.70 - 40.82, 45.50 - 46.75 |
| 54.87 | 57.13 | QMPH | |
| 57.13 | 72.57 | QGPH | scattered CARB and chlorite Phyllite bands |
| 72.57 | 88.51 | QMPH | scattered QGPH bands up to 1m thick |
| 88.51 | 93.49 | QGPH | |
| 93.49 | 115.00 | QMPH | QGPH - 100.51 - 101.81<br>CARB - 108.07 - 110.30 |
| 115.00 | 120.61 | QMPH | SMSX - 116.99 - 117.04 |
| 120.61 | 121.24 | QGPH | MSSX - 120.61 - 120.73 |
| 121.24 | 130.09 | QMPH | |
| 130.09 | 131.02 | QGPH | |
| 131.02 | 145.39 | QMPH | |
| | | EOH | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 1009A | 5.61 | 0.03 | 0.01 | 0.04 | <0.01 | <.002 |
| 1010A | 0.62 | 0.16 | 0.92 | 1.28 | 0.69 | .008 |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-7 Page 1 of 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 99,985.42 N 98,701.92 E | | DEPTH | COLLAR | 139m | | |
| ELEVATION | 1324.91 (m) | DATE STARTED 07/1/88 | DIP | -50° | -46° | | |
| CORE SIZE | NQ | DATE COMPLETED 07/3/88 | AZIMUTH | 343° | — | | |
| FINAL DEPTH | 139.29m | | | | | | |

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 20.00 | CASING | |
| 20.00 | 31.00 | CARB | Chlorite Phyllite, little carbonate |
| 31.00 | 52.70 | QGPH | |
| 52.70 | 56.35 | CARB | |
| 56.35 | 69.35 | QGPH | |
| 69.35 | 71.70 | QMPH | |
| 71.70 | 80.30 | QGPH | |
| 80.30 | 83.00 | FAULT | Highly broken, graphitic |
| 83.00 | 84.38 | QMPH | |
| 84.38 | 139.29 | QGPH | scattered <1cm CARB bands<br>Fault - 94.02 - 94.50 |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-8 — **Page 1 of 1**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 223.01 N 99, 197.19 E | | DEPTH | COLLAR | 119 m | |
| ELEVATION | 1357.35 (m) | DATE STARTED 07/3/88 | DIP | -50° | -44.4° | |
| CORE SIZE | NQ | DATE COMPLETED 07/5/88 | AZIMUTH | 340° | — | |

**FINAL DEPTH** 124.05 m

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 4.30 | CASING | |
| 4.30 | 50.70 | QGPH | 0.4 - 1 m CARB bands<br>QMPH - 30.15 - 30.85 |
| 50.70 | 59.95 | CARB | chlorite phyllite (gabbro?)<br>- 52.47 - 58.75 |
| 59.95 | 66.20 | QGPH | Fault - 65.50 - 65.80 |
| 66.20 | 79.20 | CARB | |
| 79.20 | 99.20 | QGPH | LIMS - 85.90 - 86.02 |
| 99.20 | 114.70 | QZIT | QFPH - 101.25 - 102.64<br>CARB - 111.95 - 113.15 |
| 114.70 | 118.00 | QGPH | |
| 118.00 | 124.05 | QZIT | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M 88-9 — Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,084.26 N | 99,727.85 E | DEPTH | COLLAR | 163m | |
| ELEVATION | 1412.85(m) | DATE STARTED 08/7/88 | DIP | -50° | -46° | |
| CORE SIZE | NQ | DATE COMPLETED 08/10/88 | AZIMUTH | 354° | — | |
| FINAL DEPTH | 163.68m | | | | | |

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 13.00 | CASING | |
| 13.00 | 23.10 | QMPH | |
| 23.10 | 26.25 | FAULT | scattered quartz and chlorite 0.2m recovered |
| 26.25 | 29.57 | QMPH | MSSX band - 27.07 - 27.11 |
| 29.57 | 32.61 | FAULT/QMPH | 0.05 m Recovered after 30.05 oxidized MSSX |
| 32.61 | 34.44 | MSSX | 0.43 m Recovered |
| 34.44 | 35.05 | FAULT/QMPH | 0.11 m recovery to 34.99 oxidized sulphide |
| 35.05 | 35.66 | QMPH | Heavily disseminated sulphide |
| 35.66 | 40.00 | QMPH | Limonite alteration at top of interval |
| 40.00 | 53.32 | QMPH | |
| 53.32 | 64.12 | QGPH | LIMS band - 55.58 - 56.13 |
| 64.12 | 72.80 | QMPH | |
| 72.80 | 82.04 | QGPH | Fault - 78.94 - 79.40 QMPH - |
| 82.04 | 90.00 | QMPH | |
| 90.00 | 95.00 | QMPH | SMSX - 91.74 - 91.84 QGPH - 93.84 - 94.72 |
| 95.00 | 127.65 | QMPH | QGPH - 103.78 - 104.27 |
| 127.65 | 152.22 | QGPH | scattered 10 - 50 cm CARB bands |
| 152.22 | 154.35 | CARB | |
| 154.35 | 163.28 | QGPH | Fault - 159.90 - 160.37 |
| 163.28 | 163.68 | QZIT | |
| | | EOH | |
| 32.61 | 35.61 | C HORIZON | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 851A | 3.04 | 0.35 | 0.69 | 0.23 | 0.54 | .002 |
| 852A | 1.83 | 3.48 | 3.20 | 4.60 | 2.12 | 0.020 |
| 853A | 0.61 | 0.72 | 7.78 | 0.59 | 2.49 | 0.050 |
| 854A | 0.61 | 0.22 | 5.43 | 0.03 | 3.13 | 0.032 |
| 1011A | 4.34 | 0.12 | 1.27 | 0.09 | 1.33 | .002 |
| 1012A | 5.00 | 0.01 | 0.02 | 0.01 | 0.01 | <.002 |
| | 3.05 | 2.28 | 4.56 | 2.88 | 2.40 | .028 |
| | | 9.72% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M88-10 — 

| | | | | | |
|---|---|---|---|---|---|
| COORDINATES | 100, 124.41 N | 99, 884.59 E | DEPTH | COLLAR | 66m |
| ELEVATION | 1464.07 (m) | DATE STARTED 08/11/88 | DIP | -70° | -63° |
| CORE SIZE | NQ | DATE COMPLETED 08/14/88 | AZIMUTH | 358° | — |

**FINAL DEPTH** 156.05m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 7.62 | CASING | | | | | | | | |
| 7.62 | 15.70 | CARB | QMPH - 10.97-11.45, 12.0-12.51, 12.93-13.1 chlorite phyllite from 13.10 to end | | | | | | | |
| 15.70 | 55.00 | QMPH | weak fault - 31.90 - 32.0 | | | | | | | |
| 55.00 | 57.00 | QGPH | Weak fault last 15 cm | 1013A | 2.00 | 0.03 | 0.01 | 0.05 | <0.01 | .002 |
| 57.00 | 62.65 | QGPH | | 1014A | 5.65 | 0.06 | 0.04 | 0.11 | 0.03 | .002 |
| 62.65 | 63.09 | MSSX | | 855A | 0.44 | 0.93 | 2.17 | 3.15 | 1.69 | .028 |
| 63.09 | 66.14 | MSSX | | 856A | 3.05 | 1.07 | 5.93 | 7.95 | 2.61 | .048 |
| 66.14 | 68.58 | MSSX | Drillers report 3 foot cavity | 857A | 2.44 | 5.59 | 0.28 | 3.58 | 0.83 | .052 |
| 68.58 | 71.32 | QMPH/FAULT | Highly broken from 69.40 | 1015A | 2.74 | 0.09 | 0.07 | 0.17 | 0.03 | .004 |
| 71.32 | 82.20 | QMPH | CARB - 74.98 - 75.45, 81.53 - 81.86 | | | | | | | |
| 82.20 | 85.00 | CARB | | | | | | | | |
| 85.00 | 90.90 | QMPH | | | | | | | | |
| 90.90 | 91.60 | LIMS | | 858A | 0.70 | 0.03 | 0.05 | 0.10 | 0.04 | <.002 |
| 91.60 | 92.50 | QGPH | | 859A | 0.90 | 0.06 | 0.10 | 0.22 | 0.06 | <.002 |
| 92.50 | 104.64 | QMPH | chlorite Phyllite - 93.80 - 94.48 | | | | | | | |
| 104.64 | 105.23 | QFPH | | | | | | | | |
| 105.23 | 110.70 | QGPH | | 1016A | 5.47 | 0.02 | 0.01 | 0.04 | <0.01 | .002 |
| 110.70 | 113.08 | MSSX | QGPH from 112.74 | 860A | 2.38 | 1.30 | 2.96 | 4.78 | 1.98 | .040 |
| 113.08 | 113.90 | QGPH | | 861 | 0.82 | 0.19 | 0.38 | 0.73 | 0.30 | .002 |
| 113.90 | 114.20 | MSSX | QGPH with MSSX - 113.95 - 114.13 | 862 | 0.30 | 2.24 | 2.42 | 4.43 | 2.31 | .028 |
| 114.20 | 115.00 | QGPH | | 863 | 0.80 | 0.23 | 0.28 | 0.55 | 0.18 | .004 |
| 115.00 | 115.15 | MSSX | | 864 | 0.15 | 0.77 | 1.03 | 1.92 | 1.29 | .008 |
| 115.15 | 116.40 | QMPH | | 865 | 1.25 | 0.02 | 0.04 | 0.07 | 0.04 | .004 |
| 116.40 | 117.15 | MSSX | | 866 | 0.75 | 1.58 | 2.45 | 4.60 | 1.95 | .048 |
| 117.15 | 117.40 | QGPH | | 867 | 0.25 | 0.03 | 0.05 | 0.18 | 0.03 | .008 |
| 117.40 | 117.70 | MSSX/QGPH | MSSX to 117.45 | 868 | 0.30 | 0.93 | 1.93 | 3.97 | 1.47 | .034 |
| 117.70 | 118.15 | MSSX | QGPH with MSSX - 117.84 - 118.10 | 869 | 0.45 | 0.72 | 2.14 | 3.84 | 1.70 | .038 |
| 118.15 | 119.40 | QGPH | | 870 | 1.25 | 0.09 | 0.16 | 0.44 | 0.17 | .006 |
| 119.40 | 119.94 | MSSX | MSSX bands - 119.43 - 119.50, 119.82 - 119.94 | 871 | 0.54 | 0.84 | 1.96 | 3.72 | 1.55 | .032 |
| 119.94 | 121.60 | QGPH | | 872 | 1.66 | 0.06 | 0.13 | 0.31 | 0.11 | .008 |
| 121.60 | 122.05 | MSSX | MSSX - 121.65 - 122.0 QGPH above, QMPH below | 873 | 0.45 | 1.35 | 3.02 | 5.22 | 2.36 | .022 |
| 122.05 | 123.30 | QMPH | | 874A | 1.25 | 0.43 | 0.52 | 0.98 | 0.69 | .006 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-10 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 123.30 | 124.05 | MSSX | QMPH to 123.35 | 875A | 0.75 | 1.26 | 2.85 | 5.30 | 2.17 | .026 |
| 124.05 | 125.50 | MSSX | | 876 | 1.45 | 1.64 | 2.88 | 5.10 | 1.99 | .032 |
| 125.50 | 127.00 | MSSX | | 877 | 1.50 | 1.42 | 3.19 | 5.23 | 2.21 | .048 |
| 127.00 | 128.70 | CARB | MSSX - 128.12 - 128.70 | 878 | 1.70 | 0.79 | 1.01 | 1.87 | 1.03 | .050 |
| 128.70 | 130.15 | MSSX | CARB - 129.30 - 129.55 | 879 | 1.45 | 1.67 | 2.85 | 5.37 | 2.07 | .052 |
| 130.15 | 131.60 | MSSX | | 880 | 1.45 | 1.64 | 2.89 | 5.39 | 1.97 | .070 |
| 131.60 | 133.55 | MSSX | | 881A | 1.95 | 1.00 | 2.29 | 3.90 | 2.12 | .040 |
| 133.55 | 138.00 | QGPH | PZIT from 136.20 | 1017A | 4.45 | 0.25 | 0.34 | 0.73 | 0.36 | .006 |
| 138.00 | 141.58 | PZIT | | | | | | | | |
| 141.58 | 142.34 | QGPH | | | | | | | | |
| 142.34 | 145.38 | CAVITY | | | | | | | | |
| 145.38 | 156.05 | QGPH | | | | | | | | |
| | | EOH | | | | | | | | |
| 62.65 | 68.58 | O HORIZON | | | 5.93 | 2.92 | 3.33 | 5.93 | 1.81 | .048 |
| | | | | | | 12.18% | Cu+Pb+Zn | | | |
| 110.70 | 133.55 | A HORIZON | | | 22.85 | 0.94 | 1.79 | 3.19 | 1.38 | .031 |
| | | | | | | 5.92% | Cu+Pb+Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M88-11 — 

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,124.41 N | 99,884.59E | DEPTH | COLLAR | 159m | |
| ELEVATION | 1969.07(m) | DATE STARTED 08/14/88 | DIP | -85° | -78° | |
| CORE SIZE | NQ | DATE COMPLETED 08/19/88 | AZIMUTH | 358° | — | |
| FINAL DEPTH | 172.82m | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 6.10 | CASING | | | | | | | | | |
| 6.10 | 19.55 | QMPH | | | | | | | | | |
| 19.55 | 57.03 | QGPH | Faults - 28.51 - 29.26<br>41.30 - 41.75 | | | | | | | | |
| 57.03 | 60.65 | QMPH | | | | | | | | | |
| 60.65 | 62.78 | CAVITY | Fault? | | | | | | | | |
| 62.78 | 69.95 | QMPH | | | | | | | | | |
| 69.95 | 80.00 | QGPH | | | | | | | | | |
| 80.00 | 80.92 | QGPH | | 1018A | 0.92 | 0.05 | 0.09 | 0.20 | 0.09 | .004 | |
| 80.92 | 82.20 | CAVITY | | | | | | | | | |
| 82.20 | 83.82 | MSSX | QGPH - 82.47 - 82.72 | 882A | 1.62 | 1.05 | 4.40 | 6.34 | 1.60 | .062 | T |
| 83.82 | 85.25 | MSSX | | 883 | 1.42 | 3.49 | 3.99 | 6.05 | 1.57 | .010 | |
| 85.25 | 86.87 | MSSX | | 884 | 1.62 | 2.01 | 2.25 | 6.40 | 0.97 | .014 | D |
| 86.87 | 87.75 | MSSX | Transitional lower contact | 885 | 0.88 | 2.85 | 0.53 | 3.82 | 0.04 | .016 | I |
| 87.75 | 89.00 | QMPH | 3cm sulphide bands | 886 | 1.25 | 0.48 | 0.10 | 0.33 | 0.05 | .028 | |
| 89.00 | 91.00 | QMPH | sulphide laminations | 887 | 2.00 | 0.10 | 0.41 | 0.67 | 0.17 | .012 | |
| 91.00 | 92.50 | QMPH | disseminated sulphide | 888 | 1.50 | 0.09 | 0.29 | 0.35 | 0.08 | .004 | |
| 92.50 | 94.10 | QMPH | ditto | 889A | 1.60 | 0.52 | 0.22 | 0.34 | 0.08 | .004 | |
| 94.10 | 123.00 | QMPH | QGPH - 117.0 - 117.85 | | | | | | | | |
| 123.00 | 125.50 | QGPH | | | | | | | | | |
| 125.50 | 130.60 | QMPH | QGPH - 127.71 - 128.60 | | | | | | | | |
| 130.60 | 132.48 | QGPH | | | | | | | | | |
| 132.48 | 135.68 | QMPH | QGPH - 133.75 - 134.68 | | | | | | | | |
| 135.68 | 138.55 | FAULT/QGPH | Faulted to 136.85<br>QMPH - 136.85 - 137.30 | 1019A | 2.87 | 0.04 | 0.04 | 0.19 | 0.03 | .002 | |
| 138.55 | 139.50 | MSSX | | 890A | 0.95 | 1.12 | 2.14 | 3.72 | 2.07 | .039 | |
| 139.50 | 143.30 | QMPH | Fault - 141.05 - 142.08 | 1020A | 3.80 | 0.06 | 0.02 | 0.19 | 0.06 | .002 | |
| 143.30 | 143.85 | MSSX | QGPH with MSSX bands -<br>143.35 - 143.48, 143.56 - 143.78 | 891A | 0.55 | 0.56 | 1.28 | 2.13 | 0.90 | .034 | |
| 143.85 | 149.70 | QGPH/QMPH | QGPH to 145.50 | 1021A | 5.85 | 0.05 | 0.02 | 0.05 | 0.04 | .002 | |
| 149.70 | 150.00 | QMPH | MSSX - 149.75 - 149.80 | 892A | 0.30 | 0.13 | 0.28 | 0.61 | 0.25 | .004 | |
| 150.00 | 151.48 | MSSX | Banded sulphides | 893 | 1.48 | 1.69 | 8.14 | 5.74 | 2.33 | .048 | T |
| 151.48 | 152.90 | MSSX | More massive | 894A | 1.42 | 1.35 | 3.20 | 5.40 | 2.62 | .052 | A |
| 152.90 | 157.58 | QGPH | | 1022A | 4.68 | 0.04 | 0.01 | 0.16 | 0.03 | .004 | I |
| 157.58 | 158.50 | MSSX | MSSX - 157.60 - 158.44 | 895A | 0.92 | 1.44 | 1.72 | 3.26 | 1.39 | .016 | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-11 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 158.50 | 161.00 | QGPH | | 1023A | 2.50 | 0.06 | 0.04 | 0.16 | 0.06 | .004 |
| 161.00 | 167.35 | QGPH | | | | | | | | |
| 167.35 | 172.32 | QZIT | | | | | | | | |
| | | EOH | | | | | | | | |
| 82.20 | 87.75 | D HORIZON | | | 5.55 | 2.24 | 3.05 | 5.87 | 1.16 | .027 |
| | | | | | | 11.15% Cu+Pb+Zn | | | | |
| 150.00 | 152.90 | A HORIZON | | | 2.90 | 1.52 | 3.17 | 5.57 | 2.47 | .050 |
| | | | | | | 10.26% Cu+Pb+Zn | | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M88-12 — Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,165.96 N | 99,943.19 E | DEPTH | COLLAR | 134 m | |
| ELEVATION | 1461.80 (m) | DATE STARTED 08/20/88 | DIP | -50° | -46 | |
| CORE SIZE | NQ | DATE COMPLETED 08/22/88 | AZIMUTH | 358° | — | |
| FINAL DEPTH | 134.72 m | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 10.90 | CASING | Overburden | | | | | | | |
| 10.90 | 11.60 | QZIT | | | | | | | | |
| 11.60 | 13.50 | FAULT | | | | | | | | |
| 13.50 | 29.40 | QGPH | QZIT - 46.95 - 48.05<br>QGPH - 53.94 - 57.85 | | | | | | | |
| 29.40 | 32.00 | QMPH | | | | | | | | |
| 32.00 | 38.30 | QGPH | | | | | | | | |
| 38.30 | 41.95 | QZIT | | | | | | | | |
| 41.95 | 45.00 | QGPH | | | | | | | | |
| 45.00 | 57.85 | FAULT | | | | | | | | |
| 57.85 | 62.00 | QGPH | | | | | | | | |
| 62.00 | 64.95 | QGPH | | 1024A | 2.95 | 0.04 | 0.02 | 0.21 | 0.03 | .002 |
| 64.95 | 66.14 | MSSX | Weak mineral banding | 896A | 1.19 | 3.71 | 5.00 | 10.30 | 3.62 | .046 |
| 66.14 | 67.40 | MSSX | QGPH from 67.0 | 897A | 1.26 | 2.71 | 4.68 | 9.39 | 2.77 | .060 |
| 67.40 | 68.65 | MSSX | QGPH from 67.60 | 898A | 1.25 | 3.02 | 4.84 | 8.08 | 3.18 | .054 |
| 68.65 | 73.40 | QGPH | Fault - 68.65 - 69.13 | 1025A | 4.75 | 0.11 | 0.16 | 0.28 | 0.12 | .004 |
| 73.40 | 73.85 | QGPH | 3cm and 6cm MSSX bands | 899A | 0.45 | 0.33 | 0.71 | 1.27 | 0.84 | .024 |
| 73.85 | 76.00 | MSSX | Weak banding | 900A | 2.15 | 2.15 | 3.02 | 6.30 | 2.58 | .040 |
| 76.00 | 78.00 | MSSX | | 901A | 2.00 | 1.86 | 3.17 | 5.64 | 3.32 | .044 |
| 78.00 | 79.80 | MSSX | Pitted, leached sulphides | 902A | 1.80 | 2.07 | 3.80 | 5.54 | 3.44 | .042 |
| 79.80 | 82.00 | QZIT | | 1026A | 2.20 | 0.04 | 0.07 | 0.14 | 0.07 | .002 |
| 82.00 | 84.50 | QZIT | | | | | | | | |
| 84.50 | 85.85 | QMPH | Abundant carbonate | | | | | | | |
| 85.85 | 93.00 | QGPH | CARB - 88.40 - 89.60 | | | | | | | |
| 93.00 | 107.55 | QZIT | | | | | | | | |
| 107.55 | 121.00 | QGPH | LIMS - 110.15 - 111.0 | | | | | | | |
| 121.00 | 134.72 | QZIT | QMPH - 121.0 - 123.85<br>124.22 - 125.58 | | | | | | | |
| 64.95 | 68.65 | D HORIZON | | | 3.70 | 3.14 | 4.84 | 9.21 | 3.18 | .053 |
| | | | | | | 17.19% | Cu+Pb | +Zn | | |
| 73.85 | 79.80 | A HORIZON | | | 5.95 | 2.03 | 3.31 | 5.85 | 3.09 | .042 |
| | | | | | | 11.19% | Cu+Pb | +Zn | | |

T D T A T

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-13 — **Page 1 of 2**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100,165.96 N | 99,943.19 E | DEPTH | COLLAR | 124m | | |
| ELEVATION | 1461.80 (m) | DATE STARTED 08/22/88 | DIP | -70° | -63° | | |
| CORE SIZE | NQ | DATE COMPLETED 08/24/88 | AZIMUTH | 358° | — | | |
| FINAL DEPTH | 124.05m | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 6.09 | CASING | Overburden | | | | | | | |
| 6.09 | 22.48 | QGPH | Fault - 18.30 - 20.42 | | | | | | | |
| 22.48 | 25.60 | QMPH | Fault - 24.95 - 25.60 | | | | | | | |
| 25.60 | 28.85 | QGPH | | | | | | | | |
| 28.85 | 36.80 | QMPH | | | | | | | | |
| 36.80 | 64.0 | QGPH | QZIT - 39.0 - 40.25<br>CAVITY - 50.40 - 53.31 | | | | | | | |
| 64.00 | 65.90 | QGPH | | 1027A | 1.90 | 0.02 | 0.01 | 0.13 | 0.03 | .002 |
| 65.90 | 66.80 | MSSX | QMPH - from 66.37 | 903A | 0.90 | 3.50 | 2.29 | 4.43 | 1.88 | .003 |
| 66.80 | 68.30 | QMPH | CAVITY - 67.37 - 67.97 | | | | | | | |
| 68.30 | 68.45 | MSSX | | 904A | 0.15 | 1.69 | 2.88 | 6.18 | 3.64 | .045 |
| 68.45 | 70.00 | QGPH | | 1028A | 1.55 | 0.02 | 0.01 | 0.15 | 0.03 | .002 |
| 70.00 | 74.00 | QGPH | several 10-20cm QMPH bands | | | | | | | |
| 74.00 | 76.50 | QGPH | | 1029A | 2.50 | 0.03 | 0.02 | 0.08 | 0.04 | .006 |
| 76.50 | 77.20 | MSSX | LIMS gangue | 905A | 0.70 | 0.92 | 4.37 | 7.90 | 2.30 | .049 |
| 77.20 | 82.30 | QMPH | | 1030A | 5.10 | 0.05 | 0.08 | 0.25 | 0.15 | .004 |
| 82.30 | 84.00 | MSSX | Quartz gangue | 906A | 1.70 | 1.69 | 3.00 | 5.83 | 2.67 | .046 |
| 84.00 | 86.00 | MSSX | | 907 | 2.00 | 1.54 | 2.26 | 4.24 | 2.10 | .036 |
| 86.00 | 88.00 | MSSX | | 908 | 2.00 | 1.44 | 3.23 | 5.72 | 2.61 | .042 |
| 88.00 | 90.00 | MSSX | | 909 | 2.00 | 1.96 | 3.98 | 6.39 | 3.52 | .037 |
| 90.00 | 91.00 | QGPH | | | | | | | | |
| 91.00 | 94.00 | MSSX | QMPH - 92.75 - 93.35<br>QGPH - 93.35 - 93.50 | 910A | 3.00 | 1.26 | 1.80 | 3.14 | 1.66 | .020 |
| 94.00 | 96.60 | QGPH | | 1031A | 2.60 | 0.21 | 0.31 | 0.68 | 0.29 | .008 |
| 96.60 | 96.80 | MSSX | | 911A | 0.20 | 1.13 | 2.44 | 3.90 | 2.43 | .033 |
| 96.80 | 100.00 | QGPH | | 1032A | 3.20 | 0.06 | 0.06 | 0.29 | 0.09 | .008 |
| 100.00 | 100.80 | MSSX | MSSX band - 100.12 - 100.65 | 912A | 0.80 | 0.62 | 1.15 | 1.58 | 1.68 | .038 |
| 100.80 | 102.80 | QGPH | | | | | | | | |
| 102.80 | 104.55 | QZIT | | | | | | | | |
| 104.55 | 110.75 | QGPH | CAVITIES - 106.25 - 108.21<br>109.20 - 110.03 | | | | | | | |
| 110.75 | 112.70 | QZIT | | | | | | | | |
| 112.70 | 116.95 | QGPH | LIMS - 113.53 - 113.58, 115.85 - 116.05<br>CAVITIES - 114.0 - 114.91 | | | | | | | |
| 116.95 | 119.60 | QZIT | FAULT - 118.20 - 119.0 | | | | | | | |
| 119.60 | 124.05 | QGPH | | | | | | | | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-13 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 65.90 | 68.45 | D HORIZON | | | 2.55 | 1.33 | 0.98 | 1.93 | 0.88 | .004 |
| | | | | | | 4.24% | Cu+Pb+Zn | | | |
| 82.30 | 94.00 | A HORIZON | | | 11.70 | 1.41 | 2.52 | 4.45 | 2.25 | .031 |
| | | | | | | 8.38% | Cu+Pb+Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-14 Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 171.05 N | 99, 993.89 E | DEPTH | COLLAR | 153m | |
| ELEVATION | 1,470.18(m) | DATE STARTED 08/24/88 | DIP | -50° | -50° | |
| CORE SIZE | NQ | DATE COMPLETED 08/29/88 | AZIMUTH | 358° | — | |
| FINAL DEPTH | 153.92 | | | | | |

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 3.70 | CASING | Overburden |
| 3.70 | 5.00 | QGPH | |
| 5.00 | 14.60 | QZIT | F |
| 14.60 | 22.20 | QGPH | |
| 22.20 | 27.13 | QZIT | |
| 27.13 | 33.30 | QGPH | |
| 33.30 | 42.40 | QZIT | QGPH - 38.54 - 40.90 |
| 42.40 | 44.81 | QGPH | Fault - 44.20 - 44.81 |
| 44.81 | 50.90 | QZIT | CARB - 46.40 - 47.85<br>CAVITY - 48.80 - 50.29 |
| 50.90 | 62.90 | QGPH | CAVITY - 51.76 - 52.42<br>QZIT - 57.1 - 58.5, Fault - 58.5 - 60.5 |
| 62.90 | 128.95 | QZIT | QZIT - 66.85 - 67.36<br>FAULT - 78.25 - 79.2 QGPH - 79.1 - 80.4 |
| 128.95 | 136.90 | QGPH | LIMS - 132.2 - 132.4, 134.71 - 134.78 |
| 136.90 | 139.95 | FAULT | Broken QGPH |
| 139.95 | 142.34 | CARB | |
| 142.34 | 147.54 | QZIT | |
| 147.54 | 151.70 | QGPH | |
| 151.70 | 153.01 | FAULT | Shattered. |
| 153.01 | 153.92 | QZIT | |
| | | EOH | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No. M 88-15** — **Page 1 of 1**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100, 147.64 N | 99,807.95 E | DEPTH | COLLAR | 96m | | |
| ELEVATION | 1432.44(m) | DATE STARTED 08/29/88 | DIP | -50° | -48° | | |
| CORE SIZE | NQ | DATE COMPLETED 09/1/88 | AZIMUTH | 000° | — | | |

**FINAL DEPTH** 96.92m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 9.14 | CASING | Overburden | | | | | | | |
| 9.14 | 9.68 | QMPH | | | | | | | | |
| 9.68 | 11.65 | QGPH | | | | | | | | |
| 11.65 | 25.60 | FAULT | Highly broken to shattered QGPH | | | | | | | |
| 25.60 | 36.00 | QMPH | | | | | | | | |
| 36.00 | 39.50 | QMPH | | | | | | | | |
| 39.50 | 40.00 | MSSX | SMSX to MSSX QGPH gangue | | | | | | | |
| 40.00 | 41.20 | MSSX | Mineral banding | | | | | | | |
| 41.20 | 42.41 | QMPH | LIMS - 42.17 - 42.37 | | | | | | | |
| 42.41 | 47.70 | QGPH | QMPH 46.86 - 47.70 | | | | | | | |
| 47.70 | 51.00 | QGPH | QMPH - 48.35 - 49.64 | | | | | | | |
| 51.00 | 51.80 | MSSX | QMPH, MSSX bands - 51.05 - 51.16, 51.38 - 51.48, 51.60 - 51.76 | | | | | | | |
| 51.80 | 54.80 | QGPH/QMPH | QMPH - 52.60 - 53.60, 53.87 - 54.80 | | | | | | | |
| 54.80 | 55.05 | MSSX | | | | | | | | |
| 55.05 | 58.15 | QMPH | | | | | | | | |
| 58.15 | 58.75 | MSSX | Alternating bands MSSX and heavily disseminated | | | | | | | |
| 58.75 | 59.70 | MSSX | Banded | | | | | | | |
| 59.70 | 61.15 | MSSX | Mineral banding | | | | | | | |
| 61.15 | 65.00 | QGPH | | | | | | | | |
| 65.00 | 76.15 | QGPH | | | | | | | | |
| 76.15 | 78.55 | CARB | | | | | | | | |
| 78.55 | 83.89 | QGPH | QZIT - 79.8 - 81.42 LIMS - 82.90 - 83.00 | | | | | | | |
| 83.89 | 96.92 | QZIT | QGPH - 88.50 - 89.89 91.75 - 94.60 | | | | | | | |
| 39.50 | 41.20 | D HORIZON | | | 1.70 | 3.35 | 2.52 | 4.64 | 2.36 | .033 |
| | | | | | | 10.51% | Cu+Pb | +Zn | | |
| 58.75 | 61.15 | C HORIZON | | | 2.40 | 1.65 | 2.66 | 5.20 | 2.22 | .032 |
| | | | | | | 9.51% | Cu+Pb | +Zn | | |

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# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-16 — **Page 1 of 1**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100,026.88 N | 99,800.17 E | DEPTH | COLLAR | 91m | 188m | |
| ELEVATION | 1445.94 (m) | DATE STARTED 09/2/88 | DIP | -50° | -44° | -45° | |
| CORE SIZE | NQ | DATE COMPLETED 09/4/88 | AZIMUTH | 358° | — | — | |

**FINAL DEPTH** 213.66 m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 7.0 | CASING | Overburden | | | | | | | | |
| 7.0 | 34.75 | QGPH | QZIT - 19.36 - 19.66<br>CARB - 24.35 - 27.0 | | | | | | | | |
| 34.75 | 42.05 | QMPH | Carbonate altered<br>QGPH - 39.3 - 39.77, 40.94 - 41.64 | | | | | | | | |
| 42.05 | 46.25 | QGPH | | | | | | | | | |
| 46.25 | 63.60 | QMPH | carbonate altered, LIMS - 51.73 - 52<br>QGPH - 56.7 - 58.66, 60.45 - 61.45 | | | | | | | | |
| 63.60 | 68.45 | QGPH | | | | | | | | | |
| 68.45 | 74.95 | QMPH | carbonate altered | | | | | | | | |
| 74.95 | 92.70 | QGPH | | | | | | | | | |
| 92.70 | 102.72 | QMPH | QGPH - 101.70 - 102.72 | | | | | | | | |
| 102.72 | 104.00 | QMPH | | 1041A | 1.38 | 0.17 | 0.39 | 0.85 | 0.19 | .004 | |
| 104.00 | 105.76 | MSSX | Fine mineral banding, graphite partings | 920A | 1.76 | 3.71 | 3.53 | 6.30 | 2.80 | .038 | T |
| 105.76 | 107.60 | MSSX | 60-75% sulphide, laminated | 921 | 1.84 | 3.96 | 2.50 | 4.43 | 2.13 | .032 | |
| 107.60 | 108.70 | MSSX | Massive, 90% sulphide | 922 | 1.10 | 1.96 | 2.37 | 5.06 | 1.55 | .010 | D |
| 108.70 | 110.20 | MSSX | Banded, 50-70% sulphide | 923 | 1.50 | 2.84 | 2.84 | 6.41 | 1.69 | .018 | |
| 110.20 | 111.00 | MSSX | 50% sulphide | 924 | 0.80 | 1.48 | 2.96 | 6.41 | 1.37 | .010 | |
| 111.00 | 112.05 | MSSX | 50% sulphide, QMPH gangue | 925 | 1.05 | 1.80 | 2.05 | 5.47 | 1.81 | .016 | |
| 112.05 | 112.50 | QMPH | | 926 | 0.45 | 0.29 | 0.29 | 0.55 | 0.38 | .054 | |
| 112.50 | 113.35 | MSSX | Massive, carbonate gangue | 927 | 0.85 | 2.75 | 3.53 | 7.94 | 2.03 | .016 | |
| 113.35 | 114.85 | MSSX | Massive to heavily disseminated | 928A | 1.50 | 1.22 | 1.02 | 3.53 | 0.76 | .006 | |
| 114.85 | 119.07 | QMPH | | 1042A | 4.15 | 0.08 | 0.07 | 0.20 | 0.08 | .002 | L |
| 119.07 | 169.60 | QMPH | Occasional 0.2 to 1 m QGPH bands<br>LIMS - 159.92 - 160.71 | | | | | | | | |
| 169.60 | 178.70 | QGPH | QMPH - 172.35 - 174.84<br>175.32 - 176.1 | | | | | | | | |
| 178.70 | 191.40 | QMPH | QGPH - 188.06 - 189.70 | | | | | | | | |
| 191.40 | 205.00 | QGPH | LIMS - 203.34 - 203.52 | | | | | | | | |
| 205.00 | 210.20 | QUARTZITE | QGPH - 207.95 - 208.90 | | | | | | | | |
| 210.20 | 213.60 | QGPH | | | | | | | | | |
| | | EOH | | | | | | | | | |
| 104.00 | 114.85 | D HORIZON | | | 10.85 | 2.54 | 2.48 | 5.31 | 1.76 | .022 | |
| | | | | | | 10.33% | Cu+Pb | +Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-17 — **Page 1 of 2**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,026.88 N | 99,800.17 E | DEPTH | COLLAR | 160m | |
| ELEVATION | 1445.94 (m) | DATE STARTED 09/4/88 | DIP | -65° | -57° | |
| CORE SIZE | NQ | DATE COMPLETED 09/5/88 | AZIMUTH | 000° | — | |

**FINAL DEPTH** 160.02m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 3.05 | CASING | Overburden | | | | | | | | |
| 3.05 | 20.20 | QGPH | Cavity - 8.53 - 12.19 | | | | | | | | |
| 20.20 | 27.93 | QMPH | Carbonate altered from 25.44 | | | | | | | | |
| 27.93 | 41.50 | QGPH | occasional 0.2-1 m carbonate altered QMPH bands | | | | | | | | |
| 41.50 | 44.07 | QZIT | | | | | | | | | |
| 44.07 | 46.20 | QMPH | Carbonate altered | | | | | | | | |
| 46.20 | 61.80 | QGPH | CARB - 52.9 - 56.17 | | | | | | | | |
| 61.80 | 68.72 | QMPH | carbonate altered | | | | | | | | |
| 68.72 | 91.05 | QGPH | | | | | | | | | |
| 91.05 | 105.20 | QMPH | QGPH - 93.57 - 94.45, 95.7 - 96.83<br>MSSX - 102.72 - 102.96 | | | | | | | | |
| 105.20 | 106.03 | QGPH | Fault 105.2 - 105.7 | | | | | | | | |
| 106.03 | 108.00 | QMPH | LIMS - 106.25 - 106.58 | 1043A | 1.97 | 0.17 | 0.36 | 0.34 | 0.26 | .004 | |
| 108.00 | 109.55 | MSSX | Transitional upper contact | 929A | 1.55 | 2.11 | 4.12 | 7.94 | 2.58 | .034 | T |
| 109.55 | 110.15 | MSSX | 5cm MSSX bands, quartz gangue | 930 | 0.60 | 1.71 | 2.37 | 4.79 | 1.66 | .016 | O |
| 110.15 | 110.90 | MSSX | QMPH - 110.62 - 110.90 | 931 | 0.75 | 1.74 | 1.17 | 2.70 | 0.86 | .014 | |
| 110.90 | 111.90 | MSSX | Alternating bands - MSSX and heavily disseminated sulphide | 932 | 1.00 | 2.80 | 2.93 | 6.72 | 1.39 | .020 | 1 |
| 111.90 | 112.45 | QMPH | 30% disseminated sulphide | 933 | 0.55 | 0.42 | 0.23 | 0.44 | 0.31 | .008 | |
| 112.45 | 113.85 | QMPH | | 934 | 1.40 | 0.04 | 0.01 | 0.11 | 0.01 | <.002 | |
| 113.85 | 114.40 | QMPH | | 935 | 0.55 | 0.13 | <0.01 | 0.25 | 0.05 | .002 | |
| 114.40 | 115.00 | QMPH | | 936 | 0.65 | 0.06 | 0.03 | 0.06 | 0.01 | .002 | |
| 115.00 | 116.85 | QMPH | | 937 | 1.85 | 0.32 | 0.42 | 0.79 | 0.24 | .012 | |
| 116.85 | 117.80 | MSSX | | 938 | 0.95 | 2.88 | 1.83 | 4.26 | 1.09 | .014 | T |
| 117.80 | 118.30 | QMPH | 10 cm band heavily disseminated sulphide at top | 939 | 0.50 | 1.13 | 0.44 | 2.70 | 0.49 | .020 | C |
| 118.30 | 118.90 | QMPH | | 940 | 0.60 | 0.03 | 0.04 | 0.11 | 0.06 | .006 | 1 |
| 118.90 | 119.65 | LIMS | Brecciated quartz and yellow carbonate | 941A | 0.75 | 0.01 | 0.02 | 0.14 | <.01 | <.002 | |
| 119.65 | 121.55 | QMPH | carbonate altered | | | | | | | | |
| 121.55 | 138.44 | QMPH | | | | | | | | | |
| 138.44 | 139.58 | QGPH | | | | | | | | | |
| 139.58 | 140.70 | LIMS | 50% quartz with 5mm crystals of calcite / dolomite | | | | | | | | |
| 140.70 | 147.45 | QMPH | QMPH - 143.50 - 144.92 | | | | | | | | |
| 147.45 | 152.40 | QGPH | QMPH - 149.85 - 151.51 | | | | | | | | |
| 152.40 | 160.02 | QMPH | Quartz augens | | | | | | | | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-17 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 108.00 | 111.90 | D HORIZON | | | 3.90 | 2.15 | 2.98 | 6.14 | 1.80 | .024 |
| | | | | | | 11.27% | Cu + Pb | + Zn | | |
| 116.85 | 118.3 | C HORIZON | | | 1.45 | 2.28 | 1.35 | 3.72 | 0.88 | .016 |
| | | | | | | 7.35% | Cu + Pb | + Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-18 Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 026.88 N | 99,800.17 E | DEPTH | COLLAR | 128m | |
| ELEVATION | 1,445.99 (m) | DATE STARTED 09/7/88 | DIP | -80° | -72° | |
| CORE SIZE | NQ | DATE COMPLETED 09/8/88 | AZIMUTH | 000° | — | |
| FINAL DEPTH | 130.76m | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 5.18 | CASING | Overburden | | | | | | | |
| 5.18 | 26.03 | QGPH | | | | | | | | |
| 26.03 | 31.60 | QMPH | carbonate altered | | | | | | | |
| 31.60 | 67.95 | QGPH | CARB bands - 45.75 - 46.60, 55.60 - 56.70 | | | | | | | |
| 67.95 | 71.05 | QMPH | Carbonate altered | | | | | | | |
| 71.05 | 93.57 | QGPH | Several 0.5m CARB bands | | | | | | | |
| 93.57 | 98.10 | QMPH | | | | | | | | |
| 98.10 | 103.40 | QGPH | Fault - 102.05 - 102.70 | | | | | | | |
| 103.40 | 111.00 | QMPH | QGPH - 110.46 - 111.00 | | | | | | | |
| 111.00 | 114.30 | QMPH | Fault - 111.0 - 111.8 | 1044A | 3.30 | 0.08 | 0.09 | 0.24 | 0.07 | .002 |
| 114.30 | 114.80 | QMPH | 5cm MSSX band at top | 942A | 0.50 | 0.54 | 1.65 | 3.26 | 0.61 | .002 |
| 114.80 | 115.45 | QMPH | 10cm MSSX band at top | 943 | 0.65 | 0.89 | 1.70 | 3.26 | 0.83 | .006 |
| 115.45 | 117.25 | MSSX | 75% MSSX bands in QMPH | 944 | 1.80 | 1.66 | 1.68 | 3.40 | 1.21 | .012 |
| 117.25 | 118.15 | LIMS | 2cm MSSX bands in QMPH | 945 | 0.90 | 0.80 | 0.51 | 1.68 | 0.31 | .004 |
| 118.15 | 119.05 | MSSX | 60-70% sulphides, carbonate gangue | 946 | 0.90 | 1.17 | 1.90 | 2.77 | 0.51 | .012 |
| 119.05 | 119.90 | QMPH | | 947 | 0.85 | 0.07 | 0.16 | 0.28 | 0.23 | .014 |
| 119.90 | 120.70 | MSSX | 80% sulphides | 948 | 0.80 | 2.52 | 1.75 | 4.60 | 0.83 | .016 |
| 120.70 | 121.80 | QMPH | 30-40% sulphides | 949 | 1.10 | 0.73 | 0.11 | 0.40 | 0.13 | .008 |
| 121.80 | 122.65 | QMPH | 10-15% sulphides | 950 | 0.85 | 0.03 | 0.04 | 0.15 | 0.11 | .006 |
| 122.65 | 123.50 | QMPH | 3-5% sulphides | 951 | 0.80 | | 0.01 | 0.03 | 0.03 | .002 |
| 123.50 | 125.00 | QMPH | 3% pyrite | 952A | 1.50 | 0.09 | 0.12 | 0.17 | 0.07 | .002 |
| 125.00 | 130.76 | QMPH | | | | | | | | |
| | | EOH | | | | | | | | |
| 114.30 | 120.70 | D HORIZON | | | 6.40 | 1.20 | 1.21 | 2.79 | 0.72 | 0.010 |
| | | | | | | 5.20% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-19 — 

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 99,942.18 N | 99,877.59 E | DEPTH | COLLAR | 114m | 282m | |
| ELEVATION | 1480.48 (m) | DATE STARTED 09/9/88 | DIP | -50° | -55° | -47° | |
| CORE SIZE | NQ | DATE COMPLETED 09/13/88 | AZIMUTH | 000° | — | 352° | |
| FINAL DEPTH | 288.34m | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 9.14 | CASING | Overburden | | | | | | | | |
| 9.14 | 80.52 | QGPH | QMPH - 11.23 - 13.47<br>Faults - 30.5 - 32.61, 53.75 - 55.78, 64.7 - 65.7 | | | | | | | | |
| 80.52 | 85.90 | QMPH | Carbonate altered | | | | | | | | |
| 85.90 | 92.65 | QGPH | CARB - 87.0 - 88.34 | | | | | | | | |
| 92.65 | 95.36 | QMPH | Carbonate altered | | | | | | | | |
| 95.36 | 126.80 | QGPH | CARB - 97.12-98.32,<br>120.0 - 121.67, 124.47 - 125.90 | | | | | | | | |
| 126.80 | 136.60 | QMPH | carbonate altered<br>CAVITY - 129.23 - 131.47 | | | | | | | | |
| 136.60 | 181.98 | QGPH | CARB - 154.6 - 156.92<br>Fault - 180.98 - 181.98 | | | | | | | | |
| 181.98 | 196.00 | QMPH | CAVITY - 185.64 - 186.54 | | | | | | | | |
| 196.00 | 199.64 | QMPH | | 1045A | 3.64 | <0.01 | 0.01 | 0.02 | <0.01 | <.002 | |
| 199.64 | 199.80 | MSSX | 50-60% sulphide | 953A | 0.16 | 1.47 | 3.20 | 6.30 | 1.84 | .046 | |
| 199.80 | 203.20 | QMPH/QGPH | QGPH from 202.10 | 1046A | 3.40 | <0.01 | <0.01 | 0.05 | 0.01 | <.002 | |
| 203.20 | 203.70 | QMPH | 5-7% disseminated sulphide | 954A | 0.50 | 0.88 | 0.90 | 2.17 | 0.80 | .010 | |
| 203.70 | 205.00 | MSSX | 60% banded sulphide | 955 | 1.30 | 2.52 | 4.24 | 8.22 | 3.44 | .032 | T |
| 205.00 | 207.00 | MSSX | 95% sulphide | 956 | 2.00 | 1.96 | 2.90 | 5.22 | 2.42 | .038 | |
| 207.00 | 208.40 | MSSX | 60-70% sulphide, crude banding | 957 | 1.40 | 1.99 | 4.00 | 6.94 | 2.48 | .026 | |
| 208.40 | 210.10 | MSSX | banded | 958 | 1.70 | 2.66 | 3.50 | 7.44 | 1.95 | .014 | D |
| 210.10 | 212.00 | MSSX | banded | 959 | 1.90 | 1.94 | 2.30 | 7.81 | 1.34 | .012 | |
| 212.00 | 212.60 | MSSX | 50-60% sulphide, banded | 960 | 0.60 | 6.77 | 0.88 | 5.83 | 1.02 | .028 | |
| 212.60 | 213.55 | MSSX | as above, QMPH - 213.41 - 213.55 | 961 | 0.90 | 3.02 | 1.50 | 4.79 | 0.82 | .012 | |
| 213.55 | 214.20 | QMPH | 25% Sulphide | 962 | 0.65 | 3.60 | 0.56 | 3.58 | 0.50 | .008 | |
| 214.20 | 214.90 | QMPH | 30% sulphide | 963 | 0.70 | 1.53 | 1.12 | 2.77 | 0.64 | .024 | |
| 214.90 | 215.55 | QMPH | | 964A | 0.65 | 0.17 | 0.09 | 0.19 | 0.09 | .010 | |
| 215.55 | 225.91 | QMPH | | | | | | | | | |
| 225.91 | 235.12 | QGPH | QMPH - 229.93 - 232.81 | | | | | | | | |
| 235.12 | 255.78 | QMPH | Quartz augens to 251.65 | | | | | | | | |
| 255.78 | 261.98 | QGPH | QMPH - 256.64 - 257.51 | | | | | | | | |
| 261.98 | 262.40 | MSSX | | 1680A | 0.47 | 1.56 | 2.00 | 6.26 | 2.09 | .012 | B |
| 262.40 | 269.93 | QGPH | | | | | | | | | |
| 269.93 | 276.60 | QMPH | | | | | | | | | |
| 276.60 | 278.50 | QGPH | | | | | | | | | |
| 278.50 | 288.34 | QMPH | QGPH - 285.95 - 287.20 | | | | | | | | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-19 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 203.70 | 214.90 | D HORIZON | | | 11.20 | 2.55 | 2.71 | 6.26 | 1.86 | .022 |
| | | | | | | 11.52% | Cu + Pb | + Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-20 — **Page 1 of 2**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100, 024.01 N | 99,940.80 E | DEPTH | COLLAR | 108m | 259m | |
| ELEVATION | 1509.00 (m) | DATE STARTED 09/14/88 | DIP | -60° | -57° | -53° | |
| CORE SIZE | NQ | DATE COMPLETED 09/19/88 | AZIMUTH | 000° | 353° | 347° | |

FINAL DEPTH 259.69m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 12.19 | CASING | Overburden | | | | | | | | |
| 12.19 | 19.52 | QGPH | | | | | | | | | |
| 19.52 | 28.56 | QMPH | carbonate altered QGPH - 23.1 - 26.23 | | | | | | | | |
| 28.56 | 35.95 | QGPH | | | | | | | | | |
| 35.9 | 47.70 | FAULT | Highly broken, graphitic | | | | | | | | |
| 47.70 | 89.30 | QGPH | Faults - 83.67 - 84.63 85.90 - 88.39 | | | | | | | | |
| 89.30 | 91.55 | QMPH | carbonate altered | | | | | | | | |
| 91.55 | 96.32 | QGPH | Quartz vein - 95.33 - 96.32 | | | | | | | | |
| 96.32 | 98.47 | QMPH | carbonate altered LIMS - 97.87 - 97.96 | | | | | | | | |
| 98.47 | 123.70 | QGPH | LIMS - 102.0 - 102.33 | | | | | | | | |
| 123.70 | 126.85 | QMPH | carbonate altered | | | | | | | | |
| 126.85 | 159.91 | QGPH | | | | | | | | | |
| 159.91 | 174.32 | QMPH | | | | | | | | | |
| 174.32 | 185.58 | QGPH | Fault - 183.3 - 184.09 | | | | | | | | |
| 185.58 | 187.15 | QGPH | sheared upper contact | 1047A | 1.77 | <0.01 | 0.01 | 0.02 | <0.01 | <.001 | |
| 187.15 | 189.25 | MSSX | 75% sulphide, faint banding | 1629A | 2.10 | 1.74 | 1.87 | 3.97 | 1.91 | .034 | D |
| 189.25 | 189.60 | QMPH | 30% sulphide | 1630A | 0.35 | 0.17 | 0.10 | 0.28 | 0.23 | .006 | |
| 189.60 | 190.40 | QMPH | 3% pyrite | 1631A | 0.80 | 0.02 | 0.05 | 0.09 | 0.09 | .002 | |
| 190.40 | 190.80 | QMPH | as above | 1632A | 0.40 | 0.06 | 0.40 | 0.72 | 0.21 | .004 | |
| 190.80 | 219.95 | QMPH | LIMS - 194.4 - 194.53, 215.12 - 215.62 QGPH - 205.0 - 205.77 | | | | | | | | |
| 219.95 | 221.25 | QGPH | | 1048A | 1.30 | <0.01 | 0.01 | 0.04 | 0.02 | .002 | |
| 221.25 | 223.45 | MSSX | 40% heavily disseminated sulphide QMPH - 221.25 - 221.93 | 976A | 2.20 | 1.26 | 2.10 | 4.04 | 1.55 | .018 | C |
| 223.45 | 224.35 | QMPH | | 977A | 0.90 | 0.01 | 0.02 | 0.04 | 0.03 | .001 | |
| 224.35 | 225.00 | QGPH | sulphide bands - 224.6 - 224.9 | 978A | 0.65 | 0.48 | 0.81 | 1.41 | 0.61 | .012 | |
| 225.00 | 225.70 | MSSX | sulphide bands from 225.28 | 979A | 0.70 | 1.12 | 1.21 | 2.39 | 0.86 | .005 | |
| 225.70 | 226.70 | QGPH | 5% pyrite | 980A | 1.00 | 0.07 | 0.07 | 0.19 | 0.04 | .001 | |
| 226.70 | 227.55 | QMPH | MSSX Bands - 226.82 - 226.96 227.20 - 227.52 | 981A | 0.85 | 0.76 | 2.17 | 3.72 | 1.49 | .007 | T |
| 227.55 | 228.45 | QMPH | | 982A | 0.90 | 0.47 | 1.02 | 1.89 | 0.95 | .011 | B |
| 228.45 | 229.15 | MSSX | MSSX - 228.62 - 229.12 | 983A | 0.70 | 1.74 | 2.24 | 4.35 | 1.90 | .020 | |
| 229.15 | 231.70 | QGPH | | 1049A | 2.55 | 0.07 | 0.11 | 0.30 | 0.06 | .004 | L |
| 231.70 | 233.35 | MSSX | Banded, 50-70% sulphide QMPH - 233.08 - 233.28 | 984A | 1.65 | 1.12 | 1.75 | 3.36 | 1.60 | .022 | A |
| 233.35 | 234.50 | QGPH | 5% Pyrite | 1050A | 1.15 | 0.04 | 0.04 | 0.11 | 0.03 | .002 | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-20 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 234.50 | 241.00 | QMPH | | | | | | | | |
| 241.00 | 247.90 | QGPH | | | | | | | | |
| 247.90 | 249.00 | MSSX | MSSX bands - 247.90 - 248.40<br>248.49 - 248.72 | 985.0 | 1.10 | | | | | |
| 249.00 | 249.35 | QGPH | | | | | | | | |
| 249.35 | 252.65 | QZIT | | | | | | | | |
| 252.65 | 258.47 | QMPH | carbonate altered, quartz augens. | | | | | | | |
| 258.47 | 259.69 | QZIT | | | | | | | | |
| | | EOH | | | | | | | | |
| 187.15 | 189.25 | D HORIZON | | | 2.10 | 1.74 | 1.87 | 3.97 | 1.91 | .034 |
| | | | | | | 7.58% | Cu+Pb | +Zn | | |
| 221.25 | 223.42 | C HORIZON | | | 2.20 | 1.26 | 2.10 | 4.04 | 1.55 | .018 |
| | | | | | | 7.40% | Cu+Pb | +Zn | | |
| 226.70 | 229.15 | B. HORIZON | | | 2.45 | 0.93 | 1.77 | 3.23 | 1.41 | .014 |
| | | | | | | 5.93% | Cu+Pb | +Zn | | |
| 231.70 | 233.35 | A HORIZON | | | 1.65 | 1.12 | 1.75 | 3.36 | 1.60 | .022 |
| | | | | | | 6.23% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-21 — 

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 083.32 N 100, 009.26 E | DEPTH | COLLAR | 119m | 197m | 290m |
| ELEVATION 1495.90 (m) | DATE STARTED 09/14/90 | DIP | -67° | -65° | -60° | -59° |
| CORE SIZE NQ | DATE COMPLETED 09/17/90 | AZIMUTH | 000° | (046°?) | 337° | 333° |
| FINAL DEPTH 306.32m | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 9.14 | CASING | Overburden | | | | | | | | |
| 9.14 | 36.27 | QGPH | CARB bands - 30.44 - 30.78, 32.20 - 33.70 | | | | | | | | |
| 36.27 | 39.50 | QZIT | | | | | | | | | |
| 39.50 | 114.87 | QGPH | Faults - 87.1 - 88.09, 96.0 - 97.54, 98.95 - 99.67, QZIT - 109.13 - 110.62 | | | | | | | | |
| 114.87 | 119.18 | QZIT | | | | | | | | | |
| 119.18 | 128.50 | QGPH | QMPH - 126.81 - 127.80 | | | | | | | | |
| 128.50 | 141.72 | QMPH | Numerous - 0.5 - 1m QGPH bands | | | | | | | | |
| 141.72 | 156.31 | QGPH | QMPH - 145.18 - 146.00 | | | | | | | | |
| 156.31 | 156.60 | QMPH | | 965A | 0.29 | 0.01 | 0.01 | 0.11 | <0.01 | .002 | |
| 156.60 | 157.00 | MSSX | Banded, 45% sulphide | 966A | 0.40 | 1.33 | 2.62 | 4.52 | 1.55 | .014 | T |
| 157.00 | 157.55 | QMPH | | 967A | 0.55 | 0.05 | 0.15 | 0.18 | 0.06 | .004 | D |
| 157.55 | 158.19 | MSSX | | 968A | 0.64 | 2.00 | 1.87 | 3.72 | 0.64 | .020 | L |
| 158.19 | 159.65 | QGPH | | 1051A | 1.46 | <0.01 | <0.01 | 0.06 | 0.01 | .002 | |
| 159.65 | 159.85 | MSSX | | 969A | 0.20 | 1.97 | 1.00 | 1.89 | 1.11 | .012 | |
| 159.85 | 161.45 | QGPH | QMPH - 160.1 - 160.5 | | | | | | | | |
| 161.45 | 163.00 | MSSX | | 970A | 1.55 | 1.92 | 3.32 | 6.41 | 2.42 | .034 | T |
| 163.00 | 164.80 | MSSX | | 971A | 1.80 | 3.12 | 1.75 | 4.26 | 1.84 | .034 | D |
| 164.80 | 165.10 | QMPH | 2% pyrite | 972A | 1.30 | 0.23 | 0.44 | 0.71 | 0.32 | .010 | L |
| 165.10 | 169.50 | QMPH | 2% Pyrite | 1052A | 4.40 | 0.01 | 0.04 | 0.13 | 0.07 | .002 | |
| 169.50 | 169.80 | MSSX | | 973A | 0.30 | 0.68 | 1.68 | 2.66 | 0.96 | .012 | |
| 169.80 | 171.70 | QMPH | | 1053A | 1.90 | 0.05 | 0.12 | 0.24 | 0.15 | .002 | |
| 171.70 | 173.27 | MSSX | 50-60% sulphide in QMPH | 974A | 1.57 | 1.59 | 2.19 | 4.43 | 1.75 | .022 | T |
| 173.27 | 173.42 | FAULT | shattered QMPH | 975A | 0.15 | 0.29 | 0.42 | 0.55 | 0.35 | .010 | C |
| 173.42 | 174.20 | MSSX | 50% sulphide in QMPH | 301A | 0.78 | 1.43 | 2.28 | 4.11 | 2.13 | .024 | L |
| 174.20 | 177.20 | QMPH | | 1054A | 3.00 | 0.04 | 0.03 | 0.23 | 0.06 | <.002 | |
| 177.20 | 177.50 | MSSX | | 302A | 0.30 | 1.18 | 3.14 | 6.62 | 2.01 | .034 | |
| 177.50 | 178.10 | QGPH | | 303A | 0.60 | 0.11 | 0.37 | 0.74 | 0.23 | .006 | |
| 178.10 | 179.30 | QMPH | | 1055A | 1.20 | <0.01 | 0.01 | 0.04 | 0.01 | <.002 | |
| 179.30 | 179.80 | QGPH | 0.5 cm MSSX band | 304A | 0.50 | 0.36 | 0.55 | 0.92 | 0.42 | .010 | |
| 179.80 | 180.10 | QGPH | | 305A | 0.30 | 0.02 | 0.01 | 0.10 | 0.03 | .004 | |
| 180.10 | 180.30 | QGPH | | 306A | 0.20 | 0.45 | 0.33 | 0.45 | 0.57 | .016 | |
| 180.30 | 181.30 | QMPH | | 307A | 1.00 | 0.13 | 0.24 | 0.48 | 0.20 | .006 | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-21 Page 2 of 3

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 181.30 | 181.75 | MSSX | |
| 181.75 | 182.40 | QGPH | |
| 182.40 | 184.00 | MSSX | 50% sulphide |
| 184.00 | 185.00 | MSSX | |
| 185.00 | 186.00 | MSSX | |
| 186.00 | 187.00 | MSSX | |
| 187.00 | 187.45 | MSSX | |
| 187.45 | 187.85 | QMPH | 30% sulphide |
| 187.85 | 188.45 | MSSX | |
| 188.45 | 188.80 | QGPH | Sulphide bands |
| 188.80 | 189.90 | QGPH | |
| 189.90 | 190.60 | QGPH | Sulphide bands |
| 190.60 | 192.00 | QGPH | |
| 192.00 | 192.85 | QGPH | |
| 192.85 | 193.85 | SMSX | 40% sulphide |
| 193.85 | 194.20 | MSSX | 50 - 65% sulphide |
| 194.20 | 196.60 | QGPH | QMPH - 194.2 - 194.6 |
| 196.60 | 197.21 | FAULT | weak gouge |
| 197.21 | 201.12 | QZIT | |
| 201.12 | 222.10 | QGPH | |
| 222.10 | 234.68 | QZIT | |
| 234.68 | 239.44 | QMPH | QGPH - 236.6 - 237.85 |
| 239.44 | 257.00 | QZIT | QGPH - 250.14 - 252.68 |
| 257.00 | 264.40 | QGPH | |
| 264.40 | 286.25 | QZIT | |
| 286.25 | 292.61 | FAULT | graphitic gouge |
| 292.61 | 298.42 | QZIT | |
| 298.42 | 302.92 | QMPH | QZIT - 300.10 - 301.04 |
| 302.92 | 306.32 | QZIT | |
| | | EOH | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|
| 308A | 0.45 | 1.97 | 2.14 | 4.07 | 1.95 | .022 | |
| 309A | 0.65 | 0.32 | 0.46 | 0.87 | 0.41 | .006 | |
| 310A | 1.60 | 1.43 | 2.10 | 4.04 | 2.01 | .028 | T |
| 311A | 1.00 | 1.27 | 2.33 | 4.60 | 1.92 | .034 | |
| 312A | 1.00 | 1.66 | 2.90 | 4.99 | 2.19 | .036 | B |
| 313A | 1.60 | 1.68 | 2.20 | 4.69 | 1.92 | .032 | |
| 314A | 0.45 | 1.51 | 1.98 | 3.97 | 1.57 | .020 | |
| 315A | 0.40 | 0.31 | 0.40 | 0.84 | 0.41 | .006 | L |
| 316A | 0.60 | 1.17 | 1.66 | 3.26 | 1.49 | .016 | |
| 317A | 0.35 | 0.48 | 0.72 | 1.48 | 0.55 | .006 | |
| 318A | 1.10 | 0.05 | 0.06 | 0.18 | 0.05 | .004 | |
| 319A | 0.70 | 0.40 | 0.33 | 1.71 | 0.38 | .006 | |
| 320A | 1.40 | 0.65 | 0.91 | 1.85 | 0.86 | .006 | T |
| 321A | 0.85 | 0.59 | 0.84 | 1.79 | 0.71 | .006 | |
| 322A | 1.00 | 0.81 | 1.12 | 2.06 | 0.05 | .006 | A |
| 323A | 0.35 | 1.19 | 1.66 | 3.21 | 1.66 | .008 | |
| 1056A | 2.40 | 0.05 | 0.06 | 0.16 | 0.07 | <.002 | L |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-21 

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 156.60 | 158.19 | D HORIZON | | | 1.59 | 1.16 | 1.46 | 2.70 | 1.29 | .013 |
| | | | | | | 5.32% | Cu+Pb | +Zn | | |
| 161.45 | 164.80 | D HORIZON | | | 3.35 | 2.56 | 2.48 | 5.25 | 2.11 | .034 |
| | | | | | | 10.29% | Cu+Pb | +Zn | | |
| 171.70 | 174.20 | C HORIZON | | | 2.50 | 1.46 | 2.10 | 4.10 | 1.78 | .022 |
| | | | | | | 7.66% | Cu+Pb | +Zn | | |
| 182.40 | 187.45 | B HORIZON | | | 5.05 | 1.50 | 2.32 | 4.84 | 1.97 | .031 |
| | | | | | | 8.66% | Cu+Pb | +Zn | | |
| 190.60 | 194.20 | A HORIZON | | | 3.60 | 0.75 | 1.02 | 2.02 | 0.96 | .006 |
| | | | | | | 3.79% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M 88-22 — Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 070.07 N 99,612.85 E | DEPTH | COLLAR | 110m | 188m | |
| ELEVATION | 1380.09 (m) DATE STARTED 07/18/88 | DIP | -50° | -48° | -46° | |
| CORE SIZE | NQ DATE COMPLETED 07/21/88 | AZIMUTH | 000° | 349° | 350° | |

FINAL DEPTH 203.03m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 15.00 | CASING | Overburden | | | | | | | |
| 15.00 | 70.90 | QMPH | QGPH - 46.48 - 47.97, 51.79 - 52.51, 54.0 - 54.96 | | | | | | | |
| 70.90 | 75.97 | QGPH | QMPH - 71.72 - 72.42 | | | | | | | |
| 75.97 | 105.90 | QMPH | | | | | | | | |
| 105.90 | 106.90 | QMPH | 20% sulphide | 986A | 1.00 | 0.56 | 0.33 | 0.74 | 0.45 | .009 |
| 106.90 | 107.69 | QGPH | 2% pyrite | 987A | 0.80 | 0.23 | 0.30 | 0.78 | 0.29 | .005 |
| 107.69 | 108.30 | QMPH | 15% sulphide | 988A | 0.60 | 1.40 | 1.48 | 2.96 | 1.33 | .022 |
| 108.30 | 108.90 | MSSX | QMPH gangue | 989A | 0.60 | 1.86 | 3.02 | 5.74 | 2.07 | .025 |
| 108.90 | 110.50 | MSSX | | 990A | 1.60 | 2.15 | 2.68 | 5.40 | 1.84 | .030 |
| 110.50 | 111.25 | MSSX | | 991A | 0.75 | 2.15 | 4.22 | 8.22 | 2.80 | .023 |
| 111.25 | 111.90 | QMPH | 2% PY | 992A | 0.65 | 0.34 | 0.54 | 1.00 | 0.39 | .008 |
| 111.90 | 112.90 | QMPH | 30% sulphide bands | 993A | 1.00 | 1.22 | 1.14 | 2.74 | 0.90 | .012 |
| 112.90 | 115.00 | QMPH | carbonate altered | 1057A | 2.10 | <0.01 | <0.01 | 0.03 | <0.01 | <.002 |
| 115.00 | 126.79 | QGPH | occasional CARB bands | | | | | | | |
| 126.79 | 133.23 | QMPH | carbonate altered alternating with 0.5m QGPH | | | | | | | |
| 133.23 | 145.50 | QGPH | QMPH - 133.80 - 134.23<br>CARB - 136.83 - 137.49 | | | | | | | |
| 145.50 | 157.76 | QMPH | QGPH - 146.3 - 146.39<br>carbonate altered - 154.19 - 156.47 | | | | | | | |
| 157.76 | 171.02 | QGPH | | | | | | | | |
| 171.02 | 174.87 | QMPH | Fault - 172.77 - 173.40 | | | | | | | |
| 174.87 | 203.30 | QGPH | | | | | | | | |
| | | EOH | | | | | | | | |
| 107.69 | 111.25 | A HORIZON | | | 3.56 | 1.97 | 2.87 | 5.64 | 2.00 | .026 |
| | | | | | | 10.48% | Cu+Pb | +Zn | | |

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# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No. M 88-23** — **Page 1 of 1**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,024.01 N | 99,940.80 E | DEPTH | COLLAR | 131 m | 198 m | 290 m |
| ELEVATION | 1509.00 (m) | DATE STARTED 09/19/88 | DIP | -75° | -68° | -74° | -64° |
| CORE SIZE | NQ | DATE COMPLETED 09/22/88 | AZIMUTH | 000° | 353° | 346° | 305° |

FINAL DEPTH 294.74 m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 6.39 | CASING | Overburden | | | | | | | | |
| 6.39 | 21.37 | QGPH | occasional CARB bands | | | | | | | | |
| 21.37 | 28.80 | QMPH | carbonate altered alternating with 0.3-2m QGPH | | | | | | | | |
| 28.80 | 110.70 | QGPH | CARB - 76.33-76.8, 79.18-79.68, 107.32-108.75 | | | | | | | | |
| 110.70 | 128.17 | QMPH | scattered 0.2-0.6m QGPH | | | | | | | | |
| 128.17 | 141.00 | QGPH | QMPH - 129.5-132.15, 136.3-137.12 138.7-139.5 | | | | | | | | |
| 141.00 | 148.18 | QMPH | QGPH - 145.43 - 146.95 | | | | | | | | |
| 148.18 | 151.80 | QGPH | | | | | | | | | |
| 151.80 | 156.89 | QMPH | QGPH - 152.5 - 153.62 | | | | | | | | |
| 156.89 | 175.40 | QGPH | QMPH - 159.32 - 160.28 169.8 - 171.99 | | | | | | | | |
| 175.40 | 196.43 | QMPH | | | | | | | | | |
| 196.43 | 206.93 | QGPH | Faults - 204.7 - 205.13 206.0 - 206.93 | | | | | | | | |
| 20 .93 | 209.20 | QGPH | | 1058A | 2.20 | <0.01 | <0.01 | 0.16 | 0.03 | <.002 | |
| 209.20 | 211.00 | MSSX | >90% sulphide | 994A | 1.80 | 1.76 | 3.88 | 7.44 | 3.53 | .050 | T |
| 211.00 | 213.00 | MSSX | ditto | 995 | 2.00 | 2.09 | 3.24 | 6.72 | 2.33 | .024 | D |
| 213.00 | 215.10 | MSSX | 50% sulphide, faint banding | 996 | 2.10 | 1.86 | 2.22 | 5.47 | 0.95 | .014 | ⊥ |
| 215.10 | 215.50 | QMPH | up to 30% disseminated sulphide | 997 | 0.40 | 0.14 | 0.22 | 0.77 | 0.15 | .022 | |
| 215.50 | 216.00 | QMPH | 20% sulphide | 998A | 0.50 | 0.14 | 0.36 | 0.77 | 0.16 | .006 | |
| 216.00 | 262.08 | QMPH | QGPH - 240.56 - 241.6 Fault - 246.91 - 247.2 | | | | | | | | |
| 262.08 | 263.80 | QMPH | | 1059A | 1.76 | 0.05 | 0.06 | 0.14 | 0.06 | <.002 | |
| 263.80 | 264.90 | MSSX | 40% sulphide, banded | 999A | 1.10 | 1.19 | 2.17 | 3.97 | 2.10 | .036 | T |
| 264.90 | 266.55 | MSSX | >80% sulphide, banded | 1000A | 1.65 | 1.12 | 1.38 | 3.26 | 1.41 | .024 | |
| 266.55 | 267.85 | MSSX | 60-70% sulphide | 1551A | 1.30 | 1.38 | 2.50 | 4.78 | 2.07 | .050 | A |
| 267.85 | 269.15 | MSSX | 70% sulphide | 1552 | 1.30 | 1.32 | 2.44 | 3.97 | 2.33 | .046 | ⊥ |
| 269.15 | 269.85 | QGPH | 3% pyrite | 1553 | 0.70 | 0.02 | 0.02 | 0.11 | .04 | .006 | |
| 269.85 | 270.40 | QGPH | 30% sulphide | 1554 | 0.55 | 0.29 | 0.65 | 1.18 | 0.60 | .012 | |
| 270.40 | 271.00 | MSSX | 0.9m MSSX bands, 40% sulphide overall | 1555A | 0.60 | 1.53 | 1.75 | 3.26 | 1.78 | .016 | > |
| 271.00 | 274.00 | QGPH | | 1060A | 3.00 | 0.04 | 0.02 | 0.16 | 0.05 | .004 | |
| 274.00 | 285.07 | QMPH | | | | | | | | | |
| 285.07 | 294.74 | QZIT | occasional 0.5m QGPH band | | | | | | | | |
| 209.20 | 215.10 | D HORIZON | | | 5.90 | 1.91 / 11.47% | 3.07 | 6.49 | 2.20 | .028 | |
| 263.80 | 269.15 | A HORIZON | | | 5.35 | 1.24 / 7.26% | 2.07 | 3.95 | 1.94 | .038 | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-25 Page 1 of 2

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100, 024.01 N | 99,940.80 E | DEPTH | COLLAR | 126m | 244m |
| ELEVATION 1509.00 (m) | DATE STARTED 09/25/88 | | DIP | -48° | -47° | -48° |
| CORE SIZE NQ | DATE COMPLETED 09/29/88 | | AZIMUTH | 000° | 353° | 354° |

FINAL DEPTH 248.72 m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 6.10 | CASING | Overburden | | | | | | | | |
| 6.10 | 48.05 | QGPH | Faults - 26.75 - 29.05, 37.25 - 38.71 42.0 - 49.0 | | | | | | | | |
| 48.05 | 101.40 | QMPH | Carbonate altered Fault - 99.55 - 101.10 | | | | | | | | |
| 101.40 | 114.35 | QGPH | | | | | | | | | |
| 114.35 | 124.90 | QMPH | carbonate altered alternating with 0.5m QGPH | | | | | | | | |
| 124.90 | 141.00 | QGPH | | | | | | | | | |
| 141.00 | 146.91 | FAULT | QMPH - 142.2 - 143.15 graphitic | | | | | | | | |
| 146.91 | 158.30 | QGPH | occasional QMPH bands | | | | | | | | |
| 158.30 | 169.15 | QMPH | QGPH - 166.65 - 167.67 | | | | | | | | |
| 169.15 | 178.16 | QGPH | | | | | | | | | |
| 178.16 | 181.47 | QGPH | Fault - 179.30 - 180.75 | 1061A | 3.32 | 0.04 | 0.08 | 0.23 | 0.09 | .004 | |
| 181.47 | 182.45 | MSSX | > 95% sulphide | 1556A | 0.98 | 2.07 | 2.06 | 4.43 | 4.26 | .040 | T |
| 182.45 | 184.00 | MSSX | Mineral banding | 1557 | 1.55 | 1.39 | 2.84 | 5.74 | 1.95 | .028 | |
| 184.00 | 184.55 | MSSX | 40-50% sulphide | 1558 | 0.55 | 2.42 | 0.45 | 3.01 | 0.70 | .012 | D |
| 184.55 | 185.15 | LIMS | Brecciated dolomite in dark grey quartz | 1559 | 0.60 | 1.09 | 0.06 | 0.21 | 0.13 | .010 | |
| 85.15 | 186.00 | MSSX | 50% sulphide | 1560 | 0.85 | 1.88 | 0.13 | 2.61 | 0.34 | .024 | |
| 186.00 | 187.45 | MSSX | ditto | 1561A | 1.45 | 2.09 | 0.32 | 2.13 | 0.58 | .018 | |
| 187.45 | 189.00 | QMPH | disseminated sulphide | 1062A | 1.55 | 0.17 | 0.15 | 0.32 | 0.25 | .006 | L |
| 189.00 | 199.50 | QMPH | QGPH - 199.06 - 199.50 | | | | | | | | |
| 199.50 | 200.10 | QMPH | | 1569A | 0.60 | <0.01 | 0.01 | 0.03 | 0.15 | .004 | |
| 200.10 | 200.60 | QMPH | 10% disseminated sulphide | 1570 | 0.50 | <0.01 | 0.02 | 0.03 | 0.20 | .006 | |
| 200.60 | 201.05 | QMPH | ditto | 1571 | 0.45 | 0.18 | 0.48 | 0.77 | 0.49 | .004 | |
| 201.05 | 201.30 | MSSX | 40% sulphide | 1572 | 0.25 | 0.04 | 0.24 | 0.33 | 0.07 | .002 | |
| 201.30 | 202.05 | QMPH | several 2cm MSSX bands | 1573A | 0.75 | 0.44 | 0.16 | 0.33 | 0.25 | .008 | |
| 202.05 | 205.00 | QMPH | | | | | | | | | |
| 205.00 | 208.90 | QMPH | | 1063A | 3.90 | 0.07 | 0.07 | 0.30 | 0.07 | .002 | |
| 208.9 | 209.70 | MSSX | 40% sulphide | 1562A | 0.80 | 0.94 | 1.75 | 3.36 | 1.24 | .014 | C |
| 209.70 | 213.86 | QMPH | | 1064A | 3.56 | 0.06 | 0.02 | 0.04 | 0.10 | <.002 | |
| 213.86 | 217.90 | QMPH | 0.5-3cm MSSX band - 216.05 - 217.90 | 1065A | 4.64 | 0.18 | 0.36 | 0.74 | 0.21 | .004 | |
| 217.90 | 219.60 | QMPH | | 1066A | 1.70 | 0.25 | 0.06 | 0.11 | 0.15 | <.002 | |
| 219.60 | 220.20 | MSSX | 30% sulphide | 1563A | 0.60 | 0.32 | 0.91 | 1.70 | 0.44 | .006 | |
| 220.20 | 221.00 | QGPH | | 1564A | 0.80 | 0.08 | 0.06 | 0.15 | 0.07 | .004 | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-25 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 221.00 | 222.00 | MSSX | 50% sulphide | 1565A | 1.00 | 1.45 | 1.90 | 4.11 | 1.65 | .020 | A |
| 222.00 | 225.00 | QGPH | QMPH- 222.60-223.47 | 1067A | 3.00 | 0.05 | 0.06 | 0.16 | 0.07 | <.002 | |
| 225.00 | 225.25 | MSSX | 75-85% sulphide | 1566A | 0.25 | 0.90 | 1.72 | 3.58 | 1.24 | .014 | |
| 225.25 | 225.65 | QGPH | | 1567A | 0.40 | 0.08 | 0.09 | 0.26 | 0.04 | .004 | |
| 225.65 | 226.15 | MSSX | | 1568A | 0.50 | 0.65 | 0.59 | 1.43 | 0.47 | .004 | |
| 226.15 | 228.09 | QGPH | QMPH- 226.30 - 227.09 | | | | | | | | |
| 228.09 | 232.63 | QMPH | LIMS - 230.76 - 231.11, 231.44 - 232.35 | | | | | | | | |
| 232.63 | 234.60 | QGPH | | | | | | | | | |
| 234.60 | 237.80 | QZIT | QGPH - 235.5 - 236.5 | | | | | | | | |
| 237.80 | 241.15 | QGPH | QZIT last 0.3 m | | | | | | | | |
| 241.15 | 245.00 | QMPH | carbonate altered | | | | | | | | |
| 245.00 | 248.72 | QZIT | QGPH - 245.06 - 246.58 | | | | | | | | |
| | | EOH | | | | | | | | | |
| 181.47 | 187.45 | D HORIZON | | | 5.98 | 1.98 | 1.22 | 3.40 | 1.47 | .023 | |
| | | | | | | 6.60% | Cu+Pb | +Zn | | | |
| 208.90 | 209.70 | C HORIZON | | | 0.80 | 0.94 | 1.75 | 3.36 | 1.24 | .014 | |
| | | | | | | 6.05% | Cu+Pb | +Zn | | | |
| 221.00 | 222.00 | A HORIZON | | | 1.00 | 1.45 | 1.90 | 4.11 | 1.65 | .020 | |
| | | | | | | 7.46% | Cu+Pb | +Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M88-26 — **Page 1 of 1**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,034.22 N | 99,073.09 E | DEPTH | COLLAR | 101m | 214m |
| ELEVATION | 1399.42(m) | DATE STARTED 09/25/88 | DIP | -50° | -54° | -50° |
| CORE SIZE | NQ | DATE COMPLETED 09/29/88 | AZIMUTH | 000° | 354° | 350° |

**FINAL DEPTH** 215.50m

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 9.14 | CASING | Overburden |
| 9.14 | 53.30 | QMPH | |
| 53.30 | 54.71 | QMPH | |
| 54.71 | 56.79 | QMPH | |
| 56.79 | 58.83 | QMPH | |
| 58.83 | 60.71 | QMPH | |
| 60.71 | 62.10 | QMPH | |
| 62.10 | 63.02 | QMPH | 10% sulphide |
| 63.02 | 63.26 | MSSX | |
| 63.26 | 64.10 | FAULT | 20% recovery |
| 83.10 | 83.10 | QGPH | QMPH - 75.65 - 78.70 |
| 89.10 | 89.10 | QZIT | |
| 122.60 | 122.60 | QGPH | abundant 0.3m QMPH bands to 107.0m |
| 128.33 | 128.33 | QMPH | carbonate altered |
| 149.54 | 149.54 | QGPH | QMPH - 131.15 - 132.53, 134.53 - 136.0, 138.21 - 139.97 |
| 202.13 | 202.13 | QMPH | QGPH - 176.38 - 179.10 |
| 215.50 | 215.50 | QGPH | |
| | | EOH | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 324A | 1.40 | 0.01 | 0.04 | 0.13 | 0.04 | <.002 |
| 325A | 2.08 | 0.02 | 0.02 | 0.07 | 0.01 | <.002 |
| 1574A | 2.04 | 0.01 | <0.01 | 0.03 | <0.01 | .002 |
| 1575A | 1.88 | 0.06 | 0.07 | 0.16 | 0.07 | .004 |
| 1636A | 1.39 | 0.13 | 0.23 | 0.57 | 0.09 | .002 |
| 1637A | 0.92 | 0.01 | 0.02 | 0.02 | <0.01 | .002 |
| 1638A | 0.24 | 1.12 | 2.68 | 6.41 | 1.69 | .014 |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-27 Page 1 of 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100,033.81 N | 98,877.01 E | DEPTH | COLLAR | 78m | 187m | |
| ELEVATION | 1355.94 (m) | DATE STARTED 10/2/88 | DIP | -50° | -48° | -45° | |
| CORE SIZE | NQ | DATE COMPLETED 10/7/88 | AZIMUTH | 000° | 353° | (030° ?) | |

FINAL DEPTH 188.98m

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 18.29 | CASING | Overburden |
| 18.29 | 64.78 | QFPH | |
| 64.78 | 76.87 | QMPH | alternating with 1-2m QFPH bands |
| 76.87 | 129.12 | QFPH | Fault - 124.13 - 124.65 |
| 129.12 | 130.93 | QMPH | |
| 130.93 | 154.03 | QFPH | |
| 154.03 | 156.00 | QMPH | |
| 156.00 | 188.98 | QFPH | QMPH - 162.31 - 163.49<br>178.41 - 179.71 |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-28 Page 1 of 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100,083.32 N | 100,009.26 E | DEPTH | COLLAR | 104m | 208m | |
| ELEVATION 1495.90 (m) | DATE STARTED 10/5/88 | | DIP | -50° | -60° | -50° | |
| CORE SIZE NQ | DATE COMPLETED 10/8/88 | | AZIMUTH | 000° | 355° | 357° | |

FINAL DEPTH 213.66 m

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 12.19 | CASING | Overburden |
| 12.19 | 14.90 | QGPH | |
| 14.90 | 23.47 | FAULT | Highly broken to shattered |
| 23.47 | 31.15 | QGPH | |
| 31.15 | 33.76 | QZIT | |
| 33.76 | 85.60 | QGPH | CARB - 34.44 - 36.15<br>Fault - 44.81 - 45.70 |
| 85.60 | 88.00 | QZIT | QGPH - 85.86 - 87.48 |
| 88.00 | 91.10 | FAULT | shattered |
| 91.10 | 92.93 | QZIT | |
| 92.93 | 98.50 | QGPH | QZIT - 95.73 - 96.10<br>97.62 - 98.10 |
| 98.50 | 111.20 | QZIT | |
| 111.20 | 116.20 | QGPH | |
| 116.20 | 122.00 | QZIT | |
| 122.00 | 133.50 | QGPH | QZIT - 126.10 - 127.26<br>Faults - 124.66 - 126.1, 128.6 - 129.9 |
| 133.50 | 136.40 | QZIT | QGPH - 134.5 - 135.25 |
| 136.40 | 150.80 | QGPH | QZIT - 139.2 - 140.6, 145.55 - 146.87 |
| 150.80 | 156.90 | QGPH | |
| 156.90 | 158.00 | MSSX | 80-85% sulphide |
| 158.00 | 158.50 | QGPH | |
| 158.50 | 158.80 | FAULT | |
| 158.80 | 160.98 | FAULT | Shattered QGPH |
| 160.98 | 168.60 | QGPH | QZIT - 161.5 - 161.85<br>MSSX - 164.62 - 169.69 |
| 168.60 | 170.40 | QZIT | QGPH - 168.90 - 169.50 |
| 170.40 | 174.90 | QMPH | carbonate altered |
| 174.90 | 176.10 | QGPH | |
| 176.10 | 210.00 | QZIT | |
| 210.00 | 213.66 | QGPH | |
| | | EOH | |
| 156.90 | 158.80 | D HORIZON | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 1068A | 6.10 | <0.01 | <0.01 | 0.01 | 0.04 | .002 |
| 1633A | 1.10 | 3.48 | 4.12 | 8.22 | 3.31 | .031 |
| 1634A | 0.50 | 0.59 | 1.39 | 1.83 | 1.24 | .016 |
| 1635A | 0.30 | 0.59 | 1.28 | 2.40 | 1.10 | .010 |
| 1069A | 1.70 | 0.04 | 0.09 | 0.19 | 0.12 | <.002 |
| | 1.90 | 2.26 | 2.95 | 5.62 | 2.42 | .024 |
| | | 10.83% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M88-29 Page 1 of 1

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,039.52 N | 98,744.00 E | DEPTH | COLLAR | 119m | 211m |
| ELEVATION | 1326.40 (m) | DATE STARTED 10/8/88 | DIP | -50° | -53° | -48° |
| CORE SIZE | NQ | DATE COMPLETED 10/13/88 | AZIMUTH | 000° | 353° | (029°?) |
| FINAL DEPTH | 214.44m | | | | | |

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 9.60 | CASING | Overburden |
| 9.60 | 16.56 | QGPH | |
| 16.56 | 43.52 | QMPH | |
| 43.52 | 87.48 | QGPH | QMPH - 49.42 - 51.24<br>54.60 - 55.77 |
| 87.48 | 94.28 | QMPH | QGPH - 89.71 - 91.41 |
| 94.28 | 101.40 | QGPH | |
| 101.40 | 104.10 | QMPH | |
| 104.10 | 162.90 | QGPH | Small faults - 116.92 - 122.65<br>CARB - 142.75 - 144.68 |
| 162.90 | 192.01 | QMPH | carbonate and chloritic bands (up to 3m thick) |
| 192.01 | 204.83 | QGPH | |
| 204.83 | 214.44 | QZIT | CARB - 206.35 - 208.70 |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No. M 88-30A** — 

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 100,083.32 N | 100,009.26 E | DEPTH | COLLAR | 61m | 162m | 280m |
| ELEVATION | 1495.90 (m) | DATE STARTED 10/13/88 | DIP | -88° | -87° | -83° | -72° |
| CORE SIZE | NQ | DATE COMPLETED 10/17/88 | AZIMUTH | 000° | 330° | 306° | 270° |

FINAL DEPTH 281.94m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 10.00 | CASING | Over burden | | | | | | | | |
| 10.00 | 136.00 | QGPH | | | | | | | | | |
| 136.00 | 145.00 | QMPH | | | | | | | | | |
| 145.00 | 155.83 | QGPH | | | | | | | | | |
| 155.83 | 176.59 | QMPH | QGPH - 174.61 - 175.72 | | | | | | | | |
| 176.59 | 185.75 | QGPH | | | | | | | | | |
| 185.75 | 187.94 | QGPH | | 1644A | 2.19 | 0.02 | 0.06 | 0.15 | 0.04 | .002 | |
| 187.94 | 188.61 | QMPH | Highly broken, shattered MSSX - 188.22 - 188.34 | 1645A | 0.67 | 0.39 | 0.63 | 1.49 | 0.57 | .008 | |
| 188.61 | 189.52 | MSSX | 80-85% Sulphide | 1646 | 0.91 | 0.35 | 2.12 | 2.87 | 2.86 | .050 | T |
| 189.52 | 190.18 | MSSX | ditto | 1647 | 0.66 | 0.77 | 2.34 | 4.43 | 1.56 | .030 | D |
| 190.18 | 191.00 | MSSX | ditto | 1648 | 0.82 | 1.22 | 3.34 | 7.68 | 1.52 | .020 | |
| 191.00 | 192.16 | MSSX | ditto | 1649A | 1.16 | 1.65 | 3.36 | 5.64 | 0.99 | .012 | ⊥ |
| 192.16 | 193.98 | QMPH | 2% Pyrite | 1650A | 1.82 | 0.07 | 0.22 | 0.36 | 0.08 | .002 | |
| 193.98 | 229.70 | QMPH | LIMS - 224.37 - 224.5 | | | | | | | | |
| 229.70 | 230.70 | MSSX | QMPH - 230.40 - 234.70 | 1653A | 1.00 | 0.60 | 1.14 | 2.06 | 1.02 | .014 | T |
| 230.70 | 231.40 | MSSX | 70% sulphide | 1654A | 0.70 | 1.30 | 1.90 | 3.72 | 1.46 | .022 | C |
| 231.40 | 232.69 | QMPH | | 1655 | 1.29 | <0.01 | <0.01 | 0.02 | <0.01 | .002 | ⊥ |
| 232.69 | 234.66 | QMPH | | 1656 | 1.97 | 0.13 | 0.14 | 0.25 | 0.15 | .002 | |
| 234.66 | 235.08 | MSSX | 90% sulphide | 1657 | 0.42 | 1.61 | 3.32 | 6.10 | 2.27 | .026 | T |
| 235.08 | 237.08 | QMPH | | 1658 | 2.00 | 0.02 | 0.03 | 0.06 | 0.03 | .002 | |
| 237.08 | 237.60 | MSSX | 80% sulphide | 1659 | 0.52 | 1.64 | 2.36 | 4.60 | 2.30 | .024 | B |
| 237.60 | 238.45 | QMPH | | 1660 | 0.85 | 0.34 | 0.56 | 1.15 | 0.55 | .006 | |
| 238.45 | 239.57 | MSSX | 8 - 20 cm MSSX bands in QGPH | 1661 | 1.12 | 0.82 | 1.41 | 2.66 | 1.22 | .016 | ⊥ |
| 239.57 | 241.16 | QGPH | | 1662 | 1.59 | 0.07 | 0.10 | 0.24 | 0.03 | .004 | |
| 241.16 | 243.26 | QGPH | | 1663 | 2.20 | 0.05 | 0.05 | 0.15 | 0.03 | .004 | |
| 243.26 | 244.24 | QGPH | 2-5-20 cm MSSX bands | 1664 | 0.98 | 0.93 | 1.74 | 3.05 | 0.85 | .014 | T |
| 244.24 | 245.11 | MSSX | 90% sulphide | 1665A | 0.87 | 1.58 | 2.34 | 4.79 | 1.92 | .028 | A |
| 245.11 | 245.88 | QGPH | several 2-3 cm MSSX bands | 1666A | 0.77 | 0.40 | 0.54 | 1.00 | 0.48 | .008 | ⊥ |
| 245.88 | 255.45 | QMPH | | | | | | | | | |
| 255.45 | 259.50 | QGPH | | | | | | | | | |
| 259.50 | 264.12 | QMPH | LIMS - 261.16 - 261.22<br>262.73 - 263.04 | | | | | | | | |
| 264.12 | 264.62 | MSSX | | 1667A | 0.50 | 0.90 | 1.98 | 3.84 | 1.27 | .012 | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-30A Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 264.62 | 266.38 | QGPH | | 1668A | 1.76 | 0.23 | 0.44 | 0.90 | 0.29 | .006 |
| 266.38 | 267.39 | QMPH | QGPH - 266.38 - 266.70 | 1669 | 1.01 | 0.03 | 0.04 | 0.09 | 0.01 | .002 |
| 267.39 | 268.91 | QGPH | MSSX - 267.39 - 267.52 | 1670 | 1.52 | 0.40 | 0.50 | 0.96 | 0.54 | .010 |
| 268.91 | 270.05 | QGPH | MSSX - 268.99 - 269.02 | 1671 | 1.14 | 0.40 | 0.54 | 1.04 | 0.60 | .008 |
| 270.05 | 271.27 | MSSX | 60% sulphide | 1672 | 1.22 | 1.64 | 2.31 | 4.26 | 2.16 | .024 |
| 271.27 | 272.93 | QMPH | | 1673 | 1.66 | 0.23 | 0.26 | 0.50 | 0.28 | .004 |
| 272.93 | 273.26 | MSSX | | 1674 | 0.33 | 1.56 | 1.60 | 3.58 | 1.30 | .020 |
| 273.26 | 273.77 | QMPH | | 1675 | 0.51 | 0.04 | 0.06 | 0.12 | 0.03 | .002 |
| 273.77 | 274.09 | MSSX | | 1676 | 0.32 | 0.78 | 1.08 | 2.22 | 0.99 | .012 |
| 274.09 | 274.78 | QMPH | | 1677 | 0.69 | 0.08 | 0.10 | 0.19 | 0.09 | .002 |
| 274.78 | 276.00 | QMPH | MSSX - 274.78 - 275.0<br>275.90 - 276.0 | 1678 | 1.22 | 0.51 | 0.58 | 1.18 | 0.57 | .008 |
| 276.00 | 279.48 | QGPH | several 5-20 mm MSSX bands | 1679A | 1.48 | 1.48 | 1.14 | 1.99 | 1.01 | .008 |
| 279.48 | 279.50 | QGPH | shattered at base | | | | | | | |
| 279.50 | 281.94 | QZIT | | | | | | | | |
| | | EOH | | | | | | | | |
| 188.61 | 192.16 | D HORIZON | | | 3.55 | 1.05 | 2.85 | 5.21 | 1.70 | .027 |
| | | | | | | 9.11% | Cu+Pb | +Zn | | |
| 229.70 | 231.40 | C HORIZON | | | 1.70 | 0.89 | 1.45 | 2.74 | 1.19 | .017 |
| | | | | | | 5.08% | Cu+Pb | +Zn | | |
| 234.66 | 239.57 | B HORIZON | | | 4.91 | 0.57 | 0.96 | 1.84 | 0.81 | .010 |
| | | | | | | 3.37% | Cu+Pb | +Zn | | |
| 243.26 | 245.11 | A HORIZON | | | 1.85 | 1.24 | 2.02 | 3.87 | 1.35 | .021 |
| | | | | | | 7.20% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 88-31 — **Page 1 of 1**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100, 120.48 N | 99,289.10 E | DEPTH | COLLAR | 98m | 159m | |
| ELEVATION | 1363.79 (m) | DATE STARTED 10/14/88 | DIP | -50° | -58° | -52° | |
| CORE SIZE | NQ | DATE COMPLETED 10/17/88 | AZIMUTH | 000° | 355° | (030°?) | |
| FINAL DEPTH | 160.96 | | | | | | |

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 7.50 | CASING | Overburden |
| 7.50 | 35.76 | QMPH | |
| 35.76 | 48.35 | QGPH | |
| 48.35 | 61.80 | QMPH | |
| 61.80 | 64.62 | QMPH | 10-15% sulphide |
| 64.62 | 67.06 | QMPH | ditto |
| 67.06 | 72.87 | QMPH | |
| 72.87 | 74.64 | QMPH | 1-2% pyrite |
| 74.64 | 75.10 | MSSX | 70% sulphide |
| 75.10 | 75.67 | QMPH | 20% sulphide |
| 75.67 | 76.23 | MSSX | 70% sulphide |
| 76.23 | 79.21 | QMPH | 1-2% pyrite |
| 79.21 | 82.99 | QMPH | |
| 82.99 | 105.55 | QGPH | QMPH - 100.60 - 102.12 |
| 105.55 | 113.68 | QMPH | |
| 113.68 | 115.20 | FAULT | shattered |
| 115.20 | 121.44 | QGPH | |
| 121.44 | 134.00 | QMPH | |
| 134.00 | 139.49 | QGPH | |
| 139.49 | 146.40 | QZIT | CARB - 142.00 - 143.66 |
| 146.40 | 160.96 | QMPH | |
| | | EOH | |
| 74.67 | 76.23 | A HORIZON | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 1651A | 2.82 | 0.05 | 0.26 | 0.50 | 0.06 | .003 |
| 1652A | 2.44 | <0.01 | 0.04 | 0.06 | <0.01 | .002 |
| | | | | | | |
| 1639A | 1.77 | 0.02 | 0.29 | 0.29 | 0.07 | .002 |
| 1640A | 0.46 | 0.77 | 3.32 | 7.94 | 1.95 | .076 |
| 1641A | 0.57 | 0.35 | 0.41 | 1.34 | 0.42 | .012 |
| 1642A | 0.56 | 0.65 | 4.71 | 7.16 | 2.19 | .056 |
| 1643A | 2.98 | 0.05 | 0.10 | 0.15 | 0.06 | .002 |
| | 1.59 | 0.58 | 2.77 | 5.30 | 1.49 | .046 |
| | | 8.65% | Cu+Pb+Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-32 Page 1 of 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 100,085.09 N | 99,485.70 E | DEPTH | COLLAR | 114 m | 202m | |
| ELEVATION | 1362.25(m) | DATE STARTED 10/18/88 | DIP | -50° | -49° | -45° | |
| CORE SIZE | NQ | DATE COMPLETED 10/22/88 | AZIMUTH | 000° | (030°?) | 359° | |

FINAL DEPTH 204.83m

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 24.00 | CASING | Overburden to 53 m |
| 24.00 | 93.55 | QMPH | Fault - 73.15 - 74.0 |
| 93.55 | 108.81 | QGPH | |
| 108.81 | 112.00 | QMPH | |
| 112.00 | 114.93 | QMPH | |
| 114.93 | 119.54 | FAULT | Highly broken QGPH |
| 119.54 | 123.00 | QGPH | |
| 123.00 | 164.76 | QGPH | QMPH - 131.37-133.01, 150.71 - 151.45<br>Fault - 142.55 - 143.87 |
| 164.76 | 171.47 | QMPH | |
| 117.47 | 178.55 | QGPH | |
| 178.55 | 184.32 | QZIT | |
| 184.32 | 186.44 | QGPH | |
| 186.44 | 193.19 | QMPH | |
| 193.19 | 194.65 | QGPH | |
| 194.65 | 204.83 | QZIT | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 1070A | 2.93 | <0.01 | <0.01 | 0.04 | 0.01 | <.002 |
| 1071A | 4.61 | <0.01 | <0.01 | 0.03 | 0.01 | <.002 |
| 1073A | 3.46 | <0.01 | <0.01 | 0.03 | 0.01 | <.002 |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 88-33 **Page 1 of 1**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 99,942.18 N | 99,877.59 E | DEPTH | COLLAR | 152m | 281m | 302m |
| ELEVATION | 1480.48(m) | DATE STARTED 10/19/88 | DIP | -80° | -82° | -67° | -67° |
| CORE SIZE | NQ | DATE COMPLETED 10/23/88 | AZIMUTH | 000° | 344° | 337° | 338° |

FINAL DEPTH 305.41m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 6.30 | CASING | overburden | | | | | | | | |
| 6.30 | 17.16 | QMPH | | | | | | | | | |
| 17.16 | 90.31 | QGPH | QMPH - 37.81 - 39.51<br>QFLT - 45.05 - 46.65 | | | | | | | | |
| 90.31 | 96.97 | QMPH | | | | | | | | | |
| 96.97 | 101.92 | QGPH | | | | | | | | | |
| 101.92 | 105.91 | QMPH | | | | | | | | | |
| 105.91 | 146.40 | QGPH | occasional CARB bands<br>Fault - 116.39 - 118.00 | | | | | | | | |
| 146.40 | 153.40 | QMPH | | | | | | | | | |
| 153.40 | 211.20 | QGPH | scattered QMPH bands | | | | | | | | |
| 211.20 | 220.80 | QMPH | | | | | | | | | |
| 220.80 | 222.51 | QMPH | Fault - 221.81 - 222.51 | 1681A | 1.71 | 0.03 | 0.06 | 0.09 | 0.04 | <.002 | |
| 222.51 | 223.50 | QMPH | 3 - 2-10 cm MSSX bands | 1682 | 0.99 | 1.40 | 2.62 | 5.47 | 1.50 | .012 | T |
| 223.50 | 224.64 | MSSX | 80% sulphide | 1683 | 1.14 | 1.64 | 2.65 | 4.60 | 1.39 | .022 | |
| 224.64 | 225.70 | MSSX | ditto | 1684 | 1.06 | 1.35 | 1.84 | 3.47 | 1.38 | .018 | D |
| 225.70 | 227.17 | MSSX | ditto | 1685 | 1.47 | 1.80 | 1.81 | 3.84 | 1.24 | .012 | I |
| 227.17 | 228.62 | QMPH | 2% pyrite | 1686 | 1.45 | 0.31 | 0.21 | 0.57 | 0.26 | .010 | |
| 228.62 | 229.98 | QMPH | 2% pyrite | 1687A | 1.36 | 0.80 | 0.11 | 0.19 | 0.12 | .002 | |
| 229.98 | 305.41 | QMPH | LIMS - 258.46 - 260.43 | | | | | | | | |
| | | EOH | | | | | | | | | |
| 222.51 | 227.17 | D HORIZON | | | 4.66 | 1.57 | 2.19 | 4.29 | 1.36 | .016 | |
| | | | | | | 8.05% | Cu+Pb | +Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 89-34 — **Page 1 of 2**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES | 99,848.66 N | 100,002.66 E | DEPTH | COLLAR | 117m | 206m | 315m | 444m |
| ELEVATION | 1478.81 (m) | DATE STARTED 06/14/89 | DIP | -71° | -68° | -68° | -64° | -58° |
| CORE SIZE | NQ | DATE COMPLETED 06/24/89 | AZIMUTH | 358° | 354° | 354° | 344° | 342° |
| FINAL DEPTH | 444.09m | | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 6.09 | CASING | Overburden | | | | | | | |
| 6.09 | 8.05 | QGPH | | | | | | | | |
| 8.05 | 17.82 | QZIT | | | | | | | | |
| 17.82 | 21.95 | QGPH | | | | | | | | |
| 21.95 | 26.55 | QMPH | abundant carbonate and chlorite | | | | | | | |
| 26.55 | 32.10 | QGPH | | | | | | | | |
| 32.10 | 34.13 | QZIT | | | | | | | | |
| 34.13 | 41.90 | QMPH | carbonate altered to 36.97 | | | | | | | |
| 41.90 | 55.78 | QZIT | QMPH - 44.56 - 45.48<br>51.13 - 53.90 | | | | | | | |
| 55.78 | 59.80 | QGPH | | | | | | | | |
| 59.80 | 62.07 | QMPH | abundant carbonate and chlorite | | | | | | | |
| 62.07 | 67.72 | QZIT | occasional 0.5m QGPH and QMPH bands | | | | | | | |
| 67.72 | 72.07 | QMPH | variable carbonate alteration<br>QZIT - 70.20 - 71.45 | | | | | | | |
| 72.07 | 75.90 | QGPH | | | | | | | | |
| 75.90 | 80.85 | QZIT | alternating with 0.5-1m QGPH bands | | | | | | | |
| 80.85 | 87.48 | QMPH | carbonate alter | | | | | | | |
| 87.48 | 91.35 | FAULT | broken, shattered QZIT | | | | | | | |
| 91.35 | 105.38 | QMPH | abundant carbonate and chlorite | | | | | | | |
| 105.38 | 172.21 | QGPH | CARB - 111.46 - 113.14<br>Faults - 135.56 - 137.77, 154.7 - 157.06 | | | | | | | |
| 172.21 | 178.92 | FAULT | shattered QGPH | | | | | | | |
| 178.92 | 187.39 | QGPH | | | | | | | | |
| 187.39 | 191.90 | QMPH | carbonate altered | | | | | | | |
| 191.90 | 232.62 | QGPH | | | | | | | | |
| 232.62 | 237.40 | QMPH | carbonate altered | | | | | | | |
| 237.40 | 245.43 | QGPH | | | | | | | | |
| 245.43 | 260.81 | QMPH | carbonate altered | | | | | | | |
| 260.81 | 266.88 | QGPH | | | | | | | | |
| 266.88 | 270.36 | QMPH | carbonate altered | | | | | | | |
| 270.36 | 283.52 | QGPH | | | | | | | | |
| 283.52 | 312.70 | QMPH | Fault - 292.59 - 294.15 | | | | | | | |
| 312.70 | 314.25 | QGPH | 1-2mm MSSX bands<br>313.12 - 313.22 | 1101A | 1.55 | 0.08 | 0.08 | 0.20 | 0.06 | <.002 |
| 314.25 | 315.00 | QMPH | orbicular texture | 1102A | 0.75 | 0.05 | 0.01 | 0.05 | <0.01 | .002 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 89-34 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 315.00 | 316.32 | QMPH | 5% pyrite | 1103A | 1.32 | 0.04 | 0.02 | 0.06 | 0.04 | .002 |
| 316.32 | 318.15 | QMPH | ditto | 1104 | 1.83 | 0.09 | 0.16 | 0.30 | 0.12 | <.002 |
| 318.15 | 319.54 | QMPH | ditto | 1105 | 1.39 | 0.06 | 0.06 | 0.25 | 0.06 | .002 |
| 319.54 | 320.23 | QMPH | ditto | 1106 | 0.65 | 0.07 | 0.13 | 0.23 | 0.12 | .020 |
| 320.23 | 320.58 | QMPH | SMSX, 45% sulphide | 1107 | 0.39 | .125 | 2.69 | 4.82 | 1.33 | .018 |
| 320.58 | 321.60 | MSSX | 80% sulphide | 1108 | 1.02 | 1.85 | 3.62 | 6.61 | 2.27 | .022 |
| 321.60 | 322.53 | MSSX | ditto | 1109 | 0.93 | 1.90 | 2.44 | 4.57 | 1.63 | .014 |
| 322.53 | 323.59 | QMPH | 15% sulphide | 1110 | 1.06 | 0.28 | 0.16 | 0.36 | 0.19 | .002 |
| 323.59 | 324.96 | QMPH | ditto | 1111 | 1.37 | 0.13 | 0.07 | 0.14 | 0.08 | .004 |
| 324.96 | 325.85 | QMPH | 6% sulphide | 1112 | 0.89 | 0.03 | 0.02 | 0.03 | 0.03 | .002 |
| 325.85 | 328.27 | QMPH | ditto | 1113 | 2.42 | 0.02 | 0.01 | 0.02 | 0.02 | .002 |
| 328.27 | 330.17 | QMPH | ditto | 1114 | 1.90 | 0.04 | 0.02 | 0.04 | 0.04 | .002 |
| 330.17 | 332.37 | QMPH | quartz augen present | 1115 | 2.20 | 0.14 | 0.15 | 0.22 | 0.08 | .002 |
| 332.37 | 334.50 | QMPH | ditto | 1116A | 2.13 | 0.03 | 0.01 | 0.02 | <0.01 | .004 |
| 334.50 | 340.91 | QMPH | chloritic to 335.80 QGPH - 340.46 - 340.90 | | | | | | | |
| 340.91 | 342.90 | QMPH | chloritic | 1117A | 1.99 | 0.04 | 0.01 | 0.02 | <0.01 | .002 |
| 342.90 | 344.92 | QMPH | 4% sulphide | 1118A | 2.02 | 0.03 | 0.01 | 0.02 | 0.02 | <.002 |
| 344.92 | 346.84 | QMPH | 6% sulphide | 1119A | 1.92 | 0.02 | 0.07 | 0.12 | 0.06 | .002 |
| 346.84 | 348.46 | QMPH | 10% sulphide | 1120A | 1.62 | 0.10 | 0.30 | 0.38 | 0.20 | .004 |
| 348.46 | 351.04 | QMPH | 4% sulphide | 1121A | 2.58 | 0.02 | 0.01 | 0.02 | 0.01 | <.002 |
| 351.04 | 353.00 | QMPH | | | | | | | | |
| 353.00 | 365.18 | QMPH | quartz augen present | | | | | | | |
| 365.18 | 367.73 | QMPH | 10% sulphide | 1122A | 2.55 | 0.02 | <0.01 | 0.01 | <0.01 | <.002 |
| 367.73 | 368.43 | SMSX | QMPH with 30% pyrite | 1123 | 0.75 | 0.05 | <0.01 | 0.01 | <0.01 | <.002 |
| 368.43 | 371.58 | QMPH | 10% sulphide | 1124 | 3.10 | 0.02 | <0.01 | 0.01 | <0.01 | <.002 |
| 371.58 | 373.99 | QMPH | 5% sulphide | 1125A | 2.41 | 0.02 | 0.01 | 0.01 | <0.01 | <.002 |
| 373.99 | 387.42 | QMPH | | | | | | | | |
| 387.42 | 390.65 | QGPH | 10% sulphide | 1126A | 3.23 | 0.03 | 0.01 | 0.02 | <0.01 | <.002 |
| 390.65 | 412.70 | QGPH | | | | | | | | |
| 412.70 | 425.98 | QMPH | | | | | | | | |
| 425.98 | 444.09 | QGPH | | | | | | | | |
| | | EOH | | | | | | | | |
| 320.23 | 323.59 | D HORIZON | | | 3.36 | 1.33 | 2.16 | 3.99 | 1.38 | .017 |
| | | | | | | 7.48% | Cu+Pb | + Zn | | |

T D 1

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M89-35 — Page 1 of 2

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 99,844.01 N | 100,089.29 E | DEPTH | COLLAR | 108m | 233m | 343m |
| ELEVATION | 1457.07 (m) | DATE STARTED 06/24/89 | DIP | -60° | -57° | -54° | -51° |
| CORE SIZE | NQ | DATE COMPLETED 07/03/89 | AZIMUTH | 354° | 348° | 357° | 355° |
| FINAL DEPTH | 400.51m | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 3.05 | CASING | Overburden | | | | | | | |
| 3.05 | 27.32 | QZIT | | | | | | | | |
| 27.32 | 58.09 | QMPH | Carbonate/chlorite altered 27.32-35.12, 43.70-45.75 | | | | | | | |
| 58.09 | 72.45 | QZIT | CARB - 69.19 - 70.22 | | | | | | | |
| 72.45 | 77.47 | QMPH | carbonate - chlorite altered | | | | | | | |
| 77.47 | 82.06 | QGPH | | | | | | | | |
| 82.06 | 96.65 | QMPH | carbonate - chlorite altered | | | | | | | |
| 96.65 | 99.00 | QGPH | | | | | | | | |
| 99.00 | 102.41 | QMPH | Fault - 101.77 - 102.41 | | | | | | | |
| 102.41 | 154.93 | QGPH | CARB - 112.55 - 115.74, 118.82 - 119.77, 128.43 - 129.02 | | | | | | | |
| 154.93 | 159.23 | FAULT | shattered QGPH | | | | | | | |
| 159.23 | 198.30 | QGPH | QMPH - 185.45 - 186.84 | | | | | | | |
| 198.30 | 207.46 | QMPH | carbonate - chlorite altered QGPH - 202.72 - 204.20 | | | | | | | |
| 207.46 | 242.41 | QGPH | | | | | | | | |
| 242.41 | 252.62 | QMPH | QGPH - 245.12 - 246.07, 248.40 - 250.68 | | | | | | | |
| 252.62 | 267.40 | QGPH | | | | | | | | |
| 267.40 | 279.80 | QMPH | | | | | | | | |
| 279.80 | 288.78 | QGPH | | | | | | | | |
| 288.78 | 291.20 | QGPH | 8% pyrite | 1127A | 2.42 | <0.01 | <0.01 | 0.11 | 0.04 | .002 |
| 291.20 | 292.50 | QGPH | sheared lower contact | 1128 | 1.30 | 0.10 | 0.18 | 0.46 | 0.17 | .004 |
| 292.50 | 295.21 | MSSX | Massive, coarse granular | 1129 | 2.71 | 1.40 | 4.48 | 7.44 | 1.98 | .041 |
| 295.21 | 296.20 | MSSX | 85% sulphide | 1130 | 0.99 | 2.09 | 0.63 | 3.36 | 0.73 | .018 |
| 296.20 | 297.15 | QMPH | 30% sulphide | 1131 | 0.95 | 0.96 | 0.15 | 0.32 | 0.15 | .036 |
| 297.15 | 298.49 | QMPH | 15% sulphide | 1132 | 1.34 | 0.11 | 0.06 | 0.21 | 0.05 | .004 |
| 298.49 | 300.84 | QMPH | 10% sulphide | 1133 | 2.35 | 0.03 | 0.07 | 0.15 | 0.04 | .006 |
| 300.84 | 303.23 | QMPH | orbicular texture | 1134A | 2.39 | 0.02 | 0.10 | 0.12 | 0.03 | <.002 |
| 303.23 | 317.63 | QMPH | | | | | | | | |
| 317.63 | 326.63 | QGPH | QMPH - 321.00 - 322.06 | | | | | | | |
| 326.63 | 329.68 | QGPH | 30% pyrite first 20cm | 1135A | 3.05 | 0.12 | 0.23 | 0.46 | 0.20 | .002 |
| 329.68 | 332.08 | QMPH | 5% pyrite | 1136 | 2.40 | 0.13 | 0.19 | 0.38 | 0.15 | .004 |
| 332.08 | 334.92 | QMPH | 2% pyrite | 1137 | 2.84 | <0.01 | <0.01 | 0.02 | 0.01 | <.002 |
| 334.92 | 336.00 | QGPH | MSSX bands - 334.97 - 334.97, 335.18 - 335.20, 335.34 - 335.44 | 1138A | 1.00 | 2.15 | 1.51 | 3.15 | 1.28 | .014 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M89-35 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 336.00 | 337.37 | QMPH | | 1139A | 1.37 | 0.06 | 0.07 | 0.14 | 0.07 | .002 | |
| 337.37 | 338.90 | QMPH | sulphide band - 337.68 - 337.77 | 1140 | 1.53 | 0.29 | 0.26 | 0.57 | 0.26 | .004 | |
| 338.90 | 340.42 | QMPH | | 1141 | 1.52 | 0.09 | 0.14 | 0.32 | 0.10 | .008 | |
| 340.42 | 343.15 | QMPH | | 1142 | 2.73 | 0.04 | 0.04 | 0.08 | 0.04 | .002 | |
| 343.15 | 344.63 | QMPH | 15% sulphide | 1143 | 1.48 | 0.58 | 0.65 | 1.27 | 0.47 | .004 | |
| 344.63 | 346.50 | QMPH | | 1144A | 1.87 | 0.02 | 0.06 | 0.09 | 0.04 | <.002 | |
| 346.50 | 355.09 | QMPH | LIMS - 352.59 - 352.84<br>Fault - 354.46 - 355.09 | | | | | | | | |
| 355.09 | 357.88 | QGPH | | 1145A | 2.79 | 0.03 | 0.05 | 0.10 | 0.07 | .004 | |
| 357.88 | 359.36 | QMPH | 20% sulphide | 1146 | 1.48 | 0.87 | 1.20 | 2.39 | 1.28 | .018 | |
| 359.36 | 360.50 | QMPH | 5% pyrite | 1147 | 1.14 | 0.20 | 0.28 | 0.57 | 0.33 | .011 | |
| 360.50 | 361.00 | QMPH | MSSX bands - 360.65 - 360.67<br>360.80 - 361.00 | 1148 | 0.50 | 1.32 | 1.93 | 3.84 | 1.54 | .022 | |
| 361.00 | 362.22 | QGPH | 8% Pyrite | 1149 | 1.22 | 0.12 | 0.15 | 0.40 | 0.09 | .006 | |
| 362.22 | 363.46 | QGPH | 6, 2cm, MSSX bands | 1150 | 1.24 | 0.68 | 1.06 | 2.06 | 0.79 | .014 | T |
| 363.46 | 364.03 | MSSX | QGPH - 363.55 - 363.80 | 1151 | 0.57 | 1.35 | 2.24 | 4.78 | 1.50 | .020 | B |
| 364.03 | 365.00 | QMPH | 15% sulphide | 1152 | 0.97 | 0.44 | 0.81 | 1.58 | 0.84 | .010 | |
| 365.00 | 367.40 | QMPH | Fault - 365.59 - 366.07 | 1153 | 2.40 | 0.04 | 0.08 | 0.14 | 0.07 | .002 | |
| 367.40 | 369.21 | QMPH | | 1154A | 1.81 | <0.01 | <0.01 | 0.02 | 0.02 | <.002 | |
| 369.21 | 381.51 | QZIT | | | | | | | | | |
| 381.51 | 390.51 | QGPH | LIMS - 389.45 - 389.71 | | | | | | | | |
| 390.51 | 400.51 | QMPH | QZIT - 390.51 - 391.03,<br>392.20 - 393.20, 389.30 - 399.00 | | | | | | | | |
| | | EOH | | | | | | | | | |
| 292.50 | 297.15 | D HORIZON | | | 4.65 | 1.46 | 3.75 | 5.12 | 1.34 | .035 | |
| | | | | | | 10.32% | Cu+Pb | +Zn | | | |
| 362.22 | 365.03 | B HORIZON | | | 2.78 | 0.73 | 1.26 | 2.45 | 0.94 | .014 | |
| | | | | | | 4.44% | Cu+Pb | +Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M89-36 — **Page 1 of 2**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 99,907.24 N | 99,618.26 E | DEPTH | COLLAR | 138m | 225m | 303m |
| ELEVATION | 1396.00 (m) | DATE STARTED 07/03/89 | DIP | -51.5° | -47° | -45° | -45° |
| CORE SIZE | NQ | DATE COMPLETED 07/08/89 | AZIMUTH | 358° | 360° | 358° | 349° |

FINAL DEPTH 304.50m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 22.86 | CASING | Overburden | | | | | | | | |
| 22.86 | 24.66 | QMPH | | | | | | | | | |
| 24.66 | 27.05 | QGPH | | | | | | | | | |
| 27.05 | 28.96 | QMPH | Malachite staining - 27.85-27.95 | 1155A | 1.91 | <0.01 | <0.01 | 0.03 | <0.01 | .002 | |
| 28.96 | 42.77 | QGPH | QMPH - 32.81 - 34.32 | | | | | | | | |
| 42.77 | 45.52 | QMPH | | | | | | | | | |
| 45.52 | 51.45 | QGPH | CARB - 47.73 - 49.93 | | | | | | | | |
| 51.45 | 57.50 | QMPH | | | | | | | | | |
| 57.50 | 96.62 | QGPH | CARB - 76.85 - 79.85, 86.89 - 87.87 | | | | | | | | |
| 96.62 | 110.92 | QMPH | | | | | | | | | |
| 110.92 | 120.40 | QGPH | | | | | | | | | |
| 120.40 | 132.15 | QMPH | | | | | | | | | |
| 132.15 | 135.61 | FAULT | QMPH - broken | 1156A | 3.42 | <0.01 | 0.01 | 0.02 | <0.01 | <.002 | |
| 135.61 | 135.98 | MSSX | 90% sulphide | 1157 | 0.25 | 0.48 | 3.50 | 5.22 | 2.65 | .066 | |
| 135.98 | 139.47 | QMPH | 1% pyrite | 1158 | 3.96 | <0.01 | 0.01 | 0.03 | 0.02 | <.002 | |
| 139.47 | 141.43 | MSSX | 80% sulphide QMPH - 140.73 - 141.00 | 1159 | 1.96 | 1.45 | 3.65 | 4.67 | 2.60 | .056 | D |
| 141.43 | 144.48 | QMPH | carbonate altered 5% pyrite | 1160 | 3.05 | 0.05 | 0.05 | 0.08 | 0.05 | .012 | |
| 144.48 | 147.51 | QMPH | ditto | 1161 | 3.03 | <0.01 | 0.03 | 0.04 | 0.04 | .012 | |
| 147.51 | 148.49 | QMPH | 10% sulphide | 1162 | 0.98 | 0.15 | 0.33 | 0.67 | 0.57 | .014 | |
| 148.49 | 149.40 | MSSX | 70% sulphide, sphalerite bands | 1163 | 0.91 | 2.21 | 5.29 | 9.63 | 3.73 | .072 | D |
| 149.40 | 150.78 | QMPH | carbonate altered | 1164 | 1.38 | 0.18 | 0.35 | 0.69 | 0.68 | .010 | |
| 150.78 | 154.76 | QMPH | carbonate altered | 1165 | 3.98 | <0.01 | 0.05 | 0.05 | 0.07 | .002 | |
| 154.76 | 159.20 | QMPH | | 1166 | 4.44 | <0.01 | 0.02 | 0.04 | 0.03 | .002 | |
| 159.20 | 163.60 | QMPH | | 1167 | 3.86 | 0.01 | 0.04 | 0.05 | 0.03 | .002 | |
| 163.60 | 166.73 | QMPH | | 1168 | 3.67 | <0.01 | <0.01 | 0.05 | <0.01 | <.002 | |
| 166.73 | 170.13 | QMPH | | 1169 | 3.40 | <0.01 | <0.01 | 0.01 | <0.01 | .004 | |
| 170.13 | 171.30 | QMPH | carbonate altered MSSX - 170.13 - 170.29, 171.02 - 171.30 | 1170 | 1.17 | 0.65 | 1.66 | 2.53 | 3.14 | .080 | T |
| 171.30 | 172.82 | MSSX | QMPH - 172.2 - 172.82 | 1171 | 1.52 | 1.15 | 3.20 | 5.40 | 2.64 | .110 | |
| 172.82 | 174.50 | QMPH | 15% sulphide | 1172 | 1.68 | 0.52 | 0.66 | 1.27 | 0.50 | .036 | C |
| 174.50 | 175.40 | QMPH | ditto | 1173 | 0.90 | 0.52 | 1.14 | 1.86 | 0.69 | .038 | |
| 175.40 | 176.38 | MSSX | 80% sulphide | 1174 | 0.98 | 2.39 | 5.10 | 9.36 | 2.46 | .050 | |
| 176.38 | 177.24 | MSSX | 90% sulphide | 1175A | 0.86 | 2.34 | 3.92 | 7.94 | 2.10 | .052 | T |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 89-36 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 177.24 | 178.92 | QMPH | 8% sulphide |
| 178.92 | 182.35 | QMPH | |
| 182.35 | 186.35 | QMPH | |
| 186.35 | 187.98 | QMPH | 10% sulphide |
| 187.98 | 188.89 | QMPH | 20% sulphide |
| 188.89 | 190.00 | MSSX | 80% sulphide |
| 190.00 | 191.26 | SMSX | 40% sulphide, carbonate gangue |
| 191.26 | 192.00 | MSSX | 90% sulphide |
| 192.00 | 193.38 | SMSX | 40% sulphide, carbonate gangue |
| 193.38 | 194.54 | MSSX | 70% sulphide |
| 194.54 | 195.80 | SMSX | 40% sulphide, HMS - 195.4 - 195.8 |
| 195.80 | 197.22 | MSSX | 90% sulphide |
| 197.22 | 198.57 | MSSX | ditto |
| 198.57 | 200.33 | QMPH | MSSX - 199.38 - M9.58, 199.7 - 199.82, 199.88 - 200.11, 200.19 - 200.21 |
| 200.33 | 202.64 | QMPH | 5% pyrite |
| 202.64 | 204.10 | QMPH | |
| 204.10 | 256.20 | QMPH | |
| 256.20 | 258.38 | QMPH | 3% pyrite |
| 258.38 | 259.52 | QMPH | sulphide band - 258.38 - 258.52 |
| 259.52 | 260.35 | QMPH | sulphide bands - 259.52 - 259.81, 260.15 - 260.28 |
| 260.35 | 262.68 | QFPH | |
| 262.68 | 272.10 | QFPH | |
| 272.10 | 276.00 | FAULT | shattered QFPH and QMPH |
| 276.00 | 296.28 | QFPH | |
| 296.28 | 299.30 | QZIT | |
| 299.30 | 303.28 | QFPH | |
| 303.28 | 304.50 | QZIT | |
| 139.47 | 141.43 | D HORIZON | |
| 148.49 | 149.40 | D HORIZON | |
| 170.15 | 177.24 | C HORIZON | |
| 188.89 | 200.33 | C HORIZON | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 1176A | 1.68 | 0.33 | 0.35 | 0.65 | 0.28 | 0.016 |
| 1177 | 3.43 | 0.02 | 0.03 | 0.07 | 0.03 | 0.002 |
| 1178 | 4.00 | <0.01 | 0.01 | 0.02 | 0.01 | 0.002 |
| 1179 | 1.63 | 0.05 | 0.08 | 0.15 | 0.09 | 0.012 |
| 1180 | 0.91 | 0.47 | 0.30 | 0.79 | 0.49 | 0.020 |
| 1181 | 1.11 | 2.08 | 2.82 | 5.78 | 2.30 | 0.044 |
| 1182 | 1.26 | 1.00 | 1.90 | 3.26 | 1.97 | 0.034 |
| 1183 | 0.74 | 2.80 | 2.00 | 5.06 | 2.30 | 0.030 |
| 1184 | 1.38 | 1.04 | 2.17 | 3.58 | 2.06 | 0.038 |
| 1185 | 1.16 | 0.46 | 3.02 | 3.58 | 1.66 | 0.054 |
| 1186 | 1.26 | 0.51 | 2.17 | 3.58 | 1.88 | 0.070 |
| 1187 | 1.42 | 2.15 | 1.72 | 3.72 | 1.84 | 0.030 |
| 1188 | 1.35 | 2.90 | 3.16 | 6.60 | 2.51 | 0.064 |
| 1189 | 1.76 | 0.93 | 1.72 | 3.15 | 1.63 | 0.024 |
| 1190 | 2.31 | 0.09 | 0.18 | 0.33 | 0.12 | 0.002 |
| 1191A | 1.46 | 0.04 | 0.06 | 0.18 | 0.12 | 0.002 |
| | | | | | | |
| 1192A | 2.17 | 0.04 | 0.02 | 0.04 | 0.03 | <0.002 |
| 1193 | 1.14 | 0.32 | 0.37 | 0.67 | 0.42 | 0.004 |
| 1194 | 0.83 | 0.87 | 0.72 | 1.63 | 0.74 | 0.004 |
| 1195A | 2.33 | 0.05 | <.01 | 0.14 | <0.01 | <0.002 |
| | 1.96 | 1.45 | 3.65 | 4.67 | 2.60 | .056 |
| | | 9.77% | Cu+Pb | +Zn | | |
| | 0.91 | 2.21 | 5.29 | 9.63 | 3.73 | .072 |
| | | 17.13% | Cu+Pb | +Zn | | |
| | 7.11 | 1.15 | 2.43 | 4.36 | 1.88 | .060 |
| | | 7.94% | Cu+Pb+ | Zn | | |
| | 11.43 | 1.47 | 2.27 | 4.15 | 1.95 | .040 |
| | | 7.89% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M89-37 — **Page 1 of 2**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 99, 951.87 N | 99, 292.78 E | DEPTH | COLLAR | 115m | 247m |
| ELEVATION | 1392.23 (m) | DATE STARTED 07/8/89 | DIP | -56.5° | -54° | -52° |
| CORE SIZE | NQ | DATE COMPLETED 07/12/89 | AZIMUTH | 360° | 358° | — |
| FINAL DEPTH | 247.80m | | | | | |

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 8.36 | CASING | |
| 8.36 | 14.94 | QMPH | |
| 14.94 | 20.42 | FAULT | |
| 20.42 | 24.28 | QMPH | Chloritic altered greenstone ? |
| 24.28 | 47.73 | QMPH | QGPH - 44.86 - 45.39 |
| 47.73 | 48.57 | QGPH | |
| 48.57 | 49.29 | QMPH | 1-2cm MSSX bands - 48.58, 48.81, 49.23 |
| 49.29 | 49.80 | QGPH | |
| 49.80 | 67.47 | QMPH | |
| 67.47 | 72.39 | QGPH | |
| 72.39 | 76.96 | QMPH | |
| 76.96 | 81.20 | QGPH | QMPH - 78.21 - 79.35 |
| 81.20 | 121.78 | QMPH | chloritic - 98.15 - 100.91 |
| 121.78 | 124.94 | QZIT | graphitic |
| 124.94 | 145.42 | QMPH | |
| 145.42 | 152.10 | QGPH | CARB - 145.60 - 146.91<br>Fault - 147.97 - 149.05 |
| 152.10 | 154.35 | QMPH | |
| 154.35 | 166.47 | QGPH | CARB - 157.28 - 158.47<br>160.71 - 161.70 |
| 166.47 | 169.40 | QMPH | QGPH - 167.60 - 168.20 |
| 169.40 | 171.60 | QMPH | 4% sulphide |
| 171.60 | 174.00 | QMPH | ditto |
| 174.00 | 174.90 | QMPH | 15% sulphide |
| 174.90 | 176.09 | QMPH | MSSX - 174.92 - 175.0, 175.46, 175.82 - 175.84, 176.07 - 176.09 |
| 176.09 | 178.36 | QMPH | |
| 178.36 | 179.67 | QMPH | 10% sulphide |
| 179.67 | 180.60 | QGPH | 10% sulphide |
| 180.60 | 181.42 | QMPH | |
| 181.42 | 184.00 | QMPH | |
| 184.00 | 186.23 | QMPH | |
| 186.23 | 187.13 | QMPH | |
| 187.13 | 188.18 | MSSX | |
| 188.18 | 189.42 | QGPH | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|
| 1196A | 0.72 | 0.58 | 0.35 | 0.85 | 0.26 | .005 | |
| 1197A | 2.20 | 0.04 | 0.18 | 0.35 | 0.12 | .002 | |
| 1198 | 2.40 | 0.04 | 0.18 | 0.30 | 0.10 | .002 | |
| 1199 | 0.90 | 0.47 | 1.20 | 2.39 | 0.78 | .006 | B |
| 1200A | 1.19 | 0.93 | 0.95 | 2.53 | 0.70 | .008 | |
| 1726A | 2.27 | <0.01 | 0.01 | 0.04 | <0.01 | .001 | |
| 1727 | 1.31 | 0.17 | 0.19 | 0.40 | 0.20 | .002 | |
| 1728 | 0.93 | 1.74 | 2.20 | 4.36 | 1.74 | .011 | |
| 1729 | 0.82 | 0.03 | 0.05 | 0.09 | 0.04 | .002 | |
| 1730 | 2.59 | <0.01 | 0.01 | 0.03 | 0.04 | .001 | |
| 1731 | 2.22 | <0.01 | <0.01 | 0.02 | 0.01 | .001 | |
| 1732 | 0.90 | 0.16 | 0.49 | 0.96 | 0.31 | .002 | B |
| 1733 | 1.05 | 2.30 | 2.90 | 7.16 | 2.95 | .011 | |
| 1734A | 1.24 | 0.72 | 0.12 | 0.27 | 0.13 | .002 | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M89-37 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 189.42 | 190.90 | QMPH | chlorite - carbonate altered | 1735A | 1.48 | 0.02 | 0.02 | 0.05 | 0.01 | .001 |
| 190.90 | 192.63 | QGPH | | 1736 | 1.73 | <0.01 | <0.01 | 0.03 | <0.01 | .001 |
| 192.63 | 193.36 | MSSX | 50% sulphide Quartz vein to 193.0 | 1737 | 0.73 | 1.22 | 1.63 | 3.47 | 0.54 | .005 |
| 193.36 | 194.16 | QMPH | 20% sulphide | 1738 | 0.80 | 0.38 | 0.32 | 0.79 | 0.18 | .026 |
| 194.16 | 195.22 | QMPH | | 1739 | 1.06 | 0.03 | 0.06 | 0.13 | 0.07 | .003 |
| 195.22 | 196.77 | QGPH | | 1740A | 1.55 | <0.01 | <0.01 | 0.04 | <0.01 | .001 |
| 196.17 | 203.10 | QGPH | CARB 196.77 - 197.55<br>200.96 - 202.20 | | | | | | | |
| 203.10 | 204.50 | QMPH | carbonate altered<br>sulphide band - 203.50 - 203.55 | 1741A | 1.40 | 0.06 | 0.42 | 0.79 | 0.28 | .003 |
| 204.50 | 204.90 | QMPH | MSSX - 204.65 - 204.75 | 1742 | 0.40 | 0.90 | 2.45 | 4.78 | 1.65 | .051 |
| 204.90 | 205.66 | QMPH | carbonate altered<br>8% sulphide | 1743A | 0.76 | 0.29 | 0.63 | 0.96 | 0.44 | .003 |
| 205.66 | 247.80 | QGPH | CARB - 213.96 - 214.80<br>LIMS - 231.81 - 231.97 | | | | | | | |
| | | EOH | | | | | | | | |
| 174.0 | 176.09 | B HORIZON | | | 2.09 | 0.73 | 1.06 | 2.47 | 0.73 | .007 |
| | | | | | | 4.26% | Cu+Pb | +Zn | | |
| 186.23 | 188.18 | B. HORIZON | | | 1.95 | 1.31 | 1.79 | 4.30 | 1.73 | .007 |
| | | | | | | 7.40% | Cu+Pb | +Zn | | |
| 203.10 | 205.66 | A HORIZON | | | 2.56 | 0.27 | 0.82 | 2.37 | 0.55 | .010 |
| | | | | | | 3.46% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M 89-38 — Page 1 of 2

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES | 99,762.87 N | 99,629.80 E | DEPTH | COLLAR | 178m | 304m | 422m |
| ELEVATION | 1419.51 (m) | DATE STARTED 07/12/89 | DIP | -58° | -54° | -50° | -42° |
| CORE SIZE | NQ | DATE COMPLETED 07/19/89 | AZIMUTH | 360° | 356° | 354° | 354° |

FINAL DEPTH 422.15m

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 7.83 | CASING | Overburden |
| 7.83 | 29.11 | QZIT | QMPH - 9.32 - 10.24, 11.93 - 13.17<br>QGPH - 24.13 - 25.05 |
| 29.11 | 35.06 | QGPH | CARB - 32.00 - 33.50 |
| 35.06 | 40.12 | QZIT | |
| 40.12 | 42.88 | QMPH | |
| 42.88 | 63.58 | QGPH | CARB - 45.95 - 48.67<br>55.87 - 57.50 |
| 63.58 | 65.89 | FAULT | Highly broken QGPH |
| 65.89 | 82.84 | QGPH | |
| 82.84 | 85.60 | QMPH | carbonate - chlorite altered |
| 85.60 | 89.10 | QGPH | |
| 89.10 | 94.00 | QMPH | |
| 94.00 | 112.26 | QGPH | |
| 112.26 | 126.74 | QMPH | chlorite - carbonate altered |
| 126.74 | 168.52 | QGPH | CARB - 146.50 - 148.65<br>151.48 - 154.61 |
| 168.52 | 175.15 | QMPH | chlorite - carbonate altered |
| 175.15 | 185.01 | QGPH | |
| 185.01 | 189.55 | QMPH | |
| 189.55 | 192.73 | FAULT | Highly broken QGPH |
| 192.73 | 203.93 | QGPH | CARB - 193.70 - 194.60<br>201.31 - 202.60 |
| 203.93 | 214.30 | QMPH | QGPH - 207.37 - 208.95 |
| 214.30 | 221.89 | QGPH | |
| 221.89 | 228.46 | QMPH | |
| 228.46 | 229.21 | QMPH | |
| 229.21 | 229.96 | QMPH | chloritic, 10% sulphide |
| 229.96 | 231.05 | QMPH | |
| 231.05 | 232.89 | QMPH | |
| 232.89 | 233.92 | QMPH | |
| 233.92 | 234.70 | FAULT | sericitic |
| 234.70 | 235.51 | QMPH | chloritic, 10% sulphide |
| 235.51 | 236.24 | QMPH | carbonate altered<br>15% sulphide |
| 236.24 | 236.96 | QMPH | chloritic |
| 236.96 | 237.66 | QMPH | carbonate altered, 15% sulphide |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 1744A | 0.75 | 0.01 | 0.01 | 0.03 | <0.01 | <.002 |
| 1745A | 0.75 | 0.18 | 0.17 | 0.58 | 0.17 | .002 |
| 1746A | 1.09 | <0.01 | <0.01 | 0.03 | <0.01 | <.002 |
| 1747A | 1.84 | 0.01 | 0.02 | 0.09 | 0.01 | <.002 |
| 1748A | 1.03 | 0.16 | 0.06 | 0.09 | 0.04 | <.002 |
| 1749A | 0.78 | 0.06 | 0.16 | 0.16 | 0.11 | .002 |
| 1750A | 0.81 | 0.09 | 0.03 | 0.04 | 0.03 | .004 |
| 1761A | 0.73 | 1.30 | 0.03 | 0.06 | 0.12 | .006 |
| 1762A | 0.72 | 0.03 | <0.01 | 0.02 | <0.01 | <.002 |
| 1763A | 0.70 | 1.44 | 0.03 | 0.05 | 0.11 | .004 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 89-38 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 237.66 | 238.36 | QMPH | chloritic | 1764A | 0.70 | 0.03 | 0.06 | 0.13 | 0.03 | .002 |
| 238.36 | 239.88 | QMPH | | 1765 | 1.52 | 0.01 | 0.04 | 0.04 | 0.03 | .002 |
| 239.88 | 242.18 | QMPH | chloritic | 1766 | 2.30 | 0.04 | 0.01 | 0.04 | 0.01 | <.002 |
| 242.18 | 244.32 | QMPH | | 1767 | 2.14 | 0.02 | 0.01 | 0.04 | 0.01 | <.002 |
| 244.32 | 246.24 | QMPH | | 1768 | 1.92 | 0.02 | 0.05 | 0.09 | 0.04 | <.002 |
| 246.24 | 248.06 | QMPH | | 1769 | 1.82 | 0.01 | 0.03 | 0.04 | 0.02 | <.002 |
| 248.06 | 250.05 | QMPH | | 1770 | 1.99 | <0.01 | <0.01 | 0.02 | <.01 | <.002 |
| 250.05 | 251.38 | QMPH | | 1771A | 1.33 | <0.01 | <0.01 | 0.03 | 0.01 | <.002 |
| 251.38 | 327.33 | QMPH | 270.37 - 271.19 - "orbicular" textured carbonate unit | | | | | | | |
| 327.33 | 328.88 | QMPH | | 1772A | 1.55 | 0.02 | 0.04 | 0.03 | 0.02 | <.002 |
| 328.88 | 329.90 | QMPH | 5% sulphide | 1773 | 1.02 | 0.26 | 0.24 | 0.38 | 0.13 | <.002 |
| 329.90 | 331.20 | QMPH | | 1774 | 1.34 | <0.01 | 0.06 | 0.06 | 0.03 | <.002 |
| 331.20 | 333.06 | QMPH | | 1775A | 1.84 | <0.01 | 0.04 | 0.04 | 0.01 | <.002 |
| 333.06 | 335.98 | QMPH | quartz augens present | 1076A | 2.92 | 0.02 | 0.03 | 0.06 | 0.03 | .002 |
| 335.98 | 338.32 | QMPH | as above 5% sulphide | 1077 | 2.34 | 0.11 | 0.11 | 0.17 | 0.08 | .006 |
| 338.32 | 340.46 | QMPH | ditto | 1078 | 2.14 | <0.01 | 0.04 | 0.04 | 0.02 | .002 |
| 340.46 | 342.91 | QMPH | quartz augens, 7% sulphide | 1079 | 2.45 | 0.05 | 0.20 | 0.40 | 0.07 | .002 |
| 342.91 | 344.38 | QMPH | ditto | 1080 | 1.47 | <0.01 | 0.03 | 0.06 | 0.01 | <.002 |
| 344.38 | 347.67 | QMPH | ditto | 1081A | 3.29 | 0.02 | 0.02 | 0.07 | 0.03 | <.002 |
| 347.67 | 361.30 | QMPH | | | | | | | | |
| 361.30 | 362.19 | QGPH | | 1082A | 0.89 | 0.01 | 0.01 | 0.02 | 0.05 | <.002 |
| 362.19 | 362.84 | QGPH | Mssx bands - 382.66 - 382.72 | 1083 | 0.65 | 0.41 | 1.57 | 3.15 | 0.75 | <.002 |
| 326.84 | 363.64 | QMPH | | 1084 | 0.80 | <0.01 | 0.01 | 0.03 | <0.01 | <.002 |
| 363.64 | 364.40 | QMPH | 30% Pyrite | 1085A | 0.76 | <0.01 | <0.01 | <0.01 | 0.01 | <.002 |
| 364.40 | 369.93 | QMPH | | | | | | | | |
| 369.93 | 372.15 | QZIT | | | | | | | | |
| 372.15 | 388.63 | QMPH | Faults - 380.55 - 381.61, 383.60 - 384.90, 386.30 - 387.60 | | | | | | | |
| 388.63 | 422.15 | QGPH | | | | | | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No. M 90-39a** — **Page 1 of 3**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES * | 99,760 N | 100,360 E | DEPTH | COLLAR | 110m | 264m | 329m | 419m |
| ELEVATION* | 1340 (m) | DATE STARTED 06/11/90 | DIP | -60° | -58° | -53° | -52° | -50° |
| CORE SIZE | HQ/NQ | DATE COMPLETED 06/21/90 | AZIMUTH | 355° | 350° | 345° | 348° | 341° |
| FINAL DEPTH | 434.04 m | * Approximate | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 2.20 | CASING | Overburden | | | | | | | |
| 2.20 | 36.12 | QZIT | QMPH - 12.37 - 15.30<br>QGPH - bands from 18.40 m | | | | | | | |
| 36.12 | 41.15 | QGPH | | | | | | | | |
| 41.15 | 48.40 | QZIT | several 0.4m QGPH bands | | | | | | | |
| 48.40 | 54.18 | QGPH | | | | | | | | |
| 54.18 | 59.07 | QMPH | | | | | | | | |
| 59.07 | 64.60 | QZIT | QMPH - 63.40 - 64.60 | | | | | | | |
| 64.60 | 67.51 | FAULT | Highly broken QZIT | | | | | | | |
| 67.51 | 78.18 | QZIT | QMPH - 68.88 - 70.18<br>QGPH - 75.40 - 76.80 | | | | | | | |
| 78.18 | 81.18 | FAULT | Highly broken QZIT | | | | | | | |
| 81.18 | 83.17 | QZIT | | | | | | | | |
| 83.17 | 88.88 | QMPH | abundant carbonate | | | | | | | |
| 88.88 | 92.43 | QGPH | | | | | | | | |
| 92.43 | 119.80 | QMPH | Fault - 105.30 - 106.38 | | | | | | | |
| 119.80 | 199.16 | QGPH | Faults - 121.40 - 122.10,<br>132.60 - 134.0, 192.33 - 196.20 | | | | | | | |
| 199.16 | 225.50 | QMPH | QGPH - 212.0 - 214.25 | | | | | | | |
| 225.50 | 228.60 | FAULT | Broken QMPH and QGPH | | | | | | | |
| 228.60 | 255.52 | QGPH | CARB - 230.27 - 232.70<br>QMPH - 238.32 - 239.15 | | | | | | | |
| 255.52 | 259.71 | QMPH | | | | | | | | |
| 259.71 | 285.59 | QGPH | | | | | | | | |
| 285.59 | 288.00 | QMPH | 2, 20-30 cm, QGPH bands | | | | | | | |
| 288.00 | 290.66 | QGPH | QZIT bands last metre | | | | | | | |
| 290.66 | 292.28 | CARB | Strong carbonate alteration | | | | | | | |
| 292.28 | 319.18 | QZIT | CARB - 300.79 - 302.0<br>abundant 0.3-1.5m QGPH bands | | | | | | | |
| 319.18 | 322.79 | QGPH | CARB - 326.60 - 327.15 | | | | | | | |
| 322.79 | 324.00 | QZIT | | | | | | | | |
| 324.00 | 328.35 | QGPH | | | | | | | | |
| 328.35 | 331.35 | CARB | | | | | | | | |
| 331.35 | 333.40 | QGPH | | | | | | | | |
| 333.40 | 335.85 | QMPH | | | | | | | | |
| 335.85 | 343.20 | QGPH | | | | | | | | |
| 343.20 | 344.61 | QGPH | | 1776A | 1.41 | <0.01 | <0.01 | 0.09 | 0.02 | .002 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** — **HOLE No. M90-399** — 

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 344.61 | 345.65 | QMPH | | 1777A | 1.04 | 0.08 | 0.12 | 0.22 | 0.07 | .002 | |
| 345.65 | 346.37 | QMPH | Heavily disseminated Pyrite and chalcopyrite, MSSX - 364.65-364.73 | 1778 | 0.72 | 0.73 | 1.08 | 369 | 0.62 | .018 | |
| 346.37 | 347.20 | QMPH | | 1779 | 0.83 | 0.01 | 0.03 | 0.04 | 0.02 | .006 | |
| 347.20 | 348.00 | QMPH | Heavily disseminated pyrite and chalcopyrite | 1780 | 0.80 | 0.15 | 0.27 | 0.50 | 0.27 | .010 | |
| 348.00 | 349.90 | QMPH | | 1781 | 1.90 | .0.01 | 0.04 | 0.06 | 0.02 | .002 | |
| 349.90 | 351.12 | SMSX | MSSX bands - 349.90 - 350.0, 350.3 - 350.4, 350.67 - 350.73 | 1782 | 1.22 | 1.02 | 1.48 | 2.61 | 1.02 | .012 | T |
| 351.12 | 351.66 | QMPH | | 1783 | 0.54 | 0.04 | 0.06 | 0.14 | 0.05 | .006 | |
| 351.66 | 352.35 | QMPH/SMSX | SMSX - 351.66 - 352.0 | 1784 | 0.69 | 0.47 | 1.46 | 2.52 | 0.87 | .010 | D |
| 352.35 | 353.16 | SMSX | QMPH with frequent 1cm MSSX bands | 1785 | 0.81 | 1.20 | 1.56 | 2.78 | 1.17 | .016 | |
| 353.16 | 354.10 | MSSX | 15-20% quartz gangue | 1786 | 0.92 | 1.80 | 2.16 | 4.07 | 1.94 | .020 | I |
| 354.10 | 356.30 | QMPH | | 1787 | 2.20 | 0.01 | 0.03 | 0.04 | 0.09 | .002 | |
| 356.30 | 357.62 | QMPH | | 1788 | 1.32 | <0.01 | <0.01 | 0.03 | 0.03 | <.002 | |
| 357.62 | 359.60 | QGPH | | 1789 | 1.98 | <0.01 | <0.01 | 0.07 | 0.05 | <.002 | |
| 359.60 | 361.58 | QGPH | | 1790 | 1.98 | <0.01 | <0.01 | 0.10 | 0.05 | <.002 | |
| 361.58 | 363.60 | FAULT | highly broken QGPH | 1791 | 2.02 | 0.02 | 0.04 | 0.14 | 0.05 | .002 | |
| 363.60 | 365.00 | QMPH | MSSX bands - 364.31 - 364.35, 364.61 - 364.71, 364.95 - 365.00 | 1792 | 1.40 | 0.49 | 1.00 | 1.67 | 0.66 | .014 | T |
| 365.00 | 366.84 | QMPH | | 1793 | 1.84 | 0.12 | 0.25 | 0.45 | 0.20 | .008 | |
| 366.84 | 367.59 | MSSX | | 1794 | 0.75 | 1.88 | 2.44 | 4.75 | 2.12 | .026 | B |
| 367.59 | 368.36 | SMSX | QGPH with MSSX bands 367.65 - .71, 368.03 - .11, 368.16 - .32 | 1795 | 0.77 | 0.93 | 1.12 | 1.92 | 0.94 | .016 | |
| 368.36 | 369.36 | QGPH | | 1796 | 1.00 | 0.25 | 0.28 | 0.49 | 0.20 | .004 | |
| 369.36 | 370.56 | MSSX/QGPH | MSSX bands - 369.36 - .50, 369.83 - 370.04, 370.1 - .2, 370.27 - .33 | 1797 | 1.20 | 0.72 | 1.36 | 2.65 | 1.22 | .018 | I |
| 370.56 | 371.94 | QMPH | | 1798 A | 1.38 | 0.03 | 0.07 | 0.12 | 0.06 | .002 | |
| 371.94 | 383.33 | QMPH | | | | | | | | | |
| 383.33 | 385.46 | QMPH | | 1799A | 2.13 | <0.01 | 0.01 | 0.01 | 0.01 | <.002 | |
| 385.46 | 386.00 | QMPH | Heavily disseminated Pyrite | 1800A | 0.54 | 1.50 | 1.14 | 2.16 | 1.45 | .006 | |
| 386.00 | 387.70 | QGPH | | 1851A | 1.70 | 0.01 | 0.01 | 0.14 | 0.04 | .002 | |
| 387.70 | 394.72 | QGPH | | | | | | | | | |
| 394.72 | 395.86 | QGPH | | 1852A | 1.14 | 0.01 | <0.01 | 0.13 | 0.05 | .002 | |
| 395.86 | 396.90 | QMPH/SMSX | MSSX - 396.65 - 396.90 overall - heavily disseminated sulphide | 1853 | 1.04 | 0.29 | 0.62 | 1.11 | 0.59 | <.002 | |
| 396.90 | 398.42 | QGPH | | 1854 | 1.52 | 0.01 | 0.01 | 0.15 | 0.04 | .002 | |
| 398.42 | 401.15 | QGPH | | 1855 | 2.73 | <0.01 | <0.01 | 0.10 | 0.03 | .002 | |
| 401.15 | 402.96 | QGPH | | 1856 | 1.81 | 0.03 | 0.01 | 0.11 | 0.04 | .002 | |
| 402.96 | 404.00 | SMSX | QMPH MSSX - 403.16 - .30, 403.37 - .45, 403.95 - 404.0 | 1857 | 1.04 | 0.82 | 1.32 | 2.57 | 1.19 | .008 | T |
| 404.00 | 405.46 | QMPH | 2cm MSSX bands at 404.16, .26, .40 | 1858 | 1.46 | 0.36 | 0.47 | 0.86 | 0.46 | .002 | A |
| 405.46 | 407.21 | MSSX | | 1859 | 1.75 | 1.54 | 2.16 | 3.84 | 1.71 | .018 | I |
| 407.21 | 409.32 | FAULT | | 1860A | 2.11 | 0.04 | 0.08 | 0.14 | 0.06 | <.002 | |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M90-39a 

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 409.32 | 434.04 | QZIT | Alternating with 0.5m QFPH bands | | | | | | | |
| | | EOH | | | | | | | | |
| 349.90 | 354.10 | D HORIZON | | | 4.20 | 0.99 | 1.49 | 2.64 | 1.08 | 0.013 |
| | | | | | | 5.12% | Cu+Pb | +Zn | | |
| 363.60 | 370.60 | B HORIZON | | | 7.00 | 0.61 | 0.94 | 1.74 | 0.76 | 0.013 |
| | | | | | | 3.72% | Cu+Pb | +Zn | | |
| 403.00 | 407.20 | A HORIZON | | | 4.20 | 0.95 | 1.36 | 2.17 | 1.14 | 0.010 |
| | | | | | | 4.78% | Cu+Pb | +Zn | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M90-40 — **Page 1 of 2**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES * | 99,725 N | 100,217 E | DEPTH | COLLAR | 127m | 215m | 319m | 445m |
| ELEVATION * 1351 (m) | DATE STARTED 06/21/90 | | DIP | -60° | -53° | -48° | -44° | -39° |
| CORE SIZE HQ/NQ | DATE COMPLETED 06/30/90 | | AZIMUTH | 005° | 005° | 359° | 357° | 359° |
| FINAL DEPTH 445.51m | * Approximate | | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 5.20 | CASING | overburden | | | | | | | |
| 5.20 | 12.17 | QMPH | carbonate alteration to 9.5m | | | | | | | |
| 12.17 | 60.30 | QZIT | occasional 1-3m QMPH bands | | | | | | | |
| 60.30 | 65.52 | QMPH | | | | | | | | |
| 65.52 | 73.13 | QZIT | | | | | | | | |
| 73.13 | 76.81 | FAULT | Highly broken. QMPH | | | | | | | |
| 76.81 | 91.67 | QMPH | QZIT band - 87.17-90.0 | | | | | | | |
| 91.67 | 96.60 | FAULT | Highly broken QMPH and QZIT | | | | | | | |
| 96.60 | 129.00 | QMPH | 98.50-106.9 - carbonate alteration and QGPH band | | | | | | | |
| 129.00 | 168.80 | QGPH | occasional <1m carbonate altered bands | | | | | | | |
| 168.80 | 188.67 | QGPH | Highly broken - fault? | | | | | | | |
| 188.67 | 232.50 | QGPH | CARB - 200.50 - 206.04 | | | | | | | |
| 232.50 | 241.50 | QMPH | | | | | | | | |
| 241.50 | 258.32 | QGPH | | | | | | | | |
| 258.32 | 264.27 | QMPH | carbonate altered | | | | | | | |
| 264.27 | 276.42 | QGPH | CARB - 267.47 - 269.41 | | | | | | | |
| 276.42 | 290.50 | QMPH | carbonate altered | | | | | | | |
| 290.50 | 299.93 | QGPH | CARB - 29 - 295.27 | | | | | | | |
| 299.93 | 321.01 | QMPH | QGPH - 305.46 - 309.68 | | | | | | | |
| 321.01 | 325.68 | QGPH | | | | | | | | |
| 325.68 | 326.06 | QGPH | | 1861A | 0.78 | 0.01 | 0.01 | 0.12 | 0.04 | .002 |
| 326.06 | 327.54 | QGPH | | 1862 | 1.08 | 0.03 | 0.02 | 0.13 | 0.05 | .002 |
| 327.54 | 328.07 | QGPH | MSSX - 327.54 - 327.64 | 1863 | 0.53 | 0.60 | 0.99 | 1.69 | 0.68 | .020 |
| 328.07 | 329.10 | MSSX | Massive, <5% quartz gangue | 1864 | 1.03 | 1.35 | 4.89 | 7.04 | 2.68 | .031 |
| 329.10 | 330.02 | SMSX | 30% pyrite, 10% chalcopyrite | 1865 | 0.98 | 3.68 | 0.18 | 0.87 | 0.84 | .062 |
| 330.02 | 331.01 | QMPH | 10% PY | 1866 | 0.99 | 0.09 | 0.07 | 0.18 | 0.07 | .010 |
| 331.01 | 332.15 | QMPH | 2-3% PY | 1867 | 1.14 | 0.03 | 0.01 | 0.01 | 0.04 | .002 |
| 332.15 | 333.48 | QMPH | 2-3% PY | 1868A | 1.33 | 0.01 | 0.03 | 0.02 | 0.07 | .004 |
| 333.48 | 335.88 | ? | 10-50%, 3-5mm, orbicular, radiating crystals in carbonate matrix | | | | | | | |
| 335.88 | 341.40 | QMPH | | | | | | | | |
| 341.40 | 342.80 | QMPH | ~1% disseminated sphalerite | 1869A | 1.40 | 0.03 | 0.06 | 0.20 | 0.03 | <.002 |
| 342.80 | 359.93 | QMPH | | | | | | | | |

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# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M90-40 

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 359.43 | 360.88 | QMPH | SMSX band - 359.80 - 360.0 | 1870A | 1.45 | 0.22 | 0.44 | 0.84 | 0.36 | .004 | B |
| 360.88 | 364.33 | QMPH | | | | | | | | | |
| 364.33 | 367.70 | QGPH | | | | | | | | | |
| 367.70 | 369.86 | QMPH | | | | | | | | | |
| 369.86 | 370.87 | QGPH | | | | | | | | | |
| 370.87 | 372.00 | QMPH | | 1871A | 1.17 | 0.02 | 0.04 | 0.07 | 0.03 | .002 | |
| 372.00 | 372.77 | QMPH | 15% pyrite, ~2% chalcopyrite | 1872 | 0.77 | 0.40 | 0.69 | 1.18 | 0.51 | .005 | |
| 372.77 | 373.64 | QMPH | | 1873 | 0.87 | <0.01 | 0.02 | 0.02 | 0.01 | .002 | |
| 373.64 | 374.08 | QMPH | 15% pyrite, ~2% chalcopyrite | 1874 | 0.44 | 0.63 | 0.59 | 1.04 | 0.68 | .008 | |
| 374.08 | 375.11 | QMPH | | 1875 | 1.03 | 0.11 | 0.03 | 0.06 | 0.10 | .002 | |
| 375.11 | 375.66 | MSSX | 10% quartz gangue | 1876 | 0.55 | 3.49 | 3.05 | 6.00 | 2.44 | .015 | T |
| 375.66 | 376.56 | QGPH | MSSX - 375.84 - .89, 376.30 - .44 376.45 - .50 | 1877 | 0.90 | 0.70 | 1.05 | 1.96 | 0.90 | .006 | I |
| 376.56 | 377.98 | QGPH | 2-3% pyrite | 1878 | 1.47 | 0.04 | 0.08 | 0.21 | 0.05 | .004 | |
| 377.98 | 378.73 | QMPH | 15% pyrite, 3% chalcopyrite | 1879 | 0.75 | 0.52 | 0.63 | 1.30 | 0.62 | .005 | |
| 378.73 | 380.35 | QGPH | | 1880 | 1.62 | 0.14 | 0.29 | 0.44 | 0.14 | .002 | |
| 380.35 | 381.20 | QMPH | 15% pyrite | 1881 | 0.85 | 0.38 | 0.60 | 1.05 | 0.45 | .004 | |
| 381.20 | 382.88 | QGPH | | 1882A | 1.68 | 0.04 | 0.07 | 0.13 | 0.05 | .004 | |
| 382.88 | 396.70 | QMPH | | | | | | | | | |
| 396.70 | 412.40 | QGPH | Faults - 399.29 - 400.51<br>402.64 - 409.47 | | | | | | | | |
| 412.40 | 417.33 | QMPH | carbonate alteration | | | | | | | | |
| 417.33 | 425.51 | QGPH | | | | | | | | | |
| 425.51 | 429.67 | QMPH | | | | | | | | | |
| 429.67 | 440.90 | QZIT | | | | | | | | | |
| 440.90 | 445.31 | QGPH | Highly broken | | | | | | | | |
| | | EOH | | | | | | | | | |
| 327.54 | 330.02 | D HORIZON | | | 2.48 | 2.13 | 2.27 | 3.61 | 1.57 | .041 | |
| | | | | | | 8.01% | Cu+Pb | +Zn | | | |
| 375.11 | 376.56 | A HORIZON | | | 1.45 | 1.80 | 1.84 | 3.55 | 1.51 | .010 | |
| | | | | | | 7.19% | Cu+Pb | +Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 90-41 — 

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| COORDINATES * | 99, 630 N 100, 206 E | DEPTH | COLLAR | 82m | 182m | 285m | 378m | 473m | 524m |
| ELEVATION * | 1327 (m) DATE STARTED 06/30/90 | DIP | -70° | -64° | -62° | -54° | -50° | -47° | -47° |
| CORE SIZE | HQ/NQ DATE COMPLETED 07/12/90 | AZIMUTH | 357° | 351° | 356° | 351° | 348° | 347° | (020°?) |
| FINAL DEPTH | 523.95 * Approximate | | | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1.83 | CASING | overburden | | | | | | | |
| 1.83 | 18.83 | QZIT | Reduced to NQ - 9.45m | | | | | | | |
| 18.83 | 22.65 | QGPH | | | | | | | | |
| 22.65 | 44.50 | QZIT | QMPH - 32.65 - 34.30m | | | | | | | |
| 44.50 | 49.23 | QGPH | Highly broken | | | | | | | |
| 49.23 | 58.08 | QMPH | | | | | | | | |
| 58.08 | 62.53 | QZIT | | | | | | | | |
| 62.53 | 73.95 | QMPH | | | | | | | | |
| 73.95 | 103.19 | QZIT | QGPH - 77.31 - 79.25<br>QMPH - 85.07 - 88.10, 94.00 - 95.50 | | | | | | | |
| 103.19 | 113.07 | QMPH | carbonate altered | | | | | | | |
| 113.07 | 117.15 | QZIT | | | | | | | | |
| 117.15 | 133.60 | QMPH | QZIT - 120.09 - 121.09 | | | | | | | |
| 133.60 | 146.60 | QZIT | | | | | | | | |
| 146.60 | 149.05 | QGPH | | | | | | | | |
| 149.05 | 151.18 | FAULT | shattered QZIT | | | | | | | |
| 151.18 | 167.67 | QZIT | | | | | | | | |
| 167.67 | 195.98 | QMPH | | | | | | | | |
| 195.98 | 225.75 | QGPH | scattered CARB. bands (0.5-1m)<br>QMPH - 206.43 - 210.60 | | | | | | | |
| 225.75 | 233.30 | QMPH | | | | | | | | |
| 233.30 | 279.60 | QGPH | several elm QMPH bands<br>highly broken - 238.0 - 245.0 | | | | | | | |
| 279.60 | 294.44 | QMPH | | | | | | | | |
| 294.44 | 330.47 | QGPH | QMPH - 312.15 - 313.9, 322.22 - 324.87, 325.6 - 327.13 | | | | | | | |
| 330.47 | 340.23 | QMPH | carbonate altered | | | | | | | |
| 340.23 | 366.72 | QGPH | QMPH - 345.35 - 347.25, 359.07 - 361.49 | | | | | | | |
| 366.72 | 370.04 | QMPH | | | | | | | | |
| 370.04 | 379.51 | QGPH | | | | | | | | |
| 379.51 | 380.36 | QMPH | | | | | | | | |
| 380.36 | 385.30 | QGPH | | | | | | | | |
| 385.30 | 401.12 | QMPH | | | | | | | | |
| 401.12 | 404.16 | QMPH | | 1883A | 3.04 | <.01 | 0.01 | 0.01 | <0.01 | <.002 |
| 404.16 | 405.60 | QMPH | 1% disseminated Pyrite | 1884 | 1.44 | 0.07 | 0.08 | 0.15 | 0.07 | <.002 |
| 405.60 | 407.21 | QMPH | QGPH - 405.6 - 405.7 orbicular unit - 406.1 - 406.27 10% pyrite, 2% chalcopyrite | 1885A | 1.61 | 0.13 | 0.09 | 0.18 | 0.09 | <.002 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M90-41 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 407.21 | 408.72 | QMPH | 5% pyrite, 2% chalcopyrite CARB last .3m with galena and sphalerite |
| 408.72 | 409.60 | QMPH | |
| 409.60 | 410.26 | QMPH | MSSX - 409.73 - 409.76 |
| 410.26 | 413.30 | QMPH | |
| 413.30 | 416.35 | QMPH | ~1% chalcopyrite in scattered quartz veins |
| 416.35 | 420.86 | QMPH | |
| 420.86 | 423.60 | QMPH | 2% disseminated Pyrite |
| 423.60 | 425.00 | QMPH | ~1% chalcopyrite in quartz veins 1cm sphalerite and chalco at 425.0 |
| 425.00 | 427.64 | QMPH | |
| 427.64 | 438.30 | QMPH | |
| 438.30 | 475.73 | QMPH | Grey carbonate unit - 438.3 - 447.00 QFPH - 447.0 - 447.90 |
| 475.43 | 493.77 | QFPH | QMPH - 476.6 - 477.8, 488.0 - 489.43 Highly broken - 482.93 - 484.33 486.78 - 488.0 |
| 493.77 | 499.82 | FAULT | shattered QFPH and QMPH |
| 499.82 | 511.68 | QFPH | |
| 511.68 | 518.90 | QZIT | |
| 518.90 | 523.95 | QFPH | Abundant grey carbonate |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|
| 1886A | 1.51 | 0.35 | 0.30 | 0.61 | 0.15 | .004 |
| 1887 | 0.88 | 0.02 | 0.08 | 0.11 | 0.04 | .006 |
| 1888 | 0.66 | 0.13 | 0.22 | 0.43 | 0.19 | .006 |
| 1889 | 2.87 | 0.02 | 0.02 | 0.05 | 0.01 | <.002 |
| 1890A | 3.05 | 0.07 | 0.05 | 0.12 | 0.03 | .002 |
| | | | | | | |
| 1891A | 2.74 | 0.01 | 0.02 | 0.05 | 0.03 | .002 |
| 1892 | 1.40 | 0.02 | 0.02 | 0.05 | 0.03 | <.002 |
| 1893A | 2.64 | 0.13 | 0.07 | 0.22 | 0.07 | <.002 |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 90-92 — **Page 1 of 2**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| COORDINATES * | 99,660 N | 100,376 E | DEPTH | COLLAR | 96m | 200m | 268m | 377m | 447m | 497m |
| ELEVATION * | 1283 (m) | DATE STARTED 07/12/90 | DIP | -70° | -67° | -63° | -60° | -56° | -55° | -53° |
| CORE SIZE | HQ/NQ | DATE COMPLETED 07/24/90 | AZIMUTH | 008° | 003° | 350° | 350° | 347° | 347° | 348° |

**FINAL DEPTH** 497.43 m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1.83 | CASING | Over burden | | | | | | | |
| 1.83 | 15.55 | QZIT | | | | | | | | |
| 15.55 | 20.60 | QMPH | | | | | | | | |
| 20.60 | 47.55 | QZIT | QGPH - 29.60 - 31.36 | | | | | | | |
| 47.55 | 69.60 | FAULT | shattered QZIT | | | | | | | |
| 69.60 | 114.60 | QZIT | | | | | | | | |
| 114.60 | 126.80 | CHLORITE PHYLLITE | altered greenstone/gabbro? | | | | | | | |
| 126.80 | 129.00 | QMPH | sheared from 127.70 | | | | | | | |
| 129.00 | 132.89 | QZIT | | | | | | | | |
| 132.89 | 157.56 | QMPH | | | | | | | | |
| 157.56 | 160.28 | QGPH | CARB - 158.60 - 159.66 | | | | | | | |
| 160.28 | 166.00 | QMPH | | | | | | | | |
| 166.00 | 221.45 | QGPH | | | | | | | | |
| 221.45 | 224.90 | FAULT | shattered QGPH | | | | | | | |
| 224.90 | 227.46 | QGPH | Fault - 245.10 - 249.02 | | | | | | | |
| 227.46 | 326.94 | QMPH | QGPH - 281.37 - 283.60 | | | | | | | |
| 326.94 | 333.43 | QGPH | | | | | | | | |
| 333.43 | 348.25 | QMPH | QGPH - 338.35 - 339.75<br>LIMS - 340.53 - .68, 342.35 - .50 | | | | | | | |
| 348.25 | 374.64 | QGPH | | | | | | | | |
| 374.64 | 395.74 | QMPH | QGPH - 393.67 - 394.74 | | | | | | | |
| 395.74 | 396.30 | QGPH | | 1894A | 0.85 | 0.01 | 0.03 | 0.09 | 0.02 | <.002 |
| 396.30 | 397.00 | QGPH | | 1895 | 0.70 | 0.01 | 0.01 | 0.09 | 0.02 | <.002 |
| 397.00 | 397.85 | QMPH | sulphide band - 397.21 - 397.25 | 1896 | 0.85 | 0.05 | 0.40 | 0.74 | 0.23 | .006 |
| 397.85 | 398.27 | QMPH | 20% sulphide | 1897 | 0.42 | 0.71 | 0.65 | 1.20 | 0.77 | .010 |
| 398.27 | 398.75 | MSSX | 90% sulphide | 1898 | 0.48 | 2.60 | 2.20 | 4.46 | 2.25 | .045 |
| 398.75 | 399.52 | QMPH | 5% sulphide | 1899 | 0.77 | 0.10 | 0.27 | 0.50 | 0.24 | .004 |
| 399.52 | 400.30 | QMPH | | 1900 | 0.82 | 0.03 | 0.09 | 0.13 | 0.04 | .004 |
| 400.30 | 401.73 | QMPH/CARB | orbicular textured carbonate | 1901A | 1.43 | 0.03 | 0.12 | 0.18 | 0.04 | .004 |
| 401.73 | 407.40 | QMPH | | | | | | | | |
| 407.40 | 408.80 | QMPH | 2% chalcopyrite and sphalerite? | 1902A | 1.40 | 0.09 | 0.13 | 0.08 | 0.12 | <.002 |
| 408.80 | 420.78 | QMPH | | | | | | | | |
| 420.78 | 424.60 | QGPH | | | | | | | | |

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# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M90-42 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 424.60 | 450.62 | QMPH | | | | | | | | | |
| 450.62 | 452.45 | QMPH | | 1903A | 1.83 | <0.01 | 0.01 | 0.01 | <0.01 | <.002 | |
| 452.45 | 453.39 | QFPH | | 1904 | 0.94 | 0.01 | 0.01 | 0.09 | <0.01 | <.002 | |
| 453.39 | 454.26 | SMSX | MSSX - 453.39 - 453.47<br>453.99 - 454.20 | 1905 | 0.87 | 0.69 | 1.18 | 2.26 | 0.91 | .008 | T |
| 454.26 | 454.86 | QMPH | Barren | 1906 | 0.60 | 0.07 | 0.15 | 0.24 | 0.07 | .002 | A |
| 454.86 | 455.50 | QMPH | MSSX - 454.86-.91, 455.05-.07<br>455.44 - 455.47 | 1907 | 0.64 | 0.62 | 0.84 | 1.48 | 0.76 | .010 | L |
| 455.50 | 456.88 | QMPH | Barren | 1908 | 1.38 | 0.06 | 0.10 | 0.17 | 0.06 | .002 | |
| 456.88 | 458.07 | QMPH | Barren | 1909A | 1.19 | 0.04 | 0.08 | 0.14 | 0.05 | .002 | |
| 458.07 | 462.75 | QMPH | | | | | | | | | |
| 462.75 | 465.96 | QGPH | | | | | | | | | |
| 465.96 | 469.75 | QMPH | | | | | | | | | |
| 469.75 | 473.35 | QGPH | | | | | | | | | |
| 473.35 | 480.70 | QMPH | Fault - 473.35-477.32<br>QZIT - 477.32-477.45 | | | | | | | | |
| 480.70 | 484.40 | QGPH | Interbedded with QZIT | | | | | | | | |
| 484.40 | 486.65 | QZIT | | | | | | | | | |
| 486.65 | 491.83 | QMPH | | | | | | | | | |
| 491.83 | 497.43 | QZIT | | | | | | | | | |
| | | EOH | | | | | | | | | |
| 397.85 | 398.75 | D HORIZON | | | 0.90 | 1.72 | 1.48 | 2.95 | 1.56 | .029 | |
| | | | | | | 6.14% | Cu+Pb | +Zn | | | |
| 453.39 | 455.50 | A HORIZON | | | 2.11 | 0.49 | 0.78 | 1.45 | 0.63 | .007 | |
| | | | | | | 2.72% | Cu+Pb | +Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M90-43 — **Page 1 of 2**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| COORDINATES * | 99,690 N | 99,826 E | DEPTH | COLLAR | 149m | 221m | 325m | 446m | 529m |
| ELEVATION * | 1485 (m) | DATE STARTED 07/25/90 | DIP | -70° | -66° | -64° | -62° | -59° | -56° |
| CORE SIZE | NQ | DATE COMPLETED 08/05/90 | AZIMUTH | 001° | 350° | 348° | 351° | 353° | 349° |
| FINAL DEPTH | 582.78m | * Approximate | | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 4.88 | CASING | Overburden | | | | | | | |
| 4.88 | 15.26 | QZIT | QMPH - 10.86 - 12.61 | | | | | | | |
| 15.26 | 31.78 | QMPH | Fault - 21.72 - 26.82 | | | | | | | |
| 31.78 | 43.07 | QGPH | QMPH - 32.85 - 33.96 | | | | | | | |
| 43.07 | 50.70 | QZIT | QMPH - 45.92 - 47.00 | | | | | | | |
| 50.70 | 55.17 | QGPH | Highly broken | | | | | | | |
| 55.17 | 61.70 | QMPH | carbonate altered | | | | | | | |
| 61.70 | 156.40 | QZIT | QMPH - 64.0 - 66.40, 67.67 - 71.80 | | | | | | | |
| 156.40 | 168.20 | QGPH | Fault - 165.65 - 167.03 | | | | | | | |
| 168.20 | 186.30 | QZIT | Broken from - 173.74 - 183.79 | | | | | | | |
| 186.30 | 201.00 | QMPH | Highly broken first 0.3 m | | | | | | | |
| 201.00 | 227.07 | QGPH | Broken to 207.26 QMPH - 207.26 - 208.92, 218.58 - 219.25 | | | | | | | |
| 227.07 | 231.60 | QMPH | carbonate altered | | | | | | | |
| 231.60 | 239.89 | QGPH | | | | | | | | |
| 239.89 | 246.00 | QMPH | | | | | | | | |
| 246.00 | 295.16 | QGPH | QMPH - 281.15 - 282.22, 286.85 - 288.00 | | | | | | | |
| 295.16 | 300.10 | QMPH | QGPH - 296.5 - 298.5 | | | | | | | |
| 300.10 | 303.10 | QGPH | | | | | | | | |
| 303.10 | 309.90 | QMPH | QGPH - 306.37 - 307.30 | | | | | | | |
| 309.90 | 316.15 | QGPH | | | | | | | | |
| 316.15 | 323.20 | QMPH | Fault - 317.6 - 321.75 | | | | | | | |
| 323.20 | 351.60 | QGPH | QMPH - 325.8 - 326.5, 330.5 - 332.23 | | | | | | | |
| 351.60 | 360.30 | QMPH | QGPH - 357.20 - 358.70 | | | | | | | |
| 360.30 | 370.10 | QGPH | QMPH - 362.75 - 365.6, 366.70 - 367.40 | | | | | | | |
| 370.10 | 387.90 | QMPH | | | | | | | | |
| 387.90 | 388.90 | QMPH | Barren | 1910A | 1.0 | 0.01 | 0.02 | 0.05 | 0.03 | .002 |
| 388.90 | 389.80 | QMPH | Barren | 1911 | 0.90 | <0.01 | 0.01 | 0.01 | 0.01 | .002 |
| 389.80 | 390.30 | QMPH/SMSX | MSSX - 389.90 - 389.96 15% sulphide overall | 1912 | 0.50 | 0.92 | 0.99 | 1.96 | 1.00 | .017 |
| 390.30 | 391.00 | QMPH | Barren | 1913 | 0.70 | 0.11 | 0.06 | 0.12 | 0.05 | .004 |
| 391.00 | 391.70 | SMSX | MSSX - 391.0 - .08, 391.48 - .50, 391.57 - .70 in QMPH, 30% sulphide overall | 1914 | 0.70 | 1.56 | 1.37 | 2.76 | 1.21 | .012 |
| 391.70 | 392.75 | QMPH | Sulphide band - 392.70 - .75 | 1915 | 1.05 | 0.07 | 0.08 | 0.17 | 0.10 | .004 |
| 392.75 | 393.80 | QMPH | Barren | 1916A | 1.05 | 0.02 | 0.04 | 0.09 | 0.03 | .002 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 90-43 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 393.80 | 414.53 | QMPH | | | | | | | | | |
| 414.53 | 416.61 | QMPH | ~1% disseminated sphalerite and chalcopyrite | 1917A | 2.08 | 0.02 | 0.05 | 0.14 | 0.02 | .002 | |
| 416.61 | 437.89 | QMPH | conspicuous, 1-3mm, blue quartz eyes | | | | | | | | |
| 437.89 | 438.89 | QMPH | ~1% sphalerite and chalcopyrite | 1918A | 1.00 | 0.03 | 0.05 | 0.08 | 0.05 | <.002 | |
| 438.84 | 439.96 | QMPH | Barren | 1919 | 1.12 | <0.01 | 0.01 | 0.02 | <0.01 | <.002 | |
| 439.96 | 440.96 | QMPH | 5-10% sulphide | 1920 | 1.00 | <0.01 | 0.01 | 0.01 | <0.01 | <.002 | |
| 440.96 | 441.96 | QMPH | ditto | 1921 | 1.00 | <0.01 | 0.01 | 0.01 | 0.01 | <.002 | |
| 441.96 | 442.96 | QMPH | ditto | 1922A | 1.00 | <0.01 | <0.01 | 0.01 | 0.02 | <.002 | |
| 442.96 | 447.40 | QMPH | graphitic | | | | | | | | |
| 447.40 | 459.80 | QMPH | Blue quartz eyes | | | | | | | | |
| 459.80 | 482.19 | QMPH | 10 15 %, 1-2mm, blue quartz eyes 10%, 5-15mm, black, cherty limestone frags | | | | | | | | |
| 482.19 | 511.15 | QMPH | | | | | | | | | |
| 511.15 | 515.05 | QGPH | Transitional to QMPH | | | | | | | | |
| 515.05 | 516.05 | QGPH | Barren | 1923 | 1.00 | 0.03 | 0.03 | 0.13 | 0.04 | .008 | |
| 516.05 | 516.50 | MSSX | 90% sulphide QGPH - 516.10 - 516.20 | 1924 | 0.45 | 2.31 | 4.29 | 6.55 | 3.34 | .040 | T |
| 516.50 | 517.00 | QGPH | Barren, crushed last 10cm | 1925 | 0.50 | 0.09 | 0.08 | 0.17 | 0.12 | .006 | B |
| 517.00 | 517.80 | MSSX | 80% sulphide QGPH with sulphide bands from 517.55m | 1926 | 0.80 | 1.76 | 3.80 | 6.52 | 2.56 | .045 | ⊥ |
| 517.80 | 519.05 | QMPH | Barren | 1927A | 1.25 | 0.02 | 0.05 | 0.16 | 0.02 | <.002 | |
| 519.05 | 540.95 | QMPH | Highly broken - 538.0 - 540.95 | | | | | | | | |
| 540.95 | 541.95 | QMPH | SMSX to 541.25 | 1928A | 1.00 | 0.47 | 0.68 | 1.40 | 0.50 | .004 | |
| 541.95 | 542.95 | QMPH | | 1929 | 1.00 | 0.02 | 0.02 | 0.02 | 0.02 | .002 | |
| 542.95 | 543.95 | QMPH | | 1930 | 1.00 | 0.05 | 0.07 | 0.10 | 0.05 | <.002 | |
| 543.95 | 544.45 | MSSX | 95% sulphide, broken | 1931 | 0.50 | 2.19 | 2.62 | 5.32 | 1.79 | .016 | A? |
| 544.45 | 545.45 | QGPH | Moderately broken | 1932A | 1.00 | 0.16 | 0.08 | 0.22 | 0.05 | <.002 | |
| 545.45 | 562.66 | QGPH | | | | | | | | | |
| 562.66 | 569.20 | QMPH | Highly broken to 565.00 QGPH - 564.79 - 566.45 | | | | | | | | |
| 569.20 | 572.65 | QGPH | | | | | | | | | |
| 572.65 | 578.00 | QMPH | | | | | | | | | |
| 578.00 | 582.78 | QGPH | QMPH - 579.50 - 580.40 | | | | | | | | |
| | | EOH | | | | | | | | | |
| 389.80 | 391.70 | D HORIZON | | | 1.90 | 0.86 | 0.79 | 1.58 | 0.73 | .010 | |
| | | | | | | 3.23% Cu+Pb+Zn | | | | | |
| 516.05 | 517.80 | B HORIZON | | | 1.75 | 1.42 | 2.86 | 4.71 | 2.06 | .033 | |
| | | | | | | 8.99% Cu+Pb+Zn | | | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 90-44 Page 1 of 2

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES * | 99,865 N | 99,735 E | DEPTH | COLLAR | 115m | 209m | 320m |
| ELEVATION* | 1428 (m) | DATE STARTED 08/05/90 | DIP | -65° | -63° | -60° | -57° |
| CORE SIZE | NQ | DATE COMPLETED 08/11/90 | AZIMUTH | 359° | 007° | 002° | 002° |
| FINAL DEPTH | 378.56m | * Approximate | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 3.05 | CASING | Overburden | | | | | | | |
| 3.05 | 76.85 | QGPH | occasional 0.5m QMPH bands | | | | | | | |
| 76.85 | 79.25 | QMPH | carbonate altered | | | | | | | |
| 79.25 | 89.25 | QGPH | QMPH bands | | | | | | | |
| 89.25 | 104.85 | QMPH | carbonate altered | | | | | | | |
| 104.85 | 121.00 | QGPH | | | | | | | | |
| 121.00 | 127.50 | QMPH | QGPH - 124.2 - 125.2 | | | | | | | |
| 127.50 | 145.30 | QGPH | QMPH - 133.5 - 134.6<br>139.75 - 140.60 | | | | | | | |
| 145.30 | 150.10 | QMPH | carbonate altered | | | | | | | |
| 150.10 | 157.05 | QGPH | | | | | | | | |
| 157.05 | 161.95 | QMPH | | | | | | | | |
| 161.95 | 164.50 | QGPH | | | | | | | | |
| 164.50 | 169.95 | QMPH | carbonate altered | | | | | | | |
| 169.95 | 175.30 | QGPH | | | | | | | | |
| 175.30 | 177.55 | QMPH | carbonate altered | | | | | | | |
| 177.55 | 188.50 | QGPH | several 0.3 m QMPH bands | | | | | | | |
| 188.50 | 201.70 | QMPH | | | | | | | | |
| 201.70 | 202.70 | QMPH | Barren | 1933A | 1.00 | <0.01 | <0.01 | <0.01 | <0.01 | .002 |
| 202.70 | 203.70 | QMPH | 5% sulphide, 1-2cm pyrite bands | 1934 | 1.00 | 0.18 | 0.32 | 0.65 | 0.22 | .008 |
| 203.70 | 205.70 | QMPH | 1% pyrite | 1935 | 2.00 | 0.05 | 0.08 | 0.13 | 0.07 | .010 |
| 205.70 | 207.70 | QMPH | 1% sphalerite | 1936 | 2.00 | 0.01 | 0.09 | 0.07 | 0.05 | .002 |
| 207.70 | 209.70 | QMPH | ditto | 1937 | 2.00 | 0.02 | 0.05 | 0.04 | 0.07 | .002 |
| 209.70 | 211.70 | QMPH | ditto | 1938A | 2.00 | 0.01 | 0.15 | 0.24 | 0.14 | <.002 |
| 211.70 | 232.45 | QMPH | | | | | | | | |
| 232.45 | 234.10 | QMPH | 1% pyrite | 1939A | 1.65 | <0.01 | <0.01 | 0.25 | <0.01 | <.002 |
| 234.10 | 234.60 | MSSX | 60% sulphide | 1940 | 0.50 | 0.73 | 4.48 | 6.58 | 5.72 | .218 |
| 234.60 | 235.47 | QGPH | QMPH - 235.0 - 235.47<br>5% pyrite stringers | 1941 | 0.87 | 0.05 | 0.19 | 0.32 | 0.22 | .014 |
| 235.47 | 236.07 | SMSX | 25% sulphide in QGPH | 1942 | 0.60 | 0.28 | 1.86 | 2.48 | 2.22 | .020 |
| 236.07 | 237.07 | QGPH | 3% pyrite | 1943 | 1.00 | 0.07 | 0.23 | 0.32 | 0.22 | .010 |
| 237.07 | 238.07 | QMPH | carbonate altered | 1944A | 1.00 | 0.02 | 0.11 | 0.16 | 0.12 | .002 |
| 238.07 | 244.60 | QMPH | | | | | | | | |
| 244.60 | 245.10 | QGPH | 10% pyrite | 1945A | 0.50 | <0.01 | <0.01 | <0.01 | <0.01 | <.002 |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M90-44 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 245.10 | 246.10 | QMPH | 2% pyrite | 1946A | 1.00 | <0.01 | <0.01 | <0.01 | <0.01 | <.002 |
| 246.10 | 248.10 | QMPH | 15% pyrite, ± chalcopyrite | 1947 | 2.00 | <0.01 | <0.01 | <0.01 | <0.01 | <.002 |
| 248.10 | 250.10 | QMPH | 5% pyrite | 1948A | 2.00 | <0.01 | <0.01 | <0.01 | 0.01 | <.002 |
| 250.10 | 261.60 | QMPH | | | | | | | | |
| 261.60 | 262.60 | QMPH | Blue quartz eyes | 1949A | 1.00 | <0.01 | 0.01 | <0.01 | 0.01 | <.002 |
| 262.60 | 263.60 | QMPH | 5% pyrite, ± chalcopyrite | 1950 | 1.00 | <0.01 | 0.02 | <0.01 | 0.01 | <.002 |
| 263.60 | 264.60 | QMPH | 10% pyrite | 1951 | 1.00 | <0.01 | 0.01 | <0.01 | <0.01 | <.002 |
| 264.60 | 265.60 | QMPH | 5-10%, blue quartz eyes | 1952A | 1.00 | <0.01 | 0.01 | 0.01 | <0.01 | <.002 |
| 265.60 | 307.24 | QMPH | ditto | | | | | | | |
| 307.24 | 311.00 | QGPH | | | | | | | | |
| 311.00 | 312.00 | QGPH | Barren | 1953A | 1.00 | <0.01 | 0.01 | 0.07 | 0.04 | <.002 |
| 312.00 | 312.80 | QGPH | MSSX - 312.7 - 312.8 | 1954 | 0.80 | 0.11 | 1.01 | 1.34 | 0.60 | .027 |
| 312.80 | 313.65 | QGPH | 3% pyrite | 1955 | 0.85 | 0.01 | 0.01 | 0.12 | 0.03 | .004 |
| 313.65 | 314.15 | MSSX | Quartz vein to 313.95 | 1956 | 0.50 | 0.77 | 1.84 | 2.96 | 1.14 | .012 |
| 314.15 | 315.15 | QMPH | QGPH bands, 3% pyrite | 1957 | 1.00 | 0.12 | 0.20 | 0.37 | 0.19 | .004 |
| 315.15 | 316.15 | QMPH | QGPH bands | 1958A | 1.00 | 0.37 | 0.47 | 0.89 | 0.44 | .006 |
| 316.15 | 324.75 | QMPH | | | | | | | | |
| 324.75 | 325.75 | QMPH | Barren | 1959A | 1.00 | <0.01 | 0.01 | 0.01 | 0.01 | <.002 |
| 325.75 | 326.75 | QMPH | Graphite bands 5% pyrite | 1960 | 1.00 | 0.28 | 0.36 | 0.69 | 0.38 | .002 |
| 326.75 | 327.75 | QMPH | Sulphide band - 327.6 - 327.75 | 1961 | 1.00 | 0.15 | 0.25 | 0.40 | 0.16 | .006 |
| 327.75 | 328.75 | QMPH | 3% pyrite | 1962 | 1.00 | 0.04 | 0.13 | 0.19 | 0.06 | .004 |
| 328.75 | 329.75 | QMPH | ditto | 1963 | 0.75 | 0.33 | 0.56 | 0.98 | 0.34 | .008 |
| 329.75 | 330.50 | MSSX | 80% sulphide | 1964 | 1.00 | 1.61 | 2.96 | 5.45 | 1.75 | .031 |
| 330.50 | 331.50 | MSSX | 60% sulphide | 1965 | 1.00 | 1.09 | 1.34 | 2.51 | 0.89 | .018 |
| 331.50 | 332.84 | MSSX | 85% sulphide | 1966 | 1.34 | 2.00 | 3.08 | 6.16 | 1.90 | .028 |
| 332.84 | 333.84 | QGPH | 3% pyrite | 1967 | 1.00 | 0.08 | 0.09 | 0.21 | 0.06 | <.002 |
| 333.84 | 334.84 | QGPH | 3% pyrite | 1968A | 1.00 | 0.03 | 0.08 | 0.18 | 0.08 | .002 |
| 334.84 | 363.80 | QGPH | Fault - 345.10 - 346.86 | | | | | | | |
| 363.80 | 366.37 | FAULT | Highly broken QGPH | | | | | | | |
| 366.37 | 378.56 | QZIT | | | | | | | | |
| | | EOH | | | | | | | | |
| 234.10 | 236.07 | C HORIZON | | | 1.97 | 0.29 | 1.79 | 2.57 | 2.23 | .068 |
| | | | | | | 4.65% | Cu+Pb | +Zn | | |
| 312.00 | 314.15 | B HORIZON | | | 2.15 | 0.22 | 0.81 | 1.23 | 0.50 | .014 |
| | | | | | | 2.26% | Cu+Pb | +Zn | | |
| 329.50 | 332.84 | A HORIZON | | | 3.34 | 1.61 | 2.52 | 4.85 | 1.55 | .026 |
| | | | | | | 8.98% | Cu+Pb | +Zn | | |

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# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M90-45 — **Page 1 of 2**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES * | 99,890 N | 99,503 E | DEPTH | COLLAR | 82m | 198m | 314m | 411m |
| ELEVATION * | 1392 (m) | DATE STARTED 08/11/90 | DIP | -55° | -53° | -52° | -51° | -49° |
| CORE SIZE | NQ | DATE COMPLETED 08/23/90 | AZIMUTH | 360° | 001° | 355° | 353° | 346° |

FINAL DEPTH 411.81m

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 42.00 | CASING | Overburden | | | | | | | | |
| 42.00 | 49.38 | QGPH | Fault - 45.72 - 49.38 | | | | | | | | |
| 49.38 | 65.20 | QMPH | Fault - 49.38 - 53.64 | | | | | | | | |
| 65.20 | 109.50 | QGPH | Frequent 0.5-1m QMPH bands | | | | | | | | |
| 109.50 | 111.10 | QMPH | 5% pyrite | 1969A | 1.60 | 0.01 | 0.01 | 0.04 | <0.01 | <.002 | |
| 111.10 | 112.10 | SMSX | 40% sulphide in quartz-carbonate gangue | 1970 | 1.00 | 1.89 | 0.29 | 0.78 | 0.25 | .004 | T |
| 112.10 | 113.00 | Quartz-carbonate vein | | 1971 | 0.90 | 2.17 | 0.06 | 0.16 | 0.10 | .002 | |
| 113.00 | 113.50 | SMSX | 40% sulphide MSSX - 113.05 - 113.30 | 1972 | 0.50 | 2.44 | 0.15 | 0.84 | 0.20 | .004 | |
| 113.50 | 114.00 | QMPH | 20% sulphide | 1973 | 0.50 | 1.85 | 0.04 | 0.28 | 0.12 | .006 | D |
| 114.00 | 114.60 | MSSX | 80% sulphide | 1974 | 0.60 | 2.53 | 1.01 | 4.84 | 0.76 | .006 | |
| 114.60 | 115.60 | QMPH | 20% pyrite | 1975A | 1.00 | 0.54 | 0.85 | 1.38 | 0.73 | .610 | I |
| 115.60 | 116.60 | QMPH | 15% pyrite | 658A | 1.00 | 0.16 | 0.34 | 0.54 | 0.22 | .004 | |
| 116.60 | 117.60 | QMPH | 20% pyrite | 659 | 1.00 | 0.62 | 0.37 | 0.86 | 0.35 | .004 | |
| 117.60 | 118.90 | QMPH | 20% pyrite | 660 | 1.30 | 0.10 | 0.33 | 0.65 | 0.22 | .002 | |
| 118.90 | 119.90 | QMPH | Barren | 661A | 1.00 | 0.05 | 0.04 | 0.11 | 0.04 | .002 | |
| 119.90 | 145.65 | QMPH | QGPH - 123.0 - 125.3 Abundant quartz veins | | | | | | | | |
| 145.65 | 146.65 | QMPH | ~1% chalcopyrite and sphalerite | 662A | 1.00 | 0.15 | 0.15 | 0.26 | 0.13 | .002 | |
| 146.65 | 169.00 | QMPH | scattered, 1-3mm, blue quartz eyes | | | | | | | | |
| 169.00 | 203.15 | QMPH | Quartz-chlorite-carbonate vein - 174.3 - 176.85 | | | | | | | | |
| 203.15 | 204.80 | QGPH | | | | | | | | | |
| 204.80 | 212.80 | QMPH | | | | | | | | | |
| 212.80 | 215.85 | QGPH | | | | | | | | | |
| 215.85 | 222.90 | QMPH | | | | | | | | | |
| 222.90 | 235.10 | QGPH | several 1m quartz-carbonate veins | | | | | | | | |
| 235.10 | 237.60 | QMPH | | | | | | | | | |
| 237.60 | 243.20 | Quartz-carbonate vein | LIMS - 239.3 - 241.0, 242.55 - 242.80 calcareous chert | | | | | | | | |
| 243.20 | 259.65 | QMPH | Quartz-carbonate vein - 244.70 - 246.35 LIMS - 246.35 - 246.89 | | | | | | | | |
| 259.65 | 299.30 | QGPH | CARB - 263.5 - 265.85 QMPH - 274.0 - 276.10 | | | | | | | | |
| 299.30 | 300.55 | QMPH | carbonate altered to 300.0 | | | | | | | | |
| 300.55 | 301.55 | QMPH | 1% PY | 663A | 1.00 | 0.01 | 0.66 | 0.10 | 0.04 | <.002 | |
| 301.55 | 302.55 | SMSX | MSSX - 302.15 - 302.55, in QMPH | 664A | 1.00 | 1.01 | 3.55 | 6.18 | 1.55 | .010 | T |
| 302.55 | 303.85 | QMPH | 10% PY | 665A | 1.30 | 0.41 | 1.05 | 2.46 | 0.79 | .006 | A |

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M 90-45 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 303.85 | 304.50 | MSSX | 90% sulphide |
| 304.50 | 305.50 | QMPH | MSSX - 309.58 - .60, 304.62 - .63 |
| 305.50 | 306.80 | QMPH | MSSX - 306.02 - .05, 306.62 - .65 |
| 306.80 | 308.80 | QMPH | carbonate altered, barren |
| 308.80 | 309.68 | MSSX | MSSX - 308.8 - 309.0, 309.2 - .25 309.4 - .55, QMPH gangue |
| 309.68 | 310.68 | QMPH | Barren |
| 310.68 | 315.65 | QMPH | carbonate altered from 313.00 |
| 315.65 | 319.80 | QFPH | |
| 319.80 | 336.25 | QMPH | carbonate altered |
| 336.25 | 347.50 | Chlorite Phyllite | |
| 347.50 | 354.90 | QMPH | |
| 354.90 | 360.15 | QFPH | |
| 360.15 | 367.60 | QMPH | carbonate altered first half |
| 367.60 | 394.20 | QFPH | QMPH - 384.75 - 390.65 |
| 394.20 | 396.25 | FAULT | shattered QFPH |
| 396.25 | 402.50 | QZIT | interbedded with QFPH |
| 402.50 | 411.18 | QZIT | |
| | | EOH | |
| 111.10 | 115.60 | D HORIZON | |
| 301.55 | 309.68 | A HORIZON | |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|
| 666A | 0.65 | 0.94 | 5.55 | 10.50 | 2.71 | .020 | |
| 667 | 1.00 | 0.35 | 0.38 | 0.75 | 0.25 | .004 | |
| 668 | 1.30 | 0.12 | 0.72 | 1.43 | 0.29 | .002 | A |
| 669 | 2.00 | 0.17 | 0.03 | 0.05 | 0.03 | <.002 | |
| 670 | 0.88 | 0.19 | 2.69 | 6.14 | 1.90 | .026 | 1 |
| 671A | 1.60 | 0.03 | 0.04 | 0.13 | 0.03 | .002 | |
| | 4.50 | 1.79 | 0.42 | 1.19 | 0.37 | .005 | |
| | | 3.40% Cu+Pb + Zn | | | | | |
| | 8.13 | 0.34 | 1.48 | 2.95 | 0.82 | .007 | |
| | | 4.77% Cu+Pb + Zn | | | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — HOLE No. M90-46 — Page 1 of 2

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| COORDINATES * | 99,790 N | 99,310 E | DEPTH | COLLAR | 101m | 191m | 311m | 424m |
| ELEVATION * 1430 (m) | DATE STARTED 08/23/90 | | DIP | -60° | -56° | -55° | -53° | -50° |
| CORE SIZE NQ | DATE COMPLETED 08/30/90 | | AZIMUTH | 360° | 348° | 351° | 348° | 349° |
| FINAL DEPTH 431.29m | * Unsurveyed | | | | | | | |

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 23.16 | CASING | Overburden | | | | | | | |
| 23.16 | 27.75 | QMPH | | | | | | | | |
| 27.75 | 44.55 | QGPH | Quartz vein - 32.0 - 35.35 | | | | | | | |
| 44.55 | 71.85 | QGPH | Abundant carbonate QMPH - 50.5 - 53.1 | | | | | | | |
| 71.85 | 78.30 | QMPH | | | | | | | | |
| 78.30 | 83.25 | QGPH | | | | | | | | |
| 83.25 | 116.55 | QMPH | carbonate altered from - 109.45 | | | | | | | |
| 116.55 | 137.75 | QGPH | CARB - 125.05 - 130.75, 134.85 - 136.1 | | | | | | | |
| 137.75 | 146.70 | QMPH | | | | | | | | |
| 146.70 | 148.00 | QGPH | | | | | | | | |
| 148.00 | 151.18 | FAULT | Shattered QGPH | | | | | | | |
| 151.18 | 151.91 | QGPH | Barren, Broken | 672A | 0.73 | 0.01 | <0.01 | 0.09 | <0.01 | <.002 |
| 151.91 | 152.91 | QGPH | <1% chalcopyrite | 673 | 1.00 | 0.20 | 0.01 | 0.07 | <0.01 | <.002 |
| 152.91 | 153.41 | QMPH | MSSX - 153.0 - 153.1 | 674 | 0.50 | 0.69 | 0.39 | 1.46 | 0.41 | .004 |
| 153.41 | 154.41 | QMPH | Barren | 675 | 1.00 | 0.02 | 0.03 | 0.07 | 0.04 | <.002 |
| 154.41 | 154.91 | QMPH | Barren | 676 | 0.50 | 0.04 | 0.03 | 0.11 | 0.04 | .002 |
| 154.91 | 155.91 | MSSX | 75% sulphide, quartz-carbonate gangue | 677 | 1.00 | 3.05 | 3.13 | 7.18 | 1.95 | .022 |
| 155.91 | 156.51 | MSSX | 85% sulphide | 678 | 0.60 | 2.91 | 2.09 | 7.19 | 2.22 | .022 |
| 156.51 | 157.51 | QMPH | Barren | 679A | 1.00 | 0.40 | 0.04 | 0.17 | 0.06 | .004 |
| 157.51 | 173.40 | QMPH | | | | | | | | |
| 173.40 | 174.40 | QMPH | MSSX - 173.65 - 173.85 | 680A | 1.00 | 0.33 | 0.31 | 0.77 | 0.16 | .002 |
| 174.40 | 175.40 | QGPH | Barren | 681 | 1.00 | 0.01 | 0.01 | 0.06 | <0.01 | <.002 |
| 175.40 | 176.40 | QMPH | | 682 | 1.00 | 0.01 | 0.01 | 0.04 | <0.01 | <.002 |
| 176.40 | 177.40 | QMPH | | 683 | 1.00 | 0.10 | 0.04 | 0.12 | <0.01 | <.002 |
| 177.40 | 178.40 | MSSX | 70% sulphide several 5-10cm QGPH bands | 684 | 1.00 | 3.20 | 2.77 | 7.52 | 1.55 | .016 |
| 178.40 | 179.40 | QMPH | Barren | 685A | 1.00 | 0.06 | 0.07 | 0.35 | 0.03 | .002 |
| 179.40 | 261.00 | QMPH | Fault - 192.7 - 194.5, QGPH - 202.23 - 204.2 | | | | | | | |
| 261.00 | 262.85 | QZIT | | | | | | | | |
| 262.85 | 270.95 | QMPH | carbonate altered 269.75 - 270.95 | | | | | | | |
| 270.95 | 274.80 | QGPH | QMPH - 274.20 - 274.80 | | | | | | | |
| 274.80 | 275.80 | QGPH | several 2cm sulphide bands | 686A | 1.00 | 0.02 | 0.17 | 0.24 | 0.10 | .002 |
| 275.80 | 276.80 | QMPH | QGPH to 276.20 | 687A | 1.00 | <0.01 | 0.01 | 0.03 | 0.01 | <.002 |

TD 1

# MARG DDH SUMMARY (cont.)

**Archer, Cathro & Associates (1981) Limited** HOLE No. M90-46 Page 2 of 2

| Metres From | Metres To | Rock Type | Comments | Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 276.80 | 277.80 | QMPH | MSSX - 277.37 - 277.42 | 688A | 1.00 | 0.06 | 0.83 | 1.05 | 0.42 | .002 | |
| 277.80 | 278 80 | QMPH | Barren | 689A | 1.00 | 0.01 | 0.08 | 0.11 | 0.05 | <.002 | |
| 278.80 | 288.75 | QMPH | | | | | | | | | |
| 288.75 | 289.75 | QMPH | MSSX - 289.17 - 289.20 | 690A | 1.00 | 1.33 | 1.46 | 3.46 | 1.12 | .006 | T |
| 289.75 | 290.75 | QMPH | Barren | 691 | 1.00 | <0.01 | 0.02 | 0.04 | 0.02 | <.002 | C |
| 290.75 | 291.75 | QMPH | SMSX in QGPH - 291.5 - 291.75 | 692 | 1.00 | 0.66 | 0.98 | 2.18 | 0.58 | .004 | 1 |
| 291.75 | 292.75 | QMPH | Barren | 693A | 1.00 | <0.01 | 0.02 | 0.04 | 0.01 | <.002 | |
| 292.75 | 310.05 | QGPH | QMPH - 302.25 - 303.90 | | | | | | | | |
| 310.05 | 311.05 | QGPH | 2% Py | 694A | 1.00 | <0.01 | 0.03 | 0.04 | <0.01 | <.002 | |
| 311.05 | 311.75 | SMSX | MSSX - 311.05 - .2, 311.46 - .5, 311.55 - .6, 311.63 - .7 | 695 | 0.70 | 0.79 | 1.84 | 3.86 | 1.11 | .016 | B |
| 311.75 | 312.75 | QMPH | Barren | 696A | 1.00 | 0.02 | 0.07 | 0.11 | 0.04 | .002 | |
| 312.75 | 321.55 | QMPH | QGPH - 316.85 - 318.82<br>QZIT - 319.80 - 320.35 | | | | | | | | |
| 321.55 | 373.00 | QGPH | Numerous - .5 - 2 m CARB bands from 328 - 338 | | | | | | | | |
| 373.00 | 391.60 | QMPH | carbonate - chlorite altered altered greenstone? | | | | | | | | |
| 391.60 | 410.70 | QGPH | CARB - 395.8 - 396.85 | | | | | | | | |
| 410.70 | 431.29 | QMPH | chlorite and carbonate altered<br>QGPH - 423.60 - 426.75 | | | | | | | | |
| | | EOH | | | | | | | | | |
| 154.91 | 156.51 | D HORIZON | | | 1.60 | 3.00 | 2.74 | 7.18 | 2.05 | .022 | |
| | | | | | | 12.92% | Cu+Pb | +Zn | | | |
| 288.75 | 291.75 | C HORIZON | | | 3.00 | 0.67 | 0.82 | 1.89 | 0.57 | .004 | |
| | | | | | | 3.38% | Cu+Pb | +Zn | | | |

# MARG DRILL HOLE SUMMARY

**Archer, Cathro & Associates (1981) Limited** — **HOLE No.** M 90-47 — **Page 1 of 1**

| | | | | | | |
|---|---|---|---|---|---|---|
| COORDINATES * | 99,730 N | 98,730 E | DEPTH | COLLAR | 55m | 149m | 264m |
| ELEVATION * | 1365 (m) | DATE STARTED 08/30/90 | DIP | -60° | -58° | -57° | -56° |
| CORE SIZE | NQ | DATE COMPLETED 09/6/90 | AZIMUTH | 360° | 358° | 001° | 002° |
| FINAL DEPTH | 303.58m | | | | | | |

| Metres From | Metres To | Rock Type | Comments |
|---|---|---|---|
| 0 | 4.57 | CASING | Overburden |
| 4.57 | 13.41 | QZIT | Boulders in overburden? |
| 13.41 | 158.20 | QZIT | scattered 1-2 m graphite band |
| 158.20 | 178.20 | QGPH | QZIT and white quartz 173.45 - 177.24 |
| 178.20 | 180.30 | QGPH | abundant carbonate |
| 180.30 | 181.55 | QZIT | |
| 181.55 | 226.50 | QGPH | Highly broken - 199.03 - 201.78 |
| 226.50 | 232.00 | FAULT | Broken and shattered QGPH |
| 232.00 | 261.20 | QGPH | chlorite phyllite - 242.0 - 244.14 |
| 261.20 | 264.30 | QMPH | carbonate and chlorite altered |
| 264.30 | 303.58 | QGPH | shattered - 275.1 - 286.97 |

| Sample Number | Interval | Cu % | Pb % | Zn % | Ag oz/t | Au oz/t |
|---|---|---|---|---|---|---|

* Unsurveyed

# APPENDIX G

## JANE TRENCH PLANS, TR-1 AND TR-2

## GEOCHEMICAL AND ASSAY CERTIFICATES

| Project MARG | NTS 105M/15 | Scale 1:5000 | Page 1 of 4 | Traverse |
|---|---|---|---|---|
| Sampler D. Parry | Location, Target (words) JANE ZONE | | Sample Nos | |
| Date July/Sept./90 | photo no. | | Cert. Nos | |

ATTITUDES (< 100/40 N)

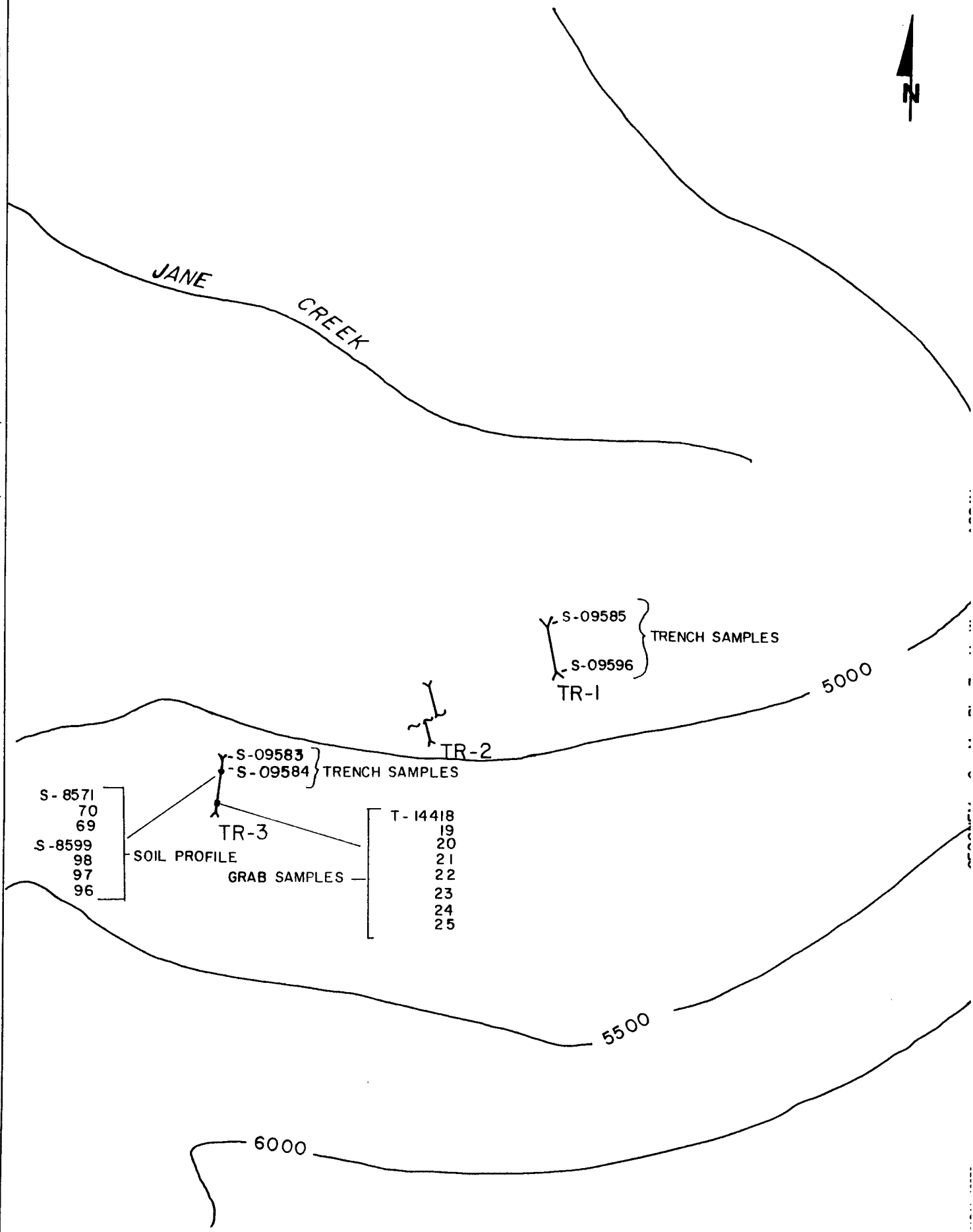
SANDSTONE SILTSTONE | CONGLOMERATE | VOLCANIC

SPECIMEN SITE A,B,...; DO NOT WRITE ON OTHER SIDE OR USE COLOURS

CHERT | SHALE | LIMESTONE DOLOMITE | INTRUSIVE | GOSSAN, MINERALS

SILT X SOIL ● ROCK ■ PAN △ WATER ○

DON'T FORGET CONTOURS, DRAINAGE, NORTH ARROW, LAT/LONG, SAMPLE SITES, WORKINGS, TRAILS, GOSSANS, OBSERVED GEOLOGY: DEFINED —— INFERRED - - - ASSUMED.....




ARCHER, CATHRO & ASSOCIATES (1981) LIMITED DAILY TRAVERSE REPORT

| Project MARG | NTS 105 M/15 | Scale 1:200 | Page 2 of 4 | Traverse TR-1 |
|---|---|---|---|---|
| Sampler D. Parry | Location, Target (words) | | Sample Nos | |
| Date July 14/90 | photo no. JANE-90-TR-1 | | Cert. Nos | |

ATTITUDES (100/40 N)

SANDSTONE SILTSTONE | CONGLOMERATE | VOLCANIC

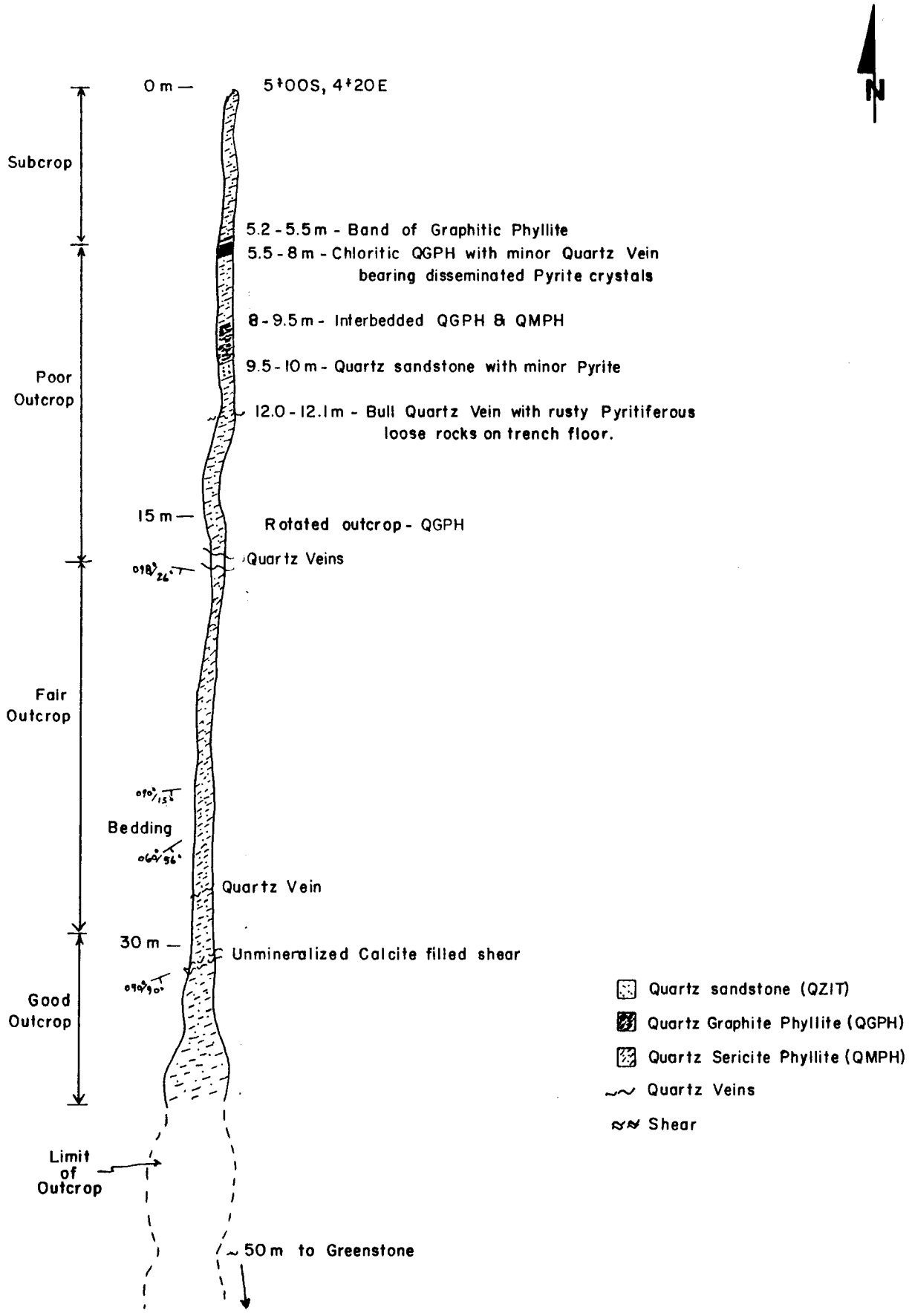
SPECIMEN SITE A,B,...; DO NOT WRITE ON OTHER SIDE OR USE COLOURS

CHERT | SHALE | LIMESTONE DOLOMITE | INTRUSIVE

SILT X SOIL ● ROCK ■ PAN △ WATER O

DON'T FORGET CONTOURS, DRAINAGE, NORTH ARROW, LAT/LONG, SAMPLE SITES, WORKINGS, TRAILS, GOSSANS, OBSERVED GEOLOGY: DEFINED —— INFERRED - - - ASSUMED .....

GOSSAN, MINERALS



| Project MARG | NTS 105M/15 | Scale 1:200 | Page 3 of 4 | Traverse TR-1 |
|---|---|---|---|---|
| Sampler D. Parry | Location, Target (words) JANE - 90 - TR-1 | | Sample Nos S09585 - S09596 | |
| Date July 16/90 | photo no. | | Cert. Nos A9019366 | |

ATTITUDES (100/40 N)

SANDSTONE SILTSTONE

CONGLOMERATE

VOLCANIC

CHERT

SHALE

LIMESTONE DOLOMITE

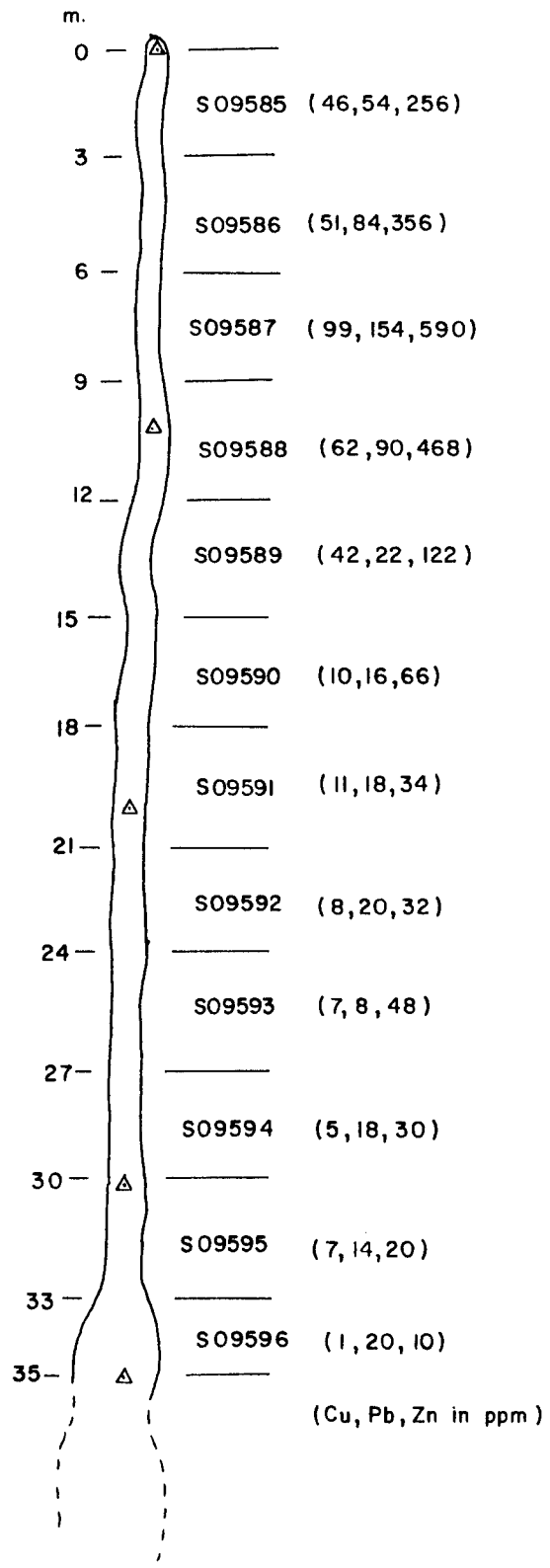
INTRUSIVE

GOSSAN, MINERALS

SILT X SOIL ● ROCK ■ PAN △ WATER O

SPECIMEN SITE A,B,...; DO NOT WRITE ON OTHER SIDE OR USE COLOURS

DON'T FORGET CONTOURS, DRAINAGE, NORTH ARROW, LAT/LONG, SAMPLE SITES, WORKINGS, TRAILS, GOSSANS, OBSERVED GEOLOGY: DEFINED —— INFERRED - - - ASSUMED.....



| Project MARG | NTS 105M/15 | Scale 1:200 | Page 4 of 4 | Traverse TR-3 |
|---|---|---|---|---|
| Sampler D. Parry / R. Carne | Location, Target (words) JANE-90-TR-3 | | Sample Nos S08569-71, S8696-99 S9583-84, T14418-25 | |
| Date July/Sept/90 | photo no. | | Cert. Nos A9019366, 9019367, 9023033 | |

ATTITUDES (100/40 N)

SANDSTONE SILTSTONE

CONGLOMERATE

VOLCANIC

CHERT

SHALE

LIMESTONE DOLOMITE

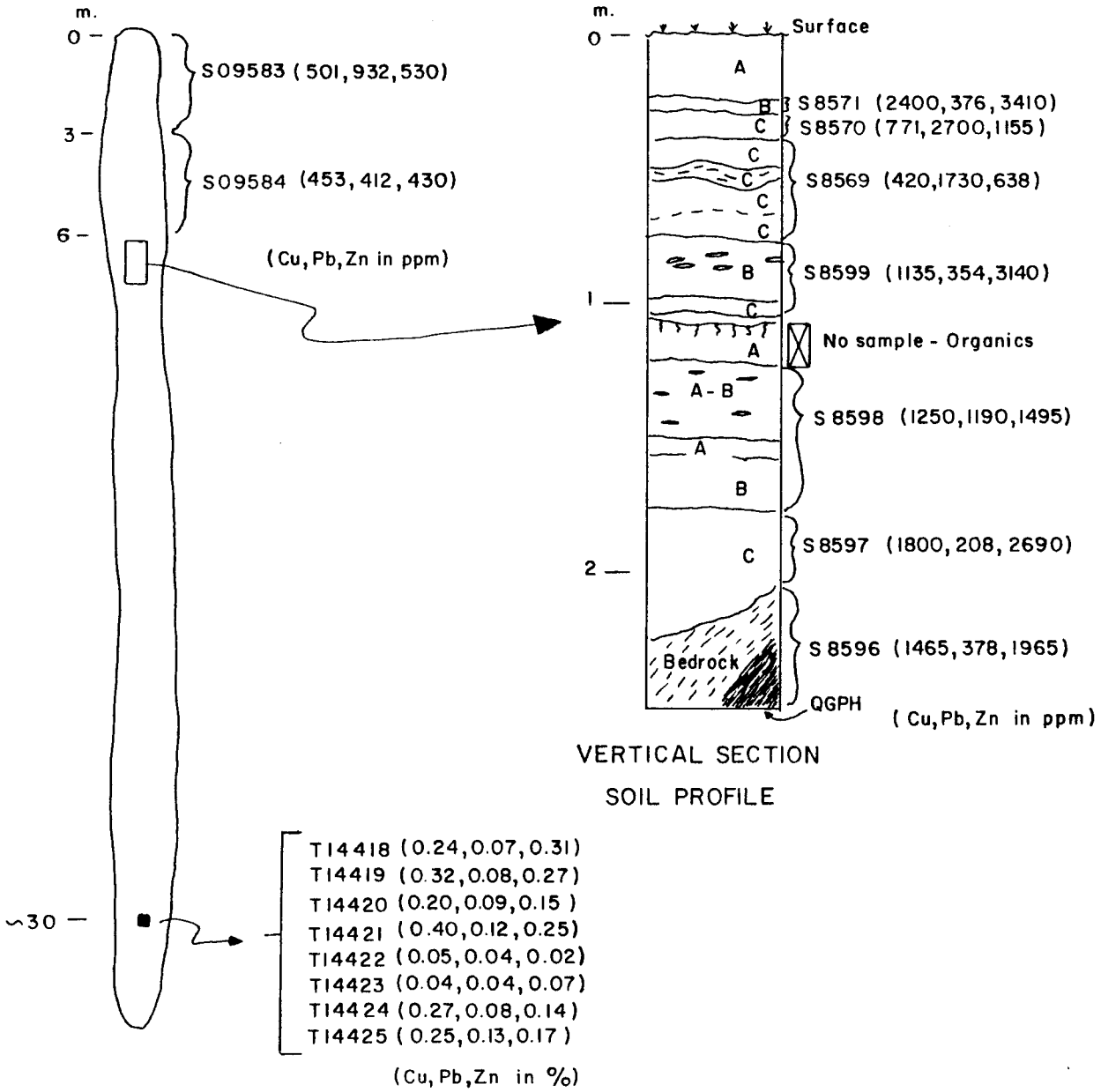
INTRUSIVE

GOSSAN, MINERALS

SILT X SOIL ● ROCK ■ PAN △ WATER ○

SPECIMEN SITE A,B,...; DO NOT WRITE ON OTHER SIDE OR USE COLOURS

DON'T FORGET CONTOURS, DRAINAGE, NORTH ARROW, LAT/LONG, SAMPLE SITES, WORKINGS, TRAILS, GOSSANS, OBSERVED GEOLOGY: DEFINED —— INFERRED - - - ASSUMED .....




VERTICAL SECTION

SOIL PROFILE

T14418 - thin limonite bands in QMPH

T14419 - limonite breccia

T14420 - banded limonite

T14421 - very limonitic QMPH

T14422 - very pyritic QMPH

T14423 - very pyritic QMPH

T14424 - banded limonite

T14425 - rusty QMPH

# Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: ARCHER CATHRO & ASSOC. (1981) LTD.

P.O. BOX 4127
WHITEHORSE, YT
Y1A 3S9

Project : JANE
Comments:

Page Number : 1-A
Total Pages : 1
Invoice Date: 28-JUL-90
Invoice No. : I-9019366
P.O. Number :

## CERTIFICATE OF ANALYSIS A9019366

| SAMPLE DESCRIPTION | PREP CODE | | Ag ppm | Al % | As ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Ga ppm | Hg ppm | K % | La ppm | Mg % | Mn ppm | Mo ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S09583 | 205 | 294 | 2.6 | 0.50 | 20 | 170 | < 0.5 | < 2 | 0.06 | < 0.5 | 4 | 77 | 501 | 8.01 | < 10 | < 1 | 0.16 | 40 | 0.13 | 35 | 10 |
| S09584 | 205 | 294 | 3.6 | 0.36 | 10 | 60 | < 0.5 | < 2 | 0.03 | < 0.5 | 4 | 32 | 453 | 6.08 | < 10 | < 1 | 0.04 | 30 | 0.21 | 30 | 5 |
| S09585 | 205 | 294 | < 0.2 | 1.36 | 15 | 140 | < 0.5 | < 2 | 0.44 | < 0.5 | 17 | 73 | 46 | 3.98 | < 10 | < 1 | 0.13 | 30 | 0.69 | 970 | 2 |
| S09586 | 205 | 294 | < 0.2 | 1.13 | 5 | 70 | < 0.5 | < 2 | 0.63 | < 0.5 | 18 | 57 | 51 | 3.96 | < 10 | < 1 | 0.09 | 30 | 0.76 | 765 | 2 |
| S09587 | 205 | 294 | < 0.2 | 1.12 | 20 | 50 | < 0.5 | < 2 | 1.19 | 0.5 | 21 | 52 | 99 | 4.15 | < 10 | < 1 | 0.06 | 30 | 0.71 | 1130 | 2 |
| S09588 | 205 | 294 | < 0.2 | 1.24 | 10 | 50 | < 0.5 | < 2 | 1.28 | 0.5 | 19 | 55 | 62 | 4.31 | < 10 | < 1 | 0.08 | 30 | 1.10 | 1060 | 2 |
| S09589 | 205 | 294 | < 0.2 | 1.67 | 5 | 170 | < 0.5 | < 2 | 0.21 | < 0.5 | 16 | 138 | 42 | 5.11 | < 10 | < 1 | 0.24 | 30 | 0.98 | 355 | 3 |
| S09590 | 205 | 294 | < 0.2 | 0.80 | < 5 | 60 | < 0.5 | < 2 | 0.48 | < 0.5 | 8 | 26 | 10 | 2.69 | < 10 | < 1 | 0.03 | 20 | 0.74 | 180 | 1 |
| S09591 | 205 | 294 | < 0.2 | 0.60 | < 5 | 140 | < 0.5 | < 2 | 0.24 | < 0.5 | 6 | 56 | 11 | 1.73 | < 10 | < 1 | 0.11 | 20 | 0.55 | 110 | < 1 |
| S09592 | 205 | 294 | < 0.2 | 0.30 | < 5 | 160 | < 0.5 | < 2 | 0.71 | < 0.5 | 6 | 50 | 6 | 1.71 | < 10 | < 1 | 0.10 | 20 | 0.46 | 255 | < 1 |
| S09593 | 205 | 294 | < 0.2 | 0.62 | < 5 | 110 | < 0.5 | 2 | 0.84 | < 0.5 | 8 | 44 | 7 | 2.61 | < 10 | < 1 | 0.07 | 20 | 0.83 | 185 | 1 |
| S09594 | 205 | 294 | < 0.2 | 0.36 | < 5 | 100 | < 0.5 | < 2 | 0.58 | < 0.5 | 6 | 52 | 5 | 1.82 | < 10 | < 1 | 0.12 | 20 | 0.56 | 150 | 1 |
| S09595 | 205 | 294 | < 0.2 | 0.16 | < 5 | 140 | < 0.5 | < 2 | 0.31 | < 0.5 | < 1 | 55 | 7 | 1.25 | < 10 | < 1 | 0.11 | 20 | 0.12 | 80 | < 1 |
| S09596 | 205 | 294 | 0.2 | 0.06 | 5 | 110 | < 0.5 | < 2 | 0.02 | < 0.5 | < 1 | 21 | 1 | 1.69 | < 10 | < 1 | 0.08 | < 10 | 0.01 | 15 | < 1 |

CERTIFICATION: B. Caplin

# Chemex Labs Ltd.

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P.O. BOX 4127
WHITEHORSE, YT
Y1A 3S9

Project : JANE
Comments:


Invoice Date: 28-JUL-90
Invoice No. : I-9019366
P.O. Number :

## CERTIFICATE OF ANALYSIS A9019366

| SAMPLE DESCRIPTION | PREP CODE | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sr ppm | Ti % | Tl ppm | U ppm | V ppm | W ppm | Zn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S09583 | 205 294 | 0.02 | 11 | 820 | 932 | < 5 | 1 | 8 | < 0.01 | < 10 | < 10 | 6 | < 10 | 530 |
| S09584 | 205 294 | < 0.01 | 5 | 710 | 412 | < 5 | 1 | 3 | < 0.01 | < 10 | < 10 | 3 | < 10 | 430 |
| S09585 | 205 294 | 0.01 | 30 | 690 | 54 | < 5 | 1 | 28 | 0.01 | < 10 | < 10 | 9 | < 10 | 256 |
| S09586 | 205 294 | < 0.01 | 28 | 480 | 84 | 5 | 1 | 34 | 0.01 | < 10 | < 10 | 7 | < 10 | 356 |
| S09587 | 205 294 | < 0.01 | 42 | 420 | 154 | < 5 | 1 | 66 | < 0.01 | < 10 | < 10 | 6 | < 10 | 590 |
| S09588 | 205 294 | < 0.01 | 32 | 580 | 90 | < 5 | 1 | 53 | < 0.01 | < 10 | < 10 | 6 | < 10 | 468 |
| S09589 | 205 294 | 0.01 | 17 | 510 | 22 | 5 | 1 | 17 | 0.01 | < 10 | < 10 | 10 | < 10 | 122 |
| S09590 | 205 294 | < 0.01 | 4 | 690 | 16 | < 5 | 1 | 40 | < 0.01 | < 10 | < 10 | 2 | < 10 | 66 |
| S09591 | 205 294 | < 0.01 | 3 | 340 | 18 | < 5 | < 1 | 26 | < 0.01 | < 10 | < 10 | 1 | < 10 | 34 |
| S09592 | 205 294 | < 0.01 | 7 | 420 | 20 | < 5 | < 1 | 71 | < 0.01 | < 10 | < 10 | < 1 | < 10 | 32 |
| S09593 | 205 294 | < 0.01 | 6 | 620 | 8 | < 5 | 1 | 84 | < 0.01 | < 10 | < 10 | 2 | < 10 | 48 |
| S09594 | 205 294 | 0.01 | 5 | 410 | 18 | < 5 | < 1 | 72 | < 0.01 | < 10 | < 10 | < 1 | < 10 | 30 |
| S09595 | 205 294 | < 0.01 | 3 | 400 | 14 | < 5 | < 1 | 38 | < 0.01 | < 10 | < 10 | < 1 | < 10 | 20 |
| S09596 | 205 294 | 0.01 | < 1 | 320 | 20 | < 5 | < 1 | 39 | < 0.01 | < 10 | < 10 | < 1 | < 10 | 10 |

CERTIFICATION: B. Caplan

# Chemex Labs Ltd.

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To: ARCHER CATHRO & ASSOC. (1981) LTD.

P.O. BOX 4127
WHITEHORSE, YT
Y1A 3S9

Project : JANE
Comments:


Invoice Date: 28-JUL-90
Invoice No. : I-9019367
P.O. Number : NONE

## CERTIFICATE OF ANALYSIS A9019367

| SAMPLE DESCRIPTION | PREP CODE | | Ag ppm | Al % | As ppm | Ba ppm | Be ppm | Bi ppm | Ca % | Cd ppm | Co ppm | Cr ppm | Cu ppm | Fe % | Ga ppm | Hg ppm | K % | La ppm | Mg % | Mn ppm | Mo ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S08569 | 201 | 238 | 3.6 | 0.44 | 10 | 80 | < 0.5 | < 2 | 0.01 | < 0.5 | < 1 | 8 | 420 | 9.93 | 20 | < 1 | 0.09 | 70 | 0.09 | 75 | 12 |
| S08570 | 201 | 238 | 7.8 | 0.54 | 35 | 60 | < 0.5 | < 2 | 0.01 | < 0.5 | < 1 | 5 | 771 | 13.90 | 20 | < 1 | 0.05 | 70 | 0.15 | 60 | 5 |
| S08571 | 201 | 238 | 4.2 | 0.94 | 55 | 30 | < 0.5 | < 2 | 0.02 | < 0.5 | 2 | 17 | 2400 | >15.00 | 30 | < 1 | 0.02 | 10 | 0.18 | 115 | < 1 |
| S08596 | 201 | 238 | 2.0 | 0.62 | 35 | 20 | < 0.5 | < 2 | 0.02 | < 0.5 | 3 | 7 | 1465 | >15.00 | 30 | < 1 | 0.04 | 30 | 0.06 | 90 | 4 |
| S08597 | 201 | 238 | 2.0 | 0.54 | 30 | 10 | < 0.5 | < 2 | 0.02 | < 0.5 | 4 | 6 | 1800 | >15.00 | 30 | < 1 | 0.02 | 10 | 0.04 | 130 | < 1 |
| S08598 | 201 | 238 | 4.6 | 0.69 | 80 | 50 | < 0.5 | < 2 | 0.03 | 1.0 | 7 | 17 | 1250 | 14.75 | 20 | < 1 | 0.03 | 30 | 0.21 | 180 | 5 |
| S08599 | 201 | 238 | 2.0 | 0.74 | 5 | 20 | < 0.5 | < 2 | 0.01 | < 0.5 | 3 | 17 | 1135 | >15.00 | 20 | < 1 | 0.03 | 10 | 0.08 | 105 | 1 |

CERTIFICATION: B. Caplin

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To: ARCHER CATHRO & ASSOC. (1981) LTD.

P.O. BOX 4127
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Project : JANE
Comments:

Page Number : 1-B
Total Pages : 1
Invoice Date: 28-JUL-90
Invoice No. : I-9019367
P.O. Number : NONE

## CERTIFICATE OF ANALYSIS A9019367

| SAMPLE DESCRIPTION | PREP CODE | | Na % | Ni ppm | P ppm | Pb ppm | Sb ppm | Sc ppm | Sr ppm | Ti % | Tl ppm | U ppm | V ppm | W ppm | Zn ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S08569 | 201 | 238 | 0.01 | 10 | 1420 | 1730 | 10 | 2 | 55 | < 0.01 | < 10 | < 10 | 9 | < 10 | 638 |
| S08570 | 201 | 238 | 0.01 | 15 | 2210 | 2700 | 10 | 2 | 34 | < 0.01 | < 10 | < 10 | 4 | < 10 | 1155 |
| S08571 | 201 | 238 | 0.01 | 56 | 1190 | 376 | 10 | 3 | 7 | < 0.01 | < 10 | < 10 | 12 | < 10 | 3410 |
| S08596 | 201 | 238 | 0.01 | 31 | 1150 | 378 | 15 | 2 | 2 | < 0.01 | < 10 | < 10 | 6 | < 10 | 1965 |
| S08597 | 201 | 238 | < 0.01 | 53 | 920 | 208 | 15 | 2 | 2 | < 0.01 | < 10 | < 10 | 4 | < 10 | 2690 |
| S08598 | 201 | 238 | 0.01 | 36 | 1480 | 1190 | 10 | 2 | 24 | < 0.01 | < 10 | < 10 | 15 | < 10 | 1495 |
| S08599 | 201 | 238 | 0.01 | 62 | 1370 | 354 | 15 | 3 | 9 | < 0.01 | < 10 | < 10 | 6 | < 10 | 3140 |

CERTIFICATION: B. Cook

# Chemex Labs Ltd.

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212 Brooksbank Ave., North Vancouver
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PHONE: 604-984-0221

To: ARCHER CATHRO & ASSOC. (1981) LTD.

1016 - 510 W. HASTINGS ST.
VANCOUVER, BC
V6B 1L8

Project : MARG (JANE)
Comments:


Invoice Date: 26-SEP-90
Invoice No. : I-9023033
P.O. Number :

## CERTIFICATE OF ANALYSIS A9023033

| SAMPLE DESCRIPTION | PREP CODE | | Au oz/T | Ag oz/T | Cu % | Pb % | Zn % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T14418 | 208 | 294 | < 0.002 | 0.05 | 0.24 | 0.07 | 0.31 | | | | | |
| T14419 | 208 | 294 | < 0.002 | 0.20 | 0.32 | 0.08 | 0.27 | | | | | |
| T14420 | 208 | 294 | < 0.002 | 0.10 | 0.20 | 0.09 | 0.15 | | | | | |
| T14421 | 208 | 294 | < 0.002 | 0.13 | 0.40 | 0.12 | 0.25 | | | | | |
| T14422 | 208 | 294 | < 0.002 | 0.02 | 0.05 | 0.04 | 0.02 | | | | | |
| T14423 | 208 | 294 | < 0.002 | 0.06 | 0.04 | 0.04 | 0.07 | | | | | |
| T14424 | 208 | 294 | < 0.002 | 0.05 | 0.27 | 0.08 | 0.14 | | | | | |
| T14425 | 208 | 294 | < 0.002 | 0.19 | 0.25 | 0.13 | 0.17 | | | | | |

CERTIFICATION: