

EIP 89-061

REPORT ON THE MEL PROPERTY
WATSON LAKE MINING DIVISION
YUKON TERRITORY

NTS 95D/6

LATITUDE: 60 DEGREES 21 MINUTES
LONGITUDE: 127 DEGREES 24 MINUTES

FOR

BARYTEX RESOURCES CORP.

BY

D.C. MILLER, P. ENG.

D.C. MILLER GEOLOGICAL SERVICES

September 19, 1989

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INTRODUCTION

At the request of H.S. Aikins, president of Barytex Resources Corp., the writer has reviewed and summarized exploration results at the Mel zinc-lead-barite property and has submitted a proposal for further exploration of the property. The purpose of this proposed exploration is to develop sufficient data to enable a feasibility study to be done to determine if production at the property is warranted.

The writer is well acquainted with the property and supervised exploration on the property during 1977 to 1987 while employed by St. Joseph Explorations Limited and its successor companies. No work has been done on the property since 1987.

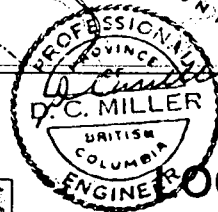
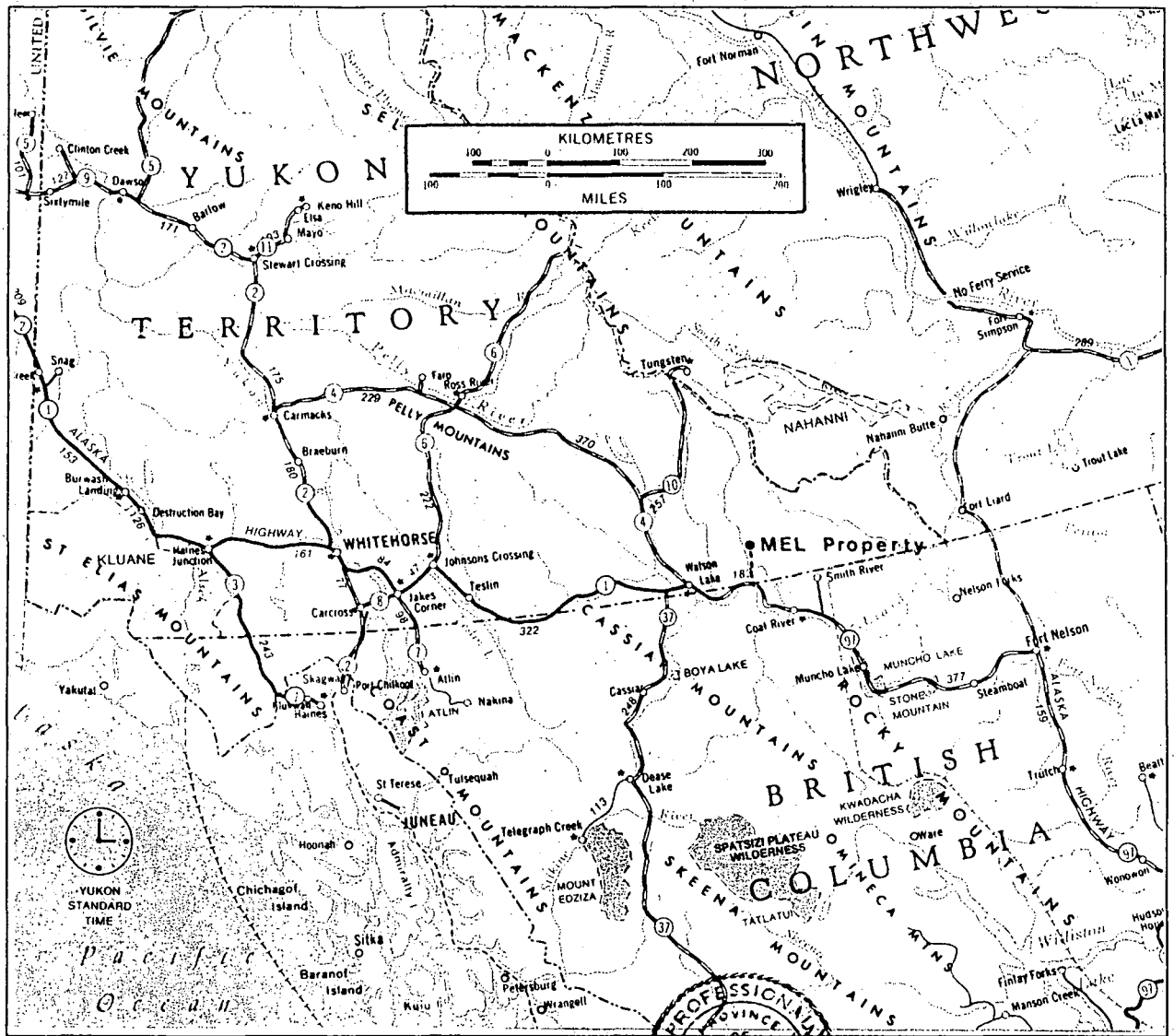
SUMMARY

The Mel zinc-lead-barite deposit is located in southeastern Yukon Territory 50 km by winter road eastward of the Alaska Highway. The deposit was first staked in 1967 and has since been explored by geological mapping, geochemistry, ground geophysics, trenching and diamond drilling. This work has indicated a stratiform, folded, lens-shaped deposit, up to 21.7 m thick at its centre, which gradually thins towards both ends over a strike-length of 800 m. Drilling to a depth of 490 m has indicated a geological reserve of 5,687,493 tonnes (6,269,324 short tons) grading 6.77% zinc, 1.92% lead and 51.1% barite. The mineralization is hosted in a cryptograined limestone unit at its contact with calcareous

slate and shale. The deposit is generally steeply dipping and is still open at depth. The deposit has good continuity and of 29 holes drilled through the deposit, all intersected mineralization. The mineralization is zoned and the best zinc grades occur outward from the centre of the deposit near surface. At depth, zinc grades are strong in 2 of the deepest holes (26 and 27) which average 14.69% zinc, 0.92% lead and 33.3% barite over an average true width of 5.92 m.

Metallurgical test work by Lakefield Research indicated excellent metal recoveries and high concentrate grades. Net smelter return data indicate the Mel deposit may be economic at present commodity prices.

In 1981 and 1984 two further zinc showings were discovered eastward of the Mel deposit (Fig.3). They were named the Mel-East and Jeri showings respectively. Preliminary work on these showings indicate they occur at or near the same stratigraphic level as the Mel, but they are less stratiform in nature and may represent feeder (vein) type mineralization.



LOCATION MAP

Watson Lake Mining District, Yukon

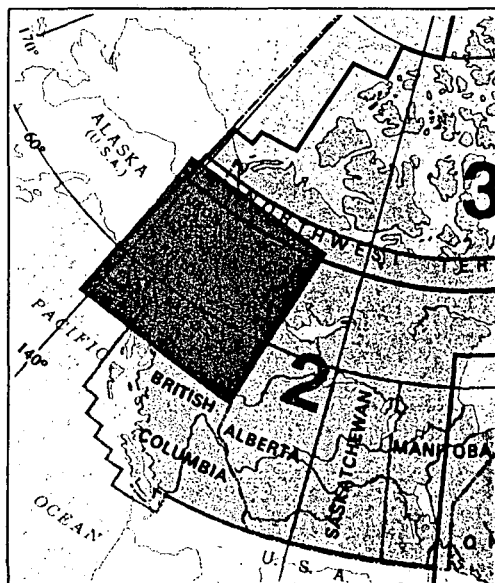
Distances from Mel Property

Watson Lake	80 km (Air)
Alaska Hwy	50 km (Winter Rd.)
Fort Nelson	507 km - Railhead
Skagway	666 km - Tidewater

INDEX MAP

Area Covered

Yukon and Northern B.C.



BARYTEX RESOURCES CORP.

**MEL PROPERTY
LOCATION & ACCESS**

DRAWN BY DCM/HSA	NTS 950/6	FIGURE
REPORT DATE SEPT. 19, 1989	PROJECT NO. 8955	1

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LOCATION AND ACCESS

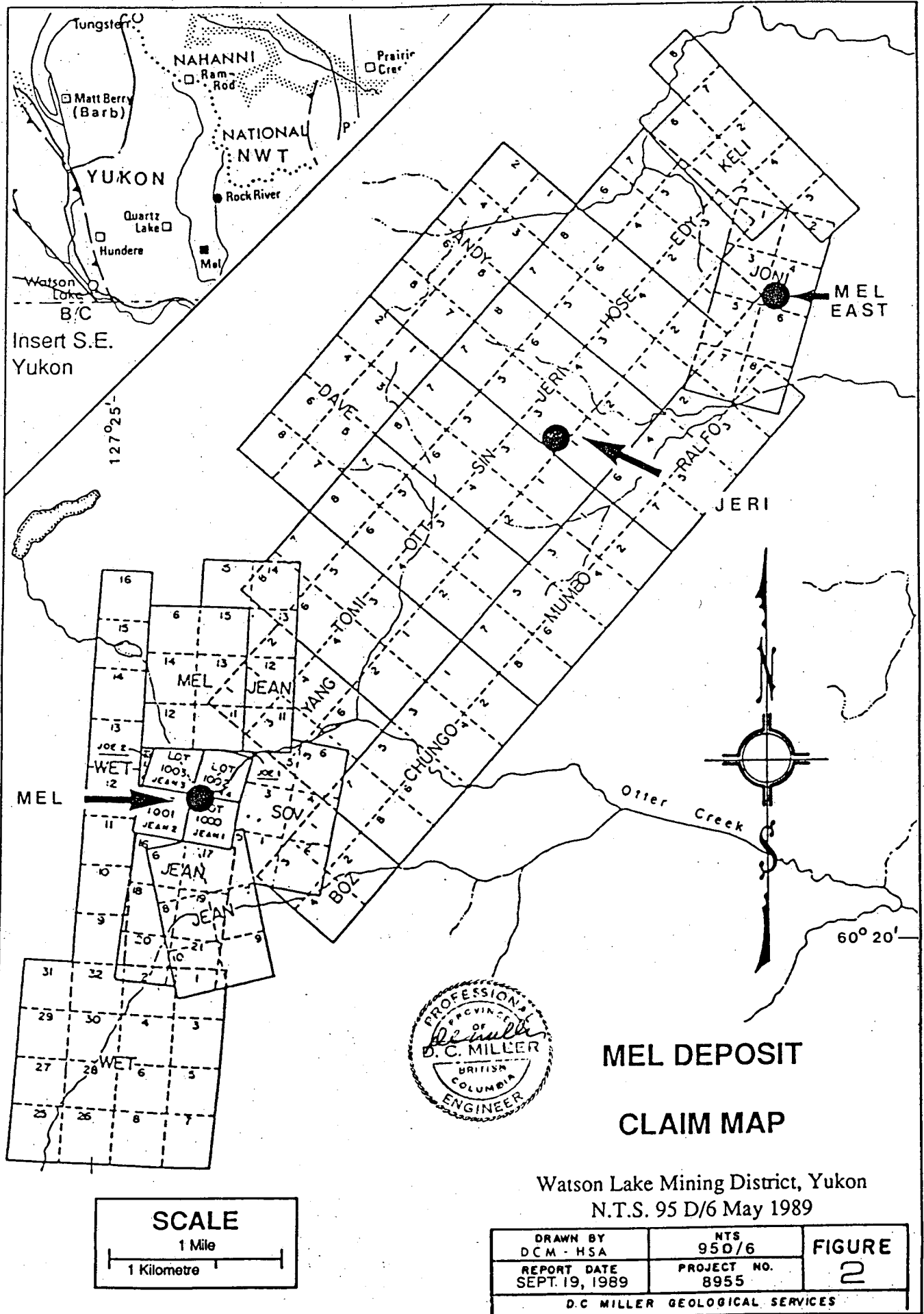
The Mel property is located in southern Yukon Territory, 80 km east-northeast of Watson Lake. Access to the property is provided by a winter road, some 50 km long, leading from the Alaska Highway at a point some 77 km eastward of Watson Lake. Alternative access is provided by a 640 m airstrip located 1.5 km south of the Mel deposit. In 1985 this airstrip accommodated a Caribou aircraft with 8,000 pound payloads. Road distance from the property to the rail-head at Fort Nelson is 507 km and to tidewater at Skagway is 666 km.

PROPERTY AND OWNERSHIP

The property comprises 171 claims and is owned jointly by Breakwater Resources Ltd. and Barytex Resources Corp. Under the terms of an agreement dated February 15, 1985 Breakwater has earned a 100 % interest in the property subject to a 10% net profits interest held by Barytex. Barytex also receives a \$20,000 per year advance royalty and has the right to earn a 5% participating interest when a production decision is reached.

Under the terms of an amending agreement dated August 31, 1989 Breakwater has agreed to grant Barytex an option to reacquire a 45% interest in the subject property.

The property is located in the Watson Lake Mining District and includes 171 contiguous claims as follows:

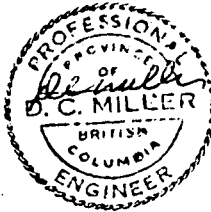


Insert S.E.
Yukon

127°25'

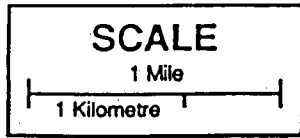
MEL

60° 20'



**MEL DEPOSIT
CLAIM MAP**

Watson Lake Mining District, Yukon
N.T.S. 95 D/6 May 1989



DRAWN BY DCM - HSA	NTS 95D/6	FIGURE 2
REPORT DATE SEPT. 19, 1989	PROJECT NO. 8955	
D.C. MILLER GEOLOGICAL SERVICES		

<u>CLAIM NAME</u>	<u>GRANT NO.</u>	<u>EXPIRY DATE</u>
Mel 11-16	Y 22230-35	April 3, 2000
Jean 1- 4	Y 72731-34	April 3, 2000
Jean 5-10	Y 72961-66	April 5, 1998
Jean 11-21	Y 74418-28	Oct. 15, 1999
Wet 1	Y 83309	April 3, 1999
Wet 2	Y 83310	April 3, 2000
Wet 3	Y 83311	April 3, 1999
Wet 4	Y 83312	April 3, 2000
Wet 5-8	Y 83313-16	April 3, 1999
Wet 9-16	Y 83317-24	April 3, 1998
Wet 25-29	Y 83325-29	April 3, 1999
Wet 30	Y 83330	April 3, 2000
Wet 31	Y 83331	April 3, 1999
Wet 32	Y 83332	April 3, 2000
Joe 1-2 Fractions	YA45269-70	Aug. 13, 1997
Sov 1-6	YA28600-05	April 26, 2000
Keli 1-4	YA66842-45	Aug. 10, 1994
Joni 1-8	YA66846-53	Aug. 10, 1994
Hose 1-8	YA66919-26	Aug. 24, 1994
Keli 5-8	YA66927-30	Aug. 24, 1994
Jeri 1-8	YA66921-38	Aug. 24, 1994
Ralfo 1-7	YA66939-45	Aug. 24, 1994
Chungo 1	YA66946	Aug. 24, 1994
Chungo 2-8	YA66947-53	Aug. 24, 1995
Ott 1-8	YA66954-61	Aug. 24, 1994
Edy 1-7	YA66962-68	Aug. 24, 1994
Tomi 1-8	YA66969-76	Aug. 24, 1994
Mumbo 1	YA66977	Aug. 24, 1994
Mumbo 2-4	YA66978-80	Aug. 24, 1993
Mumbo 5-8	YA66981-84	Aug. 24, 1994
Boz 1-4	YA66985-88	Aug. 24, 1994
Sin 1-2	YA66989-90	Aug. 24, 1994
Sin 3-5	YA66991-93	Aug. 24, 1995
Sin 6-8	YA66994-96	Aug. 24, 1994
Yang 1	YA66997	Aug. 24, 1990
Yang 2-6	YA66998-02	Aug. 24, 1994
Dave 1-8	YA72501-08	Nov. 5, 1994
Andy 1-8	YA72509-16	Nov. 5, 1994

The claim information was obtained from Breakwater records and is thought to be accurate. A cross-check against the Mining Recorder's records is recommended.

PHYSIOGRAPY AND CLIMATE

The base elevation at the property is 850 m and maximum elevations range up to 1300 m. Topography is generally moderate. Forests are composed mainly of spruce, pine and balsam. Much of the forests on the property were burned in 1982 by a large forest fire. The property is drained by Otter Creek and its tributaries which flow eastward into the Rock River and Mel Creek which flows south to the Coal River. Adequate water is present for mining and exploration purposes. The climate is similar to that at Ft. Nelson, B.C., with cold winters and moderate summers. Precipitation is moderate and winter snow accumulation is in the order of 80 cm.

HISTORY

The property was first staked in 1967 by J. Melnychuk and T. Flint and optioned to Newmont Mining Corporation. Early work by Newmont included road work, trenching and a geochemical survey. Newmont dropped their option and the property was later sold to Empire Metals Corporation which was subsequently renamed Barytex Resources Corp. Barytex optioned the property to Granby Mining Corporation, which drilled 18 diamond drill holes totalling 1952 m during 1974 and 1975. In 1976 St. Joseph Explorations Limited entered the agreement and conducted geological, geochemical and geophysical surveys followed by 4054.2 m of diamond drilling in 19 holes during 1978 and 1979. In 1981 the Canadian interests of St. Joe Minerals Corporation were sold to Sulpetro Limited and Sulpetro Minerals Limited was formed as the minerals division.

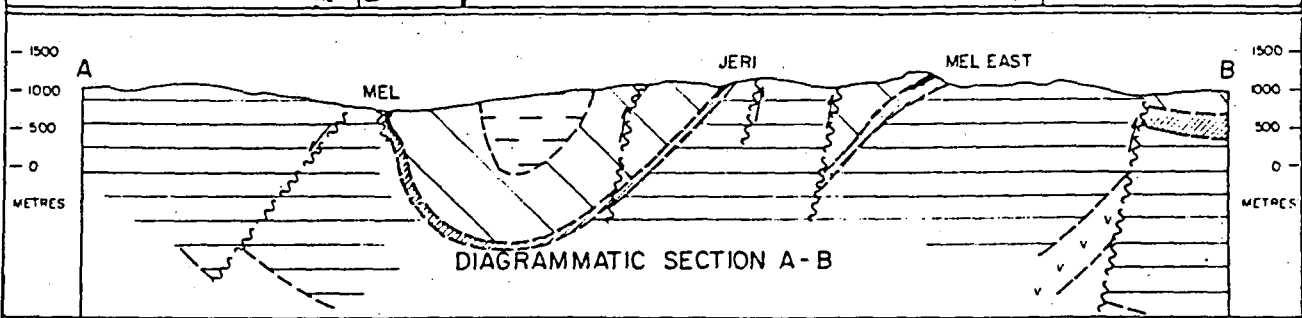
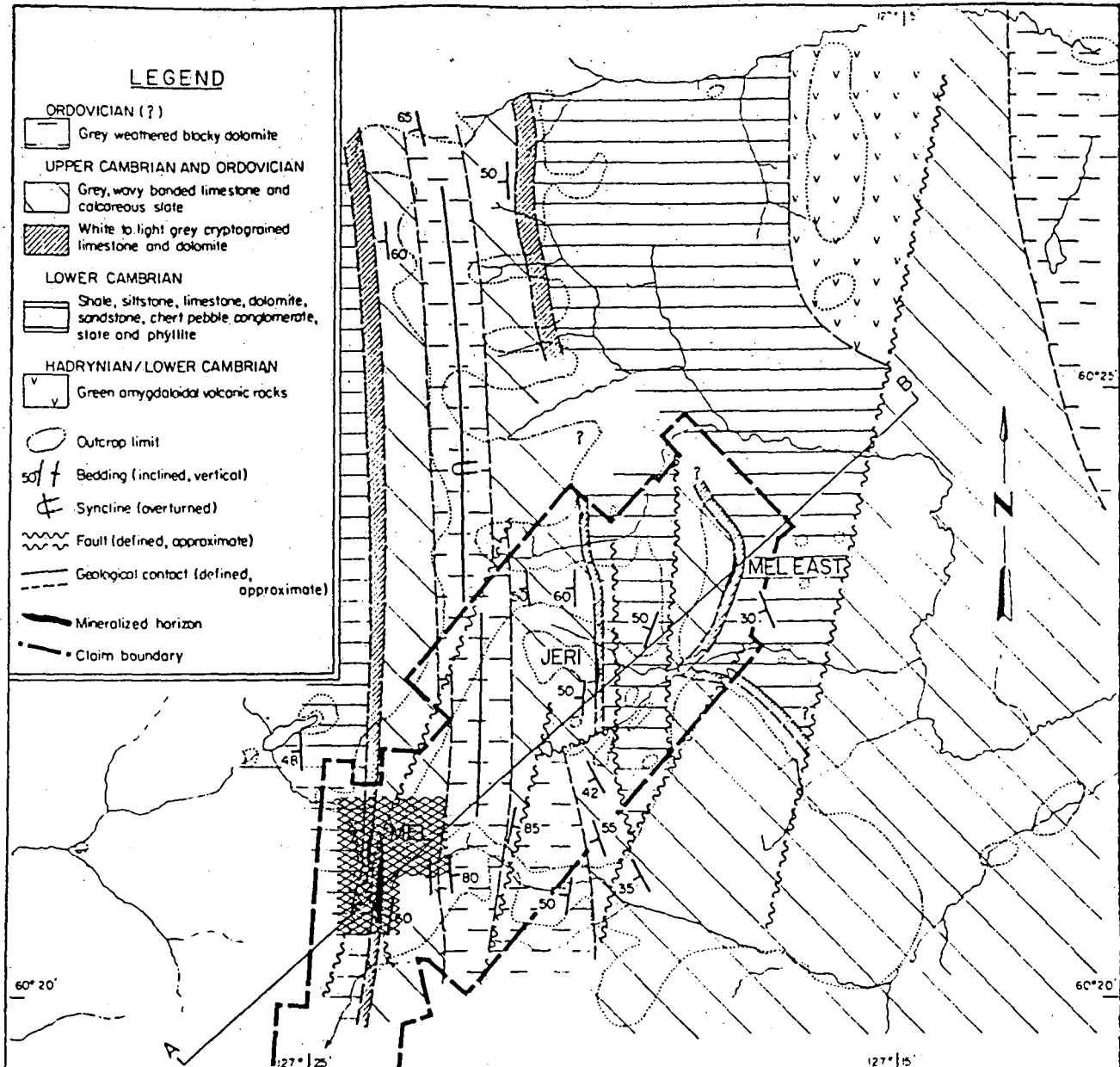
In 1981 regional exploration work by Sulpetro discovered zinc mineralization 7.3 km (Fig. 3) northeast of the Mel deposit. The showings were named Mel-East (Joni), but little further work was done in this area. In 1984 the Jeri zinc showings were discovered between the Mel and Mel-East areas (Fig. 3). Later in 1984 Sulpetro completed a new access road to the property and built an airstrip near the main Mel deposit. In 1985 Sulpetro utilized the airstrip to drill the Jeri showings with 10 diamond drill holes totalling 1009.8 m. At this time a 5.5 km tote road was built to connect the Mel and the Jeri showings. In late 1985 Sulpetro sold its mineral assets to Novamin Resources Inc., which in 1987, completed 7 diamond drill holes totalling 2011.99 m. This drilling tested the Mel deposit at depth and to the south along strike. In 1988 Novamin was purchased by Breakwater Resources Ltd.

REGIONAL GEOLOGY

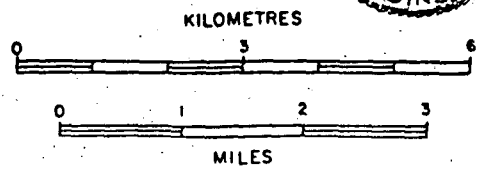
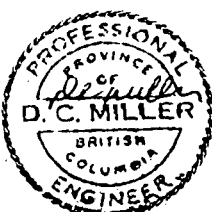
The Mel property is located in the Coal River map area, NTS 95D (Gabrielse and Blusson, 1969). It lies near the southern margin of the Selwyn Basin, a tectonic element present during early Paleozoic time. Sedimentary rocks are dominant and range in age from late Precambrian to Tertiary age. Tertiary age coal-bearing sediments are present in the upper Rock River valley. Mafic to intermediate volcanic rocks range from Late Precambrian to Middle Ordovician age. Cretaceous age felsic intrusive rocks are present north of the property, with the closest major intrusion lying some 53 km to the northwest. Major north-south trending faults have easterly directed thrust displacements ranging up to 3000 m.

LEGEND

- ORDOVICIAN (?)
 - Grey weathered blocky dolomite
- UPPER CAMBRIAN AND ORDOVICIAN
 - Grey, wavy banded limestone and calcareous slate
 - White to light grey cryptogained limestone and dolomite
- LOWER CAMBRIAN
 - Shale, siltstone, limestone, dolomite, sandstone, chert pebble conglomerate, slate and phyllite
- HADRYNIAN/LOWER CAMBRIAN
 - Green amygdaloidal volcanic rocks
- Outcrop limit
- Bedding (inclined, vertical)
- Syncline (overturned)
- Fault (defined, approximate)
- Geological contact (defined, approximate)
- Mineralized horizon
- Claim boundary



AREA COVERED BY FIGURES 4 TO 7



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MEL AREA REGIONAL GEOLOGY AND KEY MAP

DRAWN BY DCM	NTS 95D/6	FIGURE 3
REPORT DATE SEPT. 19, 1989	PROJECT NO. 8955	

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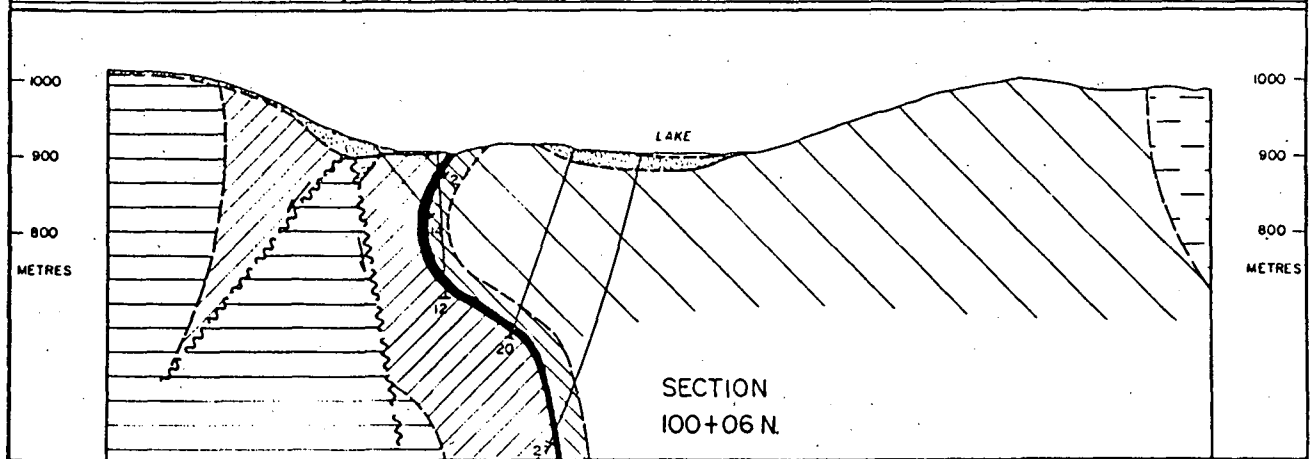
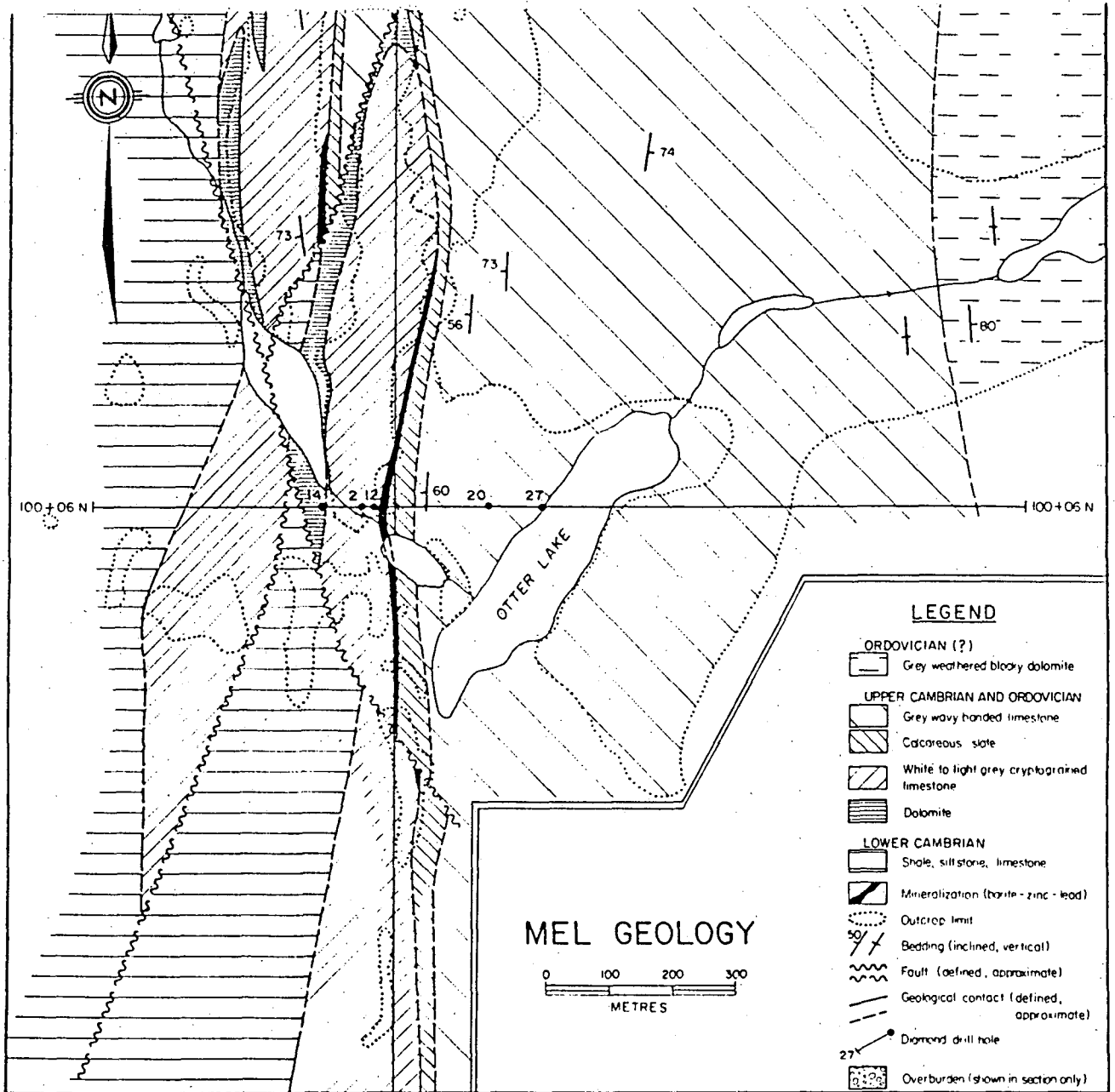
ADAPTED FROM G.S.C. MAP 11-1968 AND COMPANY PLANS

PROPERTY GEOLOGY

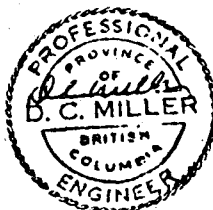
The Mel property is underlain by Cambrian to Ordovician age strata including carbonates and various clastic sediments. These beds have been folded into a north-south trending, overturned syncline (Figs. 3 and 4). The Mel zinc-lead-barite deposit occurs at the top of a 150 m thick cryptograined limestone unit which is overlain by a finely laminated slate-shale unit some 30 m thick. This unit grades upward into wavy banded limestone as the calcareous component increases. The wavy banded limestone is some 700 m thick and is in turn overlain by a dolomite unit approximately 800 m thick.

At the Mel deposit, the north part of the mineralization has been offset by a northeast striking normal fault (Fig. 4). The offset portion is known as the West Zone. Drilling at the West Zone indicates mineralization is faulted off at a shallow depth by the normal fault and has little tonnage potential. The south tip of the Mel deposit has been offset to the south by a northwest striking reverse fault. Neither of these faults affect the main portion of the deposit which appears to be relatively undisturbed by faulting.

In the eastern part of the property, two main northerly striking faults are responsible for the repetition of the cryptograined limestone unit in this area (Fig. 3).



ADAPTED FROM
COMPANY PLANS



BARYTEX RESOURCES CORP.

MEL DEPOSIT GEOLOGY

DRAWN BY
DCM
REPORT DATE
SEPT. 19, 1989

NTS
95D/6
PROJECT NO.
8955

**FIGURE
4**

DC MILLER GEOLOGICAL SERVICES

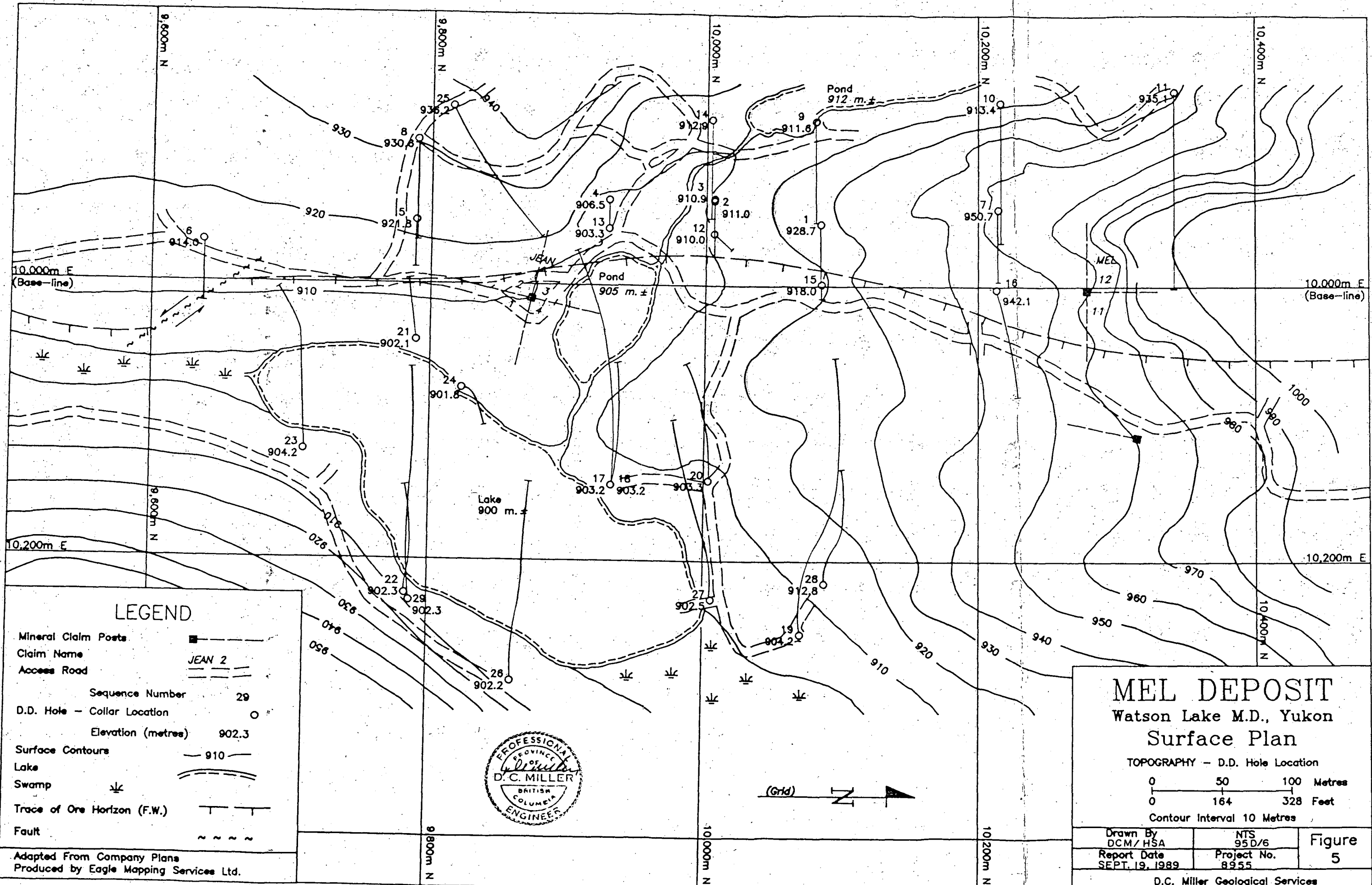
MINERALIZATION AND DRILLING

MEL DEPOSIT

At the Mel deposit, mineralization is largely confined to the cryptograined limestone, but also locally extends into the overlying slate-shale unit. The deposit is essentially strataform with good continuity and is lens shaped and up to 21.7 m thick at its centre. It tapers gradually towards both ends over a strike-length of 800 m. To date, drilling has intersected mineralization to a vertical depth of 489.5 m and the deposit is open at depth. Mineralization strikes nearly north-south and dips about 55 degrees westward at surface. It steepens to vertical at a depth of 100 m and then reverses dip to the east averaging 35 degrees over a 50 m vertical interval. The dip then steepens to 60 to 80 degrees eastward (Fig. 4).

Economic minerals include sphalerite, galena and barite with trace amounts of chalcopyrite, covellite and tetrahedrite. Gangue minerals include pyrite, quartz, calcite, and sericite. The sericite forms from the alteration of brown mudstone clasts which occur in the cryptograined limestone.

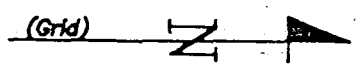
Sphalerite is nearly iron free and ranges in color from brown to honey-colored. It is associated with barite, quartz and mudstone clasts. It occurs as relatively coarse grained blebs ranging in size from less than 1 mm up to 2 cm.



LEGEND

- Mineral Claim Posts ■
- Claim Name JEAN 2
- Access Road ---
- Sequence Number 29
- D.D. Hole - Collar Location ○
- Elevation (metres) 902.3
- Surface Contours — 910 —
- Lake ~~~~~
- Swamp ⏏
- Trace of One Horizon (F.W.) - - - -
- Fault ~ ~ ~ ~

Adapted From Company Plans
Produced by Eagle Mapping Services Ltd.



MEL DEPOSIT
Watson Lake M.D., Yukon
Surface Plan

TOPOGRAPHY - D.D. Hole Location

0 50 100 Metres
0 164 328 Feet

Contour Interval 10 Metres

Drawn By DCM/HSA	NTS 95D/6	Figure 5
Report Date SEPT. 19, 1989	Project No. 8955	

D.C. Miller Geological Services

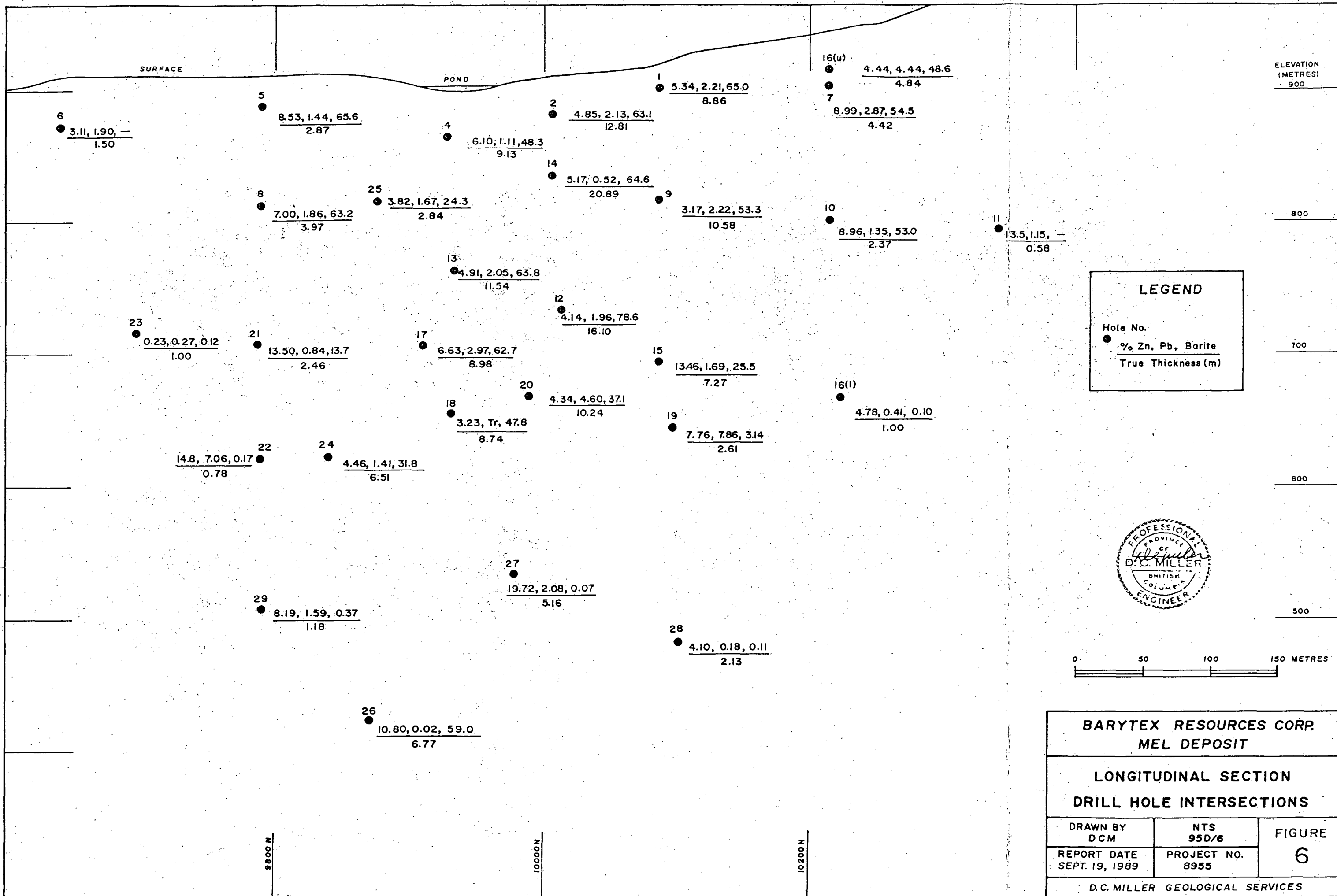
Galena occurs mainly as veinlets cutting quartz, barite and sphalerite or is interstitial to these minerals. The grain size of galena is variable, but it is generally finer than that of sphalerite.

Barite is mainly coarse grained and relatively pure. It also occurs to a minor extent in late veinlets associated with quartz and calcite.

The pyrite content is about 2% and it is mainly fine grained. It occurs as disseminations in mudstone clasts and cherty quartz and as veinlets cutting other sulphides, along grain boundaries and in wallrocks.

Mineral zoning is evident and the distribution of the highest grade combined zinc and lead is shown in longitudinal section (Fig. 7). Barite is thickest and purest in the central part of the deposit. With respect to stratigraphic level within the deposit, sphalerite content is generally highest in the lower to middle parts of the deposit. Galena is more erratically distributed and favors the mid to upper stratigraphic levels.

Diamond drill hole intersections are shown in longitudinal section on Figure 6. To date the deposit has been tested with 29 holes. With consideration to grade and thickness, the best hole is No. 27 which intersected 19.72% zinc and 2.08 % lead over a true width of 5.16 m at a vertical depth of 370 m below surface.



JERI SHOWINGS

The Jeri showings lie 4.5 km northeast of the Mel at nearly the same stratigraphic level (Fig. 3). Stratigraphically, they extend from the level of the Mel deposit to a depth of 70 m below the Mel horizon. On surface, 3 chip samples from widely spaced showings over a 400 m strike-length averaged 11.55% zinc, 0.02% lead, 0.02% barium and 0.34g/t silver over an average width of 6.9 m. The mineralization is mainly smithsonite and appears to lie parallel to the bedding which dips 50-60 degrees west and strikes due north.

The zone was tested by 10 diamond drill holes at mainly 50 to 100 m centres. These holes indicated significant sphalerite-smithsonite mineralization and strong silicification and dolomitization to occur over a 500 m strike-length and a vertical range of 100 m plus. The best intersection was 14.6% zinc over a core length of 2.15 m in hole 4. Other better intersections included 13.11% zinc over a 3.37 m core length in hole 1 and 7.96% zinc over a 4.58 m core length in hole 2. The drilling indicated the mineralization to be less uniform than that at the Mel, to be accompanied by more intense alteration and to occur over a thicker stratigraphic interval. The Jeri mineralization may be part of a feeder zone that cuts the stratigraphy, as opposed to the Mel, which is clearly conformable with bedding. Additional drilling is required to determine the extent of mineralization at Jeri.

MEL-EAST SHOWINGS

The Mel-East showings are located 7.3 km northeast of the Mel and 2.7 km northeast of the Jeri showings. They occur at the same horizon as the Mel and Jeri mineralization and closely resemble the Jeri showings. Fine to coarse smithsonite blebs occur erratically along a 170 m strike length at the top of the cryptograined limestone unit accompanied by dolomitization and silicification. Rock exposure is poor and the width of mineralization is unknown, but may exceed 3 m. Three grab samples of the best mineralization averaged 8.6% zinc, less than 0.1% lead with very minor barium and silver.

GEOCHEMISTRY

Soil samples from the "B" horizon were strongly anomalous in zinc and lead near the Mel deposit and the Jeri and Mel-East showings. Additional soil sampling is recommended near the Jeri area to test soil covered areas which may overly mineralization.

GEOPHYSICS

The Mel deposit is not a good geophysical target. Gravity and induced polarization surveys were carried out to obtain model responses over the deposit. Weak induced polarization anomalies were located which appeared to reflect pyrite and galena mineralization. As well, weak gravity anomalies were located over barite mineralization. Similar anomalies were also found well south of the known mineralization, but subsequent drilling to test these targets failed to intersect mineralization. Further geophysical surveys are not recommended.

GEOLOGICAL RESERVES

The term "geological reserves" is used here to denote mineralization which has not yet been proven to be economic to mine. While the writer was employed by St. Joseph Explorations and later by Novamin Resources, several estimates of geological reserves were calculated. The following table is based on those calculations.

The reserves were calculated on vertical cross-sections and each drill hole intersection was weighted by specific gravity, a dip-length and a strike-length. Because the drill holes are widely spaced, particularly at depth, additional drilling is required to firm-up this initial estimate. With respect to Figure 6, holes 6, 23, 29, 18, 28, 16(1) and 11 have been omitted from the following calculation because of low grades or narrow widths. It also should be noted that the zinc grade could be improved marginally by leaving out some low grade, fringe mineralization.

GEOLOGICAL RESERVE CALCULATION

T.W.= TRUE WIDTH
 S.L.= STRIKE-LENGTH
 D.L.= DIP-LENGTH
 S.G.= SPECIFIC GRAVITY

<u>SECTION</u>	<u>HOLE</u>	<u>T.W.</u> <u>(m)</u>	<u>S.L.</u> <u>(m)</u>	<u>D.L.</u> <u>(m)</u>	<u>S.G.</u>	<u>TONNES</u>	<u>%Zn</u>	<u>%Pb</u>	<u>%BaSO4</u>
97+90N	5	2.87	111.0	70.0	4.12	91,876	8.53	1.44	65.6
97+90N	8	3.97	111.0	102.0	4.07	182,940	7.00	1.86	63.2
97+90N	21	2.46	72.5	124.0	3.23	71,433	13.50	0.84	13.7
97+90N	22	2.00	72.5	100.0	3.06	44,371	5.77	2.75	0.1
98+59N	25	2.84	69.0	225.0	3.28	144,618	3.82	1.67	24.3
98+59N	24	6.51	69.0	233.0	3.41	356,895	4.46	1.41	31.8
98+59N	26	6.67	112.5	157.5	3.98	470,373	10.80	0.02	59.0
99+28N	4	9.13	73.5	94.0	3.73	235,285	6.10	1.11	48.3
99+28N	13	11.54	73.5	88.0	4.05	302,295	4.91	2.05	63.8
99+28N	17	8.98	73.5	75.0	4.11	203,454	6.63	2.97	62.7
99+28	*	5.56	50.0	70.0	3.54	68,888	8.52	0.76	36.7
100+06N	14	20.89	79.5	83.0	3.98	548,614	5.17	0.52	64.6
100+06N	2	12.81	79.5	52.0	4.05	214,474	4.85	2.13	63.1
100+06N	12	16.10	79.5	110.0	4.30	605,416	4.14	1.96	78.6
100+06N	20	10.24	79.5	130.0	3.69	390,514	4.34	4.60	37.1
100+06N	27	5.16	112.5	124.0	3.17	228,183	19.72	2.08	0.1
100+87N	1	8.86	104.5	68.0	4.09	257,503	5.34	2.21	65.0
100+87N	9	10.58	104.5	119.0	3.83	503,904	3.17	2.20	53.3
100+87N	15	7.27	104.5	105.0	3.51	279,993	13.46	1.69	25.5
100+87N	19	2.61	104.5	81.0	3.31	73,126	7.76	7.86	3.1
102+15N	16	4.84	128.0	40.0	3.97	98,380	4.44	4.44	48.6
102+15N	7	4.42	128.0	62.0	4.00	140,308	9.00	2.87	54.5
102+15N	10	2.37	128.0	148.0	3.89	174,650	8.96	1.35	53.0
Weighted		9.76				5,687,493	6.77	1.92	51.1
Averages		-----				-----	-----	-----	-----

or 6,269,324 short tons

* Average of holes 18, 24, 26, 27 and 29.

Within this reserve is a higher grade portion, equivalent to the mineralization grading over 8.5% combined zinc-lead shown on Figure 7. This reserve is estimated at 2,449,601 tonnes grading



ELEVATION (METRES)
900

800

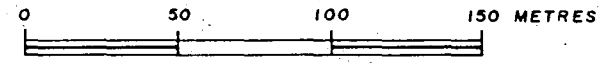
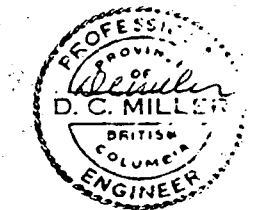
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600

500

LEGEND

- Existing diamond drill hole
- Proposed diamond drill hole
- ◐ Zones greater than 8.5% combined zinc-lead, over 2m thick
- [A, B] Blocks of near-surface, better grade mineralization
- C Potential open pit



BARYTEX RESOURCES CORP. MEL DEPOSIT		
LONGITUDINAL SECTION PROPOSED DRILLING AND GRADE DISTRIBUTION		
DRAWN BY DCM	NTS. 95D/6	FIGURE 7
REPORT DATE SEPT. 19, 1989	PROJECT NO. 8955	
D.C. MILLER GEOLOGICAL SERVICES		

9.60 % zinc, 2.31% lead and 41.8% barite over a weighted average true width of 6.18 m. This reserve is calculated from the weighted average of holes 5, 8, 7, 10, 15, 16(u), 17, 19, 20, 21, 22, 26 and 27 in the preceding table.

Similarly, within this higher grade reserve, is an estimated 1,438,066 tonnes grading 12.31% zinc, 1.55% lead and 36.9% barite over a weighted average true width of 5.39 m. This reserve has been calculated from the weighted average of holes 7, 10, 15, 19, 21, 26 and 27 in the preceding table.

With respect to near surface mineralization, 3 potential mining blocks are shown on Figure 7. Block A is estimated to contain 326,000 tonnes grading 8.67% zinc, 1.57% lead and 49.8% barite over a weighted average true width of 3.55 m. Block B is estimated to contain 1,445,500 tonnes grading 6.63% zinc, 1.97% lead and 53.1% barite over a weighted average true width of 10.46 m. Block C, potential open pit, is estimated to contain 500,000 tons grading 5.54% zinc, 2.43% lead and 62.2% barite over a weighted average true width of 9.38 m. With 50 degree pit walls, the waste to ore ratio is estimated at 4.7:1.

METALLURGICAL TESTING

Preliminary metallurgical testing was carried out by Lakefield Research on sections of mineralized drill core. The average calculated head grade was 2.30% lead, 4.80% zinc and 51.6% barite. After grinding to -100 mesh, the mineralization responded well to flotation and yielded concentrates ranging from 60.9 to 64.7% zinc, 78.0 to 79.6% lead and 90.8 to 94.4% barite with recoveries of 90.3 to 96.2% for zinc, 97.7 to 98.0% for lead and 88 to 90.9% for barite. A later large scale test was done to produce barite concentrate for market evaluation. Concentrate grading 95.1% barite with a recovery of 92.6% was produced from 12 kg of feed grading 53.5% barite.

ESTIMATED NET SMELTER RETURN

The net smelter return (NSR) is defined as the gross value of recoverable metals and commodities minus transportation and smelting charges. For higher grade mineralization at the Mel (shaded portion of Figure 7: 2,518,489 tonnes grading 9.57% zinc, 2.27% lead and 41.8% barite) the net smelter return per ton mined was estimated from current Cominco smelter schedules for zinc and lead allowing 10% for mining dilution, 93% zinc recovery and 97% lead recovery. Concentrate grades used were 62.8% for zinc and 78.8% for lead. Transportation costs were estimated at \$110 per dry tonne for zinc and lead concentrates. The zinc and lead prices used are \$0.92 and \$0.42 Can. per lb. On this basis, an NSR of about \$75 per tonne is indicated for lead and zinc in the higher grade portion of the deposit compared with combined gross metal values of \$180.81 per tonne. In this estimate, no allowances have been made for other possible penalties or credits which may apply. These can only be determined by detailed metallurgical testing and trial concentrate shipments.

For barite, no NSR been estimated because it is presently unknown how much of the barite can be sold. Barite is viewed as a by-product which may provide additional revenue if a market can be established. The location of the Mel property in relation to northern oil and gas exploration areas may provide a competitive advantage over barite supplies shipped from more southerly locations. Once it is demonstrated that the Mel property has a large stockpile of barite and could be a reliable supplier, an entry into the barite market should be possible.

On the basis of NSR analysis, the higher grade portion of the Mel deposit, including some 2.5 million tonnes grading 9.57% zinc, 2.27% lead and 41.8% barite, is thought to compare favourably with other potentially economic zinc deposits at an advanced exploration stage.

EXPLORATION POTENTIAL

It is the writer's opinion that the Mel deposit and the Jeri and Mel-East showings are geologically related and that much of the ground between these occurrences is relatively unexplored. At the present time the Mel deposit is a potential producer which requires closer spaced diamond drilling, bulk sampling, metallurgical testing and feasibility studies. Additional geological and geochemical work and diamond drilling are required to assess the potential of the Jeri and Mel-East areas.

CONCLUSIONS

- 1) The Mel property was first staked in 1967 and since that time has been explored by geological, geochemical and geophysical surveys, trenching and diamond drilling in several programs spanning 20 years. Each program has contributed positive results.
- 2) Diamond drilling and trenching have indicated the Mel deposit to be remarkably continuous and potentially economic to mine.
- 3) In addition, 2 other areas with zinc-lead mineralization have been discovered on the property, at or near the same stratigraphic level as the Mel deposit, but are located 4.5 to 7.3 km to the northeast. Further work is required to assess these areas.
- 4) Infrastructure in the area has been improved with the construction of an airstrip and a winter road. Drilling or bulk sampling can be done in either winter or in summer months on a cost effective basis.

RECOMMENDATIONS

A) Mel Deposit:

- 1) Diamond drilling is required to fill in between present wide-spaced holes near surface and at depth. Surface stripping of shallow overburden areas over the deposit should be done to allow additional sampling and mapping of the surface of the deposit.
- 2) Rejects from diamond drill hole intersections should be used for metallurgical test work.
- 3) Following drilling, a pre-feasibility study should be completed to determine the course of further work.
- 4) With encouraging results, underground bulk sampling should be done to confirm the continuity of mineralization and to assess rock characteristics. Further metallurgical testing, and a final feasibility study would commence at this time.

B) Jeri Area:

- 1) Carry out geological mapping, prospecting and soil geochemical surveys.
- 2) Conduct diamond drilling to further test the Jeri Showings as well as new targets indicated by the preceding surveys.

C) Mel-East:

- 1) Additional work at this stage would depend on favourable results from the Jeri showings which are better grade, more widespread and more easily accessed.

ESTIMATED COST

Phase 1

Mel deposit:

Stripping, geological mapping, and drill site preparation using John Deere 350 Cat. located at property, estimated all in cost.....\$ 20,000
BQ diamond drilling, 2000 m @ \$130/m all in cost..... 260,000

Jeri showings:

Geological and geochemical surveys, drill site preparation, estimated all in cost..... 15,000
BQ diamond drilling, 1000 m @ \$140/m all in cost..... 140,000

Total Phase 1 costs \$ 435,000

Phase 2

Mel deposit, (contingent on favourable Phase 1 results):

NQ diamond drilling, deep wedged holes, 3800 m @ \$160/m all in cost.....\$ 608,000
Metallurgical testing, geotechnical and pre-feasibility studies, allow..... 92,000

Total Phase 2 costs \$ 700,000

Phase 3

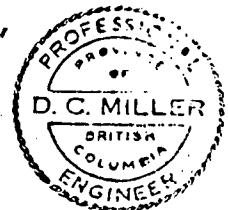
Contingent on favourable results from Phase 2, work should include sufficient underground work to determine ground conditions and to allow bulk sampling to confirm grade estimates from drill holes and to provide further material for metallurgical and marketing studies. A project feasibility study should commence following this work.

Preliminary cost estimate- Phase 3.....\$1,000,000

Respectfully submitted,

D.C. Miller

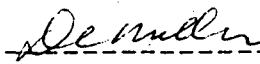
D.C. Miller, P. Eng.
September 19, 1989



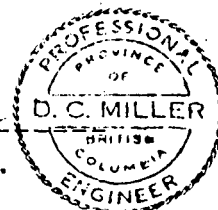
CERTIFICATE

I, David C. Miller, certify that:

- 1) I am a consulting Geological Engineer with an office at 769 Fraser Street, Kamloops, B.C. V2C 3H1.
- 2) I am a graduate of the University of British Columbia and earned a B.A.Sc. Degree in Geological Engineering in 1959.
- 3) I am a member of the Association of Professional Engineers of B.C. and a fellow of the Geological Association of Canada.
- 4) I have practiced my profession for over 25 years.
- 5) This report is based on a study of technical data and previous work on the property where I supervised exploration work during 1977 to 1987.
- 6) I have no direct interest in this property nor in the securities of Barytex Resources Corp. or Breakwater Resources Ltd.



D.C. Miller, P. Eng.



September 19, 1989

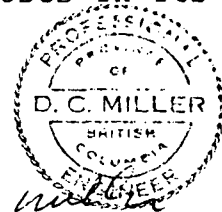
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- Wilkinson, W.J., 1975: Report on Empire Metals Option (Otter Lake) Diamond Drill Program, March - April 1975, for the Granby Mining Company Ltd.
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USE OF REPORT

Re: Report on the Mel Property by D.C. Miller, P.Eng, dated September 19, 1989:

Permission is hereby granted to use this report in a Prospectus or Statement of Material Facts or for other purposes in its entire unedited form.



D.C. Miller

D.C. Miller, P. Eng.

September 19, 1989



SANDWELL SWAN WOOSTER INC.

700-1190 Hornby Street, Vancouver, B.C., Canada V6Z 2H6 • Tel: (604) 684-9311 • Telex: 04-51275 • Telefax: (604) 688-5913
31 October 1989

Barytex Resources Corp.
305 - 535 Thurlow Street
Vancouver, B.C.
V6E 3C2

Attention: Mr. H.S. Aikins

Subject: MEL Property Prefeasibility Report

Dear Sir:

The following document represents an interim prefeasibility study for the above property aimed at supporting short-term financing. Such financing is intended to extend the exploration drilling program into further delineation of ore reserves and grade.

The document is based on preliminary drill results, metallurgical test results, discussions with Barytex and various associates and site observations by the SSW team. The data review, conceptual design, schedule and budget are cursory in nature and represent the results of good practice and experience as opposed to "hard" data. Where possible, given time constraints, "good" dollar figures have been used resulting from consultation with vendors, suppliers, contractors and consultants. Selection of the most efficient and cost effective method of electrical generation proved very difficult and may be subject to conceptual change with further study. For the purposes of this study diesel fired generation was used.

The concept of wood burning/diesel co-generation was investigated but found to be too capital cost intensive without some form of government participation which may be investigated.

The barite market may present a problem in the short-term. Although there is hope for the long-term as outlined in section 10.0, Marketing.

SSW recommend the marketing area be extensively researched in the feasibility study.

Ore crushing, grinding, flotation and recovery testing to-date indicates no untoward difficulties and lower than normal operating costs due to the "softer" nature of the run-of-mine material. The question of contained mercury will have to be addressed.

Having weighed all factors with the potential for presenting a "fatal flaw" in further property preproduction development, the SSW team unequivocally recommend that further ore body delineative drilling be carried out.



SANDWELL SWAN WOOSTER INC.

112220, Mr. H.S. Aikins, 31 October 1989

SSW are grateful to Barytex Resources for the opportunity to participate in this exciting development and look forward to a continued good working relationship.

Yours truly,

SANDWELL SWAN WOOSTER INC.

G.W. Morris, P. Eng.
Director, General Engineering

GWM/df



PROJECT 112220
PREFEASIBILITY STUDY
LEAD, ZINC, BARITE MINE

BARYTEX RESOURCES CORP.
WATSON LAKE, YUKON
DATE 31 OCTOBER 1989

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PROJECT 112220
PREFEASIBILITY STUDY
LEAD, ZINC, BARITE MINE

BARYTEX RESOURCES CORP.
WATSON LAKE, YUKON
DATE 31 OCTOBER 1989

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DRWG. NO.

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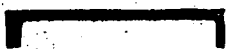
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BARYTEX RESOURCES CORP.

Proposed Lead, Zinc & Barite Mine - Yukon

PROJECT 112220
OCTOBER 1989
 **SANDWELL SWAN WOOSTER INC.**



PROJECT 112220
PREFEASIBILITY STUDY
LEAD, ZINC, BARITE MINE

BARYTEX RESOURCES CORP.
WATSON LAKE, YUKON
DATE 31 OCTOBER 1989

EXECUTIVE SUMMARY

The MEL Property is a potential zinc, lead, barite mine located north east of Watson Lake in Canada's Yukon Territory and within 50 km of the Alaska Highway.

Development to-date has been exploration drilling into ore body delineation, basic metallurgical testing, mining/milling concepts and preliminary market analysis.

The potential ROI before tax is approximately 43%. The preliminary cash flow is based on mining high grade ore early in the project life and later mining from ore zones that have a higher grade than currently indicated - both appear achievable. At full production the mill would ship almost 100,000 tonnes per year of lead-zinc concentrate.

The prefeasibility study indicates pre-production capital requirements:

Mine Facility Costs:

General	\$	3,700,000
Ore handling, crushing and screening		4,500,000
Process plant		12,700,000
Ancillary facilities		7,100,000
Indirects		<u>7,600,000</u>
Sub-total Mine Facilities	\$	35,600,000

Pre-production Costs:

Owner's costs	\$	1,500,000
Headframe/hoist/underground equipment		4,100,000
Pre-production underground		<u>5,400,000</u>
Sub-total Pre-production	\$	11,000,000
Working Capital		<u>3,200,000</u>

TOTAL PRE-PRODUCTION \$ 49,800,000



The deposit was tested with 29 drill holes with depths to 490 m. Mineralization is largely confined to the cryptograined limestone, but also extends into the overlying slate-shale unit. This work has indicated a stratiform, folded, bin shaped deposit up to 21.7 m thick at its centre, which gradually thins towards both ends over a strike length of 800 m.

The estimated mineable reserves are approximately 5 million tonnes of ore grading 6.16% zinc, 1.75% lead and 46.5% barite. Production at 1,500 tonnes/day is contemplated from initially an open pit mine and subsequent underground mine using Vertical Crater Retreat (VCR) stoping and Alimak narrow vein stoping methods. The underground mine is accessed by a 565 m vertical shaft developed in two stages in order to reduce front end capital costs and improve underground operating costs. Initial mining would be from ore grading 9.78% zinc, 2.27% lead and 32.4% barite. Remaining reserves must be improved to this quality to achieve the potential ROI.

Lead and zinc concentrates could be shipped to a smelter such as Trail, B.C. (Cominco) and the barite initially sold to markets through Edmonton, Calgary, and Medicine Hat. The client's objective will be to produce some 90,000 tons per year of 62% zinc concentrates, 15,000 tpy of 78% lead concentrates and 20,000 tonnes per year of bagged barite.

Currently all significant production of zinc concentrates is shipped to overseas markets through the ice free part of Skagway.

The projected construction period is of nineteen months duration and is seen to present no insurmountable problems neither in a technical nor permitting sense.



PROJECT 112220
PREFEASIBILITY STUDY
LEAD, ZINC, BARITE MINE

BARYTEX RESOURCES CORP.
WATSON LAKE, YUKON
DATE 31 OCTOBER 1989

1.0 INTRODUCTION

Barytex Resources Corp. (BRC) are in the process of preproduction development of a proposed 1,500 tonnes per day lead, zinc and barite mine on their MEL Property near Watson Lake, Yukon.

The property is located to the north east of Watson Lake. Access to the property is by a 50 km. haul road leaving the Alaska Highway approximately 82 km. east of Watson Lake (refer to location map).

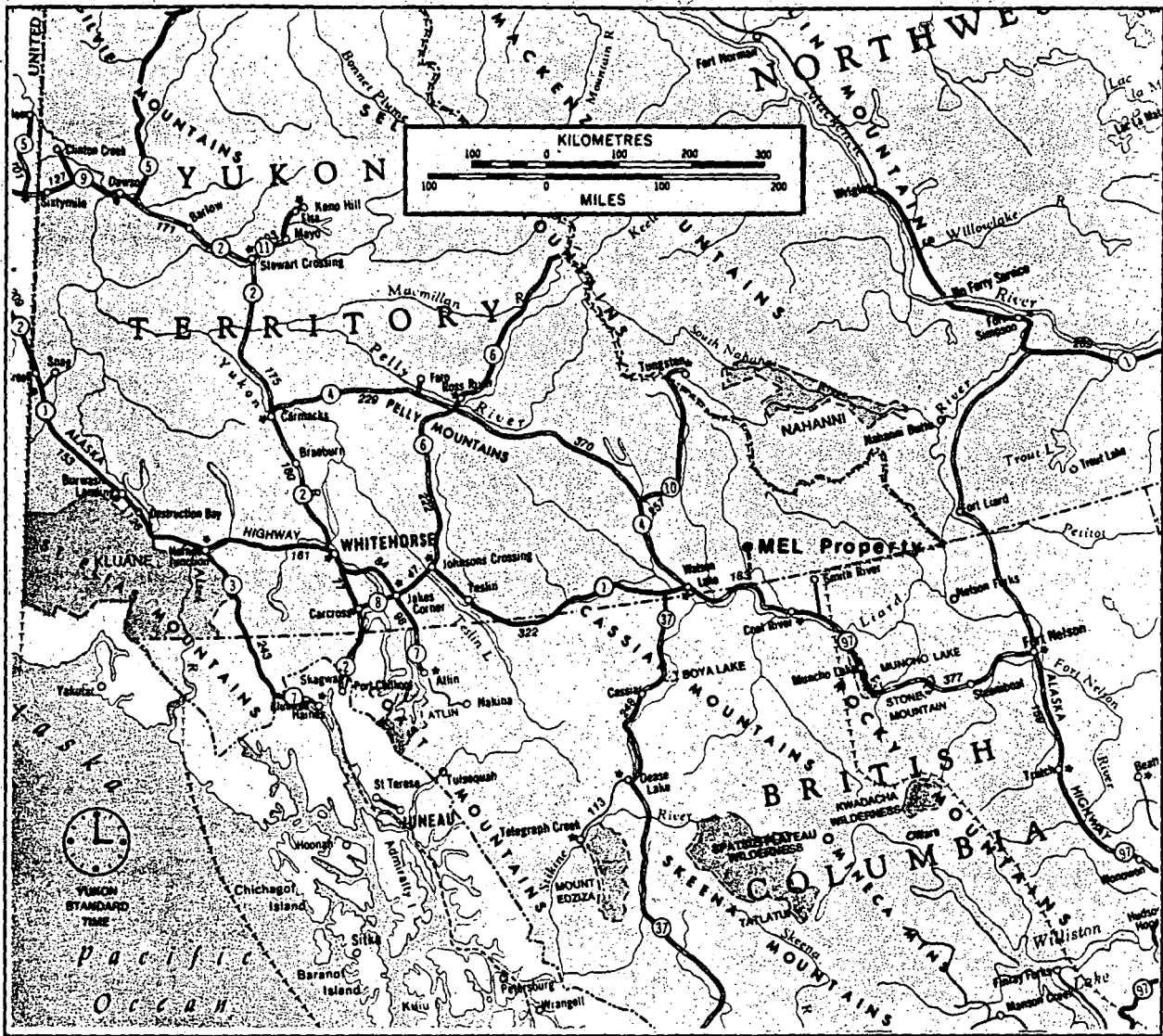
Sandwell Swan Wooster Inc. (SSW) has been retained by Barytex Resources Corp. to review all reports and information available to-date, provide a three man field investigation team and produce an interim prefeasibility report.

This prefeasibility report has been prepared in conjunction with:

Mr. G.W. Hawthorn,
West Coast Mineral Testing Inc.

Mr. B. Millar,
Industrial Mineral Consultants Ltd.

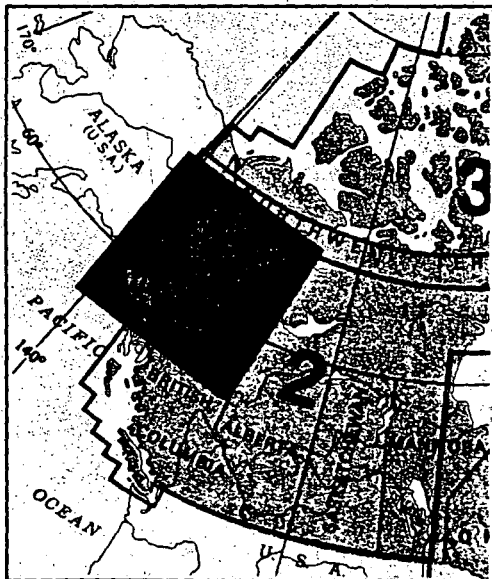
Mr. N. Krpan,
Norswego Ltd.



INDEX MAP

Area Covered

Yukon and Northern B.C.



LOCATION MAP

Watson Lake Mining District, Yukon

Distances from Mel Property

- Watson Lake 80 km (Air)
- Alaska Hwy 50 km (Winter Rd.)
- Fort Nelson 507 km - Railhead
- Skagway 666 km - Tidewater

BARYTEX RESOURCES CORP.

**MEL PROPERTY
LOCATION & ACCESS**

DRAWN BY DCM	NTS 95D/6	FIGURE 1
REPORT DATE	PROJECT NO. 8955	

D. C. MILLER GEOLOGICAL SERVICES



2.0 SCOPE OF WORK

The scope of work included in the prefeasibility study is generally as follows:

Gather all existing field data and review. Review client's planning to-date regarding plant layouts, access, infrastructure, survey monuments, drill hole locations, aggregate/fill sources, and mine planning.

On site a three man team, with client and Pamicon participation, will review the access route, examine the various power generation schemes, aggregate/fill sources, timber sources, logging questions, mine surface facilities, mine adit location(s), glory hole option configuration(s), mine waste dump locations, mill layout, ancillary facilities layout, water source tailings handling and disposal scheme(s), further fill in drilling, bulk sampling locations, further exploration drilling, explosives magazine location, construction camp location, servicing, reticulation, sewage disposal and communication support facilities.

During the field visit, general aspects of permitting will be reviewed including monitoring through to operations. Permitting procedures to be reviewed but not necessarily limited to, will be; environmental permits for water usage, emissions to atmosphere, site drainage, fisheries, effluent disposal, sewage disposal, leachate control and monitoring, stripping of soils, meet with Yukon Parks Department and decide on parameters for an environmental impact statement.



3.0 DATA BASE AND BASES OF CONCEPTUAL ESTIMATE

Data used in developing the prefeasibility report was sourced from the following:

- Geologist's report entitled "Report on the MEL Property" by D.C. Miller, P. Eng., dated 19 September 1989.
- Report Entitled "Rock River Coal Basin" author unknown.
- Geological maps, (surface maps 10m contours) drill hole listings and mineral grades provided by Barytex Resources Corporation.
- Field visit 10 - 13 October provided opportunity for site inspection, discussion with geologist and inspecting drill core.
- Environmental report for the MEL Property access road by Gartner Lee Associates Ltd.
- Lakefield Research Metallurgical Testing Report.

Capital cost estimates are based on budget quotes from equipment suppliers and development contractors as well as in-house SSW expertise. Consultant's experience from previous mining studies and operations was used to develop operating cost estimates to a prefeasibility level of accuracy. Used mine equipment prices were considered and used to minimize capital expenditures.

4.0 GEOLOGY

Details concerning property geology and ongoing exploration strategy were discussed with D.C. Miller, Consulting Geologist for Barytex Resources Corp., during the 10 to 13 October site visit. Key geological descriptions in this section were reproduced from the "Report on the MEL Property" by D.C. Miller, P. Eng., June, 1989.

Mineralization is largely confined to the cryptograined limestone, but also locally extends into the overlying slate-shale unit. The deposit is essentially stratiform with good continuity and is lens shaped and up to 21.7 m thick at its centre. The deposit tapers gradually towards both ends over a strike-length of 800 m. To-date, drilling has intersected mineralization to a vertical depth of 490 m and the deposit is open at depth. Mineralization strikes nearly north-south and dips about 55 degrees westward at surface. The deposit steepens to vertical at a depth of 100 m and then reverses dip to the east averaging 35 degrees over a 50 m vertical interval. The dip then steepens to 60 to 80 degrees eastward.

Drilling to a depth of 490 m has indicated a geological reserve of 5,687,493 tonnes (6,269,324 short tonnes) grading 6.77% zinc, 1.92% lead and 51.1% barite. The mineralization is zoned and the best zinc grades occur outward from the centre of the deposit near surface. At depth, zinc grades are strong in two of the deepest holes (26 and 27) which average 14.69% zinc, 0.92% lead and 33.3% barite over an average true width of 5.92 m.

Economic minerals include sphalerite, galena and barite with trace amounts of chalcopyrite, covellite and tetrahedrite. Gangue minerals include pyrite, quartz, calcite, and sericite. The sericite forms from the alteration of brown mudstone clasts which occur in the cryptograined limestone.

Sphalerite is nearly iron free and ranges in color from brown to honey-colored. It is associated with barite, quartz and mudstone clasts. It occurs as relatively coarse grained blebs ranging in size from less than 1 mm up to 2 cm.



Galena occurs mainly as veinlets cutting quartz, barite and sphalerite and is interstitial to these minerals. The grain size of galena is variable, but it is generally finer than that of sphalerite.

Barite is mainly coarse grained and relatively pure. It also occurs to a minor extent in late veinlets associated with quartz and calcite.

The pyrite content is about 2% and it is mainly fine grained. It occurs as disseminations in mudstone casts and cherty quartz and as veinlets cutting other sulphides, along grain boundaries and in wall rocks.

Mineral zoning is evident and the distribution of the highest grade combined zinc and lead (Drawing 4-1). Barite is thickest and purest in the central part of the deposit. With respect to stratigraphic level within the deposit, sphalerite content is generally highest in the lower to middle parts of the deposit. Galena is more erratically distributed and favours the mid to upper stratigraphic levels.

To-date the deposit has been tested with 29 holes. With consideration to grade and thickness, the best hole is No. 27 which intersected 19.72% zinc and 2.08% lead over a true width of 5.16 m at a vertical depth of 370 m below surface.

5.0 MINING

5.1 Introduction

The proposed mining sequence allows for commencing production by low cost open pit mining methods and deferring capital investment for underground development. This is accomplished by scheduling mine development and production in three phases and utilizing contractors. The three phases are briefly described below.

<u>Phase</u>	<u>Mining Method</u>	<u>Work Force</u>	<u>Ore Tonnage</u>
1	Open pit	Contractor	812,000
2	Underground (above 660 m elev): Vertical Crater Retreat Alimak Horizontal Drilling	Owner Contractor	2,504,000
3	Underground (360 m to 660 m elev): Vertical Crater Retreat Alimak Horizontal Drilling	Owner Contractor	1,690,000

The use of contractors for surface mining eliminates the need for purchase of open pit equipment. Underground development in two phases defers some capital expenditure as shaft completion can be delayed until year 6 of the project.

5.2 Mineable Reserves

The mineable reserves are based on previous studies and calculations as per the D.C. Miller June, 1989 report on the MEL Property. This report states that drilling to a depth of 490 metres has indicated a geological reserve of 5,687,493 tonnes grading 6.77% zinc, 1.92% lead and 51.1% barite.

The average grade of high grade ore zones (weighted average from holes 5, 7, 10, 15, 19, and 21 in the upper half of the mine indicates potential ore (at 10% dilution), grading 9.78% zinc, 2.27% lead and 32.36% barite. Further drilling and mine planning is required



to confirm the mineable tonnage and grade of these ore blocks. For purposes of preliminary study it is assumed that about 1.3 m tonnes could be produced at this grade during the first three (3) years.

The remaining tonnage is approximately 3.7 million tonnes at grades 4.53% zinc, 1.56% lead and 51.5% barite. Further drilling is required to encompass higher grade zones so that remaining tonnage grade can be improved to an overall average of 9.78% zinc and 2.27% lead.

For purposes of preliminary mining evaluation the following assumptions were made to convert indicated reserves to indicated mineable reserves:

Geological Reserves	5,687,000 tonnes		
Losses 20%	1,137,000 tonnes		
Dilution 10%	455,000 tonnes		
Mineable reserves	5,006,000 tonnes		
	grade 6.16% zinc	*(9.78% zinc)	
	1.75% lead	(2.27% lead)	
	46.5% barite	(32.4% barite)	

*Assumed grade improvement after detailed drilling completed.

5.3 Open Pit

The open pit located as shown in Drawing 5-1 is expected to produce 812,000 tonnes of ore and requires stripping of 1,600,000 cubic metres of waste rock. Overall stripping ratio is about two (2) cubic metres waste per tonne of ore. Near surface ore as identified by No. 1 drill hole, will allow early production and stockpiling of from the pit. Haulage distances are extremely short, 300 metres from pit exit to the waste dump and a similar distance to the ore stockpile location.



Preliminary pit plans assume 7.5 metre benches, 50 degree wall slopes and pit floor elevation at 830 metres. More detailed geotechnical and hydrogeological studies are required to confirm this planning criteria. The pit highwall will vary from 45 metres at 9900N to approximately 85 metres at 10250N.

The contractor will mine the pit and deliver crushed ore (4" minus) to the secondary crushing feed conveyor using small scale quarrying-construction type equipment.

5.4 Underground Development

Access for underground mining consists of a 20' by 9' vertical 4 compartment timbered shaft (for preliminary assessment located at 9950N, 10150E) initially developed 270 metres for production from the 660 m elevation and subsequently (year 6) deepened 295 metres for production from levels between 660 m and 360 m elevation. Further studies are required to optimize the shaft location e.g. a shaft situated south of the proposed location in the F.W. could eliminate the first leg of the overland conveyor, however, this would result in somewhat higher underground haulage costs as the shaft moves further from the ore body's centre of gravity.

A 300 metre ramp is also proposed to access high grade ore in the pit highwall at 10250N. The north ramp driven from a pit bench at 900 m elevation will provide early access to supplement pit ore with high grade ore from Alimak horizontal drill stopes. Main x-cuts, stope access and draw point drifts 4.3 m wide by 3.7 m high driven by scooptram provide access from the shaft to the ore zones. Ore passes 3 m diameter and vent raises 4.3 m diameter are developed by raise borer by Alimak. Crushing and pump stations are developed for the 660 m and 360 m elevations. It is assumed that contractors will be involved in most of the rock work development.

Drawing 5-2 and Drawing 5-3 illustrate schematically a cross section of the shaft and a typical level plan. The schedule for underground rock development is shown in Table 5-1.



5.5 Underground Mine

Vertical Crater Retreat (VCR) mining is proposed for wide (greater than 7 metres) and steep sections (greater than 65 degrees) of the ore body and raise stoping (Alimak) with horizontal drilling for the narrower ore sections. Ore located on folds flatter than 50 degrees will require other development and production techniques e.g. ramp access and short up-hole drilling. Delayed stope filling, using mill tailings and/or pit rock is planned for the project. Future detailed studies incorporating rock mechanic principals will establish stoping parameters and fill procedures.

The height of stopes for VCR and raise stoping will be a maximum of 100 metres but will vary down to 50 metres or less depending upon ore body configuration.

A typical level plan is shown in Drawing 5-3. Footwall drifts and short cross-cuts provide access to the ore zone which is slashed out at the production level. Draw points are established from the footwall drift and also at each end of the stope. A sill level for drilling is established at the top of the stope by ramping down from the upper level. Raise stopes using Alimak raises and horizontal blast hole drilling are established at the north and south ore extremities where ore sections narrows to less than 7 metre.

It is assumed that more than 75% of the underground ore can be mined by VCR methods. Average productivity for the underground mine, including labour, supervision and technical services is estimated at 15 tonnes per man shift.

5.6 Mine Equipment

The following is a list of expected mine equipment required for underground mining:

Hoist and Facilities:

Shaft	20' x 9' 4 compartments
Hoist	cage-skip combination



Headframe	steel construction with ore bin
Skip-cage	7 tonne skip 15 man cage
Loading Station	double compartment
Compressors	2 - 5,000 CFM
<u>Underground Equipment:</u>	
Crusher	1 - 30" x 42" jaw crusher (year 2)
Pumps	2 - 500 USGPM @ 1,000 ft. head pumps at each main pump level (i.e. at 660 m level and 360 m level)
Fans	1 - fresh air fan, 84", 250HP, 200,000 CFM 2 - booster fans, 48", 50 HP, 50,000 CFM 8 - auxiliary fans various sizes
Air Heater	2 air heaters 15,000,000 BTU/hr capability
Mining Equipment	1 scooptram (8 c.y.) 5 scooptrams (5 c.y.) 1 teletram (10 c.y.) 1 3 boom jumbo 2 service-bolting trucks 2 VCR 6" drills



6.0 MILLING

The Coarse Ore (CO) Feed is presently foreseen as four (4) inch minus both from the open pit and underground operations. The CO will be suitably loaded onto fabric belt conveyors housed in nominally heated tube galleries. The eventual feed to a 24 hour surge storage bin will have magnetic tramp iron contamination protection. The CO will pass over a two deck scalping undersize vibrating screen into a four (4) foot shorthead cone crusher. The crusher underflow will circulate via scissor conveyors back over a single deck vibrating screen with its underflow going directly to the Fine Ore (FO) storage bin. The screen overflow is crushed again in the four foot cone. The FO storage will also be 24 hour (1,500 tonne) and feeds a sixteen (16) foot by twelve (12) foot diameter ball mill.

The ball mill discharge is pumped to a cyclone cluster where the oversize is recirculated via gravity to ball mill feed.

The underflow is fed by gravity to the first line of floatation roughers and cleaners where the lead is depressed and sends some 27 tpd to a thickener and then a disc drum filter. The floatation overflow goes to the zinc floatation line where some 94 tpd of zinc concentrate is sent for thickening and filtering. Both Zn and Pb concentrates will receive nominal drying through waste heat into rotary dryers to achieve moisture contents of ideally 7.5%. The remaining overflow is transferred to the barite floatation line of roughers and cleaners and subsequently to a thickener and drum filter for dewatering. The unfiltered portion of the barite will be stored in a separate, "clean" tailings area or contribute to mine backfill. The amount stored will be dictated by market conditions. The plant tailings will receive one stage of dewatering - thickener - and be transported via gravity to a tailings pond which will have water reclaim capability. The reclaimed water will be returned to a reclaim water head tank in the mill building.

The nominally dried lead and zinc filter cake concentrates will be, weighed, and loaded into containers for shipping.

The utilized barite portion will be filtered and the resulting filter cake kiln dried. The kiln will receive hot air from diesel generator waste heat regenerated by diesel fired combustion as required. The dryer discharge would then be fed to a seventy-three (73) inch Raymond mill which can produce thirty (30) tph of -325 mesh barite. The feed to the mill would be less than 4% moisture and ground in a waste warm air environment. The Raymond mill will be equipped with a double whizzer. The dried barite will be cooled, weighed, bagged, and palletized for shipping.

The system requires satisfactory dust collection.

6.1 Metallurgical Testing

Information obtained from the D.C. Miller June, 1989 report on the MEL Property represents the extent of testing to-date.

Preliminary metallurgical testing was carried out by Lakefield Research on sections of mineralized drill core. The average calculated head grade was 2.30% lead, 4.80% zinc and 51.6% barite. After grinding to -100 mesh, the mineralization responded well to floatation and yielded concentrates ranging from 60.9 to 64.7% zinc, 78.0 to 79.6% lead and 90.8 to 94.4% barite with recoveries of 90.3 to 96.2% for zinc, 97.7 to 98.0% for lead and 88 to 90.9% for barite. A later large scale test was done to produce barite concentrate for market evaluation. Concentrate grading 95.1% barite with a recovery of 92.6% was produced from 12 kg of feed grading 53.5% of barite.

6.2 Preliminary Flowsheet

A simplified flow sheet for recovery of zinc, lead and barite is shown in Drawing 6-1. Further study based on pilot scale test work will result in a more accurate assessment of process and equipment requirements. Optimization of the crushing arrangement and barite recovery circuit could improve overall capital and operating costs. There is also good potential for acquisition of a used plant for considerably lower cost than a new one.



The process shown on the flow sheet shown is expected to achieve concentrate quality as good or better than that obtained during the metallurgical test work.

6.3 Tailings Disposal

The plant tailings will emanate from the barite cleaners underflow and plant wash down. The slurry will receive one stage of thickening and will report via gravity pipeline to the tailings area. Initially the tailings dam(s) will be of nominal construction (starter dams) and will be raised as operations proceed with the tailings itself. Although there will be

sulphides in the tailings, the lime content of the ore will more than neutralize any possibility for generated acid. This combined with a relatively impermeable sub-base and the normal sealing action of the finely ground fraction of the tailings is seen to obviate the necessity for further artificial methods of sealing the dam or cutting off leachate ingress to the existing sub-surface water regime. To comply with good environmental protection practice however, a curtain of underground water monitoring wells will be installed to ensure leachate egress from the tailings area is within acceptable parameters. The well curtain will be so designed that they could serve as ground water intercept wells returning any contaminated ground water to the tailings impoundment area.

A water reclaim pump barge will be commissioned in the impoundment area. Reclaimed water as noted earlier will be pumped to a devoted tank in the concentrating complex where it will be mixed with filter(s) precipitate(s), raw water and reagents in a mill water regeneration sub-process.

As underground operations proceed, a good portion of the settled out tailings will be mechanically retrieved, suitably batched and pumped as backfill into the mine.

7.0 INFRASTRUCTURE

7.1 Road Access

Road access to the MEL Property is by a 50 km. haul road leaving the Alaska Highway heading north at approximately 82 kms east of Watson Lake.

The road traverses five creeks or drainage systems prior to reaching the Coal River where a major crossing will be required. At three crossings timber trestles are in place and at two other crossings no structures were in place but were traversed by fording. All crossings were inspected. Existing structures are in extremely poor condition and must be removed and replaced with new timber trestles conforming to and constructed in accordance with environmental guidelines. Waterway passages either side of the crossings must be cleared of detritus to ensure free flow of water. It is recommended that water courses at present traversed by fording are bridged by timber trestles to eliminate the possibility of blockage and consequent "glaciering" during winter.

The Coal River crossing is expected to be a single lane, steel bridge with approximately a 40 m single span. It is anticipated that the rock bluff to the south side will be the abutment and that a concrete abutment to the north will be constructed during the low water season. If this alignment proves viable then realignment of the south approach will be necessary and instead of the road descending to the flats, it will remain at the same elevation as the bridge.

Re-alignment to the north joining the existing road will be necessary but is not considered a problem. In general, the road alignment cannot be faulted although in a few instances re-alignment may be beneficial to either straighten or reduce some steeper grades.

The road is generally in good granular material and drains well except in one area between 8 km. and 10 km. This crossing should be either trestled or culverted and cleaned out on both sides of the crossing to ensure a proper flow of water. The above is a minimum



requirement for a construction road except for any minor re-alignment which can be carried out prior to production hauling.

For production hauling we recommend truck passes be constructed every 5 kms so that product haulage will not be compromised with other traffic when the construction road is upgraded to an all weather production road.

7.2 Power Supply

Several power supply options were briefly reviewed and none of the options for power generation were conclusive for various reasons but further investigation and study is recommended.

- a) Mouth-of-Mine Coal Fired Generation
Capital cost transmission distance, emissions to atmosphere, permitting.

During the formal feasibility study the coal ore body will be re-investigated as the potential for such as installation is very real.

- b) Run-of-River hydro power generation (3 locations)
Dam would be required, capital cost transmission distance, permitting.

This option will also be reconsidered as there is ample water flow in either of two rivers.

- c) Wood Burning/Diesel Co-generation
Capital cost, emissions to atmosphere, permitting.

This option is capital intensive but the vast amount of scorched trees makes the concept attractive.

The preferred option at this stage in lieu of government participation is diesel fired power generation. The waste heat from the generator(s) would be used for facilities heating, process heat requirements and preheating of mine ventilation air.

7.3 Mine Facilities

Mine facilities required for open pit operations will generally be provided by the open pit contractor and included in the contract mining cost estimate. Water, fuels and major shop repairs will be available from OWNER provided facilities.

Facilities for underground mining include the following:

Hoist and Headframe:

- Hoist and compressor building.
- Headframe.

Mine Facilities:

- Office, dry, mine engineering complex (to accommodate 100 underground and 31 mill employees).
- Fan and air heater building.
- Electrical substation.
- Pump discharge line.
- Fresh water supply.
- Fire protection system.

7.4 Housing

As the MEL Property is in a remote location, it is planned to initially provide a 320 man camp, including commissary and recreational facilities, for construction workers, mine development workers and mine operating personnel.

On completion of construction the camp size will be reduced to a 150 - 160 man camp for use by mine development and operating personnel. Mining personnel on single status will be provided accommodation at the mine site, married personnel will be accommodated



in Watson Lake. Watson Lake is a community of approximately 1,500 persons with excellent recreational and educational facilities. The town has a number of serviced lots available and should the mine go ahead, it is suggested that Barytex consider taking options on some 20 - 30 of these lots and make an interest free loan to qualified personnel so as to encourage construction of their own homes.

The attraction will be that the operating company provides interest free loans to prospective home owners which are intended to support;

- a) House purchase, or
- b) House building, or
- c) Mobile home purchase, or
- d) Mobile home relocation, and
- e) Lot purchase.

This concept is the most capital effective and provides the least amount of administrative headaches to operating staff.

7.5 Transportation

During construction, it is expected that a number of varying sizes of contractors will be working on site at the same time. Local contractual personnel will most probably travel by pickup truck or mini bus to and from the site. Non-local construction contractors are expected to fly personnel to Watson Lake and provide a bus service to and from the site camp to the airport on a daily basis.

The housing philosophy determined for permanent mine personnel is that married personnel with family will be located in Watson Lake and single personnel located at the mine camp. The expected shifts will be ten days on site and four days off. Two transportation options are available, one by bus from Watson Lake to the mine site, the other by plane. In discussion with charter aircraft operators they are confident a regular schedule flying from



Watson Lake to the mine could be achieved throughout the year. The month of October however is the worst flying month and a regular schedule could be compromised. Nevertheless, the preferred transportation method for shift changes would be by plane on a regularly scheduled basis with a bus backup for emergencies or non-flyable weather.

Present concepts relating to capital and operating costs are that all haulage will be by highway trucks.

7.6 Water Supply and Treatment

Potable Water

Potable water will be provided for the camp and other buildings by means of an insulated and heat traced storage tank supplied by water wells. Well locations are as yet to be determined and the number required will not be established until the first well flow and recovery is measured and water demand established. It is proposed that a test well and other production wells, if necessary, are drilled prior to construction and establishment of the mine camp. The type of water treatment will be recommended after water samples have been taken and tested from the test well.

Mine and Process Water

For mine and process water, it is proposed to construct a dam across the creek upstream from where it enters the property to the west of the open pit. This will control water in the pit and provide a controlled water source for process water requirements in the mill and other areas. Water will be pumped from the creek reservoir to a 100,000 gallon insulated and heat traced water tank located on the mountain side above the mill. Supply from the water storage tank it will be a gravity feed to the mill and other buildings. The type of water treatment necessary will be established after samples have been tested.

Fire Water

For fire protection it is proposed that 33% of the process water tank will be dedicated to fire protection and supported by a dedicated system from the raw water storage dam.

General

All water reticulation will be via surface run, heated "utilidors".

7.7 Survey

Site survey location work to-date is to exploration geological standards linked with existing contour maps. Prior to the onset of design work, site survey control must be established and eventually linked to territorial geodetic, Forestry, Department of Mines and Department of Highway control grids. Surface control will be established by SSW. The mine engineering survey control and day-to-day mine surveying will be done by the OWNER. Day-to-day construction level surveying will be carried out by CONTRACTORS as part of their contractual quality control obligations. SSW will provide accurate survey control such as conveyor centre lines and will check the CONTRACTORS' surveying as part of their quality assurance obligations. As per industry practice, SSW's checking will not relieve the CONTRACTORS of their contractual responsibility in that regard.

7.8 Sewage Disposal

Sewage disposal will be by septic tank and distribution field located to the south east of the mill and camp. The septic tank and distribution field will be constructed in accordance with applicable building and health code regulations and will be sized initially to accommodate a 320 man camp and ancillary facilities. This will be adequate for the permanent mill and camp operations as the camp size will be reduced from 320 to 160 for the permanent mine employees. Modification to the disposal system will not be required for the permanent facility except to connect pipes from the mill and equipment shops when operational.



7.9 Permits

The following activities will be performed in developing the MEL Property for which some form of permitting or involvement with a governmental agency will be required.

- Upgrade haul road, creek, drainage and river crossings.
- Logging for plant site and miscellaneous road re-alignments.
- Plant site building, construction camp, sewage treatment and solid wastes disposal.
- Temporary and permanent fuel storage and dispensing.
- Dams for mine process water.
- Filling of swamps and lake with excavated mine materials.
- Tailing dams.
- Open pit and underground mine dewatering.
- Explosives magazines.
- Radio telephone and surface VHF radio network.
- Emissions to atmosphere for power generation.
- Water storage and treatment.
- Process plant liquid effluent(s) disposal and handling.
- Site drainage including leachate monitoring.
- Yukon Parks Department (road).

7.10 Land Claims

Indian and Northern Affairs Canada, Watson Lake District, provided the field investigation team with reference maps showing registered Indian Land Claims to-date. On review of the information provided there are no Indian land claims on the MEL Property or the

access road. The present haul road leaves the Alaska Highway approximately .6 km. inside the British Columbia border. If the road were to start in the Yukon, rerouting would be necessary joining the Alaska Highway approximately 4 km. to the west of the present access. Although this would be possible, another creek crossing would be required and the road relocated through a wet and marshy area. Further, there is a site specific Indian land claim on Scobie Creek, the area of which is not known at present and which the relocated road would most probably have to cross. From a location point of view, it is not recommended to pursue this rerouting.

7.11 Fuels Storage and Dispensing

A fuel oil storage and dispensing area will be constructed to the south west of the mill. The storage area will be encompassed by a containment berm in case of spillage. The storage area will contain the following fuels:

- Diesel oil for mine generators.
- Diesel oil for mine equipment.
- Diesel oil for temporary generators.
- Gasoline for surface transport.
- Heating fuel oil for construction and mine camp, kitchens, trailers, and refrigeration facilities.
- Possibly propane for miscellaneous heating purposes.

A dispensing facility will be located adjacent to the storage area.

In order to minimize capital expenditure the various bulk fuel suppliers will be requested to tender on the following basis:

- a) Tank farm supply and installation free of charge to OWNER.
- b) Fuel dispensing equipment supply and installation free of charge to OWNER.



- c) Supply of construction and pre-production fuels.
- d) Supply of production fuels for five (5) years.
- e) Barytex ownership of all tankage at the end of the mine life or twelve (12) years, whichever occurs first.

7.12 Explosives Storage and Dispensing

It is proposed that the open pit mining contractor is responsible for providing explosives storage and dispensing facilities as required for open pit mining. The cost for these facilities is included in the contract mining cost estimate.

Explosives storage and dispensing facilities for servicing the underground mining operation are included as the owner's responsibility and accounted for in the underground mining cost estimates. The magazine constructed in accordance with the Miners' Act will be situated approximately 3,000 feet north of the mine.

7.13 Site Drainage

The site will be ringed wherever possible with drainage ditches intended to catch normal run-off water and lead it to existing water courses. Internal site drainage that has the potential for contamination including mine dewatering effluents will be fed or pumped to the tailings area. As noted elsewhere in this document, leachate contamination of ground water will not be a factor. There will be no untreated tailings area overflow.

7.14 Communications

The site will be equipped with a microwave link for telephone, telex and telefax communication. A VHF emergency radio link with the RCMP and Forestry should also be provided. In addition, SSW recommend that due to distances and variety of activities

on-site, especially during the first six years, a five (5) channel UHF radio system be utilized for on-site communications. The five (5) channels will cover:

- a) Construction
- b) Open pit
- c) Access road
- d) Underground
- e) Safety, security, first aid, medevacs.

A hard wire underground communications network for the facility has also been provided.



8.0 CONSTRUCTION

8.1 Preliminary Development Schedule

The preliminary development schedule (Exhibit "8.0") shows a construction period of 19 months for the mill and infrastructure and a further 10 months for continuing mine development and mining infrastructure. The durations do not include engineering time for permitting and infrastructure requirements which we anticipate to be in the region of 4 - 6 months prior to month one as shown in the schedule.

In planning the schedule, we have taken into consideration restrictions in making numerous crossings of the Coal River without a permanent bridge. We plan to replace all road, creek crossing with bridges or culverts and upgrade the road to construction haul road standards, prepare permanent bridge buttresses, improve airstrip, drill water wells on site and prepare the site for a construction camp in the fall. During the month of January crews will create an ice bridge over the Coal River and haul in a construction camp and enough supplies and equipment to proceed with construction until the permanent bridge is constructed and operational.

Spring and summer months will see site and services development and buildings closed prior to onset of the following winter months. Process and equipment installation will proceed unhindered from weather conditions during the winter months until pre-commissioning. On final plant commissioning, part of the construction camp will be dismantled and removed leaving a minimum camp of 160 for mine workers.

8.2 Construction Philosophy

In keeping with the spirit of involving local industry to the maximum extent possible, it is proposed to contract out portions of the work in packages so as to attract local contractors and suppliers. Smaller contractors local to the Watson Lake area will, for the most part, have non-union labour. Practical considerations may dictate that the process plant contractors will have British Columbia Trades Council; i.e. union labour.



Such considerations address sufficient numbers of skilled tradesmen, harmony on-site, and so on. SSW will manage the construction work, budget and schedule as well as quality and quantity control.

It is expected that the engineer will provide process quality control and assurance in coordinating the selected vendor and client operations staff participation in the work leading up to mechanical completion and precommissioning.

The schedule allows for the client providing final commissioning and start-up leadership with the engineer and selected subcontractors assisting as required.



9.0 CAPITAL AND OPERATING COSTS

9.1 Mining

Capital Cost

The capital costs for mining are based on budget quotes received from mining contractors and equipment suppliers. Shaft and primary rock development is completed by contractors.

The following are unit rates used for rock development:

Shaft - 6.7 m x 2.8 m x 270 m deep	\$ 2,330,000
290 m extension	\$ 2,513,000
Scooptram headings - 4.3 m x 3.7 m	\$ 1,910/m
Raise bore holes, ore pass 3.0 m diameter	\$ 875/m
Raise bore holes, ventilation 4.5 m diameter	\$ 1,400/m
Rock work, slashing, station excavation	\$ 120/m ³

The underground rock work development requirements are listed as follows:

ROCK DEVELOPMENT REQUIREMENTS

Phase 2:

North ramp (pit)	300 metres
Shaft to 640 elevation	270
Vent rises	480
Ore pass	150
CR/Pump Stn.	-

760 Elevation:

Main X-C	185
FW Dr.	450 Typical level development
Draw Pts.	90 Typical level development
Sill ramp	100 Typical level development



710 Elevation:

Main X-C	135
Level development	640

660 Elevation:

Main X-C	75 metres
Level development	640

Phase 3:

Shaft to 340 elevation	295
Vent Rises	580
Ore pass	205
CR/Pump Stn.	-

560 Elevation:

Main X-C	35 Typical for each level
FW Dr.	300 Typical for each level
Draw pts.	60 Typical for each level
Sill ramp	100 Typical for each level

460 Elevation	495
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360 Elevation	495
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This rock work development is scheduled to bring phase 2 and 3 of the project into production to maintain a production rate of 1,500 tonnes per day on a 350 days/year basis for the 10 year project duration.

Production and development schedule and associated costs are illustrated in Tables 9-1 and 9-2.

**TABLE 9-1
PRODUCTION AND DEVELOPMENT SCHEDULE**

YEAR	-1	1	2	3	4	5	6	7	8	9	10
PROJECT PRODUCTION SCHEDULE (K TONNES)											
Ph.1 Open Pit		262	262	262	26						
Ph.2 U.G. - Upper			262	262	499	525	525	431			
Ph.2 U.G. - Lower								94	525	525	525

UNDERGROUND DEVELOPMENT SCHEDULE (METRES)

Phase 2:

Shaft 6.1m x 2.8m	270										
Vent Rises. 4.5 m diam.		480									
Ore Pass 3m diam.		150									
CR/Pump Stn. 1440m ³		-									
North Ramp 4.3m x 3.7m		300									
760 Elev. 4.3m x 3.7m	200	625									
710 Elev. 4.3m x 3.7m				500	275						
660 Elev. 4.3m x 3.7m						715					

Phase 3:

Shaft 6.1m x 2.8m						295					
Vent Rises 4.5m diam.						580					
Ore Pass 3m diam.						205					
CR/Pump Stn. 1440m ³						-					
560 Elev. 4.3m x 3.7m							495				
460 Elev. 4.3m x 3.7m								495			
360 Elev. 4.3m x 3.7m										495	



TABLE 9-2
UNDERGROUND DEVELOPMENT COSTS \$K

YEAR	-1	1	2	3	4	5	6	7	8	9	10
<u>Heading</u>											
Vent Rises			672								
Ore Pass			131								
CR/Pump Stn.			173								
North Ramp			573								
760 Elev.		382	1194								
710 Elev.				955	525						
660 Elev.						1366					
Vent Rises							812				
Ore Pass							179				
CR/Pump Stn.							173				
560 Elev.								945			
460 Elev.									945		
360 Elev.										945	
TOTAL		382	2743	955	525	1366	1164	945	945	945	



Prices were received from various suppliers of used mining equipment. After applying factors for reconditioning, delivery and installation, the estimated cost is summarized as follows:

Hoist and Facilities: \$ 1,928,000

Including: Hoist, headframe, skip-cage, loading station, compressors

Underground Equipment \$ 1,600,000

Including: Pumps, fans, air heater, mobile equipment crushing N.B. underground crushing capital expenditure is scheduled in year two (2).

Operating Cost

Operating costs for mining are based on contractors quotations for open pit mining and on consultant experience for underground mining. It is assumed the mine would operate on the basis of 2 - 10 hour shifts per day, 350 days per year.

Contractors quotation for open pit mining is \$ 8.00 per cubic metre of rock. Cost per tonne of ore produced at the open pit operation is:

Total material mined	1,803K m ³
Cost @ \$ 8.00/m ³	\$ 14,424K
Tonnes of ore produced	812K tonnes
Cost per tonne	\$ 17.76/tonne

The performance for underground mining by VCR and raise stoping methods is expected to be 15 tonnes per man shift (including all labour and staff associated with the mine). Average labour rate is estimated at \$ 19 per hour. Mining cost is calculated as follows:

Base labour	\$ 19.00
Fringe benefits 23.6%	4.48
Overtime allowance 8%	1.51
Bonus 20%	<u>3.80</u>
Labour Cost	\$ 28.80/hour

Labour cost per shift

10 hrs. @ \$ 28.80 = \$ 288

Labour is 60% of total cost

Total cost \$ 288/0.60 = \$ 480/shift

Productivity is 15 tonnes/man shift

Mining cost per tonne \$ 480/15 = \$ 32.00

9.2 Milling

Capital Cost

Capital cost for a mill capable of 1,500 tonnes per day production rate with three (3) stages of floatation producing zinc, lead and barite concentrate was based on considering the costs associated with recently constructed base metal mills producing a similar tonnage. Costs ranged from \$ 12 million for a previously operated mill in good condition to \$ 42 million for a new mill. It is estimated that \$ 35 million of capital would be adequate for construction of the concentrator, infrastructure and facilities as described by the flowsheet illustrated in Drawing 6-1.

Operating Cost

Further detailed study and pilot scale testing is required before an accurate operating cost can be estimated. Mill operating costs, depending upon ore characteristics and mill circuitry can vary from \$ 10.00/tonne to \$ 15/tonne. The ore from the MEL deposit is expected to be relatively easy to mill and operating costs have therefore assumed to be at a lower level of \$ 11.50/tonne.

The mill operating costs are based on the following manpower:

Labour Category:

Supervision	4
Operators	22
Maintenance	7
Miscellaneous	-
	31



Probable distribution of costs prorated from 1,100 tpd operating plant are as follows:

Crushing	\$ 1.33/tonne
Grinding and classification	3.07
Flotation	1.22
Concentrate handling	1.22
Thickening	0.97
Filter	0.32
Tailings	1.87
Stockpiling barite	<u>1.50</u>
	\$ 11.50

9.3 Infrastructure

Due to the location of the property, the development will be wholly self-sufficient in terms of temporary (construction and earlier pre-production) and permanent infrastructure. Wherever possible temporary infrastructure will be melded to permanent facilities in order that capital expenditure is kept to a minimum. The description(s) and pricing of the above are shown elsewhere in this document but the various elements and cost centres are listed as follows:

- Diesel electrical power generation
- Electrical power distribution
- Fuel storage and dispensing
- Site accommodation
- Site offices, shops and warehouse
- Water storage, treatment and distribution
- Sewage disposal and treatment
- Access and site roads
- Airstrip
- Communications
- Explosives storage
- Transportation



9.4 Engineering and Construction Management

SSW recommend the project management philosophy be the classical Engineering, Procurement and Construction Management (EPCM) concept. The concept in SSW terms is actually an OWNER/ENGINEER integrated team with the OWNER providing guidance (checks and balances) during the conceptual and basic engineering programs, regulatory bodies liaison efforts, operation parameters development and for commissioning/start-up procedures. SSW will provide all detailed design, full procurement, site supervisory, construction contract writing and administration, permitting and documentation services.

As noted elsewhere, the construction philosophy will be to utilize local contractors, expertise, services and materials to the greatest extent possible without sacrificing quality of product. All site construction and mine pre-production personnel will be housed in a camp (ATCO type) administered by the EPCM team. Each contractor will be responsible for transport of his employees. Construction contracts will be packaged into firm price units in keeping with engineering and procurement schedules, local expertise and capital cost considerations.

Open pit pre-production and operation, shaft sinking and underground development will be by contractors. The work itself will be supervised and administered by the OWNER.

SSW recommend that the EPCM work through feasibility be administered by OWNER on a reimbursable, target estimate basis. For the capital expenditure, design-construction phase SSW recommend a fixed fee with incentives based on the capital budget estimate. A firm price, turnkey approach is not recommended due to the risk monies required which will also artificially unbalance the capital estimate.

9.5 Capital Cost SummaryMine Facilities

CDN.

General

\$,000

Access road

2,200

Site grading, dams, air strip, site
ground water monitoring

1,500

Sub-total

3,700

Ore Handling, Crushing and Screening

Ore handling, crushing and screening

4,500

Sub-total

4,500

Process Plant

Grinding

1,200

Flotation

1,900

Solid liquid separation

900

Concentrate drying, regrind, bagging

2,600

Product storage and loadout and building

6,100

Sub-total

12,700

Ancillary Facilities

Equipment maintenance shops

800

Mill shops

300

Explosives magazines

100

Mine dry and engineering office

900

First aid, security, safety buildings

100

Tank farm and dispensing

100

Water storage and treatment

300

Camp and recreational facilities, sewage

1,200

Main sub-station and distribution

600

Communications

100

Generating Station and Reticulation

2,600

Sub-total

7,100

Indirects

Off-site housing	400
Engineering and project management	4,400
Catering	1,600
Insurances	100
Transportation	300
Temporary construction facilities	200
Capital spares	600

Sub-total 7,600

Total Mine Facilities \$ 35,600

Mine Development and Owner Costs

Owner's costs	1,500
Hoist headframe	
Underground equipment	4,100
Pre-production underground development	5,400

Total Mine Development and Owner's Costs \$ 11,000

Total Pre-production Cost 46,600

Working Capital 3,200

GRAND TOTAL - PRE-PRODUCTION COST \$ 49,800

10.0 MARKETING

From discussions and enquiries it appears that the barite market in North America is faced with a significant amount of over-capacity. A number of consolidations within the barite industry in the last several years has been made. In 1987, there were 29 barite producing locations in North America. One of these plants, the barite plant of M-I Drilling Fluids Canada, Inc. at Watson Lake, was not operating but two plants in Alberta had a capacity of 165,000 tpy.

The total Canadian barite market in 1987 and 1988 was about 40,000 tons per year. The total U.S. market in 1988 was about 2 million tons, of which 400,000 tons was produced in the U.S. The six leading companies supplied over 90% of this barite. The major companies are in the drilling mud business and normally 90% of barite goes into drilling mud. Smaller producers selling their barite to major producers often need to do so at a discount. The delivered price into the U.S. for a ground drilling mud grade barite is around \$ 70 per ton (U.S.).

World production of barite in 1988 was approximately 4.6 million tons. This is significantly below the estimated world production of 8.8 million tons in 1980. China is the major supplier of crude barite to the U.S. As drilling activity around the world increases, there will be ample capacity to meet the future supply, provided that the plants have been properly mothballed to enable their efficient operation.

In the short-term, the barite market does not look good. In the longer term, drilling for oil and gas in the Beaufort Sea is expected to increase which would increase the demand for barite. Any plant constructed in the Yukon would have a natural advantage for any work done in the Arctic or Alaska itself.



For purposes of this prefeasibility assessment, it is assumed that 20,000 tonnes/year @ \$ 100 (Canadian) can be marketed. The expected increase in gas and oil drilling activity (Beaufort and N.E. British Columbia) during the mid to late 1990's will result in a considerable increase in barite demand. It is assumed that Western Canadian demand will increase and Barytex's market share will also increase to provide good 'upside' potential for project economics.



11.0 ECONOMICS

11.1 Summary

Before tax Internal Rate of Return = 43% based on the following:

Ore provides a net smelter return of \$ 80.00 per tonne at the mine based on the following grades and metal prices:

Grades		Metal prices
Lead	2.27%	lead \$.51/lb.
Zinc	9.78%	zinc \$.90/lb.
Barite	32.36%	barite \$ 100/tonne

Financing options, for example, a \$ 20 m loan repaid over a five (5) year period would result in improved project economics up to a potential before tax IRR of 53%.



PRELIMINARY PROJECT ECONOMICS

DATE: 31ST OCTOBER 1989

MINE MILL

Reported in @000

YEAR	-1	1	2	3	4	5	6	7	8	9	10	TOTAL
REVENUE		20960	42000	42000	42000	42000	42000	42000	42000	42000	42000	398960
CAPITAL COST	31650	11332	5755	2079	525	3879	1164	945	945	945		59219
OPERATING COST		7273	18287	18287	21680	22050	22050	22050	22050	22050	22050	197827
TOTAL COST	31650	18605	24042	20366	22205	25929	23214	22995	22995	22995	22050	257046
NET CASH FLOW	-31650	2355	17958	21634	19795	16071	18786	19005	19005	19005	19950	141914

IRR 42.71%

CAPITAL & OPERATING COST PROFILE

DATE: 31ST OCTOBER 1989

MINE MILL

Reported in @000

DESCRIPTION	-1	1	2	3	4	5	6	7	8	9	10	TOTAL
PRODUCTION												
Tonnes	0	262	525	525	525	525	525	525	525	525	525	4987
TOTAL PRODUCTION	0	262	525	525	525	525	525	525	525	525	525	4987
CAPITAL COST												
Shaft	0	2300	0	0	0	2513	0	0	0	0	0	4813
U G Development	0	382	2743	995	525	1366	1164	945	945	945	0	10010
Sub Total	0	2682	2743	995	525	3879	1164	945	945	945	0	14823
U G Equipment	0	0	1084	1084	0	0	0	0	0	0	0	2168
Hoist / HF	0	0	1928	0	0	0	0	0	0	0	0	1928
Sub Total	0	0	3012	1084	0	0	0	0	0	0	0	4096
Mine Facilities												
Mill & Infrastructure	29000	6600	0	0	0	0	0	0	0	0	0	35600
Owners Costs	750	750	0	0	0	0	0	0	0	0	0	1500
Working Capital	1600	1600	0	0	0	0	0	0	0	0	0	3200
TOTAL CAPITAL COST	31350	11632	5755	2079	525	3879	1164	945	945	945	0	59219
OPERATING COST												
Pit Tonnes	0	262	262	262	26	0	0	0	0	0	0	812
@ c/t \$17.76	0	4653	4653	4653	462	0	0	0	0	0	0	14421
Sub Total	0	4653	4653	4653	462	0	0	0	0	0	0	14421
U G Tonnes	0	0	262	262	499	525	525	525	525	525	525	4173
@ c/t \$32.00	0	0	8384	8384	15968	16800	16800	16800	16800	16800	16800	133536
Sub Total	0	0	8384	8384	15968	16800	16800	16800	16800	16800	16800	133536
Mill Tonnes	0	262	525	525	525	525	525	525	525	525	525	4987
@ c/t \$10.00	0	2620	5250	5250	5250	5250	5250	5250	5250	5250	5250	49870
Sub Total	0	2620	5250	5250	5250	5250	5250	5250	5250	5250	5250	49870
TOTAL OPERATING COST	0	7273	18287	18287	21680	22050	22050	22050	22050	22050	22050	197827
GRAND TOTAL	31350	18905	24042	20366	22205	25929	23214	22995	22995	22995	22050	257046

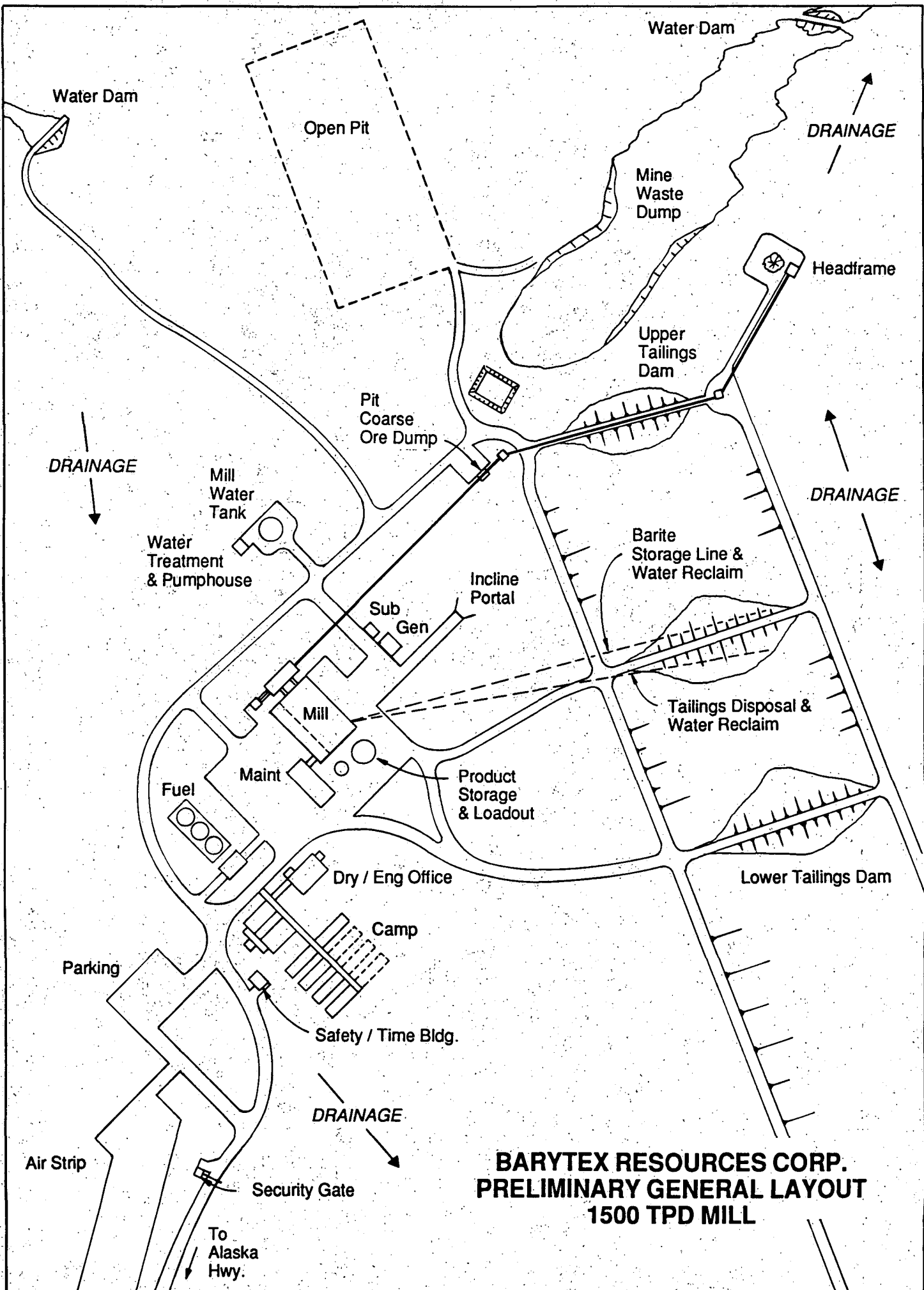
12.0 RECOMMENDATIONS

- Conduct an in-depth marketing study considering international smelters and combining shipments with other companies.
- Conduct metallurgical testing and chemical analysis of both concentrates to address mercury content, and other potential deleterious elements which may contribute to a potentially fatal flaw.
- Further drilling to delineate reserves and higher ore grades.
- Investigate federal and provincial (Yukon, B.C.) agencies for mining tax benefits and/or other forms of assistance; e.g. power generation.
- Refine the prefeasibility study in keeping with the foregoing recommendations.
- Undertake further metallurgical testing with samples taken from forthcoming drill program.
- Undertake a soils drilling and sampling program at feasibility study level for environmental purposes; e.g. ground water regime.
- Investigate to determine if the access road and infrastructure costs can be shared with other multi use areas in the region.
- Eventually commission a rock mechanics study to refine blasting pattern, examine shaft, VCR, and tunnelling stability.



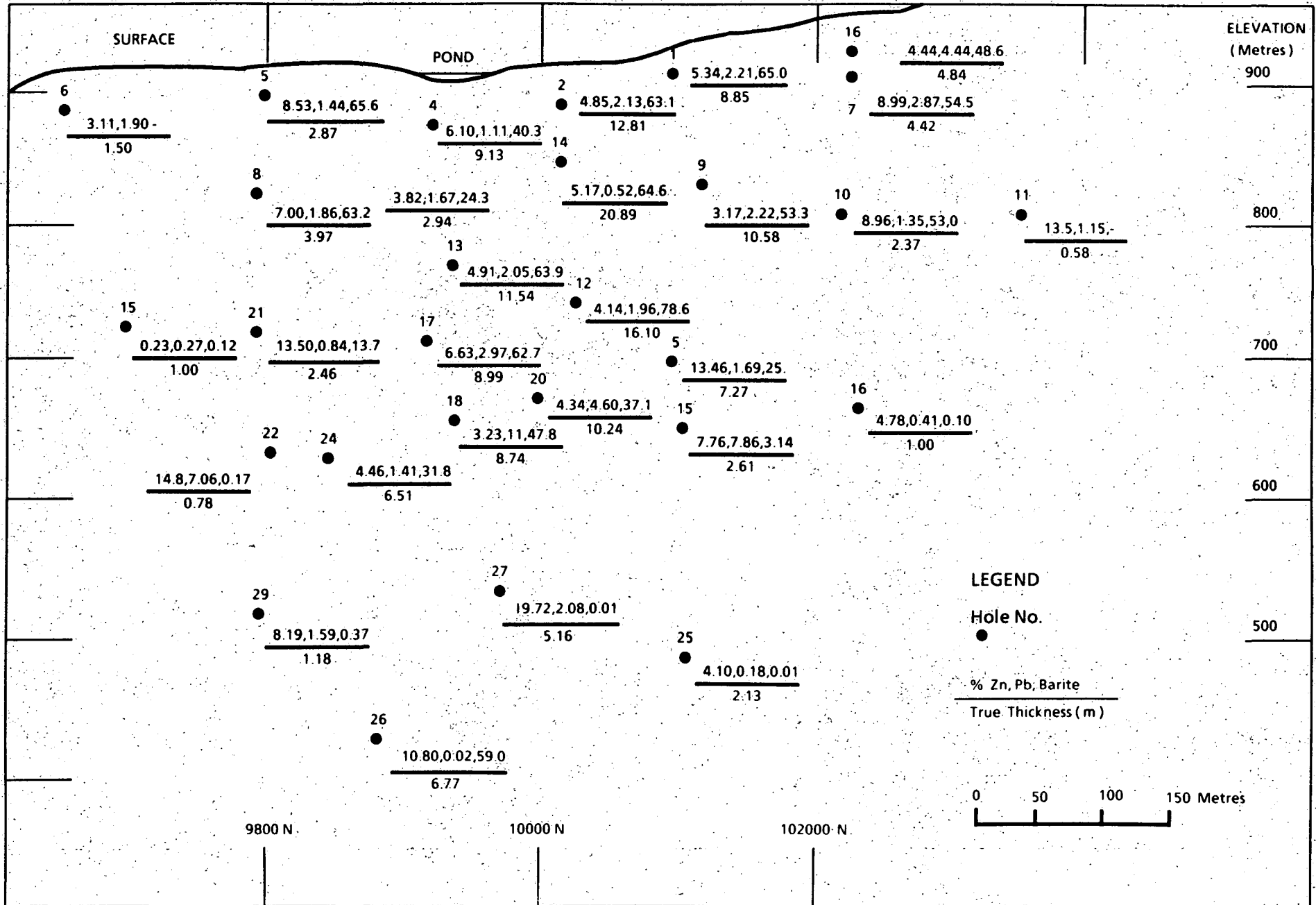
13.0 **EXHIBITS**

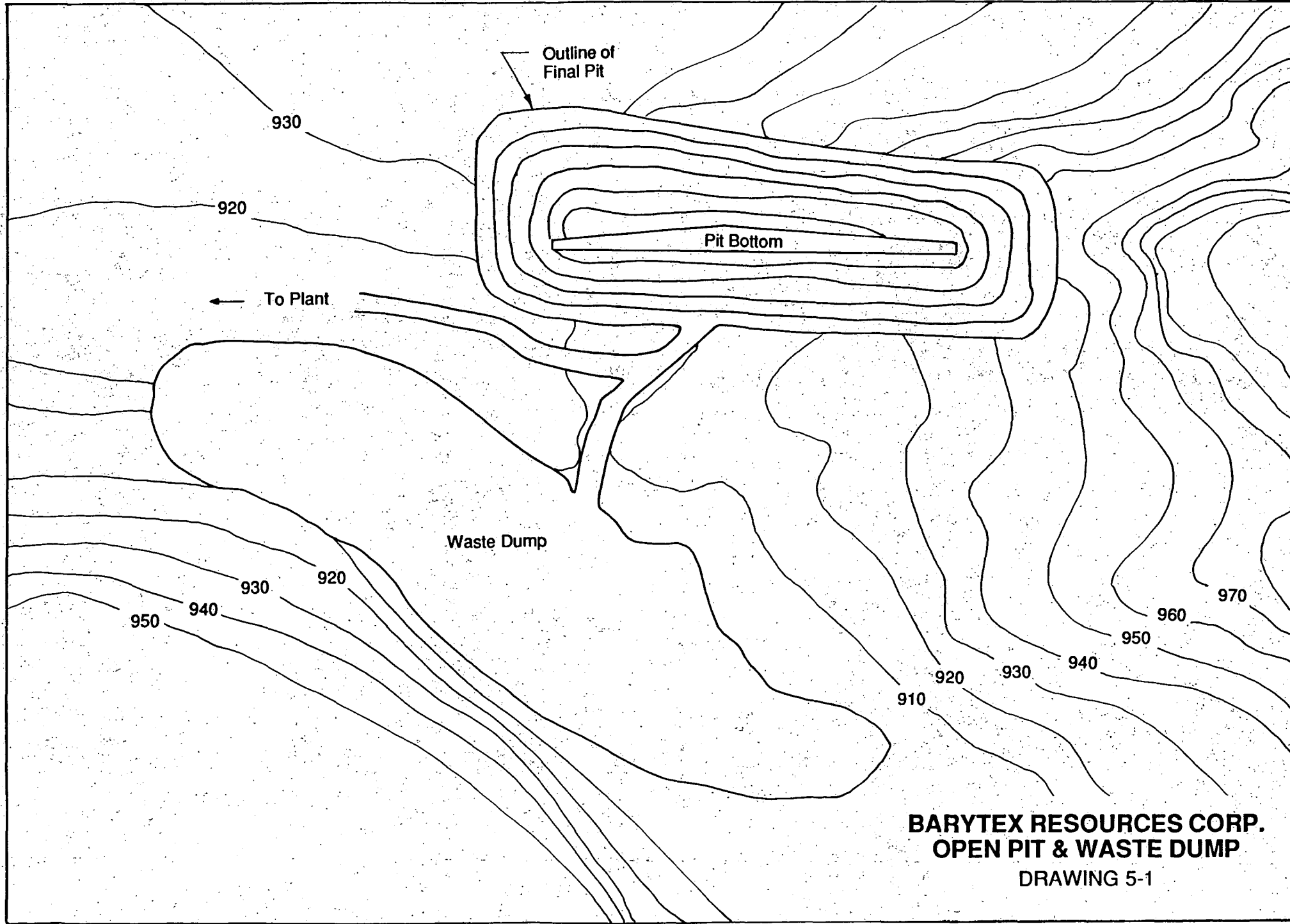
- 1.0 Preliminary General Layout
- 2.0 Longitudinal Section
Drill Hole Intersections
- 3.0 Open Pit and Waste Dump
- 4.0 Schematic Shaft Section
- 5.0 Schematic Level Plan/Stoping Method
- 6.0 Proposed Mill Flow Sheet
- 7.0 Barite Flow Sheet
- 8.0 Preliminary Development Schedule



**BARYTEX RESOURCES CORP.
PRELIMINARY GENERAL LAYOUT
1500 TPD MILL**

DWG. 4-1 LONGITUDINAL SECTION DRILL HOLE INTERSECTIONS





Outline of Final Pit

930

920

To Plant

Pit Bottom

Waste Dump

950

940

930

920

910

920

930

940

950

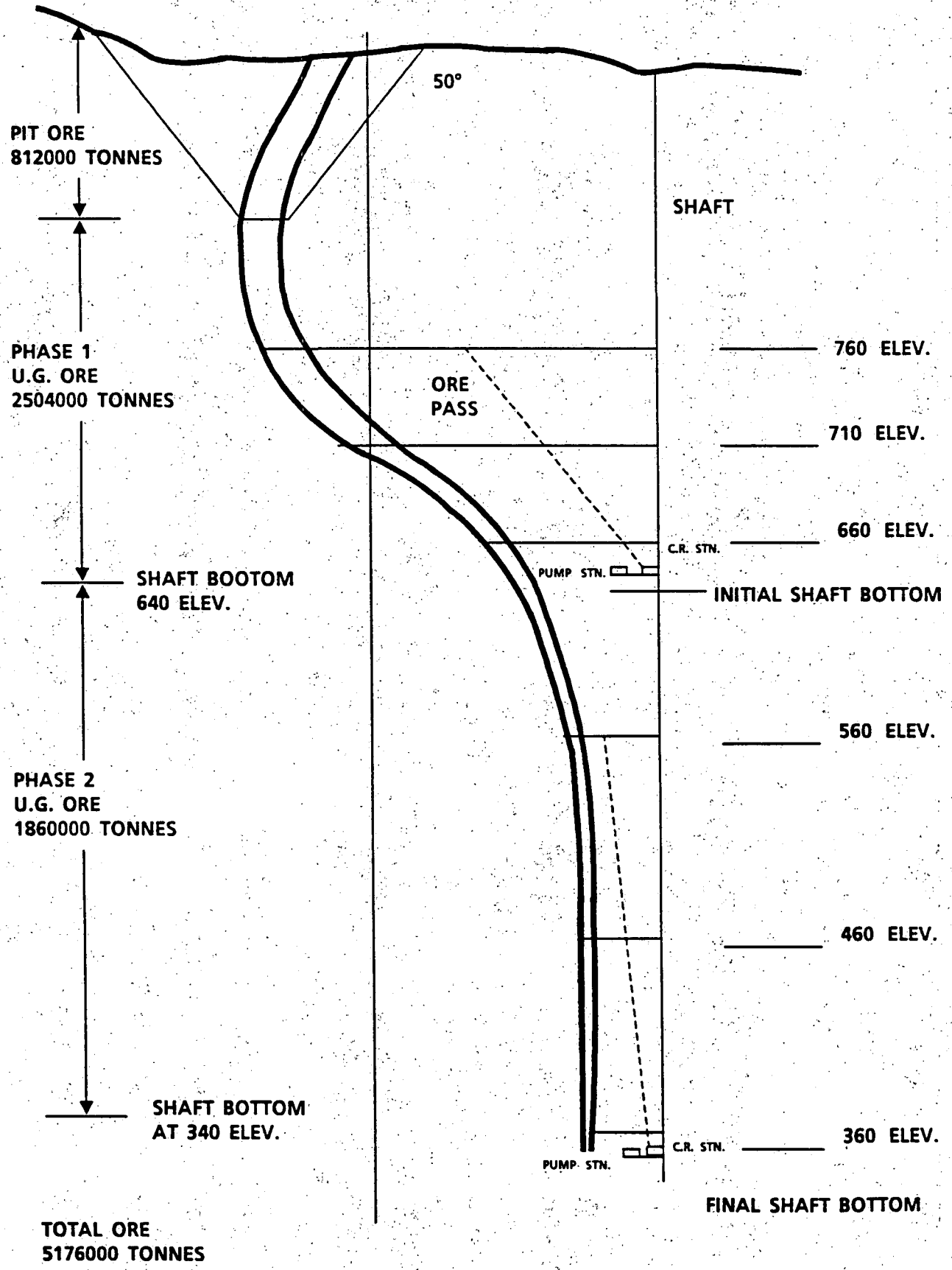
960

970

**BARYTEX RESOURCES CORP.
OPEN PIT & WASTE DUMP**

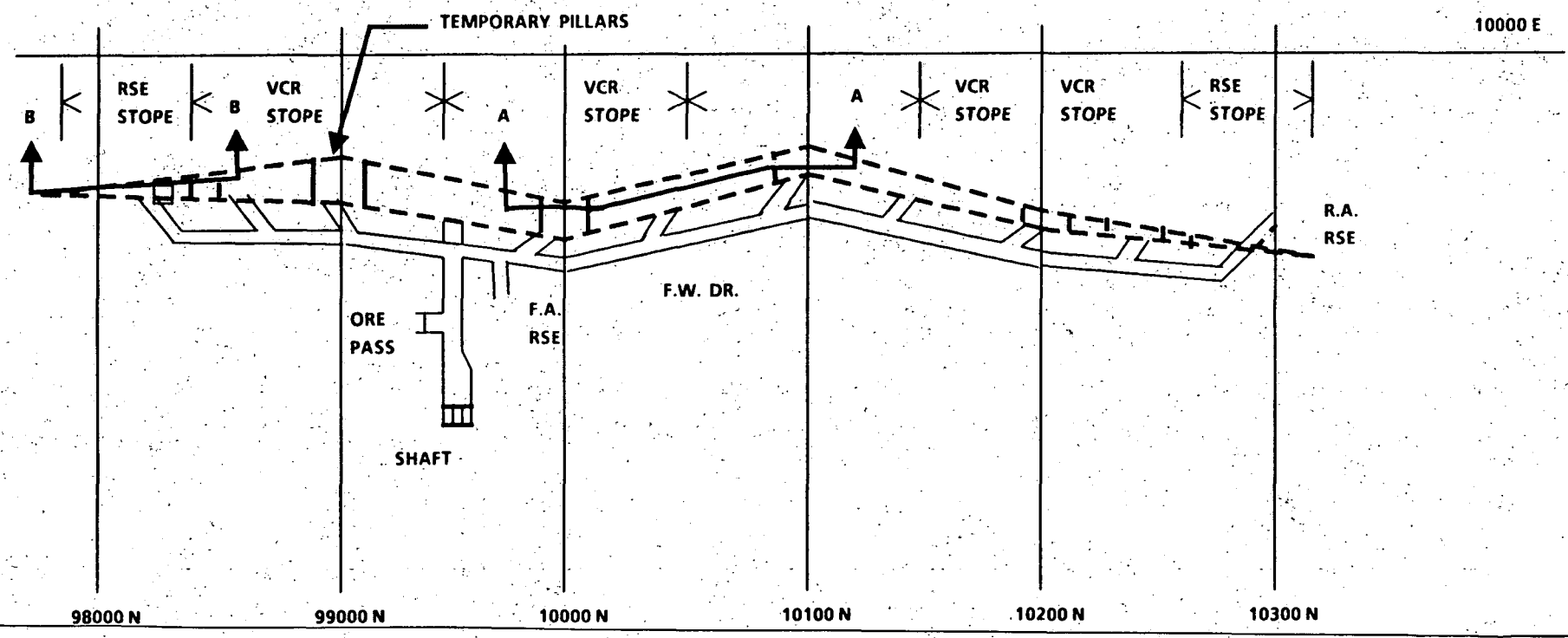
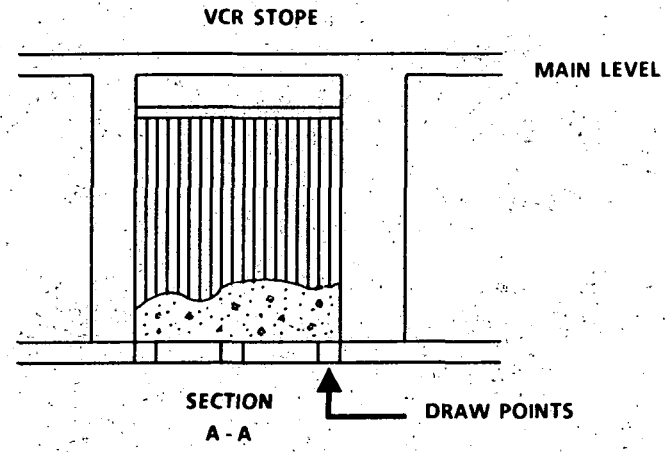
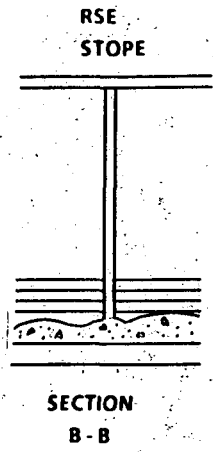
DRAWING 5-1

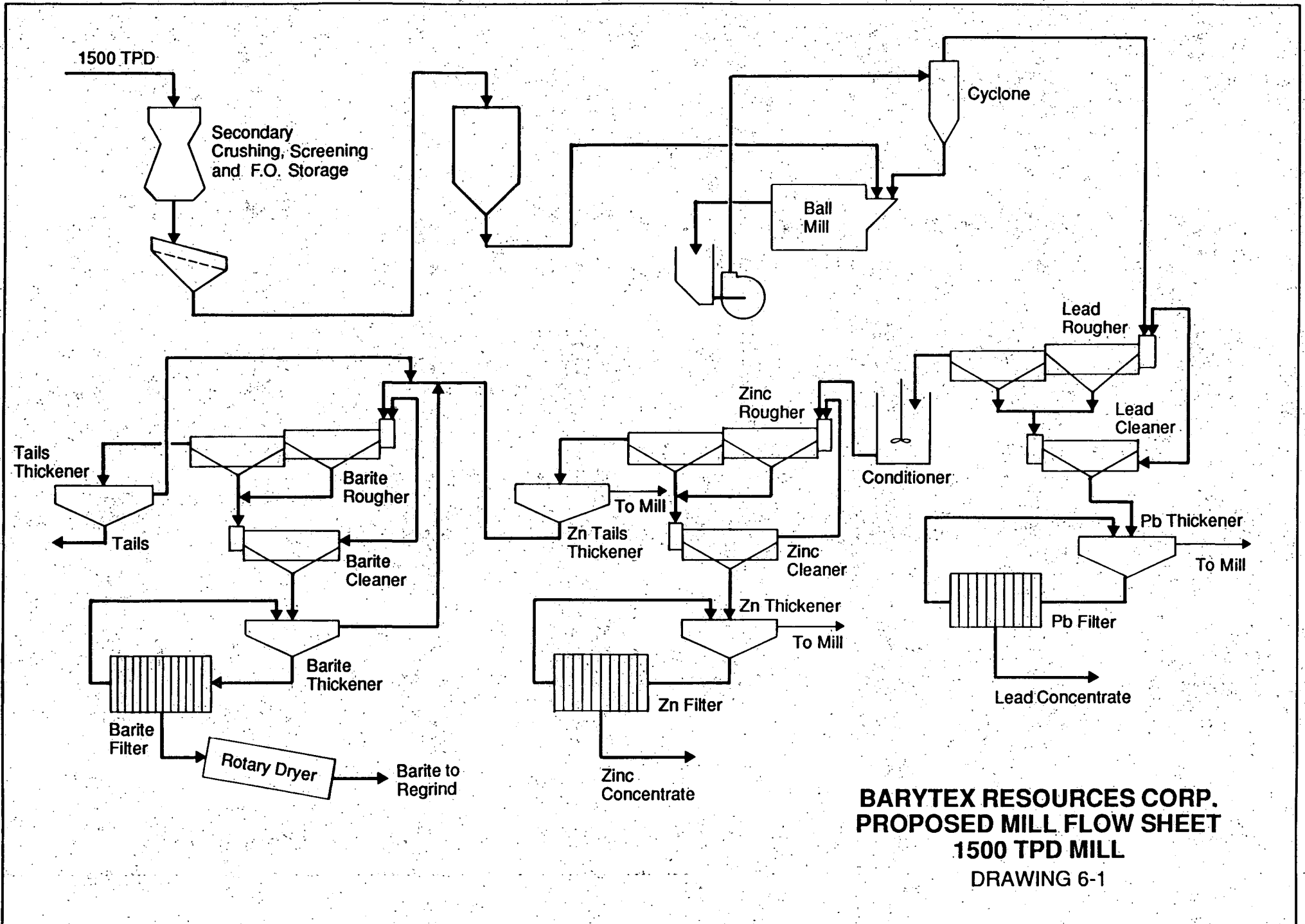
DWG. 5-2 SCHEMATIC SHAFT SECTION 9950 N



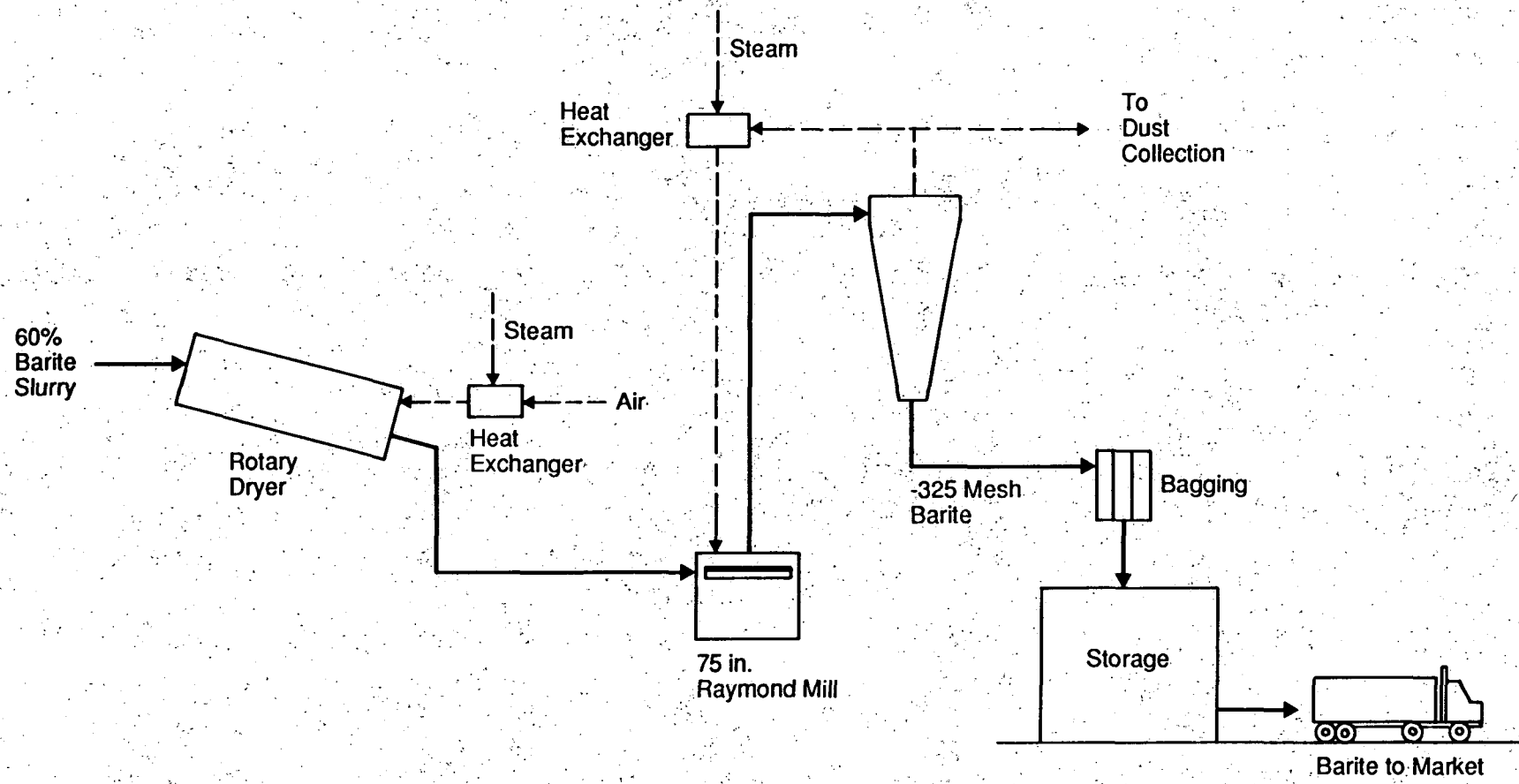
DWG 5-3 SCHEMATIC LEVEL PLAN / STOPING METHOD ELEVATION 660 2ND. LEVEL

SANDWELL SWAN WOOSTER

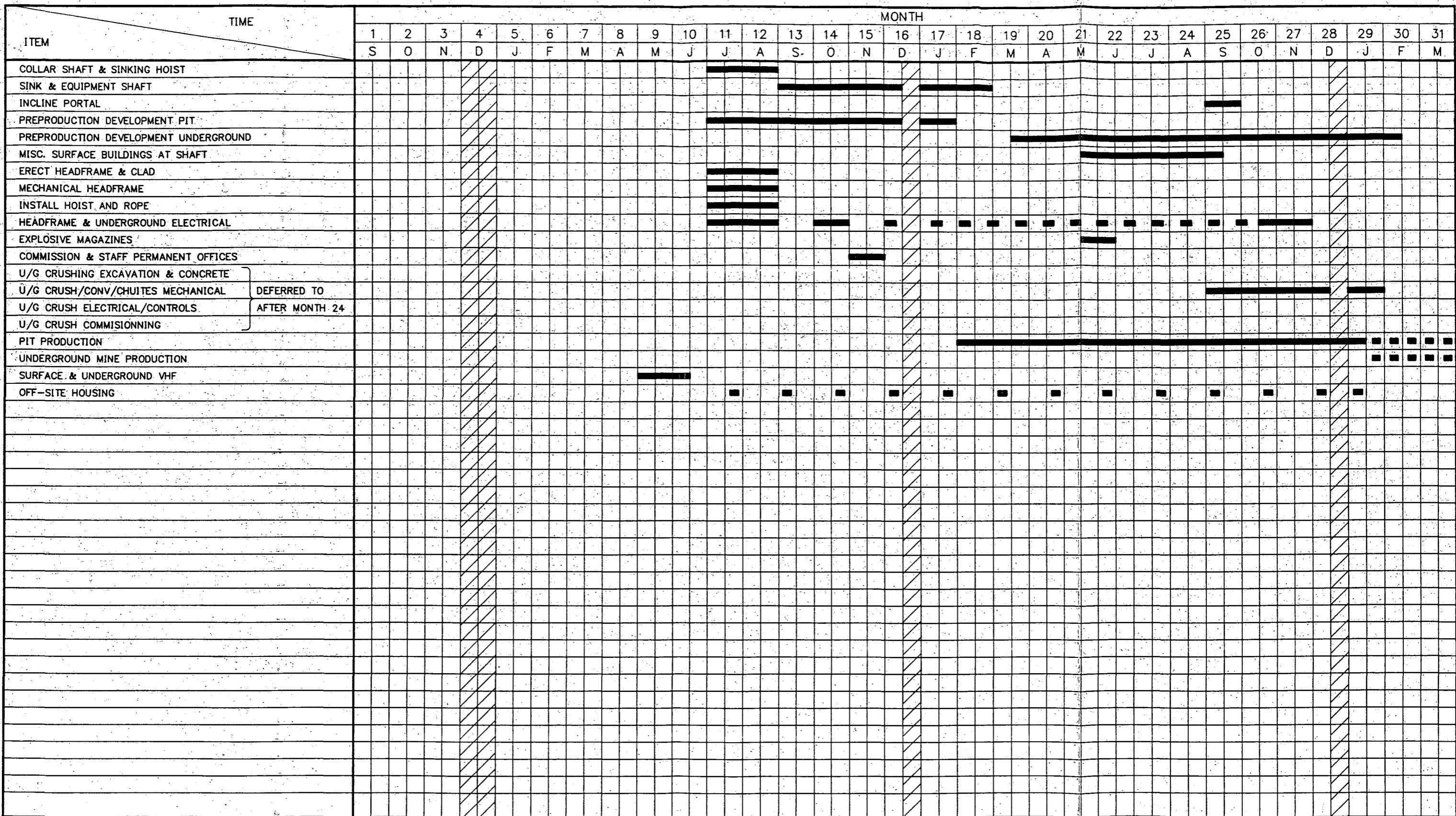




BARYTEX RESOURCES CORP.
PROPOSED MILL FLOW SHEET
1500 TPD MILL
DRAWING 6-1



**BARYTEX RESOURCES CORP.
BARITE FLOW SHEET**




REV.	BY	DATE	REVISION	APP'D.

BY	DATE	PRELIMINARY ISSUE
SSW CAD FILE NO. 2220-002		

APPROVED
DATE
B.

SCALE	YR.	MO.	DAY
DRAWN T.B.	89	10	18
CHECK			
DESIGN			
DES. CHK.			


SANDWELL SWAN WOOSTER
THIS DRAWING IS THE PROPERTY OF SANDWELL SWAN WOOSTER AND MUST BE RETURNED TO SANDWELL SWAN WOOSTER ON REQUEST. ITS CONTENTS ARE SECRET AND CONFIDENTIAL. ANY INFORMATION OBTAINED BY INSPECTION OF THIS DRAWING SHALL NOT BE USED FOR ANY OTHER THAN THE SPECIFIC PURPOSE FOR WHICH ITS INSPECTION IS AUTHORIZED BY SANDWELL SWAN WOOSTER.

BARYTEX RESOURCES CORPORATION	
MEL PROPERTY	
PRELIMINARY DEVELOPMENT SCHEDULE	
SHEET 2 OF 2	
DWG. 112200-002	REV

GEOCHEMICAL REPORT ON THE JERI AREA, MEL PROPERTY

WATSON LAKE MINING DIVISION

YUKON TERRITORY

NTS 95D/6

LATITUDE: 60 DEGREES 23 MINUTES

LONGITUDE: 127 DEGREES 20 MINUTES

FOR

BARYTEX RESOURCES CORP.

COVERING FIELD WORK DURING

OCTOBER 4 TO 14, 1989

BY

D.C. MILLER, P. ENG.

D.C. MILLER GEOLOGICAL SERVICES

JANUARY 23, 1990

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FIGURE 7	S GRID, CUMULATIVE FREQUENCY PLOT FOR ZINC....	7
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INTRODUCTION

At the request of H.S. Aikins, president of Barytex Resources Corp., the writer and assistant Leo Loranger undertook a programme of line cutting and geochemical soil sampling on the Jeri area of the Mel property, southern Yukon. The programme was to have included prospecting, but an early snowfall prevented the accomplishment of this work.

The writer and Loranger mobilized from Kamloops on Oct. 4 utilizing a Toyota 4x4 truck and reached Watson Lake, Yukon on Oct. 6. A Bell 206B helicopter was used to mobilize to the property from Watson Lake. Property work commenced on October 7 and was completed on October 13. The writer was absent from the project for 2 days during this period to work on the nearby Mel project.

LOCATION AND ACCESS

The property is located in southern Yukon Territory, 80 km east-northeast of Watson Lake. Access to the property is by helicopter, fixed wing aircraft, or by a winter road, some 50 km long which joins the Alaska Highway at a point 77 km east of Watson Lake.

PHYSIOGRAPHY

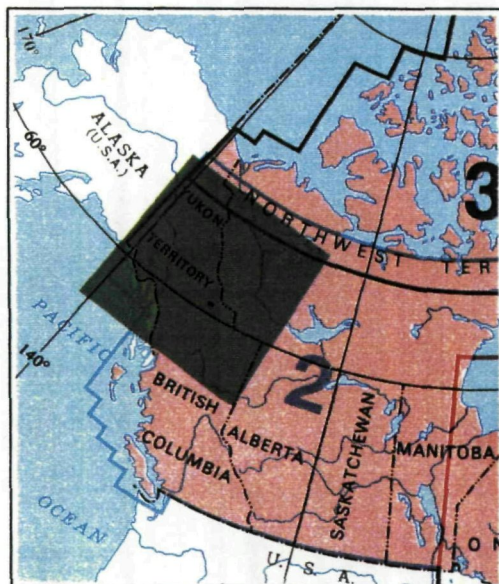
The base elevation at the property is 850 m and maximum elevations range up to 1300 m. Topography is generally moderate. Forests include stands of spruce, balsam and pine, much of which were burned in 1982. Near the Jeri, thick undergrowth of alder, willow and buckbrush is common. The property contains several



INDEX MAP

Area Covered

Yukon and Northern B.C.



LOCATION MAP

Watson Lake Mining District, Yukon

Distances from Mel Property

Watson Lake	80 km (Air)
Alaska Hwy	50 km (Winter Rd.)
Fort Nelson	507 km - Railhead
Skagway	666 km - Tidewater

BARYTEX RESOURCES CORP.

MEL PROPERTY LOCATION & ACCESS

DRAWN BY DCM/HSA	NTS 95D/6	FIGURE 1
REPORT DATE JAN. 23, 1990	PROJECT NO. 9067	

D.C. MILLER GEOLOGICAL SERVICES

small streams which generally carry enough water for camp and drilling purposes.

HISTORY

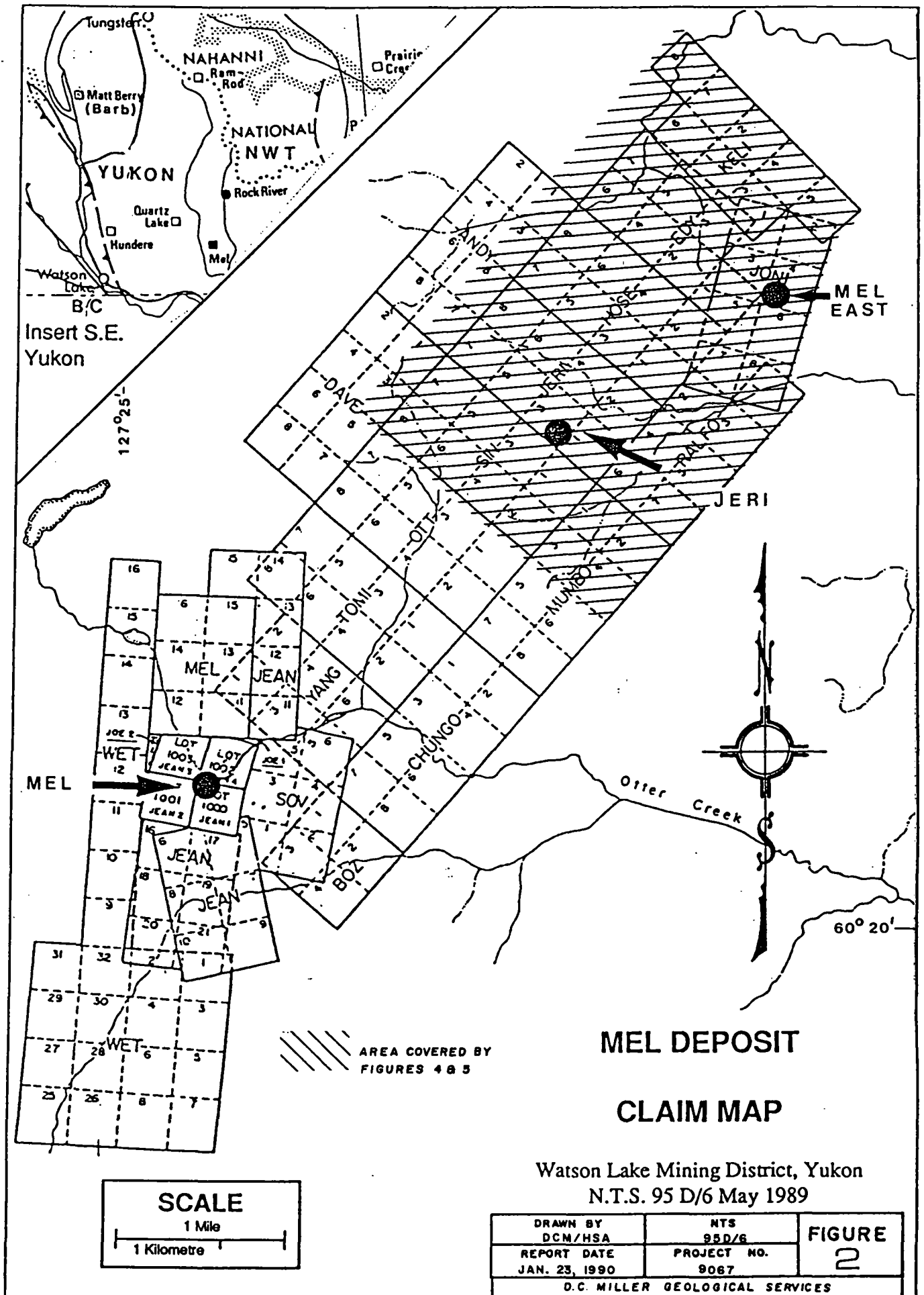
The Mel deposit was first staked by J. Melnychuk in 1967 and optioned to Newmont Mining Corporation which conducted road work, trenching and geochemistry. Newmont dropped the property and it was restaked by Melnychuk and optioned to Empire Metals Corporation which was later renamed Barytex Resources Corp. Barytex optioned the property to Granby Mining Corporation which drilled 18 diamond drill holes totalling 1952 m during 1974 and 1975. In 1976 St. Joseph Explorations entered the agreement and completed geological, geochemical and geophysical surveys and 4054.2 m of diamond drilling in 19 holes in 1978 and 1979.

In 1981 St. Joseph Explorations was renamed Sulpetro Minerals Limited and during the same year, Sulpetro discovered zinc mineralization 7.3 km northeast of the main Mel deposit. The new showings were named the Mel-East, but little further work was done on them. In 1984 Sulpetro discovered the Jeri zinc showings between the Mel-East and the main Mel deposit (Fig. 3). Later in 1984, Sulpetro built a new access road to the Mel property and built an airstrip 1.5 km south of the Mel deposit. In 1985 Sulpetro used the airstrip to mobilize drill equipment to the Jeri prospect which was tested with 10 diamond drill holes totalling 1009.8 m. Also at this time the Jeri showings were connected to the Mel area with a 5.5 km cat trail. In 1985 Sulpetro sold its mineral assets to Novamin

Resources Inc., which in 1987 completed 7 diamond drill holes totalling 2011.9 m at the main Mel deposit. In 1988 Novamin was purchased by Breakwater Resources Ltd.

PROPERTY AND OWNERSHIP

The property comprises 171 claims jointly owned by Breakwater Resources Ltd. and Barytex Resources Corp. under the terms of agreements dated February 15, 1985 and August 31, 1989. The later agreement grants Barytex an option to reacquire a 45% interest in the property. The property is located in the Watson Lake Mining District and includes the following contiguous claims:



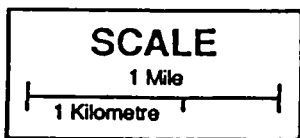
Insert S.E. Yukon

127°25'

60° 20'

**MEL DEPOSIT
CLAIM MAP**

Watson Lake Mining District, Yukon
N.T.S. 95 D/6 May 1989



DRAWN BY DCM/HSA	NTS 95D/6	FIGURE 2
REPORT DATE JAN. 23, 1990	PROJECT NO. 9067	
D.C. MILLER GEOLOGICAL SERVICES		

<u>CLAIM NAME</u>	<u>GRANT NO.</u>	<u>EXPIRY DATE</u>
Mel 11-16	Y 22230-35	April 3, 2000
Jean 1- 4	Y 72731-34	April 3, 2000
Jean 5-10	Y 72961-66	April 5, 1998
Jean 11-21	Y 74418-28	Oct. 15, 1999
Wet 1	Y 83309	April 3, 1999
Wet 2	Y 83310	April 3, 2000
Wet 3	Y 83311	April 3, 1999
Wet 4	Y 83312	April 3, 2000
Wet 5-8	Y 83313-16	April 3, 1999
Wet 9-16	Y 83317-24	April 3, 1998
Wet 25-29	Y 83325-29	April 3, 1999
Wet 30	Y 83330	April 3, 2000
Wet 31	Y 83331	April 3, 1999
Wet 32	Y 83332	April 3, 2000
Joe 1-2 Fractions	YA45269-70	Aug. 13, 1997
Sov 1-6	YA28600-05	April 26, 2000
Keli 1-4	YA66842-45	Aug. 10, 1994
Joni 1-8	YA66846-53	Aug. 10, 1994
Hose 1-8	YA66919-26	Aug. 24, 1994
Keli 5-8	YA66927-30	Aug. 24, 1994
Jeri 1-8	YA66921-38	Aug. 24, 1994
Ralfo 1-7	YA66939-45	Aug. 24, 1994
Chungo 1	YA66946	Aug. 24, 1994
Chungo 2-8	YA66947-53	Aug. 24, 1995
Ott 1-8	YA66954-61	Aug. 24, 1994
Edy 1-7	YA66962-68	Aug. 24, 1994
Tomi 1-8	YA66969-76	Aug. 24, 1994
Mumbo 1	YA66977	Aug. 24, 1994
Mumbo 2-4	YA66978-80	Aug. 24, 1993
Mumbo 5-8	YA66981-84	Aug. 24, 1994
Boz 1-4	YA66985-88	Aug. 24, 1994
Sin 1-2	YA66989-90	Aug. 24, 1994
Sin 3-5	YA66991-93	Aug. 24, 1995
Sin 6-8	YA66994-96	Aug. 24, 1994
Yang 1	YA66997	Aug. 24, 1990
Yang 2-6	YA66998-02	Aug. 24, 1994
Dave 1-8	YA72501-08	Nov. 5, 1994
Andy 1-8	YA72509-16	Nov. 5, 1994

The claim information was obtained from Breakwater records and is thought to be accurate. A cross-check against the Mining Recorder's records is recommended.

CURRENT WORK

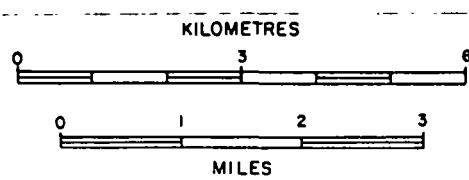
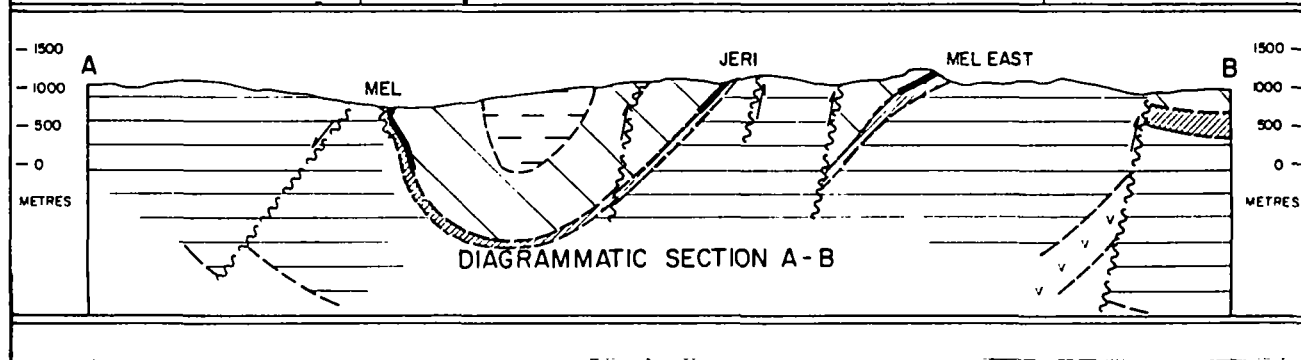
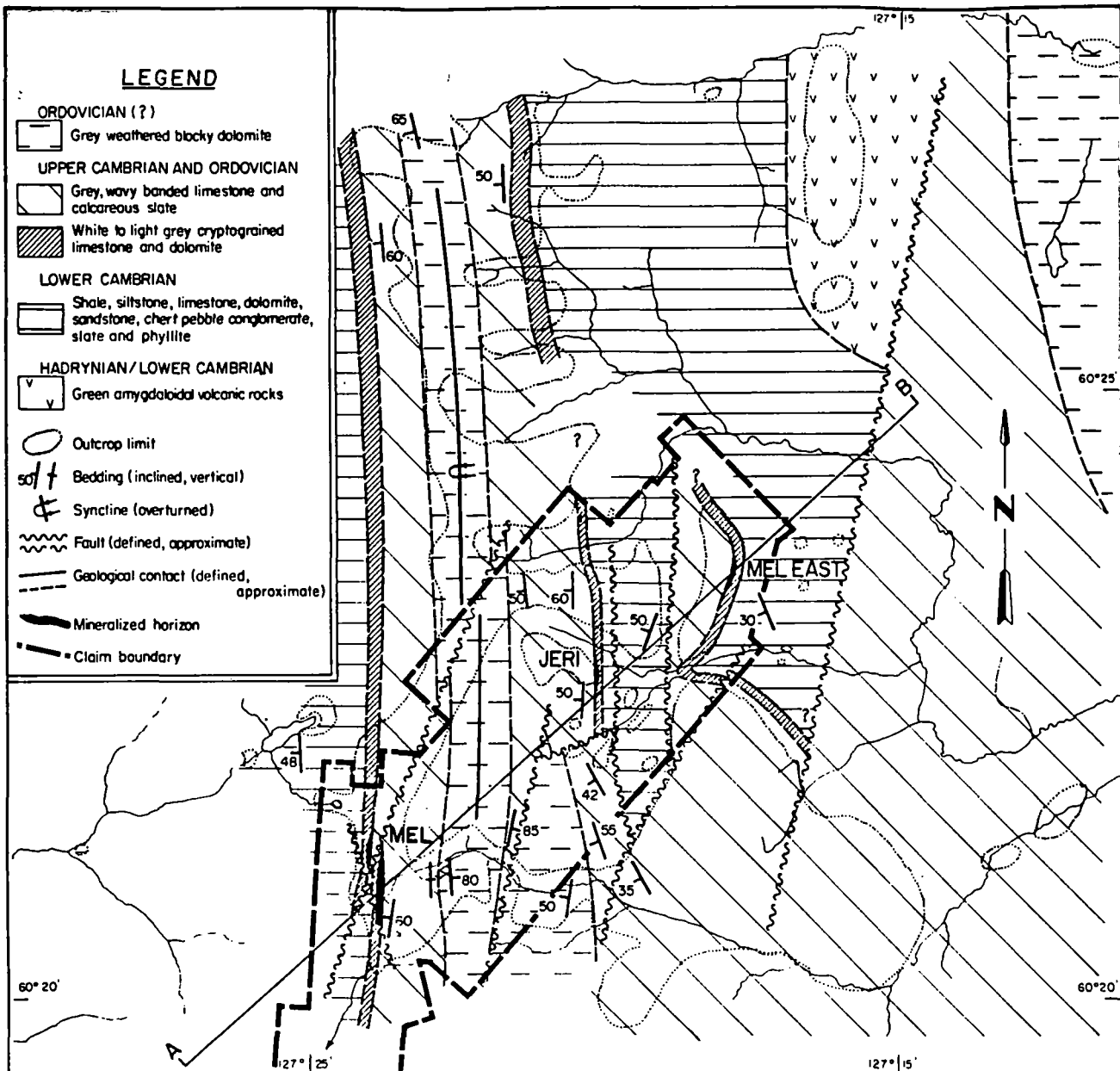
Current work included recutting and reflagging the Jeri baseline (N Grid) from 96N to 109N (1.3 km) and cutting new baseline from 109N to 118N (0.9 km). Cross lines 100 m apart were flagged, but not cut between 110N and 118N for a total of 2.975 km. On the S Grid, located on the Sin 4 claim (Fig. 4 and 5), a 600 m baseline was cut and picketed and 5 crosslines spaced 100 m apart were flagged, but not cut out. Crosslines totalled 1.25 km.

A total of 100 soil samples were collected at stations spaced 25 m apart along crosslines on the N Grid and similarly, 56 soil samples were collected from the S Grid.

GEOLOGY AND MINERALIZATION

The Mel property is underlain by Cambrian to Ordovician age strata including carbonates and various clastic sediments. These strata have been folded into a north-south trending, overturned syncline (Fig. 3). The Mel deposit and the Jeri and Mel-East showings occur at nearly the same stratigraphic position although separated by several kilometres along a northeasterly trend. They occur at or near the contact of a cryptograined limestone unit and a younger calcareous shale unit.

The Mel deposit, which is the largest and most continuous of the 3 occurrences, is essentially strataform and contains about 50% barite. It is viewed as a syngenetic deposit which formed on the sea floor. Drill indicated reserves are estimated at 6 million tons grading 6.77% zinc, 1.92% lead and 51.1% barite. The Jeri and the



ADAPTED FROM G.S.C. MAP
11-1968 AND COMPANY
PLANS

BARYTEX RESOURCES CORP.		
MEL AREA REGIONAL GEOLOGY AND KEY MAP		
DRAWN BY DCM	NTS 95 D/6	FIGURE 3
REPORT DATE JAN. 23/90	PROJECT NO. 9067	
D.C MILLER GEOLOGICAL SERVICES		

Mel-East are more structurally complex, lower grade and are zinc rich, containing only traces of lead and virtually no barite.

The Jeri prospect consists of widely spaced showings over a 400 m strike length with much of the area covered by overburden. Three chip samples from these showings in 1984 averaged 11.55% zinc, 0.02% lead, 0.02% barium and 0.34 g/t silver over an average width of 6.9 m. The mineralization is mainly smithsonite. The Jeri prospect was tested by 10 diamond drill holes in 1985 (Fig. 6). These holes indicated significant sphalerite-smithsonite mineralization over a 500 m strike length and a vertical range exceeding 100 m. Better intersections included 14.6 % zinc over 2.15 m in hole 4, 13.11% zinc over 3.37 m in hole 1 and 7.96% zinc over 4.58 m in hole 2. The drilling indicated the mineralization to be less uniform than that at the Mel, but to occur over a thicker stratigraphic interval and to be accompanied by intense silicification, dolomitization and siderite alteration. It is thought that the Jeri mineralization may be part of a cross-cutting feeder system which is only partly conformable with bedding which strikes northerly and dips 50- 60 degrees west. In general, this initial drilling did not adequately test the favourable contact between the cryptograined limestone unit and the calcareous shale, nor did it test the possibility of an easterly dip for mineralization.

The Mel-East showings are similar to those at the Jeri, but they are lower grade, less extensive and relatively inaccessible.

GEOCHEMISTRY

A limited soil sampling programme tested 2 potentially mineralized areas on the property. On the Sin 4 claim the S-Grid was located to test several anomalous stream sediment samples from 1984 work (Fig. 4 and 5). A few strongly anomalous zinc and lead values were obtained a short distance above the former samples in a low, overburden covered area which is at a topographic divide. The area is underlain by wavy banded limestone which is generally barren. The anomaly is thought to be related to fault which is inferred to strike nearly east-west and which would connect to a previous strong zinc anomaly straddling the boundary of the Mumbo 1 and Sin 1 claims (Fig. 4).

On the accompanying Figures 4 and 5, soil values are only shown for current work, but previous grids are shown. Previous anomalies from 1984 work and stream sediment values are also shown.

The N-Grid was extended from the Jeri showings to cover favourable stratigraphy to the north. Several possibly anomalous zinc/lead values and one definitely anomalous (line 115) zinc value were obtained along the grid which covers an easterly sloping, mainly overburden covered hillside. Two zinc bearing float boulders were found in this area in 1984.

Soil samples from both grids were taken mainly from the "B" horizon from an average depth of 25 cm. The soils ranged from brown to reddish brown. They were collected in kraft bags and analyzed at the Kamloops Research and Assay Laboratory. The analysis

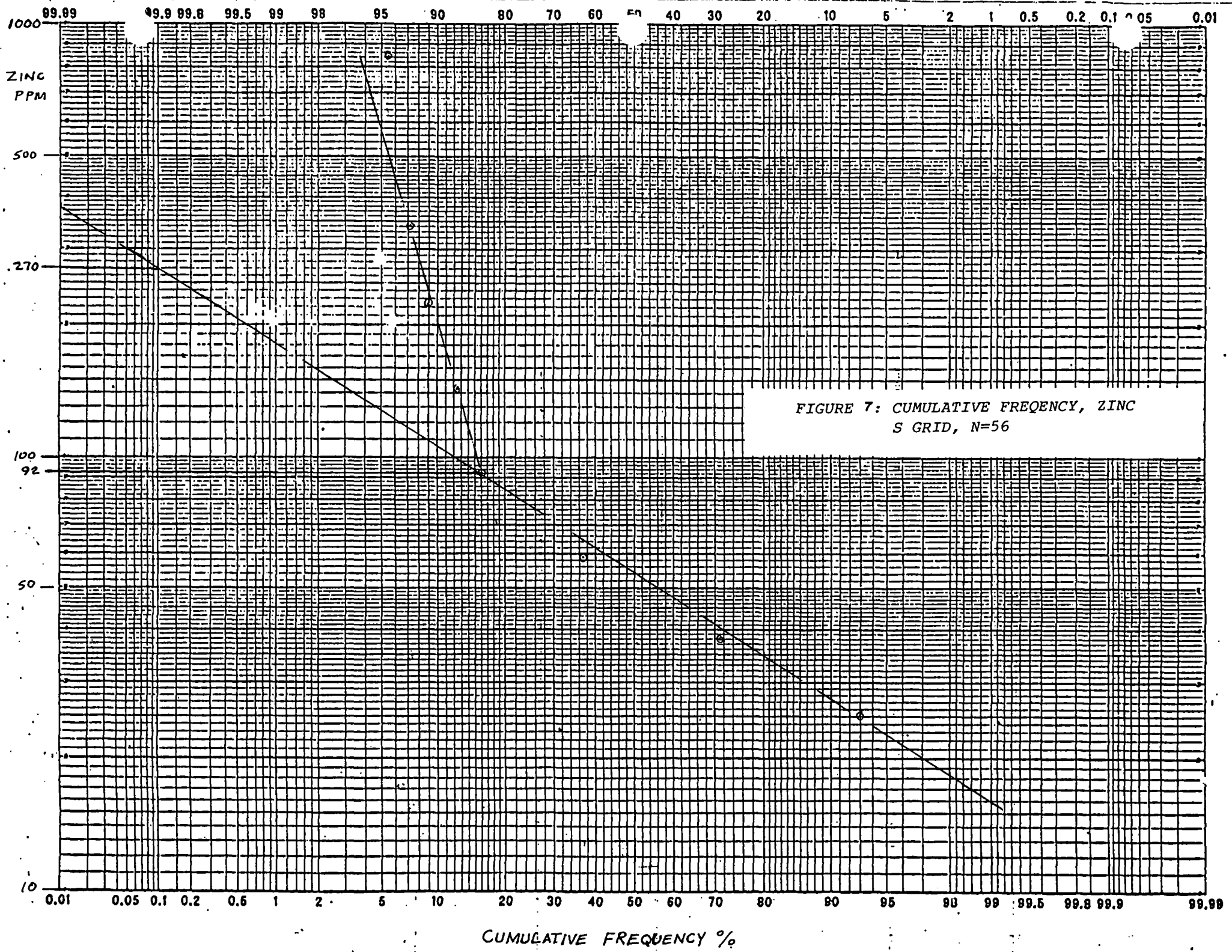


FIGURE 7: CUMULATIVE FREQUENCY, ZINC
S GRID, N=56

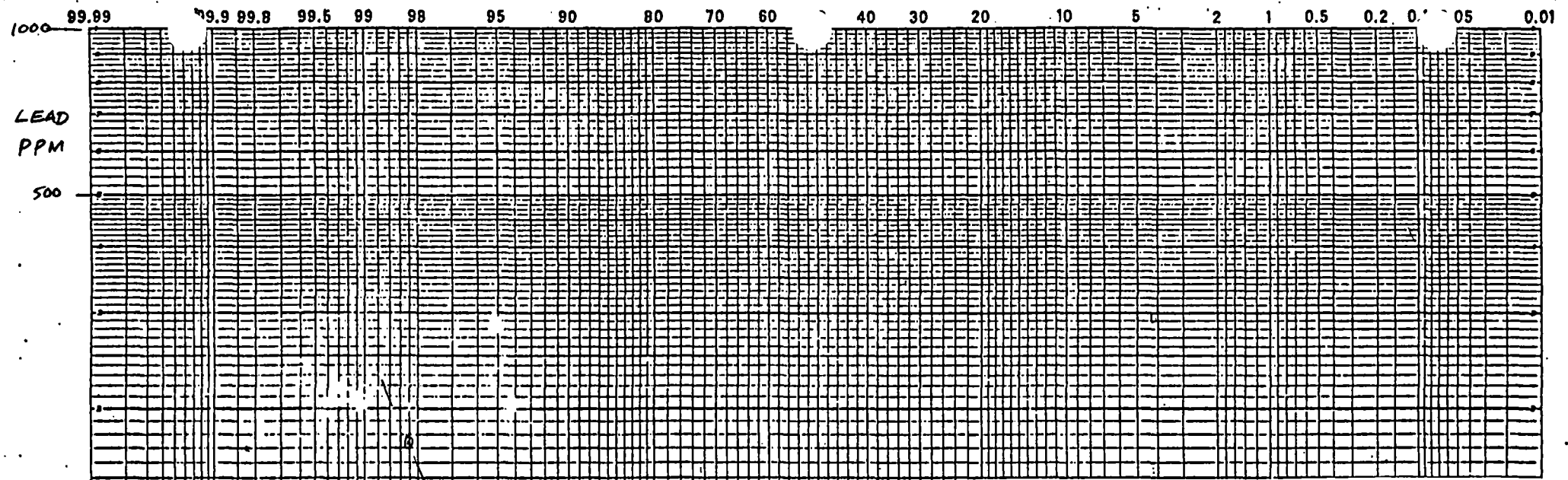
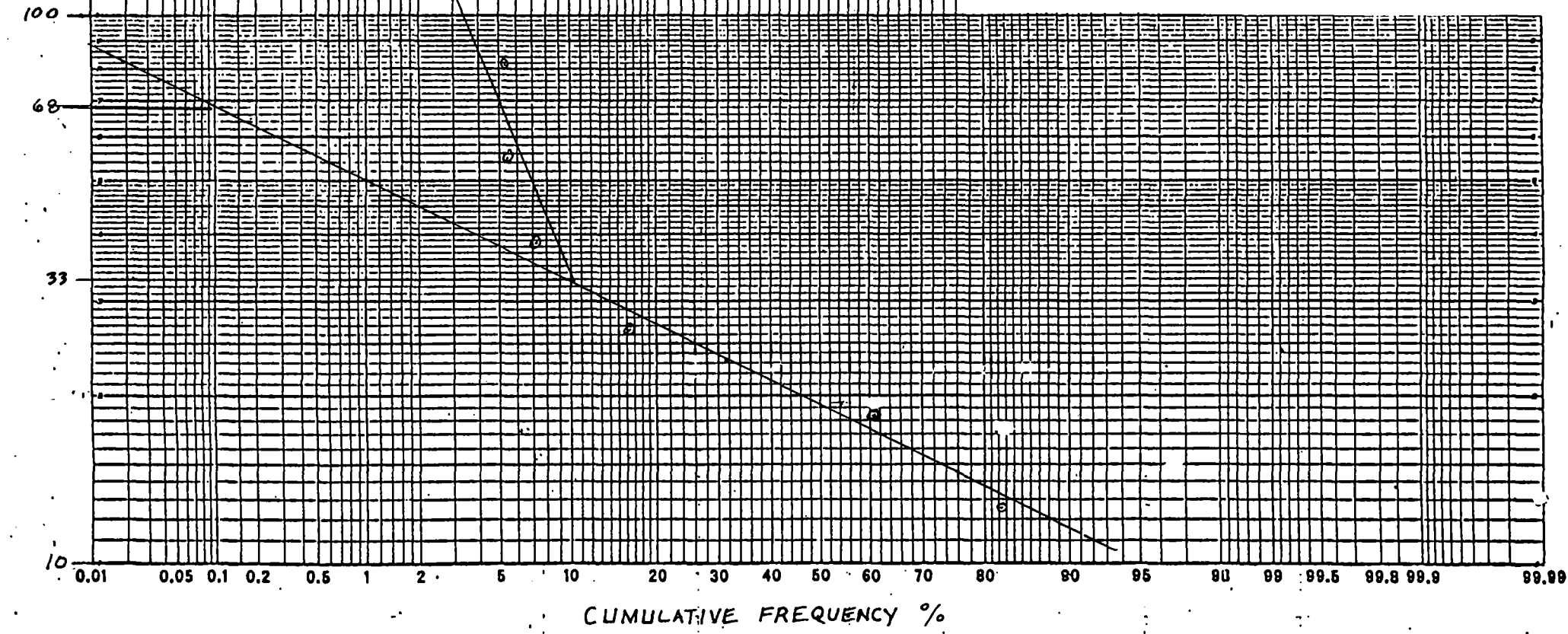
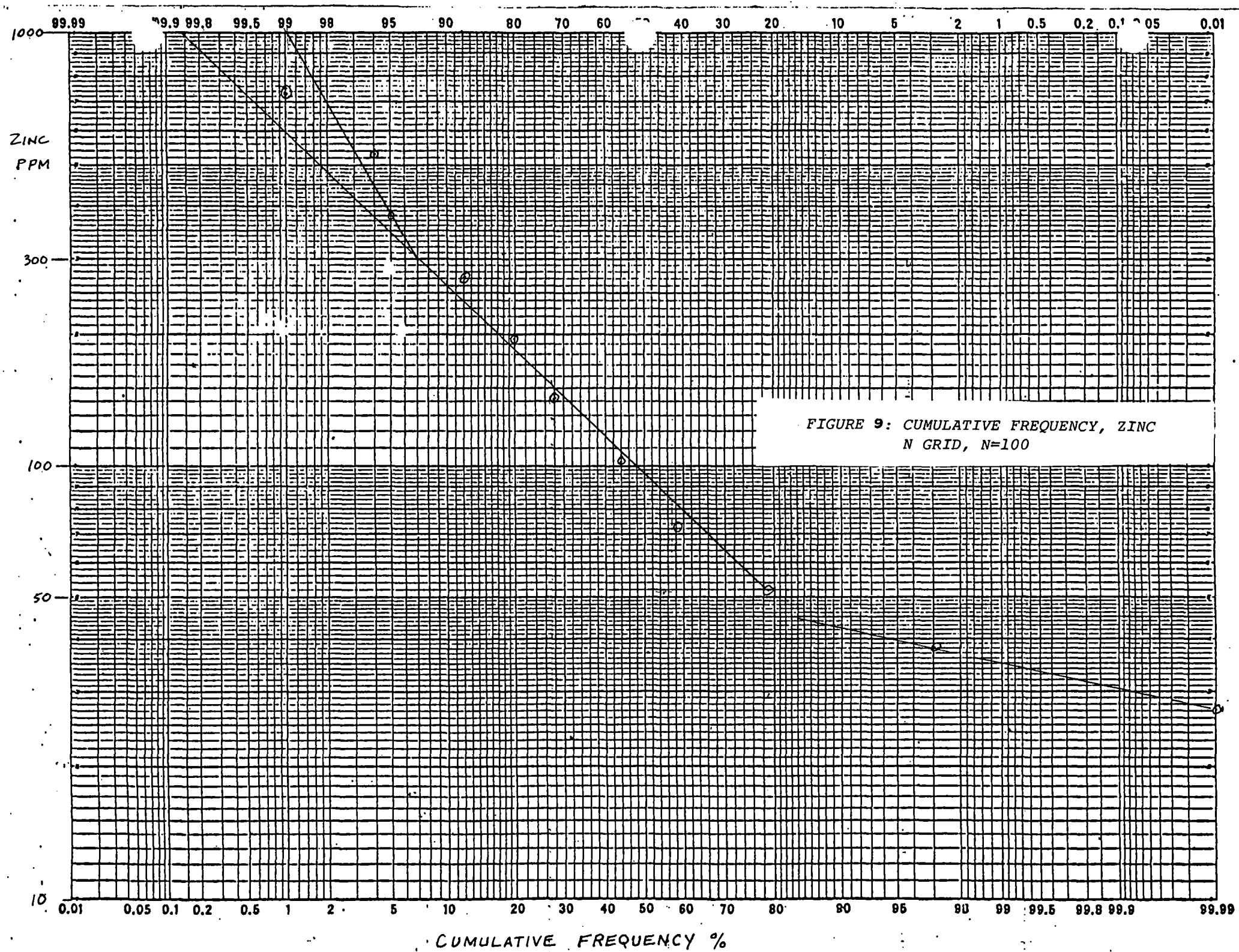


FIGURE 8: CUMULATIVE FREQUENCY, LEAD
S GRID, N=56



CUMULATIVE FREQUENCY %



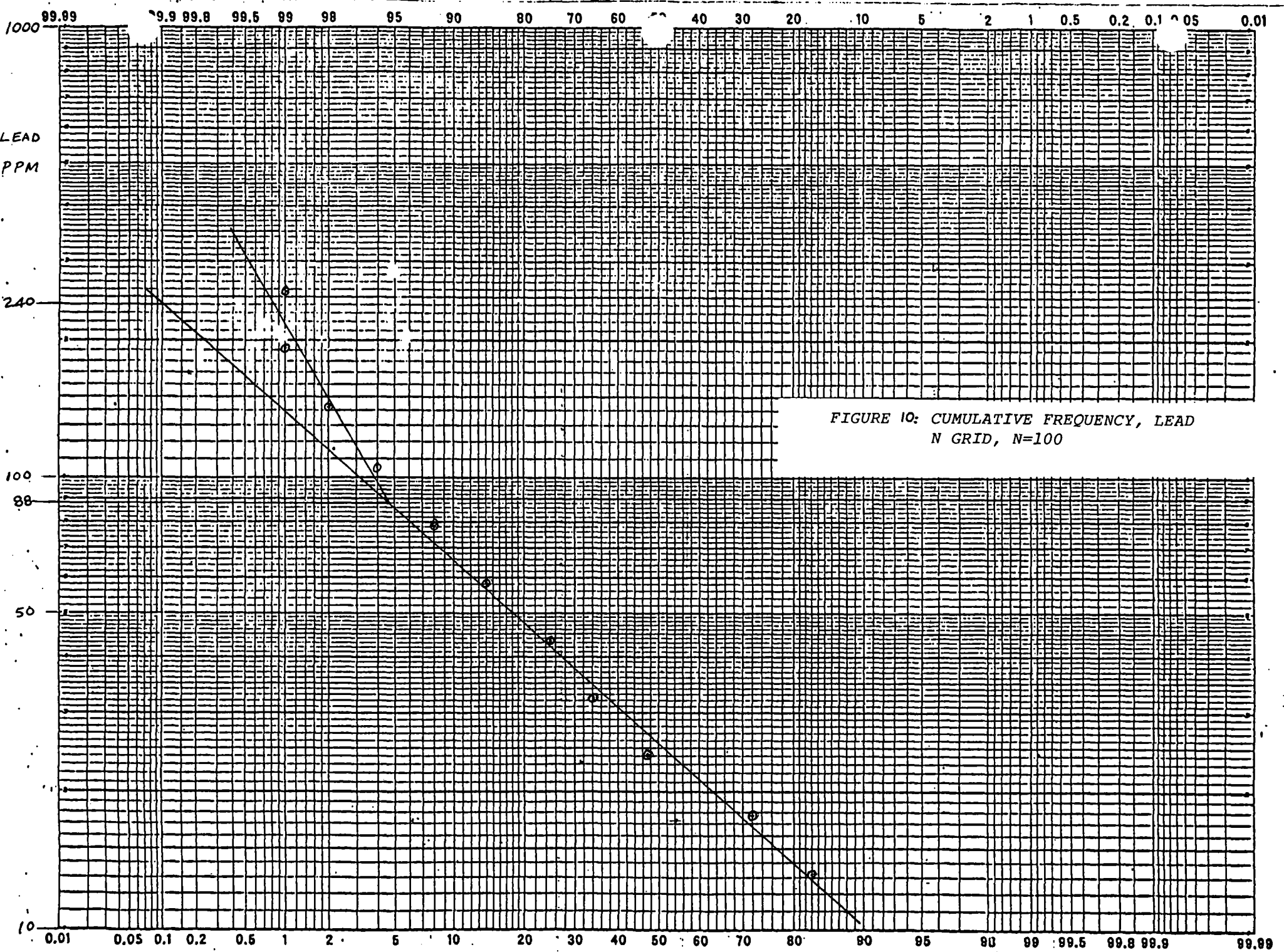


FIGURE 10: CUMULATIVE FREQUENCY, LEAD
N GRID, N=100

CUMULATIVE FREQUENCY %

method consists of digesting a portion of the -80 mesh fraction of each sample in hot aqua regia with analyses for zinc, lead and silver by atomic absorption. Copies of analyses reports complete with a logarithmic cumulative frequency distribution are appended.

The cumulative frequency data is plotted on Figures 7 to 10. These plots indicate threshold values for zinc and lead on the S-Grid to be 92 and 33 ppm respectively. For the N grid threshold values for zinc and lead are estimated at 300 and 88 ppm respectively. In the more extensive 1984 survey, threshold values for zinc and lead were 170 and 54 ppm. In order to compare the current survey with the 1984 results, the 1984 divisions are used on Figures 4 and 5.

Silver values were mainly less than 0.1 ppm on both grids, but included 6 samples between 0.20 and 0.30 ppm and 2 samples between 0.28 and 0.71 ppm. Silver values were not plotted.

CONCLUSIONS


1) The current soil sample results, together with previously located float boulders, indicate that zinc mineralization in the Jeri area extends northward along the favourable horizon to line N 117N.

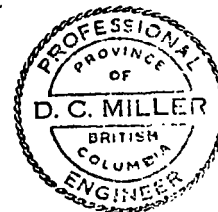
2) On the Sin 4 claim current soil sample results indicate limited zinc mineralization to occur just above former stream sediment samples. This anomaly is thought to be related to an inferred east-west fault and may indicate additional mineralization at depth along the favourable cryptograined limestone-shale contact.

RECOMMENDATIONS

- 1) At the Jeri showings, deeper drilling is recommended to test the favourable contact zone well below surface in the vicinity of the best surface showings.
- 2) At least 1 hole should be drilled to test the possibility of of the mineralization dipping to the east.
- 3) The strong 1984 soil anomaly near previous hole 10 (Sin 1 claim) should be tested with at least one additional hole to test the favourable contact in this area.
- 4) The 3820 ppm zinc value on line N 115N should be trenched to determine its cause with follow-up drilling if warranted.
- 5) To facilitate work near the Jeri the present cat-trail should be upgraded to a 4 wheel drive road.
- 6) Additional work on the Mel East should be deferred until the Jeri area mineralization is assessed.

Respectfully submitted,


D.C. Miller, P. Eng.
Jan. 23, 1990



LIST OF NAMES AND ADDRESSES OF PERSONS EMPLOYED

- 1) D.C. Miller, 769 Fraser Street, Kamloops, B.C. V2C 3H1
- 2) Leo Loranger, 6545 Beaver Crescent, Kamloops. B.C. V2C 4V2

CERTIFICATE

I, D.C. Miller hereby certify that:

- 1) I am a Consulting Geological Engineer with an office at 769 Fraser Street, Kamloops, B.C. V2C 3H1.
- 2) I am a graduate of the University of British Columbia and earned a B.A.Sc. in Geological Engineering in 1959.
- 3) I am a member of the Association of Professional Engineers of B.C. and a Fellow of the Geological Association of Canada.
- 4) I have practiced my profession for over 25 years
- 5) This report is based on personal observations at the subject property.
- 6) I have no direct interest in this property nor in the securities of Barytex Resources Corp. or Breakwater Resources Ltd.

D.C. Miller

D.C. Miller, P. Eng.
Jan. 23, 1990



COST STATEMENT

1) Wages and salaries: D. Miller 9 man-days, L. Loranger 10 man-days.....	\$ 4368.91
2) Transportation: Kamloops to Watson Lake	850.00
Watson Lake to Jeri (helicopter).....	1630.00
(return costs charged to diamond drilling)	
3) Watson Lake accommodation.....	111.00
4) Consumable supplies.....	180.00
5) Groceries.....	283.00
6) Power saw.....	100.00
7) Radio telephone.....	150.00
8) Analyses.....	756.60
9) Freight.....	50.00
10) Report.....	1200.00
11) Printing and handling.....	50.00

Total.....	\$9728.91
	=====

REFERENCES

Miller, D.C., 1984: Geological and Geochemical Report, Joni Claims, for Sulpetro Minerals Limited.

1985: Diamond Drilling Report, Jeri and Sin Claims Mel Property, for Sulpetro Minerals Limited.

1989: Report on the Mel Property for Barytex Resources Corp.

APPENDIX

GEOCHEMICAL ANALYSES

**KAMLOOPS
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B.C. CERTIFIED ASSAYERS

912 - 1 LAVAL CRESCENT, KAMLOOPS, B.C. V2C 5P5 PHONE (604) 372-2784 FAX 372-1112

**** GEOCHEMICAL REPORT ****



TO: R. D. C. MILLER
769 FRASER ST.,
KAMLOOPS, B.C.
V2C 3H1

Number: 2211A

Date: JAN. 4, 1990

Proj.:

Attn:

PAGE 1 / 2

KRAL NO.	IDENTIFICATION	PB PPM	ZN PPM
1	99+50E SL 101N	15.0	23.0
2	99+75E	26.0	43.0
3	100E	24.0	55.0
4	100+25E	12.0	70.0
5	100+50E SL 101N	13.0	36.0
6	98+00E SL 102N	11.0	16.0
7	98+25E	20.0	37.0
8	98+50E	16.0	39.0
9	98+75E	21.0	51.0
10	99+00E	24.0	44.0
11	99+25E	26.0	46.0
12	99+50E	15.0	27.0
13	99+75E	24.0	58.0
14	100+00E	20.0	59.0
15	100+25E	23.0	65.0
16	100+50E SL 102N	22.0	59.0
17	99+00E SL 103N	16.0	26.0
18	99+25E	16.0	27.0
19	99+50E	10.0	17.0
20	99+75E	23.0	38.0
21	100+00E	12.0	25.0
22	100+25E	19.0	54.0
23	100+50E	11.0	22.0
24	100+75E	18.0	36.0
25	101+00E	20.0	35.0
26	101+25E	22.0	62.0
27	101+50E	23.0	78.0
28	101+75E	13.0	60.0
29	102+00E SL 103N	18.0	84.0
30	99+00E SL 104N	25.0	64.0
31	99+25EE	23.0	57.0
32	99+50E	22.0	42.0
33	99+75E	49.0	70.0
34	100+00E SL 104N	32.0	56.0
35	100+25E	26.0	65.0
36	100+50E	25.0	69.0
37	100+75E	16.0	36.0
38	101+00E SL 104N	10.0	41.0
39	99+00E SL 105N	29.0	48.0
40	99+25E	22.0	39.0

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KRAL NO.	IDENTIFICATION	PB PPM	ZN PPM
41	99+50E	21.0	49.0
42	99+75E	24.0	71.0
43	100+00E	15.0	184.0
44	100+25E	6.0	37.0
45	100+50E	101.0	1020.0
46	100+75E	248.0	1260.0
47	101+00E SL 105N	27.0	1270.0
48	99+00E SL 106N	15.0	47.0
49	99+25E	12.0	58.0
50	99+50E	8.0	30.0
51	99+75E	11.0	69.0
52	100+00E	19.0	340.0
53	100+25E	28.0	202.0
54	100+50E	92.0	620.0
55	100+75E	26.0	130.0
56	101+00E SL 106N	34.0	102.0

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V2C 3H1

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CUMULATIVE FREQUENCY PLOT FOR ZN USING A LOGARITHMIC CONVERSION

CLASS	FREQUENCY	% FREQUENCY	CUMULATIVE FREQUENCY %
16.00--	24.78	4	7.1
24.78--	38.38	12	21.4
38.38--	59.43	19	33.9
59.43--	92.04	12	21.4
92.04--	142.55	2	3.6
142.55--	220.76	2	3.6
220.76--	341.90	1	1.8
341.90--	529.50	0	0.0
529.50--	820.04	1	1.8
820.04--	1270.00	3	5.4

MEAN 121.9

STD. DEV. 232.0

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~~CUMULATIVE FREQUENCY PLOT FOR Pb USING A LOGARITHMIC CONVERSION~~

CLASS	FREQUENCY	% FREQUENCY	CUMULATIVE FREQUENCY %
6.00-- 8.71	2	3.6	100.0
8.71-- 12.63	8	14.3	96.4
12.63-- 18.32	12	21.4	82.1
18.32-- 26.59	25	44.6	60.7
26.59-- 38.57	5	8.9	16.1
38.57-- 55.97	1	1.8	7.1
55.97-- 81.20	0	0.0	5.4
81.20-- 117.81	2	3.6	5.4
117.81-- 170.93	0	0.0	1.8
170.93-- 248.00	1	1.8	1.8

MEAN 25.7

STD. DEV. 29.2

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KRAL NO.	IDENTIFICATION	PB PPM	ZN PPM
1	100+00E NL 110N	16.0	64.0
2	100+25E	19.0	45.0
3	100+50E	18.0	46.0
4	100+75E	24.0	70.0
5	101+00E	11.0	54.0
6	101+25E	13.0	53.0
7	101+50E	60.0	214.0
8	101+75E	16.0	58.0
9	102+00E	10.0	60.0
10	102+25E	19.0	55.0
11	102+50E NL 110N	12.0	29.0
12	100+00E NL 111N	15.0	61.0
13	100+25E	21.0	40.0
14	100+50E	13.0	54.0
15	100+75E	11.0	41.0
16	101+00E	10.0	42.0
17	101+25E	22.0	99.0
18	101+50E	11.0	61.0
19	101+75E	18.0	95.0
20	102+00E	33.0	357.0
21	102+25E	72.0	410.0
22	102+50E NL 111N	26.0	102.0
23	100+00E NL 112N	8.0	41.0
24	100+25E	8.0	41.0
25	100+50E	15.0	59.0
26	100+75E	4.0	34.0
27	101+00R	13.0	96.0
28	101+25E	21.0	105.0
29	101+50E	49.0	168.0
30	101+75E	346.0	651.0
31	102+00E	63.0	225.0
32	102+25E	21.0	137.0
33	102+50E NL 112N	15.0	88.0
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36	100+50E	10.0	80.0
37	100+75E	8.0	61.0
38	101+00E	9.0	27.0
39	101+25E	25.0	120.0
40	101+50E	20.0	103.0

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48	100+75E	16.0	51.0
49	101+00E	19.0	110.0
50	101+25E	22.0	99.0
51	101+50E	61.0	258.0
52	101+75E	149.0	656.0
53	102+00E	65.0	154.0
54	102+25E	58.0	156.0
55	102+50E	29.0	64.0
56	102+75E NL 114N	51.0	148.0
57	100+00E NL 115N	25.0	60.0
58	100+25E	16.0	45.0
59	100+50E	21.0	50.0
60	100+75E	49.0	3820.0
61	101+00E	101.0	285.0
62	101+25E	114.0	731.0
63	101+50E	49.0	359.0
64	101+75E	32.0	228.0
65	102+00E	40.0	146.0
66	102+25E	53.0	230.0
67	102+50E NL 115N	22.0	58.0
68	99+50E NL 116N	20.0	50.0
69	99+75E	17.0	48.0
70	100+00E	18.0	45.0
71	100+25E	23.0	66.0
72	100+50E	21.0	67.0
73	100+75E	67.0	257.0
74	101+00E	21.0	121.0
75	101+25E	43.0	375.0
76	101+50E	89.0	273.0
77	101+75E	36.0	216.0
78	102+00E NL 116N	22.0	90.0
79	99+50E NL 117N	21.0	64.0
80	99+75E	20.0	65.0

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Number: 2222A

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PAGE 3 / 3

KRAL NO.	IDENTIFICATION	PB PPM	ZN PPM
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82	100+25E	19.0	40.0
83	100+50E	49.0	130.0
84	100+75E	108.0	139.0
85	101+00E	97.0	252.0
86	101+25E	30.0	87.0
87	101+50E	28.0	127.0
88	101+75E	16.0	77.0
89	102+00E NL 117N	24.0	84.0
90	99+50E NL 118N	38.0	321.0
91	99+75E	18.0	87.0
92	100+00E	49.0	106.0
93	100+25E	32.0	101.0
94	100+50E	24.0	100.0
95	100+75E	24.0	65.0
96	101+00E	33.0	114.0
97	101+25E	34.0	127.0
98	101+50E	89.0	286.0
99	101+75E	37.0	139.0
100	102+00E NL 118N	51.0	147.0

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TO: R. D. C. MILLER
769 FRASER ST.,
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V2C 3H1

Number: 2222A

Date: JAN 4, 1990

Proj.:

Attn:

CUMULATIVE FREQUENCY PLOT FOR ZN USING A LOGARITHMIC CONVERSION

CLASS	FREQUENCY	% FREQUENCY	CUMULATIVE FREQUENCY %
27.00-- 37.56	3	3.0	100.0
37.56-- 52.25	18	18.0	97.0
52.25-- 72.69	21	21.0	79.0
72.69-- 101.13	14	14.0	58.0
101.13-- 140.69	16	16.0	44.0
140.69-- 195.72	8	8.0	28.0
195.72-- 272.28	8	8.0	20.0
272.28-- 378.79	7	7.0	12.0
378.79-- 526.97	1	1.0	5.0
526.97-- 733.10	3	3.0	4.0
733.10-- 1019.87	0	0.0	1.0
1019.87-- 1418.81	0	0.0	1.0
1418.81-- 1973.80	0	0.0	1.0
1973.80-- 2745.89	0	0.0	1.0
2745.89-- 3820.00	1	1.0	1.0

MEAN 162.7

STD. DEV. 331.9

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**** CUMULATIVE FREQUENCY ****

Mr. D. C. MILLER
769 FRASER ST.,
KAMLOOPS, B.C.
V2C 3H1

Number: 2222A

Date: JAN 4, 1990

Proj.:

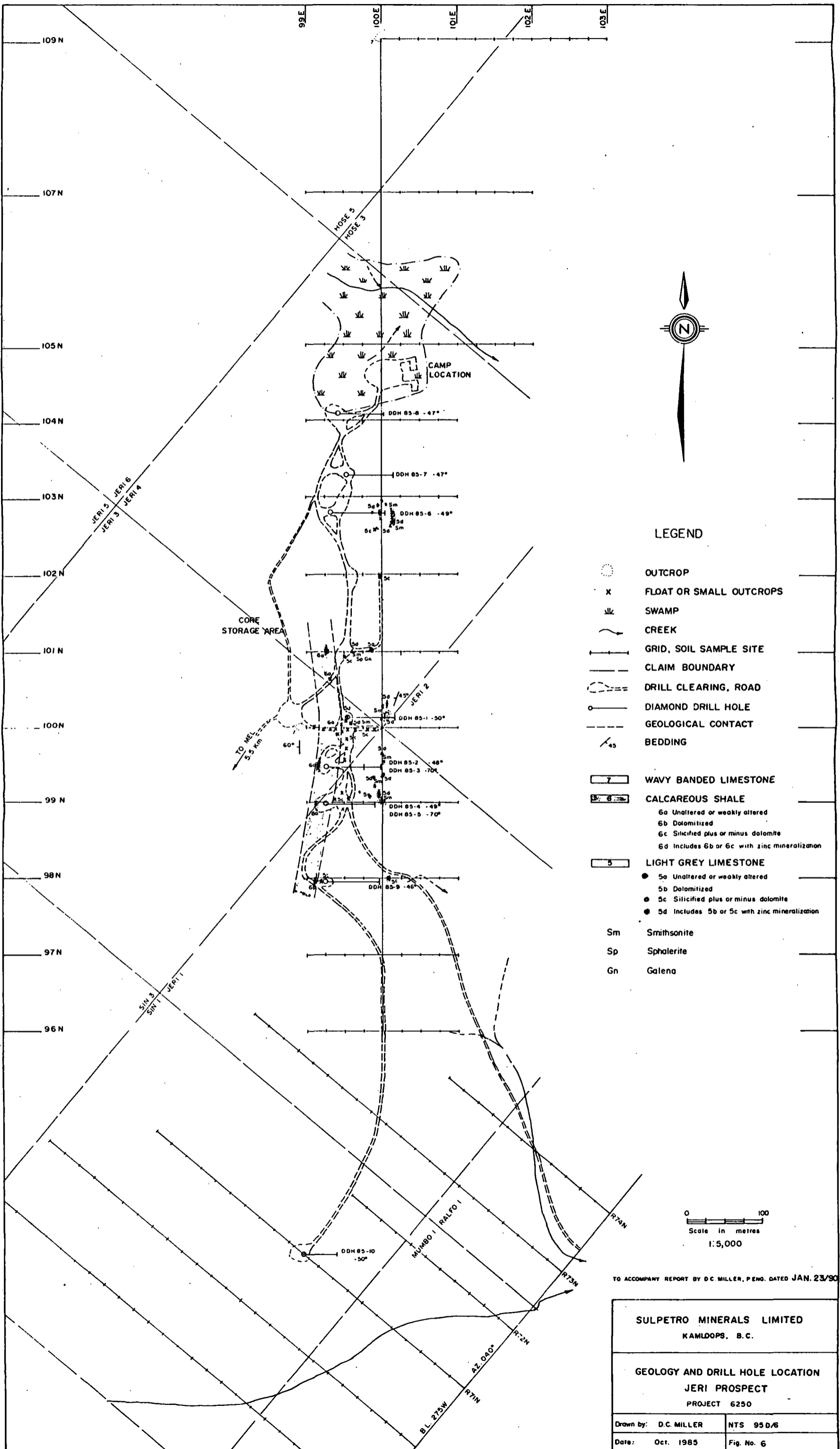
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CUMULATIVE FREQUENCY PLOT FOR PB USING A LOGARITHMIC CONVERSION

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7.25--	9.76	4	4.0
9.76--	13.14	11	11.0
13.14--	17.69	11	11.0
17.69--	23.82	25	25.0
23.82--	32.06	13	13.0
32.06--	43.17	9	9.0
43.17--	58.11	11	11.0
58.11--	78.24	6	6.0
78.24--	105.33	4	4.0
105.33--	141.80	2	2.0
141.80--	190.90	1	1.0
190.90--	257.00	0	0.0
257.00--	346.00	1	1.0

MEAN 35.7

STD. DEV. 37.9

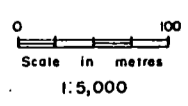


LEGEND

- OUTCROP
- FLOAT OR SMALL OUTCROPS
- SWAMP
- CREEK
- GRID, SOIL SAMPLE SITE
- CLAIM BOUNDARY
- DRILL CLEARING, ROAD
- DIAMOND DRILL HOLE
- GEOLOGICAL CONTACT
- BEDDING

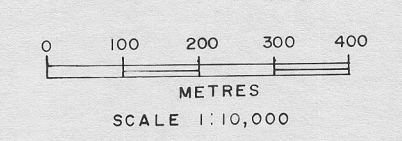
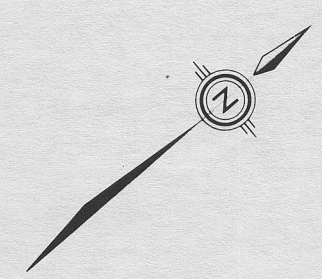
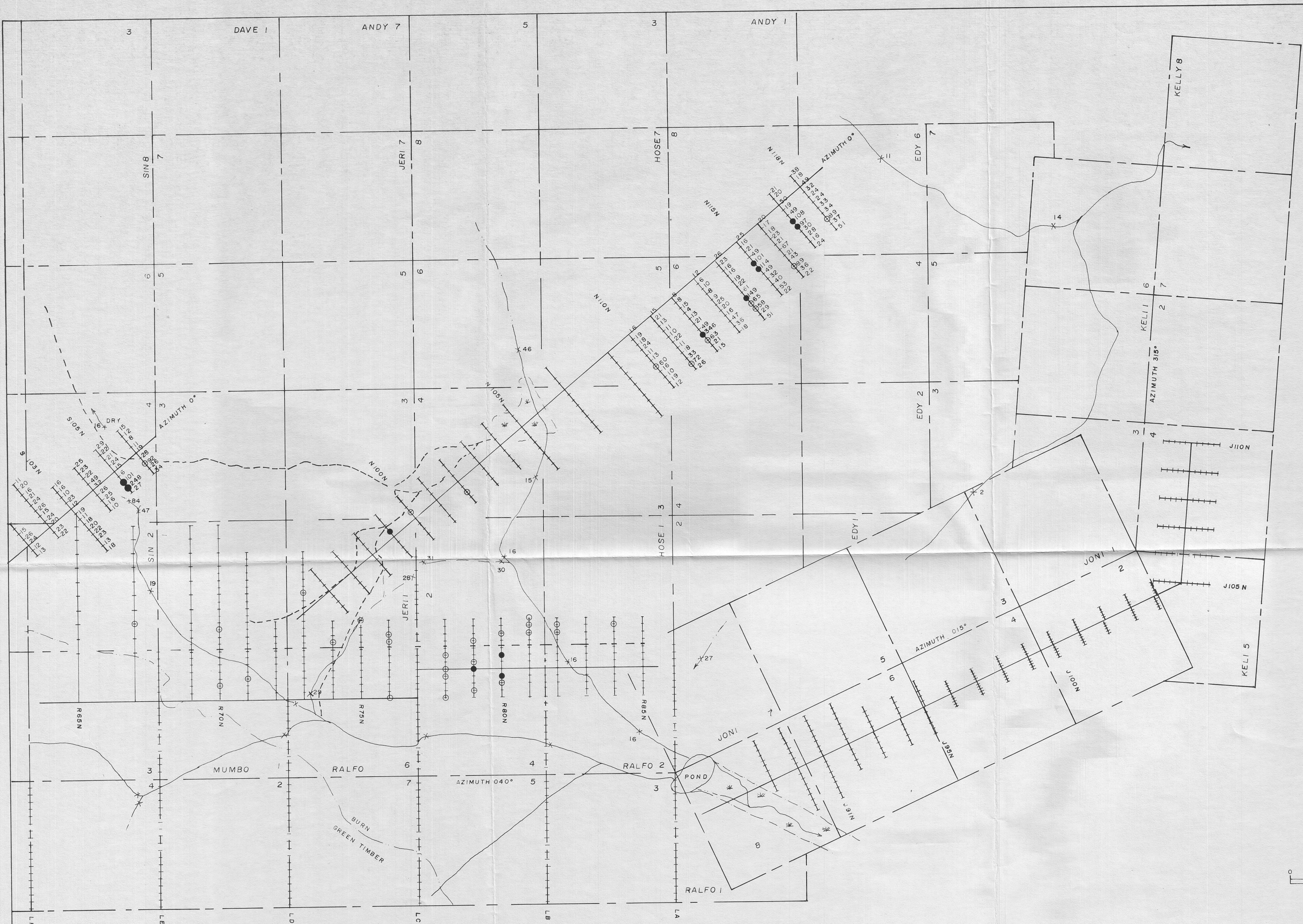
- WAVY BANDED LIMESTONE
- CALCAREOUS SHALE
 - 6a Unaltered or weakly altered
 - 6b Dolomitized
 - 6c Silicified plus or minus dolomite
 - 6d Includes 6b or 6c with zinc mineralization
- LIGHT GREY LIMESTONE
 - 5a Unaltered or weakly altered
 - 5b Dolomitized
 - 5c Silicified plus or minus dolomite
 - 5d Includes 5b or 5c with zinc mineralization

- Sm Smithsonite
- Sp Sphalerite
- Gn Galena



TO ACCOMPANY REPORT BY D.C. MILLER, P. ENG. DATED JAN. 23/90

SULPETRO MINERALS LIMITED KAMDOPS, B.C.	
GEOLOGY AND DRILL HOLE LOCATION JERI PROSPECT PROJECT 6250	
Drawn by: D.C. MILLER	NTS 95 D/6
Date: Oct. 1985	Fig. No. 6

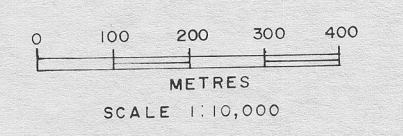
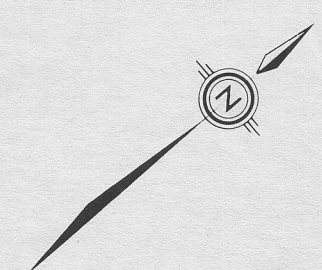
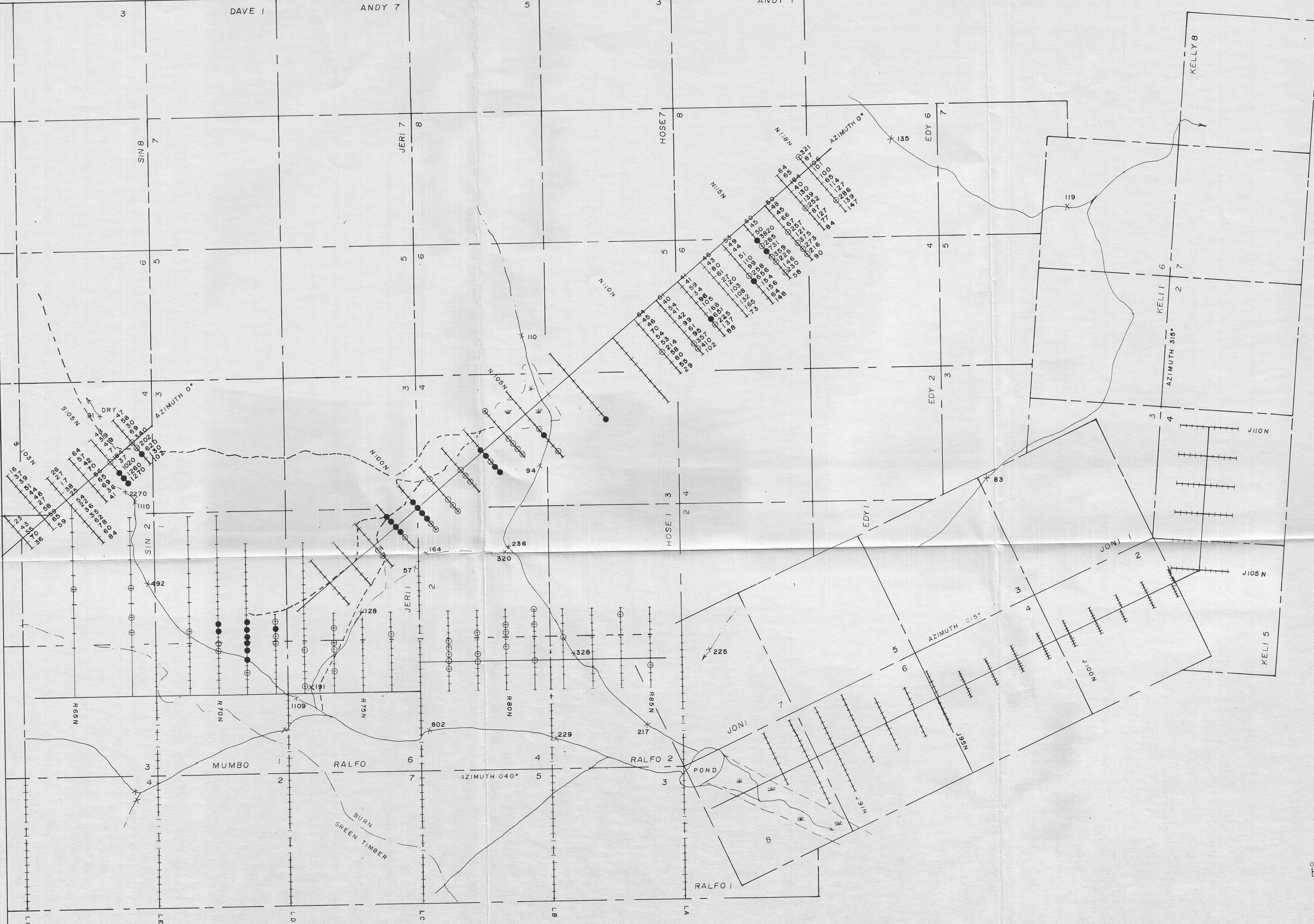


LEAD IN SOILS

- + LESS THAN 54 PPM
- ⊕ 54 - 96 PPM
- GREATER THAN 96 PPM

- ++++ GRID LINE AND SOIL SAMPLE SITES
- ← X → STREAM AND 1984 SILT SAMPLE SITE
- |||| SWAMP / MEADOW
- CLAIM BOUNDARY
- - - CAT TRAIL

BARYTEX RESOURCES CORP.		
JERI & MEL EAST AREAS		
LEAD GEOCHEMISTRY PPM		
DRAWN BY DCM	NTS 95D/6	FIGURE 5
REPORT DATE JAN. 23, 1990	PROJECT NO. 9067	
D. C. MILLER GEOLOGICAL SERVICES		



ZINC IN SOILS

- + LESS THAN 170 PPM
- ⊕ 170-479 PPM
- GREATER THAN 479 PPM

- ++++ GRID LINE AND SOIL SAMPLE SITES
- STREAM AND 1984 SILT SAMPLE SITE
- ~~~~ SWAMP / MEADOW
- CLAIM BOUNDARY
- CAT TRAIL

BARYTEX RESOURCES CORP.		
JERI & MEL EAST AREAS		
ZINC GEOCHEMISTRY PPM		
DRAWN BY DCM	NTS 95 D/6	FIGURE 4
REPORT DATE JAN. 23, 1990	PROJECT NO. 9067	
D.C. MILLER GEOLOGICAL SERVICES		

DESIGNATION NO. EIP89061

REPORT ON DIAMOND DRILLING

MEL PROPERTY, YUKON

(JEAN 3 CLAIM)

CLAIM SHEET 95D/6

LATITUDE 60 DEGREES 21 MINUTES NORTH

LONGITUDE 127 DEGREES 24 MINUTES WEST

PREPARED BY

D.C. MILLER, P.ENG.

FOR

BARYTEX RESOURCES CORP.

COVERING FIELD WORK

BETWEEN

OCTOBER 4 AND NOVEMBER 13, 1989

SUBMITTED JANUARY 31, 1990

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INTRODUCTION AND SUMMARY

Previous drilling at the Mel property during 1974-1987 indicated geological reserves totalling 5,687,493 tonnes grading 6.77% zinc, 1.92% lead and 51.1% barite. In this calculation, individual drill sample assays were combined by linear weighting and the combined assays representing each drill hole intersection were weighted by a block of mineralization calculated taking into account the specific gravity of that block. Mineralization occurs in a stratiform, folded lens-shaped body up to 21.7 m thick at its centre. Mineralization gradually thins towards both ends over a 800 m strike-length.

During October and November 1989, 4 BQ diamond drill holes totalling 662.94 m tested the north and upper part of the zone. The drilling was designed to firm up estimated geological reserves within a proposed open pit location and to delineate the fold structure in more detail. To obtain the maximum amount of information, the holes were located to intersect the zone above and below the fold axis. Three holes were completed to total depth with dual intersections and the final hole was suspended due to weather after intersecting only the upper part of the zone. The drilling provided seven additional intersections within the mineralized unit. All intersections occurred within a few metres of the predicted location, but variations in grade and thickness indicate trends not previously recognized in earlier drilling at wider spacing. Continuation of drilling at 50 metre spacing is clearly warranted.

As drilling operations were suspended for a planned winter shut-



LOCATION MAP

Watson Lake Mining District, Yukon

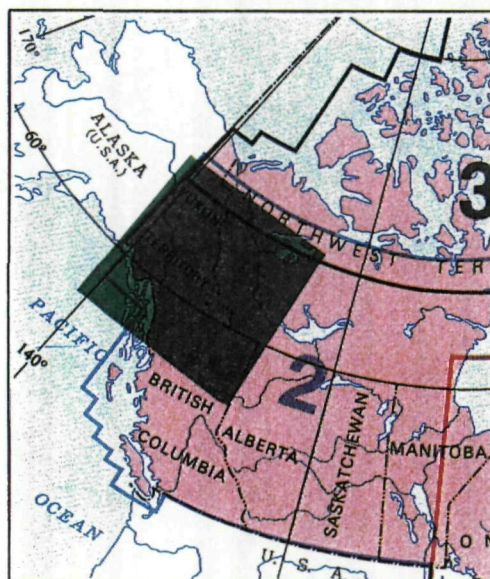
Distances from Mel Property

Watson Lake	80 km (Air)
Alaska Hwy	50 km (Winter Rd.)
Fort Nelson	507 km - Railhead
Skagway	666 km - Tidewater

INDEX MAP

Area Covered

Yukon and Northern B.C.



BARYTEX RESOURCES CORP.

**MEL PROPERTY
LOCATION & ACCESS**

DRAWN BY DCM	NTS 95D/6	FIGURE 1
REPORT DATE JAN. 31, 1990	PROJECT NO. 9068	

D. C. MILLER GEOLOGICAL SERVICES

down, the program as outlined in my Report dated September 19, 1989 has not yet been completed. Work is expected to resume in March and a comprehensive review of data will be completed following this work.

The results of the recent drilling continue to suggest that the Mel deposit compares favourably with existing base metal deposits.

LOCATION AND ACCESS

The Mel property is located 80 km east-northeast of Watson Lake, Yukon. Access is provided by a winter road, some 50 km long, leading from the Alaska Highway at a point some 77 km eastward of Watson Lake. Alternative access is provided by a 640 m airstrip located 1.5 km south of the Mel deposit or by helicopter. Road distance from the property to the railhead at Fort Nelson is 507 km and to tidewater at Skagway is 666 km.

PROPERTY AND OWNERSHIP

The property comprises 171 claims and is jointly owned by Breakwater Resources Ltd. and Barytex Resources Corp. Under the terms of an agreement dated February 15, 1985 Breakwater has earned a 100% interest in the property subject to a 10% net profits interest held by Baytex. Barytex also receives a \$20,000 per year advance royalty and has the right to earn a 5% participating interest when a production decision is reached.

Under the terms of an amending agreement dated August 31, 1989 Breakwater has agreed to grant Barytex an option to reacquire a 45% interest in the property. The property is located in the Watson Lake Mining District and includes 171 contiguous claims as follows:

<u>CLAIM NAME</u>	<u>GRANT NO.</u>	<u>EXPIRY DATE</u>
Mel 11-16	Y 22230-35	April 3, 2000
Jean 1- 4	Y 72731-34	April 3, 2000
Jean 5-10	Y 72961-66	April 5, 1998
Jean 11-21	Y 74418-28	Oct. 15, 1999
Wet 1	Y 83309	April 3, 1999
Wet 2	Y 83310	April 3, 2000
Wet 3	Y 83311	April 3, 1999
Wet 4	Y 83312	April 3, 2000
Wet 5-8	Y 83313-16	April 3, 1999
Wet 9-16	Y 83317-24	April 3, 1998
Wet 25-29	Y 83325-29	April 3, 1999
Wet 30	Y 83330	April 3, 2000
Wet 31	Y 83331	April 3, 1999
Wet 32	Y 83332	April 3, 2000
Joe 1-2 Fractions	YA45269-70	Aug. 13, 1997
Sov 1-6	YA28600-05	April 26, 2000
Keli 1-4	YA66842-45	Aug. 10, 1994
Joni 1-8	YA66846-53	Aug. 10, 1994
Hose 1-8	YA66919-26	Aug. 24, 1994
Keli 5-8	YA66927-30	Aug. 24, 1994
Jeri 1-8	YA66921-38	Aug. 24, 1994
Ralfo 1-7	YA66939-45	Aug. 24, 1994
Chungo 1	YA66946	Aug. 24, 1994
Chungo 2-8	YA66947-53	Aug. 24, 1995
Ott 1-8	YA66954-61	Aug. 24, 1994
Edy 1-7	YA66962-68	Aug. 24, 1994
Tomi 1-8	YA66969-76	Aug. 24, 1994
Mumbo 1	YA66977	Aug. 24, 1994
Mumbo 2-4	YA66978-80	Aug. 24, 1993
Mumbo 5-8	YA66981-84	Aug. 24, 1994
Boz 1-4	YA66985-88	Aug. 24, 1994
Sin 1-2	YA66989-90	Aug. 24, 1994
Sin 3-5	YA66991-93	Aug. 24, 1995
Sin 6-8	YA66994-96	Aug. 24, 1994
Yang 1	YA66997	Aug. 24, 1990
Yang 2-6	YA66998-02	Aug. 24, 1994
Dave 1-8	YA72501-08	Nov. 5, 1994
Andy 1-8	YA72509-16	Nov. 5, 1994

The claim information was obtained from Breakwater records and is thought to be accurate. A cross-check against the Mining Recorder's records is recommended.

PHYSIOGRAPHY AND CLIMATE

The base elevation at the property is 850 m and maximum elevations range up to 1300 m. Topography is generally moderate. Forests are composed mainly of spruce, pine and balsam. Much of the forests on the property were burned in 1982 by a large forest fire. The property is drained by Otter Creek and its tributaries which flow eastward into the Rock River and Mel Creek which flows south to the Coal River. Adequate water is present for mining and exploration purposes. The climate is similar to that at Ft. Nelson, B.C., with cold winters and moderate summers. Precipitation is moderate and winter snow accumulation is in the order of 80 cm.

HISTORY

The property was first staked in 1967 by J. Melnychuk and T. Flint and optioned to Newmont Mining Corporation. Early work by Newmont included road work, trenching and a geochemical survey. Newmont dropped their option and the property was later sold to Empire Metals Corporation which was subsequently renamed Barytex Resources Corp. Barytex optioned the property to Granby Mining Corporation, which drilled 18 diamond drill holes totalling 1952 m during 1974 and 1975. In 1976 St. Joseph Explorations Limited entered the agreement and conducted geological, geochemical and geophysical surveys followed by 4054.2 m of diamond drilling in 19 holes during 1978 and 1979. In 1981 the Canadian interests of St. Joe Minerals Corporation were sold to Sulpetro Limited and Sulpetro Minerals Limited was formed as the minerals division.

In 1981 regional exploration work by Sulpetro discovered zinc mineralization 7.3 km (Fig. 3) northeast of the Mel deposit. The showings were named Mel-East (Joni), but little further work was done in this area. In 1984 the Jeri zinc showings were discovered between the Mel and Mel-East areas (Fig. 3). Later in 1984 Sulpetro completed a new access road to the property and built an airstrip near the main Mel deposit. In 1985 Sulpetro utilized the airstrip to drill the Jeri showings with 10 diamond drill holes totalling 1009.8 m. At this time a 5.5 km tote road was built to connect the Mel and the Jeri showings. In late 1985 Sulpetro sold its mineral assets to Novamin Resources Inc., which in 1987, completed 7 diamond drill holes totalling 2011.99 m. This drilling tested the Mel deposit at depth and to the south along strike. In 1988 Novamin was purchased by Breakwater Resources Ltd.

CURRENT WORK

MOBILIZATION AND CAMP

Initial mobilization started on October 4 when the writer and assistant Leo Loranger drove from Kamloops to Watson Lake bringing a load of exploration equipment. Initially this equipment was used for a brief program of soil sampling and line cutting on the adjoining Jeri claims. On October 14 much of the camp equipment from the Jeri campsite was slung by helicopter to the Mel campsite. A 14x16 tent frame left from 1987 was utilized for the office tent. During October 15-19 additional lumber, plywood, groceries, drill equipment and 4 drillers and a cook were were flown from Watson Lake and Contact Creek using Bell 205 and Bell 206B helicopters. As the materials arrived, a camp consisting of a 14x16 kitchen tent and a 12x14 driller's tent was set up. On October 18 a mechanic was brought in and started up the John Deere 350 C tractor which had been stored at the airstrip since 1985.

Diesel fuel consumption was about 1 barrel per day for the drill, coil heater, pumps, tractor and oil stoves. Gasoline consumption for the generator, Ferret tractor and power saws was about 2 gallons per day. Initially old fuel left at the property from previous programs was used and later, new fuel was brought in by Beaver aircraft as required while empty drums were taken out.

WEATHER

From Oct. 14 to 25 the weather was fairly mild with temperatures averaging about -2 deg. C. with several periods of snowfall.

From Oct. 26 to Nov. 1 temperatures dropped to as low as -20 deg. C., but averaged -10 deg. C. From Nov. 2 to 7, temperatures were milder, averaging about -2 deg. C. A cooling trend started on Nov. 8 which resulted in lows of -30 and -42 deg. C. on Nov. 10 and 11 respectively. Total snow accumulation by Nov. 11 was 45 cm.

DIAMOND DRILLING

During Oct. 20 to Nov. 9, 4 BQ holes totalling 662.94 m were completed to test relatively near surface mineralization within a broad fold structure between sections 10,050N and 10,200N. Drilling was done with a hydracore drill. Three days were lost because of mechanical problems, but when operating normally the drill performed well, good core recovery was obtained and good directional control was maintained.

The first 3 (deeper) holes were surveyed with a Pajari compass-dip instrument and survey results are appended to this report. Very little hole deviation occurred.

Drill core was logged on a daily basis and all significant mineralization was split and shipped to Chemex Labs, North Vancouver, B.C. where samples were assayed for silver, zinc, lead and barite.

Drilling was stopped temporarily on Nov. 9 and the drill was left set up at hole 89-33. It is planned to resume drilling in March 1990.

DIAMOND DRILLING SUMMARY TABLE

HOLE NO.	LAT. (m)	DEP. (m)	ELEV. (m)	GRID AZ. (DEG)	DIP (DEG)	O.B. (m)	TOTAL DEPTH (m)	DATE START/ FINISH
89-30	10,097.3	9,974.5	924.7	270	-85	0.76	184.10	OCT. 20/24
89-31	10,157.3	9,985.4	935.0	270	-88	3.28	220.06	OCT. 26/30
89-32	10,198.6	9,988.0	942.1	270	-87	0.30	204.22	OCT. 30/ NOV. 07
89-33	10,049.3	9,973.4	919.0	270	-89.5	0.61	54.56	NOV. 08/09
TOTAL							662.94	=====

SURVEY

A survey was done to tie the base line to a previous claim survey, to re-establish the baseline and to survey the collars of the current drill holes. A Wild T1A theodolite and a metric stadia rod were used. For control with respect to astronomic north, 2 iron pins of the claim survey were located. These included the main iron pin at the common point of the Jean 1-4 claims and the north iron pin between the Jean 3 and 4 claims. The azimuth of the base line was determined to be 1 deg. 54 min. 20 sec.

In previous surveys the Granby base point was assigned coordinates of 9,971.58N, 10,000E and an elevation of 906.05 m. This point was used to set 4 iron pins along the baseline between 9800.00N and 10110.80N and as a reference to tie in the current drill holes.

CORE STORAGE

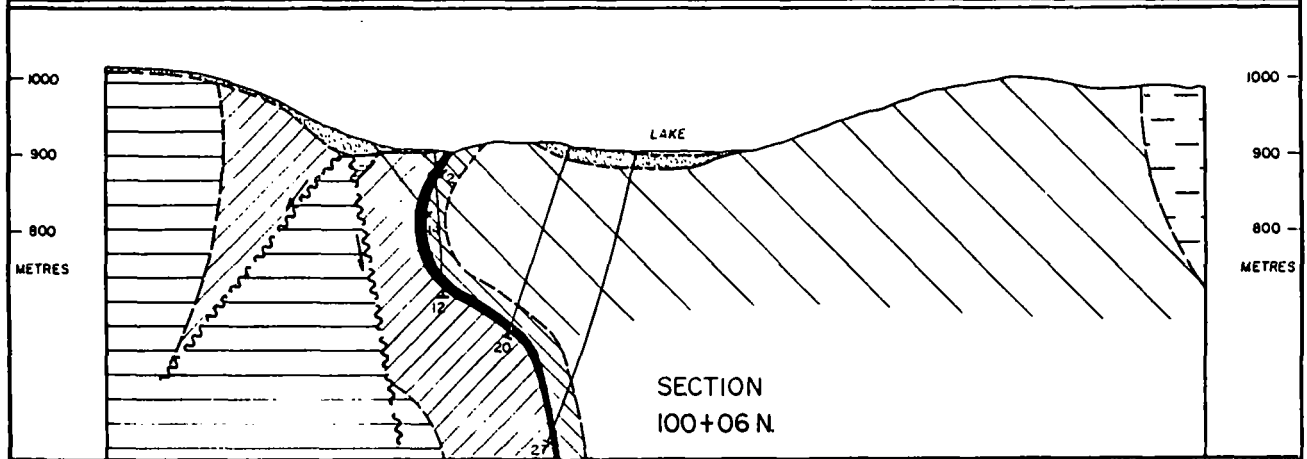
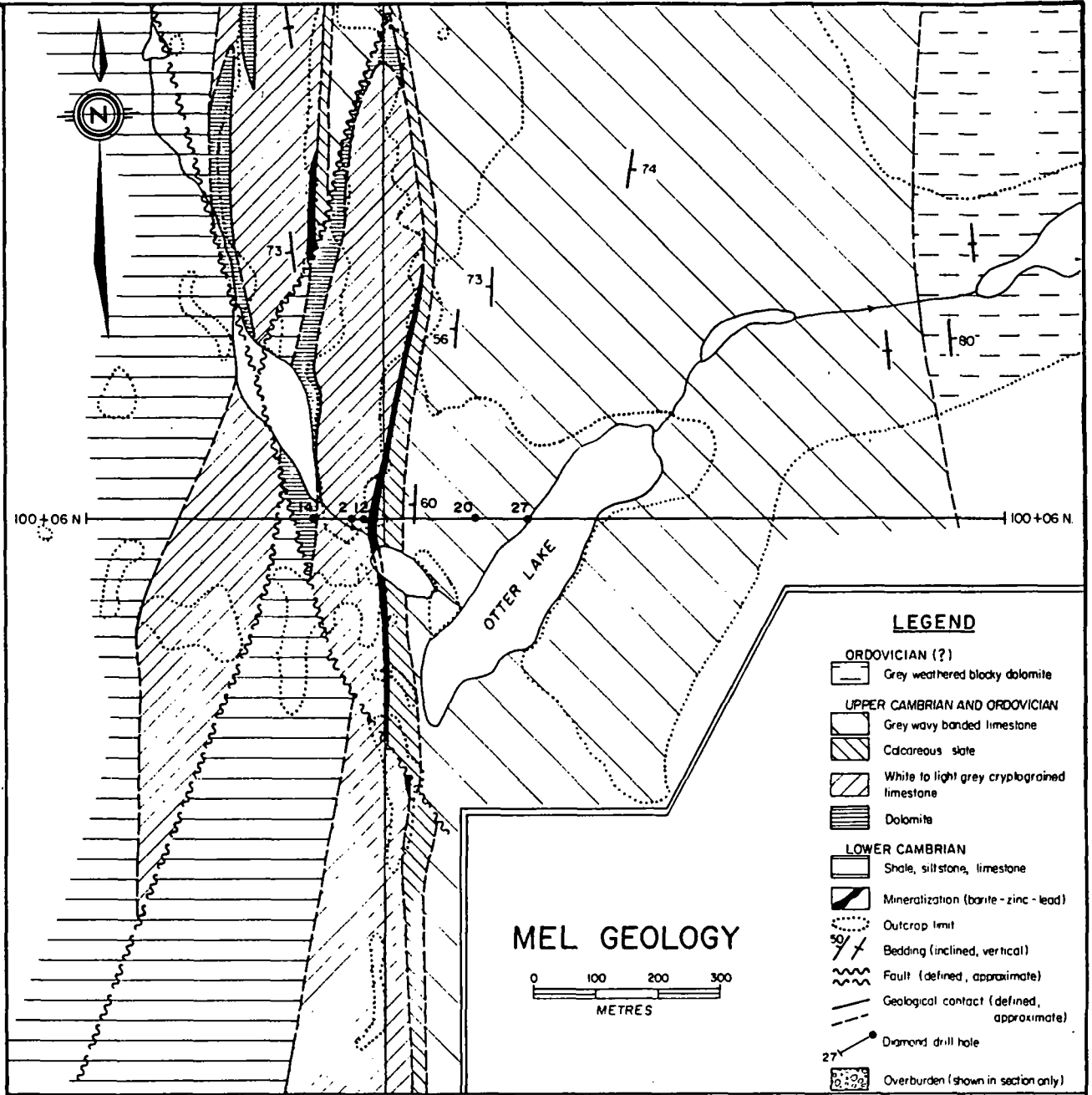
The core rack materials arrived on Oct. 27 and the core rack was constructed using 2x6 lumber and 1/2 in. rebar on 4 in. centers. It has a capacity for 360 NQ or BQ core boxes. The site for the

core rack was levelled by the John Deere tractor before deep frost and the rack was well braced by 2x6 lumber and steel rods. All core except for parts of holes 30 and 33 are stored in this core rack located on the Jean 4 claim near its initial post. Core from 171.30 to 175.00 m in hole 30 and from approximately 20 to 50 m in hole 33, was shipped to Vancouver and is being used for petrographic and metallurgical testing.

GEOLOGY

The Mel area is underlain by Cambrian to Ordovician strata including carbonates and various clastic sediments. These strata have been folded into a north-south trending overturned syncline. The Mel zinc-lead-barite deposit occurs at the top of a 200 m thick cryptograined limestone unit which is overlain by a finely laminated calcareous shale-phyllite unit some 30 m thick which in turn grades into a thick overlying unit of wavy banded limestone.

Zinc-lead mineralization is largely confined to a baritic bed which occurs in the upper part of the cryptograined limestone and is thought to represent a sediment hosted exhalative deposit. Lesser, apparently remobilized zinc-lead and barite mineralization locally extends a few metres into the shaly unit. The deposit is essentially strataform and occurs in a folded lens-shaped body up to 21.7 m thick at its centre and gradually thinning outward over a total strike-length of 800 m. To date drilling has intersected mineralization to a vertical depth of 489.5 m and the deposit is still open at depth.



ADAPTED FROM
COMPANY PLANS

BARYTEX RESOURCES CORP.

MEL DEPOSIT GEOLOGY

DRAWN BY

DCM

NTS

95D/6

FIGURE

3

REPORT DATE

JAN. 31, 1990

PROJECT NO.

9068

DC MILLER GEOLOGICAL SERVICES

DIAMOND DRILLING RESULTS

Assay results are tabulated in Table 2 with averaged grade results shown below the single dashed line. The averaging was done using a specific gravity weighting for each assay interval. Thus, each assay is weighted by the product of the linear assay interval and the calculated specific gravity. This method is technically more accurate than linear weighting alone.

Geological descriptions corresponding to the assay interval and sample number are obtained by referring to the appended diamond drill hole logs and the drill hole sections. Holes 30, 31 and 32 were drilled through a fold structure and each cut 2 intersections through the mineralized zone. Hole 33 tested only the upper limb of the fold structure.

HOLE 89-30 (SECTION 10,100N, FIGURE 5)

This hole intersected the zone much as expected. The best part of the upper intersection from 32.4 to 46.0 m, or 13.6 m averaged 6.58% zinc, 1.09% lead and 64.86% barite over an estimated 6.80 m true width. Core recovery averaged about 98% overall. The best part of the lower intersection averaged 4.76% zinc, 0.82% lead and 41.43 % barite over a length of 9.10 m, or an estimated 5.22 m true width.

HOLE 89-31 (SECTION 10,150N, FIGURE 6)

This hole also intersected the zone as expected, but the grade of the upper intersection was lower than expected. It averaged 1.89% zinc, 1.31% lead and 40.73% barite over length of 12.34 m, or an estimated 6.17 m true width. The lower intersection averaged 8.25% zinc, 2.53% lead and 44.30% barite over a 10.00 m length, or an estimated 7.07 m true width. Core recoveries averaged about 98%.

HOLE 89-32 (SECTION 10,200N, FIGURE 7)

This hole also intersected the zone as expected. The upper intersection averaged 5.36% zinc, 3.47% lead and 55.47% barite over a length of 15.7 m, or an estimated 8.32 m true width. The lower intersection averaged 2.81% zinc, 1.55% lead and 59.19% barite over a length of 5.45 m, or an estimated 3.50 m true width. Core recovery averaged about 95% in the upper zone and 98% in the lower zone.

HOLE 89-33 (SECTION 10,050N, FIGURE 8)

This hole tested only the upper zone of the fold structure and intersected better than expected mineralization averaging 9.60% zinc, 0.41% lead and 65.30% barite over a 15.02 m length, or an estimated 8.62 m true width. A higher grade section averaged 12.24% zinc, 0.42% lead and 59.48% barite over a 10.25 m interval. Core recovery averaged about 98%.

Barytex Resources Corp.

MAIN MEL ZONE

DIAMOND DRILL HOLE ASSAY DATA - TABLE II

Sequence No.	Hole No.	Sample No.	From (metres)	To (metres)	Interval (metres)	Silver O.P.T.	Zinc %	Lead %	Barite %	Specific Gravity
30	89-30	447401	31.09	31.50	0.41	0.01	0.12	0.07	0.34	2.71
		447402	31.50	32.40	0.90	0.03	2.53	0.13	10.35	2.94
		447403	32.40	34.40	2.00	0.04	5.83	0.23	37.38	3.50
		447404	34.40	36.30	1.90	0.06	6.10	0.55	77.15	4.24
		447405	36.30	37.90	1.60	0.01	2.17	0.06	87.34	4.32
		447406	37.90	40.00	2.10	0.04	14.40	0.70	57.78	4.06
		447407	40.00	42.00	2.00	0.01	4.60	0.61	69.50	4.07
		447408	42.00	44.00	2.00	0.03	6.30	2.50	61.00	4.06
		447409	44.00	46.00	2.00	0.06	5.54	2.71	63.89	4.11
		447410	46.00	47.10	1.10	0.01	1.86	0.30	22.94	3.17
		447411	47.10	47.90	0.80	0.01	0.05	0.16	84.63	4.23
		447412	47.90	48.60	0.70	0.02	0.07	0.57	1.39	2.76
Not assayed			48.60	165.40	116.80					
		447413	165.40	166.10	0.70	0.06	4.90	3.39	20.22	3.35
		447414	166.10	166.50	0.40	0.22	3.97	3.57	23.45	3.40
		447415	166.50	168.50	2.00	0.03	2.22	0.39	71.71	4.06
		447416	168.50	170.00	1.50	0.01	0.96	0.39	82.76	4.23
		447417	170.00	171.30	1.30	0.01	4.43	0.02	64.74	3.95
		BTX_1	171.30	173.40	2.10	0.01	4.35	0.02	49.96	3.68
		BTX_2	173.40	173.70	0.30	0.63	3.14	7.15	60.50	4.24
		BTX_3	173.70	175.00	1.30	0.15	5.32	1.11	29.23	3.39
		447418	175.00	177.00	2.00	0.10	5.64	0.61	18.35	3.17
		447419	177.00	179.10	2.10	0.10	4.60	1.12	40.10	3.57
		447420	179.10	180.00	0.90	0.04	1.74	0.48	4.50	2.84
Sp.Gr. Avg. -Upper			32.40	46.00	13.60	0.04	6.58	1.09	64.86	4.06
Sp.Gr. Avg. -Lower, all			165.40	180.00	14.60	0.07	3.76	0.87	47.81	3.68
Sp.Gr. Avg. -Lower, best			170.00	179.10	9.10	0.09	4.76	0.82	41.43	3.58

Ref: Cert of Analysis #A8929347 & #A8929499

File: M_DCALC8.WK1 Nov.15/89

Barytex Resources Corp.

MAIN MEL ZONE

DIAMOND DRILL HOLE ASSAY DATA - TABLE II

=====

Sequence No.	Hole No.	Sample No.	From (metres)	To (metres)	Interval (metres)	Silver O.P.T.	Zinc %	Lead %	Barite %	Sp.Gr. (Calc.)		
31	89-31	447421	33.10	33.40	0.30	<0.01	1.15	0.03	11.59	2.93		
		447422	33.40	34.90	1.50	0.01	0.10	0.29	45.03	3.53		
		447423	34.90	36.35	1.45	<0.01	3.53	0.06	12.20	2.99		
		447424	36.35	38.00	1.65	<0.01	2.70	0.04	73.41	4.08		
		447425	38.00	40.00	2.00	<0.01	3.72	0.42	63.38	3.94		
		447426	40.00	40.60	0.60	0.02	0.12	1.83	72.22	4.10		
		447427	40.60	42.00	1.40	0.03	1.35	1.22	40.27	3.52		
		447428	42.00	43.35	1.35	0.03	0.18	1.51	40.27	3.51		
		447429	43.35	44.60	1.25	0.01	0.04	0.58	3.18	2.79		
		447430	44.60	46.00	1.40	0.06	2.30	2.49	21.24	3.26		
		447431	46.00	47.24	1.24	0.08	0.04	5.52	8.11	3.15		
		Outside of zone	N/S		47.24	202.80	155.56					
				447432	202.80	204.00	1.20	0.01	0.03	0.72	0.34	2.75
				447433	204.00	205.70	1.70	<0.01	0.04	0.32	1.36	2.74
				447434	205.70	207.70	2.00	0.07	6.30	6.36	39.08	3.88
447435	207.70			210.00	2.30	0.04	5.74	3.09	78.17	4.39		
447436	210.00			212.00	2.00	0.03	7.05	1.06	22.43	3.30		
447437	212.00			214.00	2.00	0.03	10.70	0.44	38.23	3.62		
447438	214.00			215.70	1.70	0.04	13.50	0.75	24.98	3.45		
447439	215.70			216.40	0.70	0.03	1.14	0.53	1.36	2.78		
Sp.Gr. Avg. - Upper			34.90	47.24	12.34	0.02	1.89	1.31	40.73	3.54		
Sp.Gr. Avg. - Lower			205.70	215.70	10.00	0.04	8.25	2.53	44.30	3.80		
32	89-32	447440	44.30	46.10	1.80	0.08	6.83	1.58	32.80	3.51		
		447441	46.10	48.20	2.10	0.04	4.60	2.94	68.14	4.18		
		447442	48.20	50.20	2.00	0.01	8.08	0.44	69.84	4.14		
		447443	50.20	52.20	2.00	0.04	5.40	5.53	74.09	4.44		
		447444	52.20	54.20	2.00	0.03	5.64	4.68	76.81	4.45		
		447445	54.20	55.70	1.50	0.01	7.16	1.10	52.68	3.85		
		447446	55.70	56.60	0.90	0.03	2.77	1.30	4.57	2.91		
		447447	56.60	58.50	1.90	0.01	0.23	0.25	1.48	2.74		
		447448	58.50	60.00	1.50	0.06	4.60	10.90	53.70	4.36		
		447449	60.00	62.00	2.00	<0.01	0.05	0.38	1.90	2.76		
		447450	62.00	64.00	2.00	0.02	0.87	0.72	25.83	3.22		
		447451	64.00	65.68	1.68	0.03	2.87	0.87	50.30	3.71		
		Outside of zone	N/S		65.68	188.10	122.42					
				447452	188.10	189.30	1.20	<0.01	0.01	0.27	0.54	2.72
				447453	189.30	189.80	0.50	0.02	1.22	1.19	0.51	2.80
447454	189.80			191.65	1.85	0.03	1.97	2.61	31.10	3.44		
447455	191.65			193.35	1.70	<0.01	0.56	0.31	82.59	4.21		
447456	193.35			195.25	1.90	0.07	5.64	1.83	60.67	4.00		
Sp.Gr. Avg. - Upper			44.30	60.00	15.70	0.03	5.36	3.47	55.47	3.99		
Sp.Gr. Avg. - Lower			189.80	195.25	5.45	0.03	2.81	1.55	59.19	3.91		

Ref: Cert of Analysis #A8929668 & #A8929953

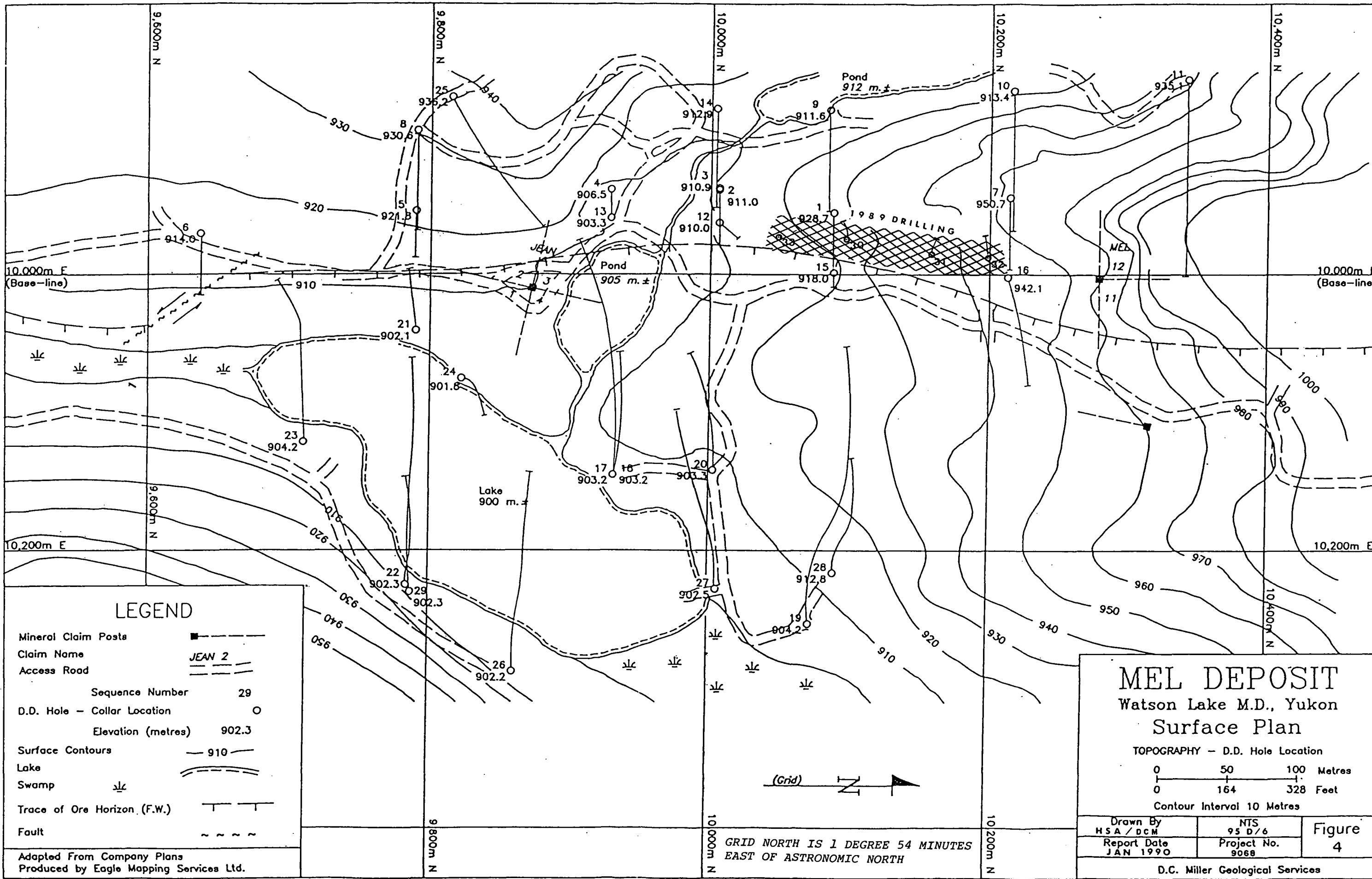
File: M_DCALC9.WK1

Barytex Resources Corp.

MAIN MEL ZONE
 DIAMOND DRILL HOLE ASSAY DATA - TABLE II
 =====

Sequence No.	Hole No.	Sample No.	From (metres)	To (metres)	Interval (metres)	Silver O.P.T.	Zinc %	Lead %	Barite %
33	89-33	475751	23.34	25.15	1.81	0.02	0.54	0.38	15.02
		475752	25.15	27.84	2.69	<0.01	5.53	0.04	59.99
		475753	27.84	30.00	2.16	NA	6.91	0.76	79.53
		475754	30.00	32.25	2.25	0.02	7.39	0.96	81.57
		475755	32.25	35.40	3.15	0.04	26.80	0.04	23.96
		475756	35.40	36.10	0.70	<0.01	8.37	0.00	34.67
		475757	36.10	37.20	1.10	<0.01	0.04	0.00	93.12
		475758	37.20	40.17	2.97	<0.01	4.90	0.62	79.53
		475759	40.17	42.44	2.27	<0.01	2.45	0.06	50.64
		475760	42.44	43.60	1.16	0.02	1.20	0.24	34.33
Sp.Gr. Average			25.15	40.17	15.02	0.02	9.60	0.41	65.30

Ref: Cert. No. A8931755 & A8932204
 File: M_DCALCO.WK1
 Revised: Date: Dec.29/89



LEGEND

- Mineral Claim Posts
- Claim Name JEAN 2
- Access Road
- Sequence Number 29
- D.D. Hole - Collar Location
- Elevation (metres) 902.3
- Surface Contours
- Lake
- Swamp
- Trace of Ore Horizon (F.W.)
- Fault

Adapted From Company Plans
Produced by Eagle Mapping Services Ltd.

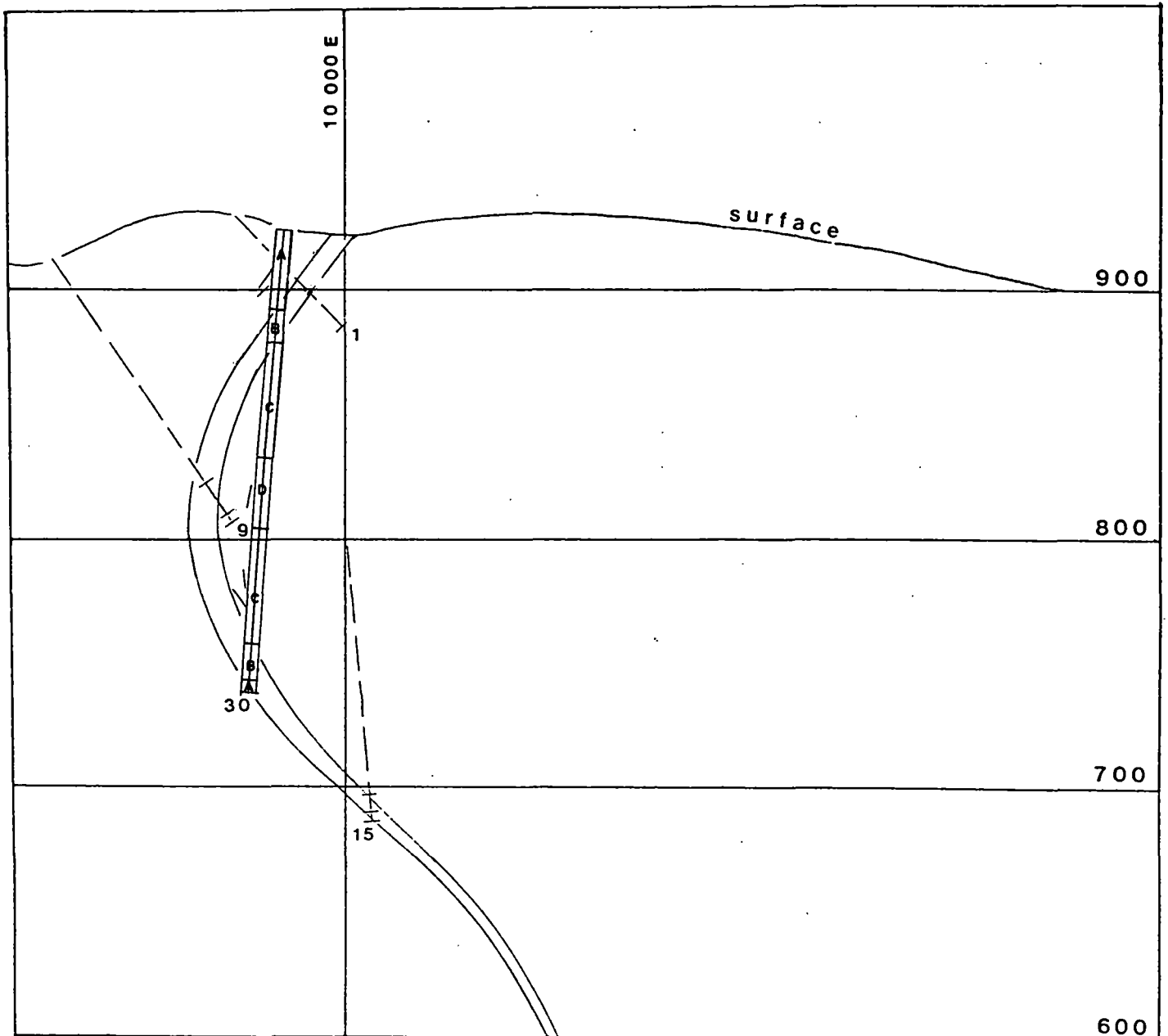
MEL DEPOSIT
Watson Lake M.D., Yukon
Surface Plan

TOPOGRAPHY - D.D. Hole Location
 0 50 100 Metres
 0 164 328 Feet
 Contour Interval 10 Metres

Drawn By HSA / DCM	NTS 95 D/6	Figure 4
Report Date JAN 1990	Project No. 9068	

D.C. Miller Geological Services

GRID NORTH IS 1 DEGREE 54 MINUTES
EAST OF ASTRONOMIC NORTH



PLOT of D.D.H. #30 (1989)

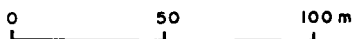
See text for surface & downhole (Pajari) survey data.
See assay data table for analytic results.

RESULTS

(Lithology structure)

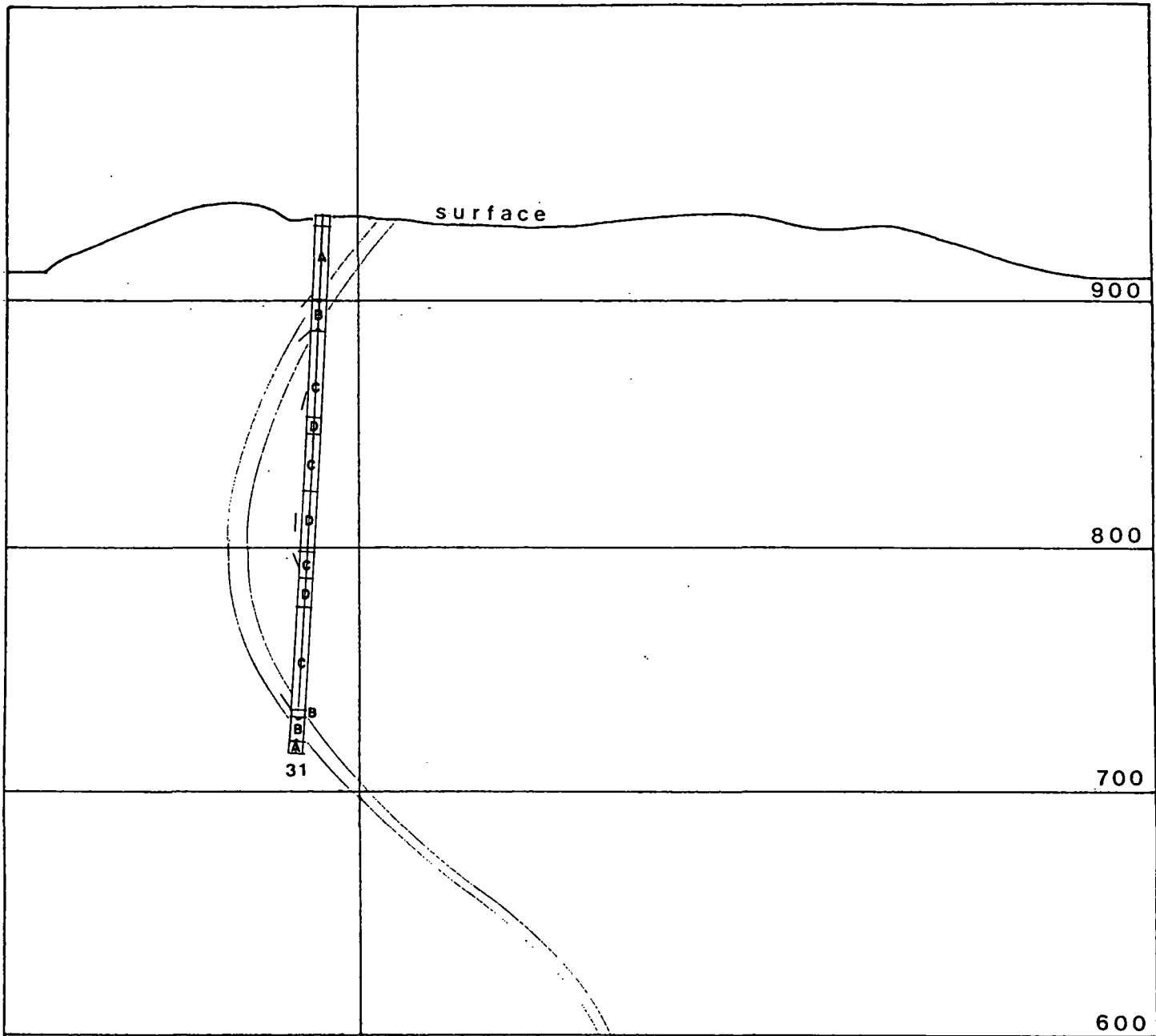


- Wavy Banded Limestone
- Calcareous Shale
- Cryptograined Limestone
- Barite, Sphalerite,
Galena, Quartz
- Banding attitude, dips



scale 1:2500






Barytex Resources Corp.		
MEL Project Section 10,100N		
DRAWN BY HSA	NTS 95 D6	FIGURE 5
REPORT DATE JAN. 31, 1990	PROJECT NO. 9068	
D.C. MILLER GEOLOGICAL SERVICES		

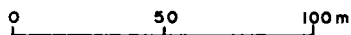


PLOT of D.D.H. #31 (1989)

See text for surface & downhole (Pajari) survey data.
See assay data table for analytic results.

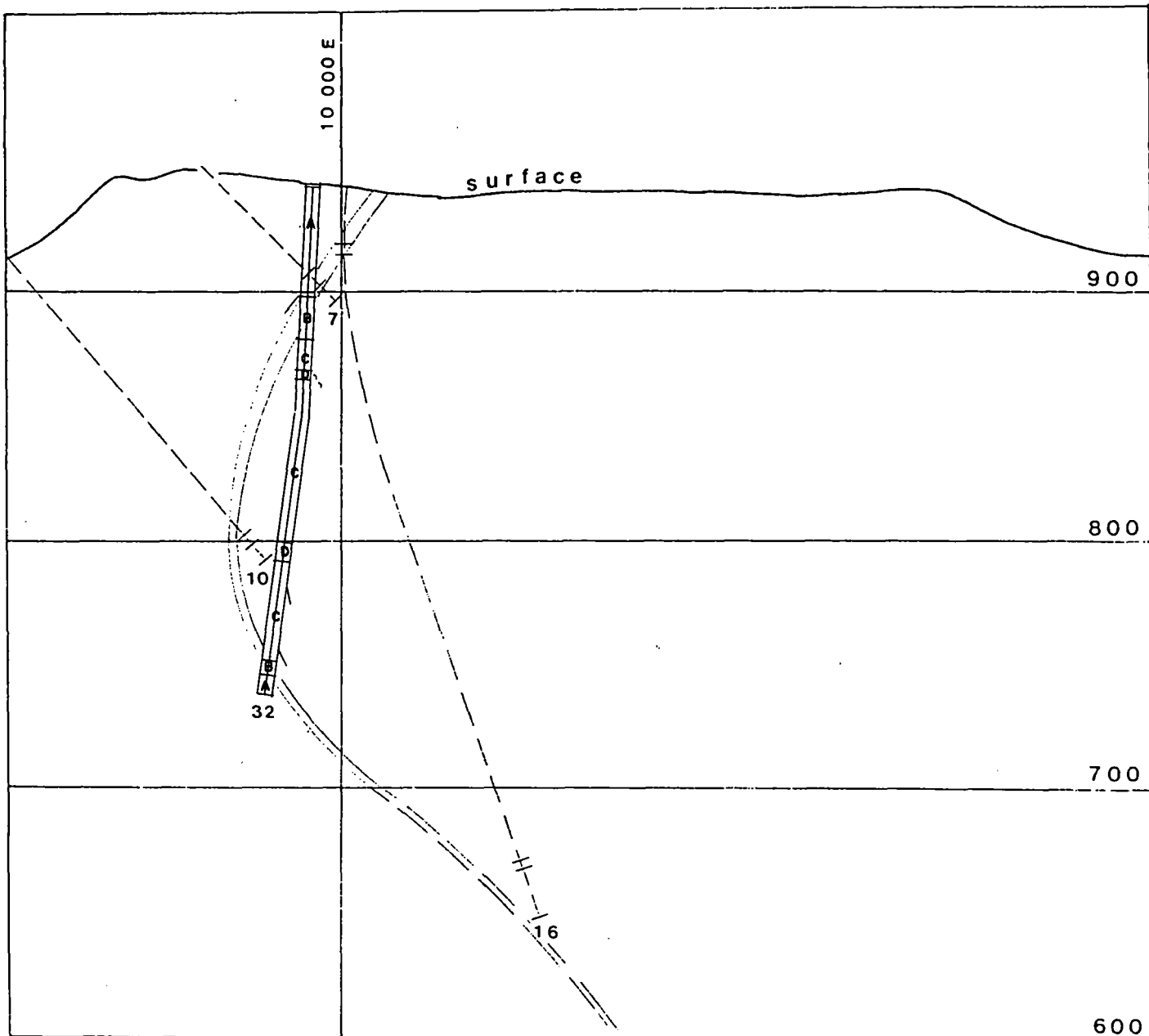
LEGEND (Lithology-structure)

-  Wavy Banded Limestone
-  Calcareous Shale
-  Cryptograined Limestone
-  Barite, Sphalerite, Galena, Quartz
-  Banding attitude, dips



scale 1:2500






Barytex Resources Corp.		
MEL Project Section 10,150 N		
DRAWN BY HSA	NTS 95 D 6	FIGURE 6
REPORT DATE JAN. 31, 1990	PROJECT NO. 9068	
D.C MILLER GEOLOGICAL SERVICES		

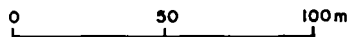


PLOT of D.D.H. #32 (1989)

See text for surface & downhole (Pajari) survey data.
See assay data table for analytic results.

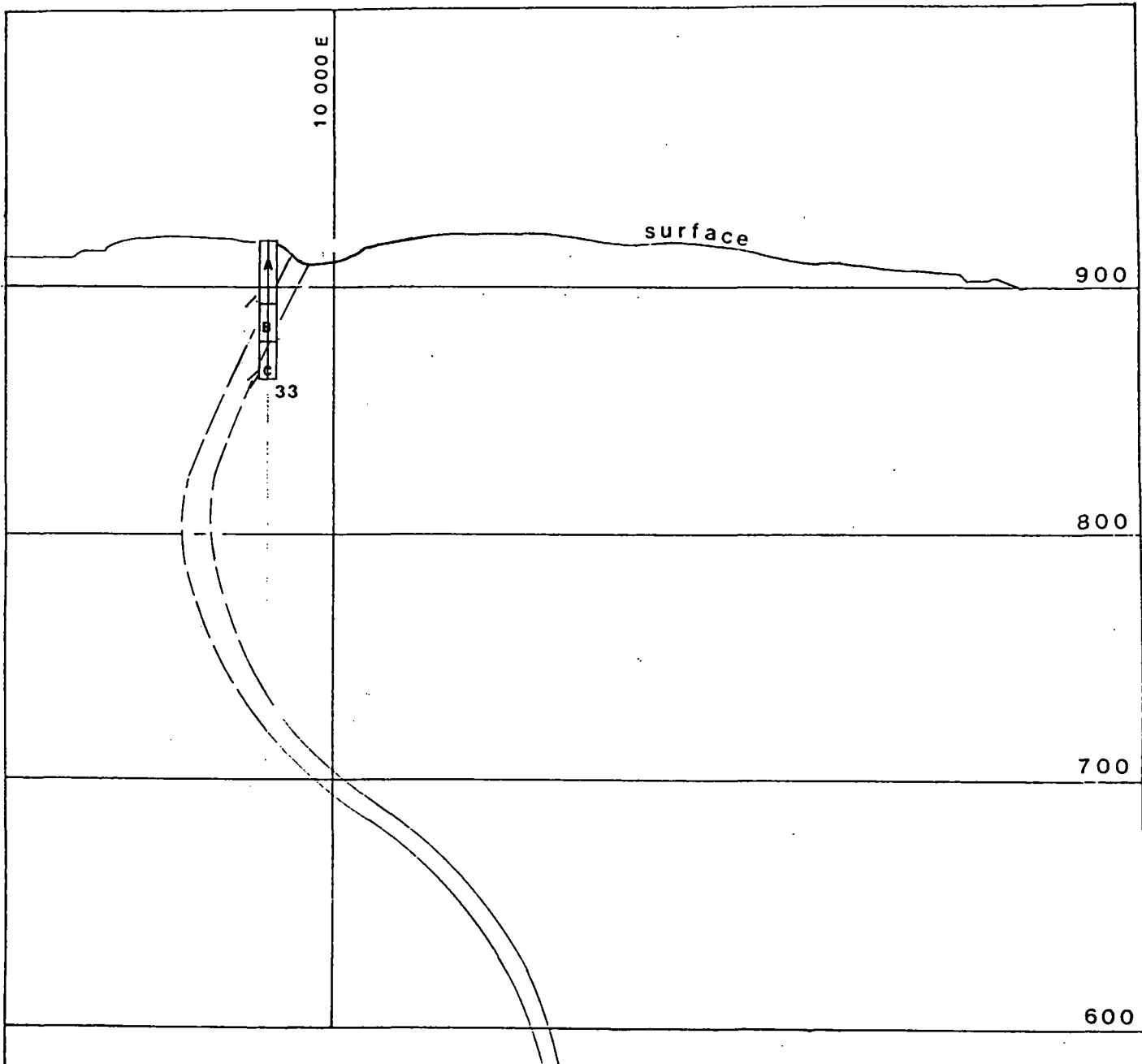
RESULTS (Lithology-structure)

-  Wavy Banded Limestone
-  Calcareous Shale
-  Cryptograined Limestone
-  Barite, Sphalerite,
Galena Quartz
-  Banding attitude, dips



scale 1:2500

Barytex Resources Corp.		
MEL Project Section 10,200 N		
DRAWN BY HSA	NTS 95 D6	FIGURE 7
REPORT DATE JAN. 31, 1990	PROJECT NO. 9068	
DC MILLER GEOLOGICAL SERVICES		



PLOT of D.D.H. #33 (1989)

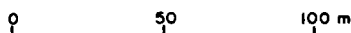
See text for surface & downhole (Pajari) survey data.
See assay data table for analytic results.

RESULTS

(Lithology-structure)



- Wavy Banded Limestone
- Calcareous Shale
- Cryptograined Limestone
- Barite, Sphalerite,
Galena Quartz
- Banding attitude, dips



scale 1:2500

Barytex Resources Corp.		
MEL Project		
Section 10,050 N		
DRAWN BY HSA	NTS 95 D6	FIGURE 8
REPORT DATE JAN. 31, 1990	PROJECT NO. 9088	
D.C MILLER GEOLOGICAL SERVICES		

CONCLUSIONS

- 1) Four BQ diamond drill holes were drilled to fill in between previous widely spaced drill holes at the north end of the Mel deposit. The holes were located to intersect both limbs of a major fold structure and to firm up estimated tonnages and grades within a proposed open pit.
- 2) The holes intersected the mineralized zone much as expected and indicated good continuity of mineralization.
- 3) In order to obtain a firm estimate of tonnage and grade, drilling at about 50 m centres will be required. Surface stripping, mapping and sampling will help in the calculation of near surface reserves.

RECOMMENDATIONS

- 1) Continue drilling the upper portion of the deposit at 50 m centres to firm up grade and tonnage estimates of sections where open pit and underground mining are proposed.
- 2) Strip, wash, map and sample as much of the surface of the mineralization as is possible.
- 3) With encouraging results from near surface work, additional deep drilling is recommended to firm up and expand the deeper reserves.

Respectfully submitted,

D. C. Miller

D.C. Miller, P. Eng.
January 31, 1990



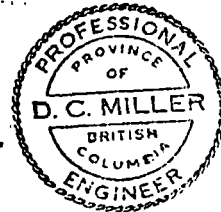
CERTIFICATE

I, David C. Miller, hereby certify that:

- 1) I am a Consulting Geological Engineer with an office at 769 Fraser Street, Kamloops, B.C. V2C 3H1.
- 2) I am a graduate of the University of British Columbia and earned a B.A.Sc. Degree in Geological Engineering in 1959.
- 3) I am a member of the Association of Professional Engineers of B.C. and a Fellow of the Geological Association of Canada.
- 4) I have practiced my profession for over 25 years.
- 5) This report is based on personal observations at the subject property.
- 6) I have no direct or indirect interest in this property nor in the securities of Barytex Resources Corp. or Breakwater Resources Ltd.

D.C. Miller

D.C. Miller, P. Eng.
January 31, 1990



NAMES AND ADDRESSES OF EMPLOYEES AND CONTRACTORS
AND TIME EMPLOYED IN PREPARING REPORT

- 1) D.C. Miller, 769 Fraser Street, Kamloops, B.C., V2C 3H1
- 2) L. Loranger, 6545 Beaver Crescent, Kamloops, B.C., V2C 4V2
- 3) J. Van Bibber, Box 494, Watson Lake, Yukon Territory, Y0A 1C0
- 4) Pat Lund, Watson Lake, Yukon Territory, Y0A 1C0
- 5) J. Melnychuk, Box 350, Watson Lake, Yukon Territory, Y0A 1C0
- 6) H.S. Aikins, 305-535 Thurlow Street, Vancouver, B.C. V6E 3L2
- 7) Nomad Drilling Inc.,
 604-543 Granville Street, Vancouver, B.C. V6C 1X8

Time spent preparing report:

- a) Drill hole assay averaging, drafting, drill hole
 survey calculations, drill log preparation..... 6 days

- b) Report writing, proof reading, manual checking of
 computer calculations, printing, binding and
 mailing..... 5.5 days

- Total 11.5 days

COST ESTIMATE

1) Diamond drilling charges.....	\$ 39,144.75
2) Fees, wages, CP and UI (includes some travel expenses, and equipment charges).....	31,005.91
3) Fuel.....	3,514.19
4) Land freight.....	63.65
5) Insurance.....	400.00
6) Frontier Helicopters.....	15,236.39
7) Watson Lake Flying Services.....	3,492.80
8) Campground Services (groceries).....	3,833.91
9) Cat rental and parts.....	3,270.06
10) Vancouver Petrographics.....	518.75
11) Chemex assays and freight.....	3,584.57
12) Cedar Motel.....	132.20
13) Pajari rental.....	550.00
14) L & R Aircraft repair.....	540.00
15) Prints.....	44.68

Subtotal	\$105,331.86

16) Estimated January charges.....	3,000.00

Total estimated cost	\$108,331.86
	=====

REFERENCES

Miller, D.C., 1989: Report on the Mel Property, Watson Lake
Mining Division, Yukon Territory for Barytex Resources Corp.

APPENDIX

DIAMOND DRILL HOLE LOGS, DRILL HOLE SURVEY CALCULATIONS
AND PETROGRAPHIC REPORT

D.C. MILLER GEOLOGICAL SERVICES

DRILL LOG

HOLE NO. 89-30
Sheet 1 of 6

PROPERTY MEL	TP OR AREA	AZIMUTH (Grid) 270° @ Collar	DATE STARTED October 20, 1989	CORRECTED DIP TESTS			
PROJECT	LOT & CONC.	DIP -85° @ Collar	DATE COMPLETED October 24, 1989	Pajari	Test	@	565'
CLAIM NO. JEAN 3	CO-ORDINATES. 10,097.3 N	LENGTH 184.10	DRILLED BY Nomad Drilling	Corr.	to Grid	-32°	
GRID NO.	9,974.5 E	COLLAR ELEV. 924.7	LOGGED BY D. C. Miller	172.2m		Brg. 256°	Dip -86°

METRES		SECTION	DESCRIPTION	CORRECTED DIP TESTS			
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
			OBJECTIVES:- Delineate mineralization on fold structure, B.Q. core.				
0	0.76		Casing, no core.				
0.76	31.09		<u>Cryptograined Limestone</u> White to pale grey; very fine grained; contains numerous irregular shaped pale grey clasts and occasional pale brown mudstone clasts and bands to 10 cm; locally dolomitic; local fine white veining by calcite/dolomite. (0.76-14.3) - Leached, orange discoloured core, generally blocky and broken-oxidized zone; approx. 85% core recovery. (14.3-31.09) - Good core, 95% recovery, local weak layering @ 30-45°; minor fine pyrite in mudstone clasts.				
31.09	48.60		<u>Mineralized Zone</u> (31.09-31.50) - Siliceous limestone; weakly mineralized with brown sphalerite and galena, 99% recovery; also minor fine pyrite associated with brown mudstone clasts; vague layering @ 40-45°. (31.50-32.40) - Siliceous limestone with increasing fine sphalerite and galena mineralization; 15% soft broken mudstone clasts - well mineralized; 99% recovery.	447401H	31.09	31.50	0.41
				447402H	31.50	32.40	0.90

METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
31.09	48.60		<p><u>Mineralized Zone (Cont'd)</u></p> <p>(32.4-34.4) - Limestone and minor barite with 35% large and small mudstone clasts; best barite at 33.8-34.4; good core; about 10% brown to honey coloured sphalerite and minor galena as fine to coarse grains; 95% core recovery;</p> <p>(34.4-36.3) - Now mainly barite with less than 5% brown mudstone clasts; about 5% coarse brown sphalerite as multiple grains; about 1% galena as veinlets and grains locally cutting sphalerite; good core, 99% recovery.</p> <p>(36.3-37.9) - Similar; less sphalerite; good core, 99% recovery.</p> <p>(37.9-40.0) - Similar but strong sphalerite mineralization, particularly at 37.9-38.7; overall estimate 10% sphalerite and 1% galena; about 1% brown mudstone; good core, 99% recovery.</p> <p>(40.0-42.0) - Similar; less sphalerite; more barite; good core, 99% recovery.</p> <p>(42.0-44.0) - Now increased galena; fair sphalerite and about 10% mudstone clasts, mainly barite; good core, 99% recovery.</p> <p>(44.0-46.0) - Similar, but with good sphalerite at 44.0-44.8; good core, 99% recovery; estimate 6% sphalerite and 2% galena.</p> <p>(46.0-47.1) - Silica zone; about 3% fine sphalerite and 1% galena; good core, 99% recovery.</p> <p>(47.1-47.9) - Mainly barite with 10% broken shale clasts; broken core, 95% recovery.</p>	447403H	32.4	34.4	2.0
				447404H	34.4	36.3	1.9
				447405H	36.3	37.9	1.6
				447406H	37.9	40.0	2.1
				447407H	40.0	42.0	2.0
				447408H	42.0	44.0	2.0
				447409H	44.0	46.0	2.0
				447410H	46.0	47.1	1.1
				447411H	47.1	47.9	0.8

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
48.6	91.6		<p><u>Mineralized Zone (Cont'd)</u></p> <p>(47.9-48.6) - Mineralized shale; bleached pale brownish-grey; finely laminated at 60-65°; good core but breaks easily parallel to banding; contains fine galena and pyrite veinlets and minor sphalerite.</p> <p><u>Calcareous Shale</u></p> <p>Dark and light grey, dark colours predominant; finely laminated; soft blocky core; broken at 48.6-49.0; minor fine pyrite veinlets mainly parallel to banding; variable layering: 50° @ 49 m, 6° @ 50.5 m, 30° @ 50.2 m.</p> <p>Broken core @ 48.6-49.0; breaks along bedding plane partings.</p> <p>(48.6-49.6) - Weakly calcareous, dark grey.</p> <p>(49.6-91.6) - Increasingly calcareous with light and dark grey laminae ranging from 1 mm to 3 cm; some boundinage structure; layering at 40° @ 57 m, 0° @ 52.0 m, 25-40° @ 52.2 to 91.6 m; about 5% white carbonate veining parallel to and cutting across layering, generally good core, 95% recovery.</p> <p>(51.4-51.9) - Broken core associated with bedding plane fault @ 30°.</p> <p>(59.0-62.0) - Broken, ground core associated with bedding plane slips @ 25-40°, 50% recovery.</p> <p>(80.0-80.5) - Bedding plane slips with thick white carbonate veining parallel to layering @ 30°.</p>	447414H	47.9	48.6	0.7
91.6	119.7		<p><u>Wavy Banded Limestone</u></p> <p>Banded light and dark grey, light bands predominate; band widths vary from 1 mm or less to over 1 cm; generally strong</p>				

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
91.6	119.7		<p><u>Wavy Banded Limestone</u> (Cont'd)</p> <p>boudinage structure; generally good core, recovery averages about 95%; this unit is gradational with the preceeding unit over 1 metre as the percentage of light coloured bands increases to over 50%.</p> <p>Banding: 20-25° from 91.6-96.5, 0-10° from 96.5-111.0, 15° from 111.0-119.7.</p> <p>White carbonate veining: approximately 3% mainly cutting layering.</p> <p>Broken core: 92.4-92.6, associated with bedding plane slips; 95.1-97.0 broken and ground with 75% core recovery.</p>				
119.7	165.4		<p><u>Calcareous Shale</u></p> <p>Similar to 48.6-91.6 preceeding; contact with wavy banded limestone gradational over several metres; good core, 99% recovery.</p> <p>Banding: 15° @ 119.7-123.0, 20-25° @ 123.0-127.0, 0-10° @ 127.0-131.5, 10-25° @ 131.5-141.5, 0-10° @ 141.5-143.5, 10-25° @ 143.5-146.0, 25-40° @ 146.0-152.5, 20-0° @ 152.5-157.5, 35-40° @ 157.5.</p> <p>White carbonate veining: approximately 5% both cutting and parallel to layering; rare fine pyrite associated with white carbonate veinlets.</p> <p>(163.90-164.90) - Thick light and dark grey bands up to 10 cm composed of fine 2 mm laminae, less than 1% fine pyrite veinlets.</p> <p>(164.90-165.40) - Brownish grey, weakly calcareous shale; less than 1% fine pyrite veinlets.</p>				

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
165.4	180.0		<u>Lower Mineralized Zone</u>				
			(165.4-166.1) - Mineralized shale; fair brown sphalerite-barite veining with minor galena to 3 cm thick sub-parallel to laminations at 40-55°, average 50°, about 7% sphalerite; 99% recovery.	447413H	165.40	166.10	0.70
			(166.1-166.5) - Silica band, good sphalerite and galena; no layering; about 99% sphalerite, 3% galena, 99% recovery.	447414H	166.10	166.50	0.40
			(166.50-168.50) - Barite, patchy coarse grained sphalerite and minor galena; 2.5 cm. jasperoidal quartz clast at 167.7, about 5% sphalerite, 99% recovery.	447415H	166.50	168.50	2.00
			(168.50-170.0) - Similar, less sphalerite, 99% recovery.	447416H	168.50	170.0	1.50
			(170.0-171.3) - Similar, siliceous near 171.3 about 7% sphalerite and 1% galena, 99% recovery.	447417H	170.0	171.30	1.30
			(171.30-175.00) - Core taken to Vancouver. Siliceous with minor barite and about 10% sphalerite at 171.3-172.97; barite and quartz at 172.97-173.70, with about 6% combined sphalerite and galena; 80% mudstone at 173.7-175.0 with about 10% sphalerite and galena. Three specimens from this portion of the zone were selected for Petrographic examination. See appendix for petrographic descriptions.	BTX 1	171.30	173.40	2.10
				BTX 2	173.40	173.70	0.30
				BTX 3	173.70	175.00	1.30
			(175.00-177.00) - 80% brown mudstone with about 7% fine brown sphalerite, minor soft broken core; strong sericite alteration; about 2% fine galena, less than 1% fine pyrite.	447418H	175.00	177.00	2.00
			(177.0-179.10) - Similar, barite @ 177.90-178.55.	447419H	177.00	179.10	2.10
			(179.10-180.00) - Similar, weaker mineralization.	447420H	179.10	180.00	0.90

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
180.0	184.10		<p><u>Cryptograined Limestone</u></p> <p>Light grey, massive, well fractured with fine fractures filled with dark grey material; several dark grey clasts to 3 cm mineralized with very fine pyrite.</p> <p>(180.00-180.30) - Brown mudstone with 2% very fine pyrite.</p> <p>(181.40-181.60) - Grey, fractured quartz band trending @ 40-50°.</p> <p>End of hole.</p>				
604	E.O.H. Feet						

D.C. MILLER GEOLOGICAL SERVICES

DRILL LOG

HOLE NO. 89-31
Sheet 1 of 6

PROPERTY MEL	TP OR AREA	AZIMUTH (Grid) 270° @ Collar	DATE STARTED October 26, 1989	CORRECTED DIP TESTS	
PROJECT	LOT & CONC.	DIP -88° @ Collar	DATE COMPLETED October 30, 1989	Pajari	Test @ 600'
CLAIM NO. JEAN 3	CO-ORDINATES. 10,157.3 N	LENGTH 722' = 220.06 m.	DRILLED BY Nomad Drilling	Corr.	to Grid -32°
GRID NO.	9,985.4 E	COLLAR ELEV. 935.0	LOGGED BY D. C. Miller	183 m	Brg. Dip 298° -86°

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
0	3.28		OBJECTIVES:- Test mineralization and delineate fold structure.				
3.28	33.10		Casing, no core.				
			<u>Cryptograined Limestone</u> Light grey, minor white; local weak fine banding; contains about 4% brown mudstone clasts which are more numerous and larger (up to 10 cm.) near mineralization and carry up to 10% fine pyrite as disseminations and discontinuous veinlets; pyrite increases near mineralization; limestone also contains numerous carbonate clasts and is cut by about 5% white carbonate veinlets at various angles; generally good core with 98% recovery; locally blocky with minor orange to rusty oxidation coloring on fractures and carbonate veinlets and clasts.				
			Banding: 40-55° @ 3.28 - 27.0 m , 43° @ 27.84 m, 40° @ 28 m, 43° @ 31 m.				
33.10	47.24		<u>Upper Mineralized Zone</u> (33.1 - 33.4) - Brown mudstone, soft, broken; sharp contact with previous unit with broken core at contact; contains about 3% fine sphalerite and galena and traces of pyrite; some barite near 33.4; 95% core recovery.	447421H	33.1	33.4	0.3

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
33.10	47.24		<p><u>Upper Mineralized Zone (Cont'd)</u></p> <p>(33.40 - 34.90) - Mixed brown mudstone, barite and grey quartz breccia; core breaks at 40 - 70°; blocky with minor broken core; mainly mudstone and quartz with about 4% sphalerite and galena as fine to medium grains; mudstone is partly altered to sericite and clay; contains about ½% of very fine pyrite; core recovery - 95%.</p> <p>(35.40 - 36.35) - Similar; less galena, but some good honey coloured and brown sphalerite; 95% recovery.</p> <p>(36.35 - 38.00) - Mainly barite with about 20% gray quartz as veins and blebs apparently cutting the barite; fair galena and coarse honey-brown sphalerite associated with quartz; good core; 99% recovery; about 6% combined sphalerite and galena.</p> <p>(38.00 - 40.00) - Similar with about 40% grey quartz; 99% recovery.</p> <p>(40.00 - 40.60) - Mainly barite with fair galena and sparse sphalerite; 15% grey green shale bands @ 45°; good core, 99% recovery.</p> <p>(40.60 - 42.00) - Mainly grey quartz with minor barite and 10% grey green shale remnants; good galena and fair sphalerite; fold structure at 40.60 - 40.80 with limbs @ 40-45°; good core; 99% recovery.</p> <p>(42.00 - 43.35) - Mainly grey-green shale with minor quartz and barite veining up to 20 cm thick; fair galena as veinlets and sparse sphalerite; 30-40° banding; good core; 99% recovery.</p>	447422H	33.40	34.90	1.50
				447423H	34.90	36.35	1.45
				447424H	36.35	38.00	1.65
				447425H	38.00	40.00	2.00
				447426H	40.00	40.60	0.60
				447427H	40.60	42.00	1.40
				447428H	42.00	43.35	1.35

METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
33.10	47.24		Upper Mineralized Zone (Cont'd) (43.35 - 44.60) - Grey-green shale with minor galena - pyrite veining; minor barite veining; good core 99% recovery; 43° banding. (44.60 - 46.00) - Similar but with fair sphalerite-galena mineralization. (46.00 - 47.24) - Similar to preceeding but with minor sphalerite and fair galena; soft broken core; breaks along 45° partings parallel to layering; 90% recovery.	447429H	43.35	44.60	1.25
				447430H	44.60	46.00	1.40
				447431H	46.00	47.24	1.24
47.24	82.48		<u>Calcareous Shale</u> Banded dark and light grey with layers averaging about 1 cm. in thickness; individual dark and light layers are composed of many very fine laminae; core recovery averages about 97%; generally good core; contains about 5% white carbonate veinlets. Banding: 45° @ 47.24 m, 50° @ 48 m, 30° @ 51 m, 50° 53 m, 25° @ 55 m, 25-35° @55-73 m, 12° @ 73.4-74.5 m, 25-30° @ 75.0-82.48 m. <u>Broken Core:</u> (47.24 - 53.80) - With bedding plane faults @ 53.00 - 53.80; 69.7 - 70.6 - associated with bedding plane slips.				
82.48	88.60		<u>Wavy Banded Limestone</u> Mainly light grey, lesser dark grey bands; gradational with previous unit over about 2 m; strong boudinage structure; generally excellent core; 5% white carbonate-quartz veins ranging up to 5 cm parallel to banding. Banding: 40° @ 83 m, 30° @ 85 m, 40° @ 86.5 m, 0° @ 88.0 m. <u>Broken Core:</u> (87.80 - 88.60) associated with 0° core angle.				

METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
88.60	112.0		<p><u>Calcareous Shale (Transition Zone)</u></p> <p>Similar to 47.24 - 82.48, dark grey bands predominate; contains about 3% white carbonate-quartz veins to 4 cm thick mainly parallel to banding. Banding: 0-60° (folded) at 88.7-90.4; 30° @ 92 m, 45-60° @ 92.5-93.0, 30° @ 92.6-97.0, 25-20° @ 97.5-103.0, 20-0° @ 103.5-104.0, 20-10° @ 104.0-112.0.</p> <p><u>Broken Core</u>: 86.60-88.90, 89.90-90.60, associated with low core angles; 98.70-98.80 associated with bedding plane slips; 103.70-105.0 - associated with low core angles.</p> <p>This section is a transitional zone between calcareous shale and wavy banded limestone.</p>				
112.0	137.0		<p><u>Wavy Banded Limestone</u></p> <p>Similar to 82.48-88.60; excellent core; 99% recovery; contains about 8% white carbonate veins mainly about 2 m thick and oriented at right angles to banding, giving a striped effect; this was referred to as tiger texture in 1979 drill logs; these veinlets are present from 114.5-137.0 and occur at the hinge line of the fold structure.</p> <p>Banding: uniform 0-5° @ 112.0-137.0.</p>				
137.0	147.0		<p><u>Calcareous Shale Transition Zone</u></p> <p>Similar to 88.60-112.00, excellent core; 99% recovery; striped texture ends at 145.40.</p> <p>Banding: 10-20° @ 137.0-145.0; 20-25° @ 145.0-147.0.</p>				

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
147.0	159.50		<u>Wavy Banded Limestone</u> As 117.0-137.0; excellent core; 99% recovery. Banding @ 25-35°.				
159.50	202.8		<u>Calcareous Shale</u> Similar 137.0-147.0; generally good core; 99% recovery. Banding: 0-15° @ 159.50-166.0, 20-30° @ 167.0-186.0, 30-40° @ 186.5-201.4 with relatively few drag fold structures; tight fold structures @ 198.6-198.7, 200.15-200.35 and 201.4-202.0; 0-40° @ 202.0-202.8.				
202.8	216.4		<u>Mineralized Zone</u> (202.8-204.0)- Partly silicified mineralized shale; blocky and broken core; breaks along partings; folded at 0-30°; contains about 1% pyrite and ½% galena as fine veinlets; 95% recovery. (204.0-205.7) - Similar, softer; breaks along partings at 50-60° parallel to banding; 95% recovery; 2 cm. barite vein @ 205.0 m. (205.7-207.7) - Main zone; good coarse brown-honey colored sphalerite and good galena; mainly barite host rock with a quartz band at 205.7-206.1 and mudstone at 206.8-207.3 - good core, 99% recovery; estimate 5% galena and 5% sphalerite; some calcite with barite.	447432H	202.8	204.0	1.2
				447433H	204.0	205.7	1.7
				447434H	205.7	207.7	2.0

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
202.8	216.4		<p><u>Mineralized Zone (Cont'd)</u></p> <p>(207.7-210.0) - Similar; good sphalerite and galena in a baritic host rock with 10% brown mudstone clasts; good core 95% recovery; estimate 2% galena and 6% sphalerite; some calcite with barite.</p> <p>(210.0-212.0) - Mainly brown mudstone with fair sphalerite and minor galena; soft broken core @ 210.2-211.4; 95% recovery; estimate 1% galena and 6% sphalerite; limestone mixed with mudstone.</p> <p>(212.0-214.0) - Good sphalerite in a mainly brown mudstone - barite host rock with some limestone and calcite veining; broken at 212.0-212.7 along banding? @ 0-10°; core recovery 99%; estimate 9% sphalerite and less than 1% galena.</p> <p>(214.0-215.7) - High grade brown to honey coloured sphalerite; fine to medium grained, in a mainly mudstone host rock; good core; 99% recovery; estimate 18% sphalerite and less than 1% galena.</p> <p>(215.7 - 216.4) - Weakly mineralized mudstone with about 3% fine to medium grained, brown to honey coloured sphalerite; good core, 99% recovery.</p>	447435H	207.7	210.0	2.3
				447436H	210.0	212.0	2.0
				447437H	212.0	214.0	2.0
				447438H	214.0	215.7	1.7
				447439H	215.7	216.4	0.7
216.4	220.06		<p><u>Cryptograined Limestone</u></p> <p>White to pale grey with about 10% brown mudstone clasts which carry 1% fine pyrite; excellent core, 99% recovery; massive core; vague 20° bands @ 217.10.</p>				
E.O.M.	722		End of hole.				

D.C. MILLER GEOLOGICAL SERVICES

DRILL LOG

HOLE NO. 89-32
Sheet 1 of 5

PROPERTY MEL	TP OR AREA	AZIMUTH (Grid) 270° @ Collar	DATE STARTED October 30, 1989	CORRECTED DIP TESTS		
PROJECT	LOT & CONC.	DIP -87° @ Collar	DATE COMPLETED November 7, 1989	Pajar. Test @ 600'		
CLAIM NO. JEAN 3	CO-ORDINATES. 10,198.6 N	LENGTH 204.22	DRILLED BY Nomad Drilling	Depth	Dip	Brg.
GRID NO.	9,988.0 E	COLLAR ELEV. 942.1	LOGGED BY D. C. Miller	182.9m	-83°	259°

METRES		SECTION	B.Q. Core	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO							
0	0.30			OBJECTIVES:- Test mineralization and delineate fold structure.				
0.30	44.30			Casing, no core.				
				<u>Cryptograined Limestone</u> Pale grey, minor white, generally massive with weak, local layering, cut by 5% fine, white carbonate veinlets commonly @ 45° but also at all angles; contains about 30% brown mudstone clasts which carry 1-5% very fine pyrite; core commonly breaks through these clasts, also contains numerous carbonate clasts which are oxidized to an orange colour near surface; carbonate veins are also orange coloured near surface; core recovery - about 95%.				
				(0.30-7.0) - Broken and blocky core.				
				(7.0-33.2) - Generally good core.				
				(33.2-36.3) - Oxidized, broken core (water channel?)				
				(36.3-44.30) - Good core, locally broken.				
				Banding: 47° @ 22.9, 35° @ 24.3 and 35° @ 45.9.				
44.30	65.68			<u>Mineralized Zone</u> (44.30-46.10) - Well mineralized brown mudstone with minor barite, some calcite; core loss at 44.30-44.81; sharp 60° contact at 44.30; generally good core with 90% core recovery;				

METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
44.30	65.68		<u>Mineralized Zone</u> (Cont'd) estimate 10% sphalerite, minor galena. (46.10-48.20) - Barite with good sphalerite and galena; good core 95% recovery; estimate 4% sphalerite and 3% galena, some calcite. (48.20-50.20) - Similar, better sphalerite (about 10%); good core, 99% recovery. (50.20-52.20) - Similar; 99% core recovery; estimate 5% sphalerite; 3% galena. (52.20-54.20) - Similar, quartz band @ 53.70-54.20; estimate 3.5% galena and 5% sphalerite; good core, 98% recovery. (54.20-55.70) - Similar, quartz band @ 54.20-54.80; estimate 2% galena, 5% sphalerite; good core, 99% recovery. (55.70-56.60) - Silicified, mineralized shale; 30-40° layering; good core, 95% recovery; estimate 3% sphalerite and 2% galena. (56.60-58.50) - Mineralized shale, pale green, soft layering at 10-30°; soft broken and blocky core with sparse 1 mm galena veinlets parallel to layering; 95% core recovery. (58.50-60.00) - Mixed barite, shale and minor quartz; good sphalerite and galena; 95% core recovery; estimate 5% galena, 4% sphalerite. (60.00-62.00) - Mineralized shale; as 56.60-58.50; soft broken core; breaks along layering at 70-20°; 90% recovery, core in 1 cm to 10 cm pieces with some clay on partings.	447440H	44.30	46.10	1.80
				447441H	46.10	48.20	2.10
				447442H	48.20	50.20	2.00
				447443H	50.20	52.20	2.00
				447444H	52.20	54.20	2.00
				447445H	54.20	55.70	1.50
				447446H	55.70	56.60	0.90
				447447H	56.60	58.50	1.90
				447448H	58.50	60.00	1.50
				447449H	60.00	62.00	2.00

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
44.30	65.68		<p><u>Mineralized Zone (Cont'd)</u></p> <p>(62.00-64.00) - Similar badly broken core; 10 cm barite-sphalerite vein @ 63.70; core is shattered into chips mainly 1 cm in size from 62.50-63.25.</p> <p>(64.00-65.68) - Mineralized shale and barite with fair local sphalerite and galena; broken core with 90% recovery; baritic section from 64.00-64.92; soft, broken shale @ 64.92-65.70; 30° layering; sericite/clay on partings.</p>	447450H	62.00	64.00	2.00
65.68	72.60		<p><u>Calcareous Shale</u></p> <p>Light and dark grey; layering mainly @ 30°, folded @ 72.10-72.60 at 0-30°; soft, broken core.</p> <p>(66.44-66.6), (67.0-67.06), (71.10-71.32) - Shattered core with clay gouge on 30° partings; about 85% recovery.</p>	447451H	64.00	65.68	1.68
72.60	75.30		<p><u>Wavy Banded Limestone</u></p> <p>Mainly light grey; strong boudinage structure; banding @ 40-50°; good core 99% recovery.</p>				
75.30	142.50		<p><u>Calcareous Shale</u></p> <p>As 65.68-72.60 preceeding, but good core; consists of dark and light layers averaging about 1 cm; about 95% recovery.</p> <p>75.30- abrupt change in banding from 50° to 0-10°; possible fault.</p> <p>Banding: 0-15° @ 75.30-78.00, 20-30° @ 78.00-91.60, 0-30° @ 91.60-97.80, 30° @ 97.80-99.0, 0-15° @ 100.0-142.5.</p> <p>Veining: (75.30 - 97.54) - Less than 5% white carbonate veins;</p>				

METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
75.30	142.50		<p><u>Calcareous Shale (Cont'd)</u></p> <p>(97.54-133.3) Increase in white carbonate veining to about 5% with some veinlets parallel to banding and a strong set at right angles to banding (Striped structure).</p> <p>(91.60-91.80), (92.00-92.30) - Soft broken core with clay gouge associated with bedding plane slips.</p> <p>(119.0-142.5) - Excellent core in pieces 50 cm long.</p>				
142.5	151.00		<p><u>Wavy Banded Limestone</u></p> <p>Fairly abrupt change from previous unit with dominant light bands with strong boudinage structure; good core, 99% recovery.</p> <p>Banding: 0-25° @ 142.5-151.0.</p>				
151.00	188.10		<p><u>Calcareous Shale</u></p> <p>Similar to 75.30-142.50 with dark bands greater than light coloured bands and little or no boudinage structure; excellent core in pieces to 1.5 m; contact gradational over 3 m.</p> <p>Veining: less than 5% white carbonate veinlets both cross-cutting and parallel to banding; some quartz blebs in thicker veinlets.</p> <p>Banding: 15-25° @ 151.00-164.00, 25-30° @ 164.00-184.00, undulating 0-30° @ 184.00-189.30; lighter bands are pale greenish altered at 181.00-189.30 with less than 1% fine pyrite veinlets and disseminations; generally good core in this section but with sericite on fractures @ 0-45°.</p> <p>Broken core: 187.25-187.50 - associated with 0-5° fractures.</p>				

METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
188.10	195.25		<p><u>Mineralized Zone</u></p> <p>(188.10-189.30) - Weakly mineralized calcareous shale with fine galena/pyrite veinlets and disseminations; approx. 1% pyrite and less galena; good core, 90% recovery; banding undulating @ 0-30°.</p> <p>(189.30-189.80) - Similar, better galena and some fine brown sphalerite; 99% recovery, 0-30° banding.</p> <p>(189.80-191.65) - Main zone; siliceous host rock @ 189.80-190.20 and 190.90-191.65, otherwise barite; fair galena and sphalerite; vague 40° banding @ 190.00; good core, 98% recovery.</p> <p>(191.65-193.35) - Mainly barite, sparse galena and sphalerite; good core, 98% recovery.</p> <p>(193.35-195.25) - Mixed barite, silica and mudstone; fair-good sphalerite as fine-medium sized grains associated with mudstone clasts; mainly barite to 194.5 m; then mainly mudstone and silica breccia; contact @ 195.25 @50° - brown mudstone against cryptograined limestone along fracture; good core 98% recovery.</p>	447452H	188.10	189.30	1.20
				447453H	189.30	189.80	0.50
				447454H	189.80	191.65	1.85
				447455H	191.65	193.35	1.70
195.25	204.22		<p><u>Cryptograined Limestone</u></p> <p>White to pale grey, massive with about 15% white carbonate veinlets and clasts and about 4% brown mudstone clasts which carry about 1% very fine pyrite disseminations; good core, 95% recovery.</p> <p>End of hole.</p>	447456H	193.35	195.25	1.90
	670 ft.						

D.C. MILLER GEOLOGICAL SERVICES

DRILL LOG

HOLE NO. 89-33
Sheet 1 of 3

PROPERTY		TP OR AREA	AZIMUTH (Grid)	DATE STARTED	CORRECTED DIP TESTS		
MEL			270°	November 8, 1989	No tests.		
PROJECT		LOT & CONC.	DIP	DATE COMPLETED			
			-89½°	November 9, 1989			
CLAIM NO.		CO-ORDINATES.	LENGTH	DRILLED BY			
JEAN 3		10,049.3 N	54.56 m	Nomad Drilling			
GRID NO.			COLLAR ELEV.	LOGGED BY			
		9,973.4 E	919.0	D. C. Miller			
METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
			OBJECTIVES:- Drill hole for metallurgical tests and to test mineralization and structure on section 10,050 N.				
0	0.61		Casing, no core.				
0.61	23.30		<u>Cryptograined Limestone</u> White to pale gray; contains about 5% brown mudstone clasts ranging in size from a few millimetres to over 10 cm; core commonly breaks through larger mudstone clasts; also contains about 15% carbonate clasts and veinlets at various orientations which are oxidized to an orange colour near surface; core tends to be blocky, but core recovery average about 95%. Banding - local vague banding @ 40-50°. Siderite alteration @ 22.90-23.10.				
23.30	45.25		<u>Mineralized Zone</u> (23.30-25.15) - Mixed mudstone, barite, quartz and calcite with fair galena and very sparse sphalerite; broken core @ 24.23-25.15; overall 97% recovery; minor fine pyrite. (25.15-26.00) - Mainly mudstone with fair to fine to medium grained sphalerite, broken core; 97% recovery. (26.00-32.30) - Mainly barite host rocks with fair patchy coarse brown sphalerite often associated with mudstone clasts; some local galena; good core, 99% recovery.	475751	23.34	25.15	1.81
				475752	25.15	27.84	2.69
				475753	27.84	30.00	2.16
				475754	30.00	32.25	2.25

METRES		SECTION	DESCRIPTION	SAMPLE NO.	FROM	TO	LENGTH
FROM	TO						
23.30	45.25		<u>Mineralized Zone</u> (Cont'd)				
			(32.30-36.10) - High grade coarse brown sphalerite associated with mainly mudstone host rocks; lesser barite, quartz and calcite; local strong breccia structure; generally good core with 98% recovery; soft and broken with clay/sericite at 33.83-34.14, also broken at 35.20-35.40.	475755	32.25	35.40	3.15
				475756	35.40	36.10	0.70
			(36.10-40.17) - Mainly barite host rocks, similar to 26.00-32.30; very minor white silica alteration; good core, 98% recovery.	475757	36.10	37.20	1.10
				475758	37.20	40.17	2.97
			(40.17-42.44) - Mainly pale grey silica, minor mudstone and calcite; fair sphalerite to 41.50 then very sparse with increasing fine pyrite, up to 2%; good core, 99% recovery.	475759	40.17	42.44	2.27
			(42.44-42.75) - Mainly barite, good core, 99% recovery.	475760	42.44	43.60	1.16
			(42.75-43.60) - Medium to pale grey silica; sparse sphalerite about 1% pyrite, block core, 99% recovery.				
			(43.60-45.25) - Weakly mineralized shale; pale green grey, soft, blocky and broken core with sericite on partings parallel to fine laminae @ 30-40° with some 0° undulations; mineralization includes minor brown sphalerite and pyrite as veinlets and blebs subparallel to banding and cutting banding.				

METRES		SECTION	DESCRIPTION				
FROM	TO			SAMPLE NO.	FROM	TO	LENGTH
45.25	49.30		<p><u>Altered Calcareous Shale</u></p> <p>Pale green-grey, finely laminated, soft, locally broken; breaks into 1-10 cm pieces along sericite altered partings parallel to banding; some brecciation and clay gouge at 48.40-49.30; core is mineralized with about 2% fine pyrite veinlets mainly subparallel to banding, mainly at 50-55° but locally undulating to 0°; about 4% white calcite-quartz veinlets, up to 2 cm thick, mainly parallel to banding; good core recovery, about 95%.</p>				
49.30	54.56		<p><u>Calcareous Shale</u></p> <p>Dark and light grey, well banded at 35-50° with local 0° folding; fair core but tends to break along partings parallel to banding; about 3% white calcite veining; 94% core recovery.</p> <p>End. Drill left on set-up (November 9, 1989).</p> <p>Mineralized core not split; mineralized section and adjacent core shipped to Vancouver in 4 boxes.</p>				

MEL DEPOSIT DIAMOND DRILLING - 1989

DIAMOND DRILL HOLE SURVEY CALCULATIONS

Sequence No.	Hole No.	Location of Collar or Node			Dip (decimal)	Bearing (Grid)	Survey point	Slope distance	Horiz. component	Vert. comp.	Northing N +, S -	Easting E +, W -	
30	89-30	10097.30	9974.50	924.70									
		10097.30	9967.00	838.93	-85	270	0.00	86.10	7.50	-85.77	0.00	-7.50	
		10095.65	9960.36	741.17	-86	256	172.20	98.00	6.84	-97.76	-1.65	-6.63	
							184.10	0.00					
	Top of U. zone	10097.30	9971.68	892.42	From Collar		32.40	32.40	2.82	-32.28	0.00	-2.82	
	Mid' of U. zone	10097.30	9971.08	885.65	From Collar		39.20	39.20	3.42	-39.05	0.00	-3.42	
	Base of U. zone	10097.30	9970.49	878.88	From Collar		46.00	46.00	4.01	-45.82	0.00	-4.01	
	Top of L. zone	10095.96	9961.63	759.82	"measure from end"		165.40	18.70	1.30	18.65	0.32	1.27	
	Mid' of L. zone	10095.84	9961.13	752.54	"measure from end"		172.70	11.40	0.80	11.37	0.19	0.77	
	Base of L. zone	10095.72	9960.64	745.26	"measure from end"		180.00	4.10	0.29	4.09	0.07	0.28	
	End of Hole	10095.65	9960.36	741.17			184.10	184.10	14.34	-183.53	-1.65	-14.14	
	31	89-31	10157.30	9985.40	935.00								
			10157.30	9982.21	843.56	-88	270	0.00	91.50	3.19	-91.44	0.00	-3.19
10161.51			9974.29	715.31	-86	298	183.00	128.56	8.97	-128.25	4.21	-7.92	
							220.06						
Top of U. zone		10157.30	9984.18	900.12	From Collar		34.90	34.90	1.22	-34.88	0.00	-1.22	
Mid' of U. zone		10157.30	9983.97	893.96	From Collar		41.07	41.07	1.43	-41.04	0.00	-1.43	
Base of U. zone		10157.30	9983.75	887.79	From Collar		47.24	47.24	1.65	-47.21	0.00	-1.65	
Top of L. zone		10161.04	9975.17	729.63	"measure from end"		205.70	14.36	1.00	14.33	-0.47	0.88	
Mid' of L. zone		10161.20	9974.87	724.65	"measure from end"		210.70	9.36	0.65	9.34	-0.31	0.58	
Base of L. zone		10161.37	9974.56	719.66	"measure from end"		215.70	4.36	0.30	4.35	-0.14	0.27	
End of Hole		10161.51	9974.29	715.31			220.06	220.06	12.16	-219.69	4.21	-11.11	
32		89-32	10198.60	9988.00	942.10								
			10198.60	9983.21	850.78	-87	270	0.00	91.45	4.79	-91.32	0.00	-4.79
	10195.98		9969.72	738.85	-83	259	182.90	112.77	13.74	-111.93	-2.62	-13.49	
							204.22						
	Top of U. zone	10198.60	9985.68	897.86	From Collar		44.30	44.30	2.32	-44.24	0.00	-2.32	
	Mid' of U. zone	10198.60	9985.27	890.02	From Collar		52.15	52.15	2.73	-52.08	0.00	-2.73	
	Base of U. zone	10198.60	9984.86	882.18	From Collar		60.00	60.00	3.14	-59.92	0.00	-3.14	
	Top of L. zone	10196.35	9971.65	776.20	"measure from end"		188.10	16.12	1.96	16.00	0.37	1.93	
	Mid' of L. zone	10196.27	9971.22	760.20	"measure from end"		191.68	12.54	1.53	12.45	0.29	1.50	
	Base of L. zone	10196.19	9970.80	747.75	"measure from end"		195.25	8.97	1.09	8.90	0.21	1.07	
	End of Hole	10195.98	9969.72	738.85				204.22	18.53	-203.25	-2.62	-18.28	
	33	89-33	10049.30	9973.40	919.00								
						-89.5	270	54.56	54.56	0.48	-54.56	0.00	-0.48
Top of U. zone			10049.30	9973.18	893.85			25.15	25.15	0.22	-25.15	0.00	-0.22
Mid' of U. zone			10049.30	9973.11	886.34			32.66	32.66	0.29	-32.66	0.00	-0.29
Base of U. zone			10049.30	9973.05	878.83			40.17	40.17	0.35	-40.17	0.00	-0.35
End of Hole			10049.30	9972.92	864.44			54.56	54.56	0.48	-54.56	0.00	-0.48

File: C:\WORK\SURVEY-9
 Calc: Nov.15/89 HSA



Vancouver Petrographics Ltd.

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Report for: H.S. Aikins,
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Invoice 8630

November 20th, 1989

Samples:

3 samples of drill core for sectioning and petrographic examination.

Samples are as follows:

Sample	Corresponding Assay Intervals
BTX-1	562 - 569 ft.
BTX-2	569 - 570 ft.
BTX-3	570 - 574 ft.

The samples consist of a piece of "typical" material from each assayed interval. They were prepared for optical examination as polished thin sections.

Summary:


These samples consist of sphalerite and galena as streaky and clumpy segregations in an intensely silicified matrix.

The mineralization in BTX-1 and 3 is essentially monomineralic sphalerite. In BTX-2 it includes major proportions of galena. Pyrite is a trace accessory in all cases, and chalcopyrite and tetrahedrite are additional trace constituents in BTX-3.

Barite is an accessory gangue component, together with carbonate and sericite. Barite forms irregular impregnations and veinlets in the siliceous matrix.

There is evidence of contemporaneous deformation and mineralization. Sulfides in BTX-2 typically incorporate foliaceous sericite, and in BTX-3 are partially in fragment-like clumps and partially as fine-grained, streaked-out trains.

Individual petrographic descriptions are attached.

A handwritten signature in cursive script, appearing to read "J.F. Harris".

J.F. Harris Ph.D.

(929-5867)

SAMPLE BTX-1

Estimated mode

Quartz	87
Carbonate	4
Barite	3
Sericite	trace
Sphalerite	6
Pyrite	trace
Tetrahedrite(?)	trace

This is a mineralized sample consisting predominantly of quartz (as vein material or totally silicified host rock).

The quartz matrix is made up of a rather equigranular, randomly interlocking aggregate of anhedral-subhedral, prismatic grains, 0.05 - 0.3mm in size.

Carbonate forms randomly scattered, small pockets, 0.2 - 1.0mm in size. A few larger pockets occur, in which the carbonate is intergrown with well-crystallized barite. Barite also forms a few areas of pockety and veniform impregnations of the quartz matrix, independent of carbonate.

Sericite is seen as rare, fine-grained flecks and wisps.

Sulfides consist of monomineralic sphalerite. This is a light brown, colour-zoned variety. It occurs as sporadic, irregular patches, 0.5 - 3.0mm in size. These show crenulate outlines, and often contain small inclusions of the quartz matrix. They are fringed by halos of clear recrystallized quartz (distinct from the diffusely turbid quartz of the matrix as a whole).

Trace accessories are pyrite, as occasional small euhedra (to 0.2mm) in the quartz matrix and as rare inclusions in sphalerite. Rare traces of a brownish phase (tetrahedrite?) occur in a few as inclusions, to 25 microns in size, in sphalerite.

SAMPLE BTX-2

Estimated mode

Quartz	55
Sericite	5
Leucoxene(?)	2
Carbonate	2
Barite	10
Galena	17
Sphalerite	9
Pyrite	trace

A little over half of this slide is made up of an aggregate of turbid quartz similar to the matrix in BTX-1. This consists of anhedral to subhedral, locally comb-textured or lamellar quartz, of grain size 0.1 - 0.3mm, with a much finer-grained cherty intergranular component.

This is cut by occasional veinlets and pockets of carbonate and of barite.

One side of the slide consists of a strongly mineralized assemblage. This is made up of irregular, streaky masses of sulfides in a gangue of lamellar-textured quartz, barite and rather abundant fine-grained, foliaceous sericite, plus minor carbonate. The barite forms some relatively coarse patches, up to 2mm or more, and also extends as occasional veinlets into the adjacent barren quartz area.

Sulfides are galena and sphalerite in heterogenous intergrowth. In part, they form segregated streaks and patches, up to 1 or 2mm in size, but they are also present in finer-grained mutual intergrowth (irregular inclusions, one in the other) on a scale down to 0.05 - 0.1mm.

A minor proportion of the sulfides, especially galena, occur as small intergranular pockets in the quartz/barite gangue.

A notable feature is the intimate association of sericite with the sulfides, as contorted swarms and meshworks of minute, scaly flakes, included within otherwise well-segregated sulfides.

Pyrite is a minor accessory, as scattered, individual euhedra, 0.02 - 0.5mm in size, in the gangue matrix, and also within galena or sphalerite.

SAMPLE BTX-3

Estimated mode

Quartz	45
Plagioclase	14
Sericite	15
Leucoxene(?)	2
Barite	3
Carbonate	5
Sphalerite	15
Galena	0.5
Pyrite	0.5
Chalcopyrite	trace
Tetrahedrite	trace

The mineralization in this sample is characterized by sphalerite, as abundant disseminated clumps through an altered rock matrix.

The latter is a heterogenous, vari-granular aggregate having the aspect of a strongly silicified, possibly brecciated host.

It consists predominantly of quartz, as an anhedral aggregate of grain size 0.05 - 0.2mm, interstitially pervaded by fine-grained sericite and minor carbonate.

This matrix incorporates sporadic, streaked-out lenses of foliaceous, shale-like and/or felsitic (tuffaceous?) material, diffusely impregnated with leucoxene; patches of cherty-textured quartz speckled with small carbonate porphyroblasts; and occasional patches of compact sericite, having the aspect of altered feldspar phenocrysts.

Sulfides consist almost entirely of light brown, colour-zoned sphalerite, as in BTX-1. They form highly irregular clumps, 0.5 - 3.0mm in size, as well as clusters and streaky trains of finer-grained pockets and tiny granules, 20 - 200 microns in size.

The sphalerite clumps commonly show marginally intergrown patches of coarse quartz and carbonate - some of which look like fragments.

Accessory sulfides are slightly more abundant than in BTX-1. They consist principally of galena - as scattered, small pockets and tiny inclusions, 0.02 - 0.5mm in size, in sphalerite - and pyrite, as sparsely disseminated individual euhedra, 10 - 100 microns in size, mostly in the silicified matrix.

Chalcopyrite and tetrahedrite are notable trace constituents, mostly as small patches of polymineralic intergrowth with galena within, or marginal to, sphalerite clumps.

Sample BTX-3 cont.

Barite occurs sporadically, in association with the sulfides and quartz, as veinlets and coarse pockets and, locally, as intimate fine-grained impregnations of the matrix. In part, the barite veinlets cross-cut the sphalerite - possibly as a result of remobilization.

The rock appears somewhat sheared and/or cataclastically disrupted, possibly by a pene-contemporaneous and/or post mineralization event. The deformation could be non-tectonic - i.e. this could be a slumped melange of exhalative sedimentary affinities.