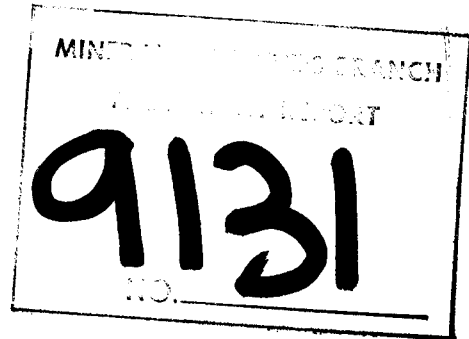


181-# 226-# 9131



part 1
of 2

NORCEN ENERGY RESOURCES LIMITED
ASSESSMENT REPORT
GEOLOGICAL AND GEOCHEMICAL PROGRAM
GROUP V
GOLDEN MINING DIVISION
BRITISH COLUMBIA

Claims: Cog 1
Cog 2
Cog 3
Cog 4
Tect 4

Location: 45 km south of Golden, B.C.

Latitude: 50° 56' N

Longitude: 116° 57' W

NTS: 82 K 14, 15

A large, stylized handwritten signature in black ink, likely belonging to L. J. Smith.

February 1981

L. J. Smith, P. Geol.

R. J. Laird

A handwritten signature in black ink, likely belonging to R. J. Laird.

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I. SUMMARY

The 1980 exploration program was divided into two projects:

- (i) the detailed project which concentrated on areas of known mineralization;
- (ii) the reconnaissance project which evaluated the extensive Norcen land holdings in the surrounding area.

The detailed exploration included geological mapping, geochemical surveying, geophysical surveying, trenching, and diamond drilling. Seven diamond drill holes totalling 530.03 metres (1739 feet) were completed between July 19th and August 8, 1980.

The reconnaissance program included geochemical surveying, geological mapping and prospecting. Work was completed between May 15th and July 31, 1980. A total of 1,084 soil samples were collected and analyzed for lead, zinc, copper, silver, iron and manganese. Mapping and prospecting was carried out in the vicinity of the gridded area and within areas of anomalous geochemical values. Most geochemically anomalous areas were found to be coincident with axial plane traces of major folds which have acted to localize mineralization. No mineralization of economic significance was discovered.

II. INTRODUCTION

1. History

Mining exploration in the Crystal Creek area dates back to the late 19th century. Showings were first reported in the Crystal and Vermont valleys. The latter developed into a deposit (Ruth Vermont Mine) and has been sporadically produced since 1898.

The showings on the north side of Crystal Creek were first reported in 1890. These and other showings were located and staked by Mr. R. Renn in 1965. The property was optioned to Purcell Range Mines Ltd. who completed bulldozer stripping with little success. Ownership of the claims was transferred to Medesto Exploration Ltd. in 1967 who completed a limited amount of trenching and two short diamond drill holes. A soil geochemistry survey and eighty metres of diamond drilling were reported in 1974. In 1977 Medesto was purchased by Cochrane Oil and Gas Limited. Cochrane completed more soil geochemistry surveying, trenching and minor diamond drilling. The property optioned by Norcen also covers a copper showing near Warren Creek. This showing was originally discovered in the 1920's and was partially explored by two small tunnels. In 1960 and 1961 airborne and ground geophysics and 1,100 metres of diamond drilling were completed for St. Andrews Mining Co. Further electromagnetic surveying, trenching and 700 metres of diamond drilling was done in 1968. In 1972 geological, soil geochemical and self potential surveys were carried out for Carolin Mines Ltd. The last physical work on the showing was soil geochemical surveying in 1973.

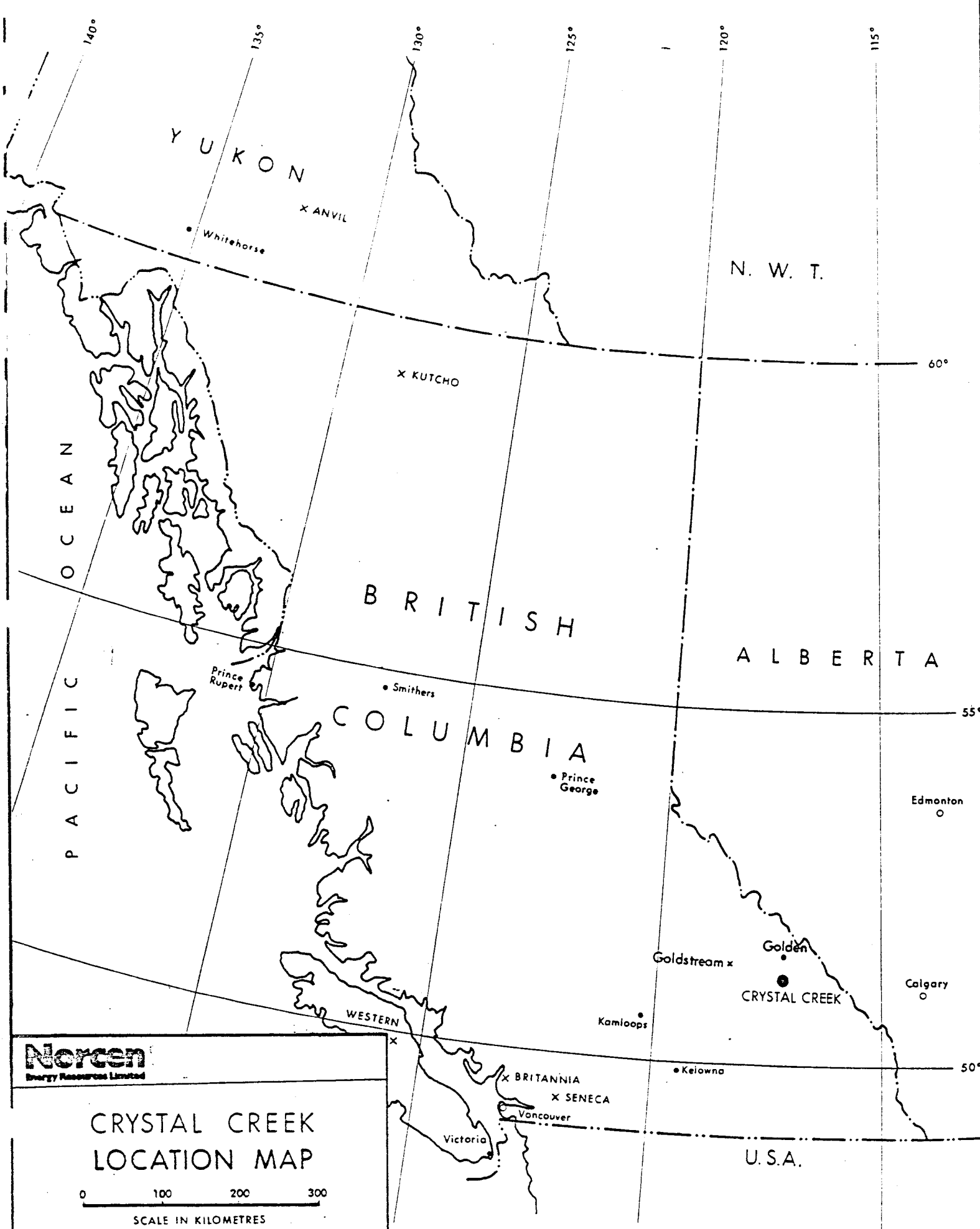
Norcen Energy Resources acquired the extensive Crystal Creek property from Cochrane Oil and Gas Limited under an option agreement dated August 14, 1979. Work carried out by Norcen in 1979 was restricted mainly to a gridded area which included the showings north of Crystal Creek. The 1979 exploration included geological mapping, soil geochemical surveying, electromagnetic surveying and the diamond drilling of twelve holes totalling 763 metres.

2. Ownership

The Crystal Creek property was acquired by Norcen Energy Resources Limited from Cochrane Oil and Gas Limited under the agreement dated August 14, 1979.

3. Location

The Crystal Creek property is located in the Golden Mining Division, British Columbia, approximately 42 kilometres due south of Golden within N.T.S. 82-K-14 and 15. The reference coordinates are 50° 55' north latitude and 116° 55' west longitude.



Norcen
Energy Resources Limited

CRYSTAL CREEK
LOCATION MAP



x MASSIVE SULPHIDE DEPOSITS

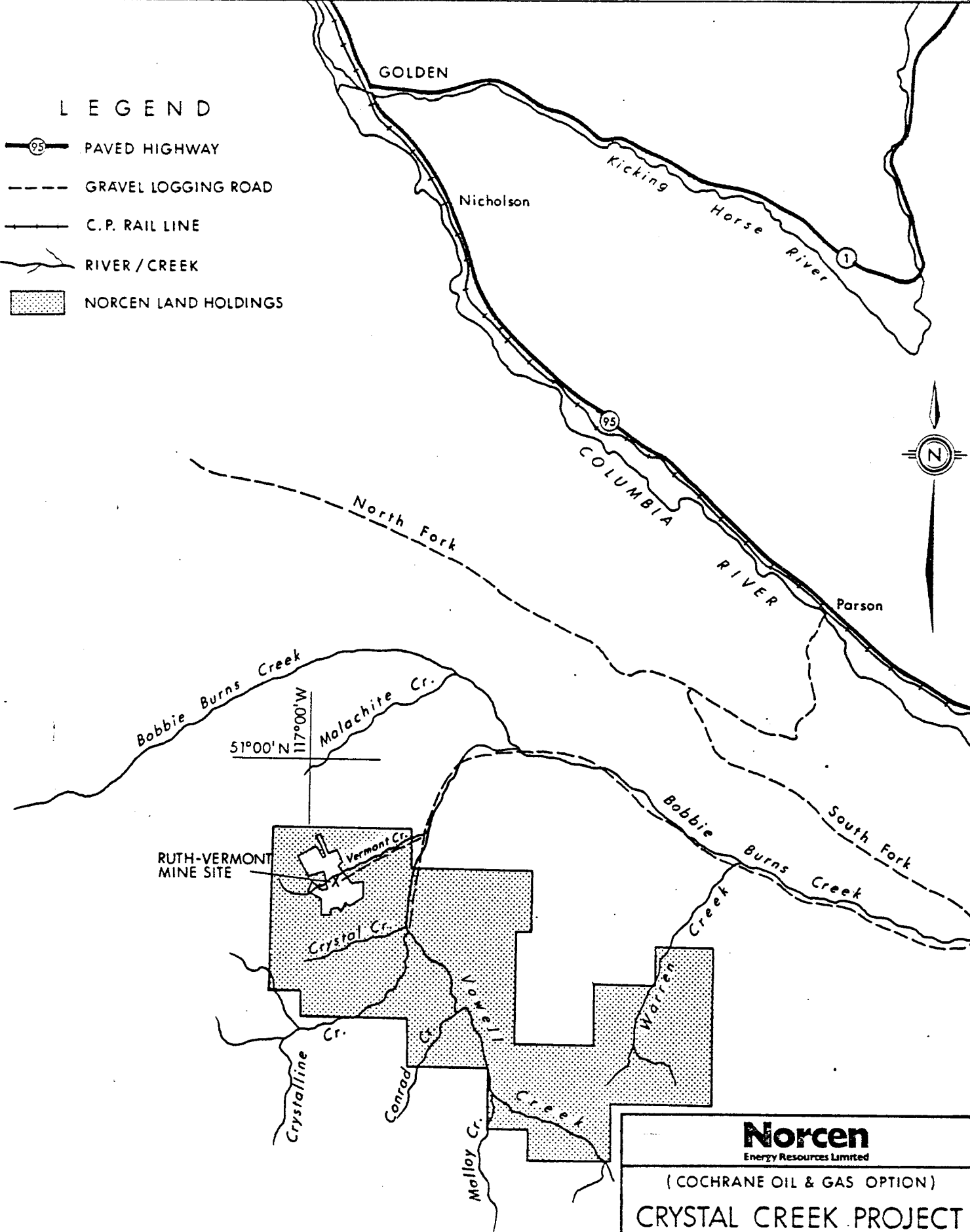
The area covered by the claims is extremely rugged in excess of 1,500 metres of relief over the entire property. Areas over 2,100 metres above sea level are covered by alpine type vegetation. Permanent snow fields and glaciers are common above 2,300 metres. Areas below 1,700 metres are generally covered by merchantable timber and thick undergrowth.

4. Access

The north western portion of the claims is accessible from Parson by fifty kilometres of well maintained logging road up Bobby Burns and Vowell Creeks. Parson is thirty-five kilometres southeast of Golden on Provincial Highway #95. The southern and eastern portions are poorly accessible by little used jeep trails along Warren and upper Vowell Creeks. The higher elevations are accessible only by helicopter.

L E G E N D

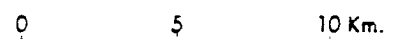
-  PAVED HIGHWAY
-  GRAVEL LOGGING ROAD
-  C. P. RAIL LINE
-  RIVER / CREEK
-  NORCEN LAND HOLDINGS



Norcen
Energy Resources Limited

(COCHRANE OIL & GAS OPTION)

CRYSTAL CREEK PROJECT
BRITISH COLUMBIA
LOCATION MAP



SCALE 1: 250,000

III. REGIONAL GEOLOGY

1. Geological Setting

The general area of the Crystal Creek property is underlain by Hadrynian aged sediments of the Horsethief Creek Group. These form the upper part of the Precambrian section exposed in the Purcell Anticlinorium. The lower portion is the Purcell Group; fine grained siliceous clastics which were deposited as a west-ward prograding terrace wedge on the western margin of the North American craton. These sediments were uplifted and slightly metamorphosed by the East Kootenay Orogeny. Deposition was renewed with the Toby Formation and the Horsethief Creek Group in Hadrynian time. The Horsethief Creek is composed of coarse, poorly sorted material which reflects the increased relief of the source areas as compared to Purcell time but like the Purcell Group was west-ward a prograding wedge. Extensive sedimentation continued well into the Paleozoic.

The overwhelming structure of the area is Mesozoic in age, caused by the uplift and major mountain building event of that time. Granitic plutons range in age from mid-Jurassic to Cretaceous and intrude all Precambrian and lower Paleozoic rocks. The rocks are folded about upright axes that trend northwest-southeast. These folds generally have a northward plunge but reversal of this is not uncommon.

2. Property Geology

A Lithology

The Crystal Creek property is underlain by sediments of the Horsethief Creek Group. These are dominantly poorly sorted clastic rocks with very minor limestone. One limestone bed, on the order of 30 metres thick was mappable over several kilometres in the western portion of the property. Although this limestone is volumetricly insignificant within the section it appears to mark a very sharp change in the depositional regime during Horsethief Creek time. Below the limestone the sediments are dominated by relatively coarse grained clastics such as arenites and conglomerates. They occur in fining upward cycles of various thicknesses. These have the appearance of turbidity deposits and generally conform to Bouma's A B E divisions. Their overall coarseness would indicate deposition proximal to the turbidity current source. This is also indicated by the exposure of a large channel way approximately 0.5 km west-northwest of the grid area. Across approximately 400 metres of exposure a conglomerate lense is seen to grade from a coarse arenite, thicken and coarsen toward the centre and then grade back to coarse arenite. Clasts are dominantly composed of quartz but limestone clasts are common. The limestone clasts become more abundant and much larger toward the centre of the lense, reaching a maximum observed size of approximately 2 metres. These clasts are very similar to limestone of the Mount Nelson formation which lies unconformably below the Toby formation and is exposed 25 kilometres to the southwest. Also found as clasts in the conglomerate lense are large angular blocks (2) of coarse quartz arenite or quartz gravel conglomerate which appear to be interformational ripped-up blocks.

Stratigraphically below this conglomerate lense is a lense of coarse quartz arenite within a shale unit. Above the conglomerate is a clean, fine grained quartzite which also appears to be a lense within a shale unit. Thus, it would seem that the conglomerate is indeed a channel way deposit and that the channel was used over a long period by turbidity currents and later by more stable, steady flow. It would also appear that these deposits are of a regressive sequence which culminates with the deposition of the limestone, approximately 100 metres above the channel way deposits.

Overlying the limestone are thick sequences of predominately greywacke with subordinate arenite and shale. All are fine grained and reflect an increase in the amount of clay being supplied to the area. Graded bedding and fining upward sequences are common, giving the impression of deposition in the distal region of turbidity current activity. Higher in the section black shales become more common, as opposed to the grey and green shales lower down. Certain of the shale horizons have a varved appearance suggestive of differential settling of a suspended sediment load. These are features of deep water deposition. Hence it would appear that after the deposition of the limestone the area experienced extensive transgression creating the deep water sediments observed in the western portion of the property.

III.

B Structure

The area was tectonically deformed during the Mesozoic Era. As previously stated the deformation affected all rocks from Helikian to Devonian and was caused by foreshortening during the Mesozoic mountain building events. The overwhelming dominant structural style is parallel folding along near vertical axial planes that trend northwest-southeast.

The major fold on the property is an anticlinorium whose axis, or more precisely, axial area, runs through the Ruth Vermont Mines deposit and through the showings on the north side of Crystal Creek. This fold is well exposed on the north and south sides of Vermont Creek and it was found that, while structure was easily definable within the flanks, the central or axial area was highly foliated and contorted. This zone was some 1.5 kilometres wide. Along strike this zone is largely obscured by the overburden within Vowell Creek but may be recognized in isolated outcrops by an associated strong foliation. Such a major anticlinorium must have adjacent synclinoria. The one to the southwest was not observed, being out of the area of interest. The one to the northeast is within the property boundaries but is not documented because of the incomplete nature of mapping in the Warren Creek area. It would appear that the axial area of the synclinorium passes through the vicinity of the Warren Creek showings. A limestone bed outcrops in that area which may be correlatable with the one previously mentioned as no other limestone was observed to the west. If such is the case it would mark the exposure of younger rocks in the trough of the synclinorium.

The secondary folds on the limbs of these major structures are generally parallel and upright. The wavelength of these folds appears to be on the order of 0.5 kilometres. They are seen to plunge either north and south or to have horizontal axes. It was observed in the western portion of the property that some anticlines die out to the north by changing along strike from anticlines to structural terraces. At those points the folds had a gentle northerly plunge.

Fracturing was observed in most folds parallel to the axial planes. These fractures seem to have localized quartz veining which in turn is often accompanied by sulphide mineralization. It was also observed that anticlinal axial planes were often highly altered and hematized. Faults are neither major or common within the map area.

C Mineralization

The observed mineralization on the property, other than that in the area of the original showings, is related to quartz veining. The quartz veining appears to be controlled by release fractures along the axial planes of anticlines. Minor amounts of galena in quartz were observed in the northwest corner of the property. Sulphide staining was observed in quartz veins along Conrad Creek. The area lies on the axial trace of the Vermont anticlinorium. Also found on that trace were boulders of quartz containing associated galena. These were discovered on the southwest side of Crystalline Creek.

In the Warren Creek area the dominant base metal observed was copper. The aforementioned Warren Creek showings occur in quartz veins which may occupy a shear zone. The sulphide minerals present are pyrite and chalcopyrite. Values of 5% Cu over 0.6 metres across the vein on surface and 2.2% Cu over 6 metres of vein material in diamond drill core are reported. Eighteen hundred metres of drilling proved the existence of three quartz veins with pyrite and chalcopyrite pods along the vein walls. These quartz veins strike 135° to $145^{\circ}A_2$ and are steeply easterly dipping.

Other mineralization was found at the head waters of the small creek draining past the Warren Creek showings. Malachite was observed in a sheared or highly foliated zone in dirty quartz arenites. This zone occurs at the axis of a small anticline and is parallel to that axis ($140^{\circ} A_2$). Close by to this, pyrite, chalcopyrite and galena was found in quartz-filled cross fractures striking $45^{\circ} A_2$ and dipping 55° northwest. These fractures had the appearance of tension gashes.

Large quartz veins carrying small pods of chalcopyrite and stained with malachite were found 3.5 kilometres south-southwest from the Warren Creek showings. These appeared very similar to but smaller than the Warren Creek showings. The veins strike $140^{\circ} A_2$, dip steeply southwest and are near an anticlinal axial plane.

IV. REGIONAL GEOCHEMISTRY

A total of 1,084 soil samples were taken over the course of the summer's regional evaluation of the Crystal Creek property. In addition to that, selected stream sediment samples and rock samples were also taken. The soil stream sediment samples were analyzed for lead, zinc, copper, silver, iron and manganese. The rock samples were analyzed for nine major oxides (excluding Si) and fourteen minor and trace elements.

The soil samples were taken on a grid pattern of 200 x 400 metres where possible. The lack of soil development at higher elevations and rugged terrain resulted in the selection of available and accessible samples. Stream sediment samples were taken from tributaries of the major creeks and rivers. Rock samples were taken in lieu of soil samples at some higher elevations and where anomalous metal content was suspected.

All samples were sent to Barringer Magenta Ltd. of Calgary for analysis. In addition to geochemical analysis a standard statistical analysis was also run by Barringer. The results in both arithmetic and log normal forms are herein presented.

The statistical analysis provides, for each element, arithmetic and log transformed frequency distribution histograms and probability plots, correlation matrices, means and standard deviation. The arithmetic mean and standard deviation were used to determine thresholds. cursory examination of the log transformed probability plots reveal polymodal populations for all the data. It is suspected that the data is trimodal; one population due to the veins along the axial trace, one in the well developed soils at the lower elevations and one due to the juvenile soils sampled at higher elevation. A simple portioning of the sample values on the basis of arithmetic mean and standard deviations shows some interesting features.

The lead values were slightly above average in the Warren Creek area and on the Pro claims. Some lead mineralization was found in the Warren Creek area but none was discovered on the Pro claims. Another area with above average lead content and the majority of highly anomalous values is found along the axial trace of the Vermont anticline. This area of highs is truncated in the Vowell valley in an area where large amounts of glacial debris from the Bugaboo Batholith may be observed.

The zinc values display no recognizable pattern except when considering the highly anomalous values. Although these are slightly scattered a number are coincident with the Vermont anticline axial trace.

Copper values also outline the Vermont axial trace. The values are however, only above average with isolated anomalies. The Warren Creek area has numerous copper anomalies but no definite trend can be seen. It is interesting to note that the area along structural strike (on claims S2 and S3) also has a number of anomalous copper values which may mark a copper-rich synclinal axial trace. Another area of interest lies within claim WC7 which contains high copper values but unlike the two previously mentioned areas does not have a surrounding area of above average values. Copper mineralization in quartz veins was found near this area and may be used to explain these sharp anomalies.

Analysis of the silver values is somewhat misleading. Over 40% of the samples contained silver in amounts below detection limits. The calculations of mean and standard deviation of these samples are not considered, giving a strongly bottom censored distribution. Thus, in actual fact, if a sample contained a detectable amount of silver, it was near the actual arithmetic mean. Recalculation using hypothetical values for samples without detectable amounts of silver would not, however, create radically different anomaly thresholds. The mean would be lower, but the standard deviation would be higher so that choosing an arbitrary threshold level of the mean plus 2 x the standard deviation produces approximately the same result. This allows the major trends to stand out as, in this case, the highly anomalous values that mark the Vermont anticline axial trace. Censorship of the distribution must be considered in areas where a large number of samples are above the calculated mean as is the case near the confluence of Malloy and Vowell Creeks. No explanation of this grouping was forthcoming.

Iron values show little in the way of patterns. The Warren Creek and S2 and S3 claims areas have above average iron contents. This may be due to some factor related to the synclinal trace as speculated for the copper values or to more iron-rich sediments exposed in the synclinal trough. This model may also be used to explain the high copper values. Another area of interest is coincident with the area of above average silver values near Malloy Creek. A dark shale with abundant pyrite cubes up to 3 centimetres in size outcrops in that area. This may be the cause of the above average iron contents. It should be noted that the correlation coefficient for silver to iron is slightly negative.

Manganese values do not reveal any obvious patterns. High values in the Warren Creek, S2 and S3 claims areas are coincident with iron highs. Isolated extremely anomalous samples occur along the Vermont axial trace.

In summary, the most significant feature of the soil geochemistry data is the anomalous trend that occurs along the Vermont anticline axial trace. This geochemical trend can be seen in the lead, zinc, copper and silver data even though correlation coefficients are relatively low, particularly for silver. This indicates that the trace area is enriched in those elements but that chemical partitioning has been extensive in the surface environment. One possible explanation for the enrichment is the percolation of metal rich fluids through the axial fracture and cleavage system. These fluids could perhaps be related to the Cretaceous, acidic intrusives. One such intrusive, the Bugaboo Batholith outcrops near to the trace and is known to be enriched in heavy elements such as rare earths and uranium and may certainly have released late stage fluids rich in other heavy metals. Another area of interest would appear to be the Warren Creek area. Copper mineralization in that area could explain the high copper values. The high iron and manganese values associated with the copper values may indicate enrichment in the sediments themselves.

Fifty-eight samples from the initial portion of the soil sampling program were found to be above threshold values for one or more of the economic metals analyzed. The thresholds used for this purpose were 0.8 ppm, 64 ppm, 77 ppm and 127 ppm for silver, copper, lead and zinc respectively. Many of the sample sites were revisited and 39 were resampled. These results are summarized in Table IV-1. The silver anomalies are very difficult to reproduce. Anomalous samples from the Vermont Valley and the Warren Creek areas were repeatable. Many of these samples were found to be anomalous in metals whose values were below thresholds in the initial sample and represent valid insitu anomalies. This is particularly true of samples whose metal content is higher than the metal samples taken from higher soil profiles such as 1003, 1014, 3256 and 2130.

The stream sediment data identified high metal values in Vermont Valley, as expected and some above average values in the tributaries to Conrad Creek. The Warren Creek area has two anomalies, one below and one above the showings.

TABLE IV - 1

INITIAL SAMPLE	RESAMPLE NUMBER AND COMMENT	AG	CU	FE	MN	PB	ZN
1001		1.1	27	3.3	250	16	99
	2153	.5	51	4.0	335	45	120
1002		1.2	27	3.6	200	27	109
	2157 "B" horizon	.7	19	3.3	3.5	35	120
	2158 "C" horizon	.5	47	3.8	240	32	115
1003		.6	26	3.2	350	26	129
	2154 from 20 m east "B" horizon	.3	45	3.7	230	89	170
	2155 from 20 m east "C" horizon	.6	57	3.8	225	258	170
	2156	.4	32	4.2	245	26	155
1011		1.2	29	3.7	250	20	69
	1265	.2	27	3.5	225	23	63
1012		1.7	15	2.8	180	37	70
	1267 15 cm	.2	22	3.3	235	43	105
	1268 25 cm	.1	32	3.4	325	59	110
1014		.9	21	3.0	120	48	61
	1263 "B" horizon	.3	33	3.5	155	45	62
	1264 "C" horizon	.3	45	4.6	225	65	125
1015		1.1	21	3.5	150	38	66
	1261 "B" horizon	.1	27	3.6	215	34	68
	1262 "C" horizon	.2	41	4.8	255	67	135
1016		1.2	16	3.2	170	53	99
	1269 "B" horizon	.2	18	3.2	155	45	115
	1270 "C" horizon	.3	20	3.0	165	39	115
1018		1.1	25	3.5	400	35	111
	6041 in vicinity						
1023		.9	17	1.9	180	8	38
	6038 in vicinity, "B" horizon	.4	38	4.2	415	16	105
	6039 in vicinity, "C" horizon	.4	32	3.4	475	16	64
	2159 in vicinity	.3	21	2.6	205	34	56
1053		ND	70	2.4	48	11	52
	6046	ND	126	3.4	455	14	70
1145		ND	105	3.8	615	108	79
	1274	.2	190	8.7	973	194	165
2028		.4	17	2.7	210	8	776
	1250	.1	22	3.2	2.5	24	69
	1251 "C" horizon	.1	21	3.4	205	4	6

TABLE IV - 1 (Cont'd)

INITIAL SAMPLE	RESAMPLE NUMBER AND COMMENT	AG	CU	FE	MN	PB	ZN
2030		.1	95	4.3	300	17	95
	1252	.1	95	4.8	355	21	115
2063		.1	12	2.5	150	13	150
	6036 10 cm	.1	53	2.8	585	66	185
	6037 20 cm	ND	62	3.5	515	69	155
2119		.6	55	2.8	880	199	59
	6052	.6	195	8.7	1961	840	195
	6003R						
2120		.3	36	4.2	266	82	59
	6053	.2	61	10.9	459	237	150
	6004R						
2129		ND	81	44	934	45	85
	6054	ND	205	12.3	2008	95	204
2130		ND	107	3.6	923	45	76
	6055	ND	200	9.4	2535	105	205
3003		1.6	30	2.9	30	29	76
	2145 40 cm	ND	54			31	66
	2146 65 cm	.4	35			16	73
3004		1.3	44	1.4	100	44	52
	2142 40 cm	.2	28			25	82
	2143 75 cm	.3	33			26	70
3058		.9	14	2.0	220	17	46
	2144	.5	27			16	47
3110		.4	37	3.1	620	77	97
	6035	.5	28	1.3	445	16	46
3163		.1	16	4.0	300	24	140
	1271	.2	41	3.6	385	28	130
3222		.1	29	3.6	155	34	130
	1257 "B" horizon	MS					
	1258 "C" horizon	MS					
3249		.5	50	3.6	545	48	150
	6047	.2	76	6.9	783	66	235
3250		.4	148	4	1692	144	98
	6048	ND	85	9.8	1717	122	230

TABLE IV - 1 (Cont'd)

INITIAL SAMPLE	RESAMPLE NUMBER AND COMMENT	AG	CU	FE	MN	PB	ZN
3255	6049	.9	51	3.8	719	82	96
		.6	125	8.6	1484	148	205
3256	6050	1.1	63	5.0	2295	606	280
		1.6	150	12.5	3523	1450	1000
3257	6051	1.6	82	5.8	820	296	360
		.4	130	13.5	1739	223	285
3285	1276	ND	230	5.4	185	107	101
		ND	140	11.4	1069	42	170
3298	1237	ND	74	8.5	725	28	104
		.3	47	4.2	645	73	72
4036	1226 25 cm 1227 45 cm	.7	35	3.0	3100	28	663
		.5	34			19	55
		.4	25			14	53
4040	1259 1260 "C" horizon	1.0	62	3.7	540	84	66
		.1	21	2.2	530	15	56
		.1	48	1.8	215	34	57
4047	1225	ND	13	1.5	640	7	136
		.3	14			5	34
4155	1256	.8	28	4.7	3700	900	500
		.2	18	4.0	2200	303	205
4160	1254	.2	13	3.1	1600	30	220
		.1	21	2.8	925	28	195
4163	1255	ND	28	4.2	450	39	135
		.1	34	4.2	555	38	150
5052	1275	.1	75	5.7	875	55	97
		.6	295	11.4	1885	141	190
	1272R	In vicinity of 3163 grey shale					
	1273R	In vicinity of 3163 grey shale					
	2012R	Black pyritic shale in vicinity of 3312-3315					
	1235R)	In vicinity of 3298					
	1236R)	grey black pyritic shale					

V. LOCAL GEOLOGY

A series of traverses were made chiefly along the ridges between Crystalline and Vermont Creeks in order to get additional geological information in the immediate Crystal Creek area. This information is presented on the 1:5000 scale map.

The rock units encountered in the 1:5000 map area are essentially the same as those found in the detailed grid: conglomerate, arenite, wacke, shale and limestone.

1. Structure

The relative scarcity of outcrop in the area results in tentative structural interpretation; however some large scale features have been recognized.

The core of a major regional anticline cuts through the ridge north of Crystal Creek at 643000 north 502500 east (coordinates indicated on the 1:5000 map). This core zone is characterized by intense quartz veining. Similar quartz veining is found on the grid at 0+10 m north 100 m west and 1+75 m south 1+50 m west suggesting that this zone extends through the grid area on a trend of $323^{\circ} A_2$.

To the east of this anticlinal axis the structure appears to be simple. All the beds dip steeply to the east and strike about $300^{\circ} A_2$. East of the anticlinal axis the sequence is quartz arenite, shale, quartz arenite, conglomerate, shale, quartz arenite and then shale.

To the west of the anticlinal axis the structure is much more complex. There is a zone of tight, often overturned folding for about 400 metres occurring in shales and interbedded arenites and shales. This section probably correlates with the first two units east of the axis. It is overlain by coarse grained arenites and gravel conglomerate that correlates with the similar unit east of the axis, however, the sequence is then cut off by a structural discontinuity that can be observed only from the air on the north slope of the peak at 642700 north 501850 east. West of this discontinuity coarse grained arenites and shales alternate in a westerly dipping sequence.

Just west of the map area is a major (15-20 metre) limestone and calcareous shale unit, the Crystal Creek Limestone, that correlates with the limestone in the southwest corner of the map area. The Crystal Creek Limestone is, in turn, overlain by a thick sequence of graded, interbedded arenites and shales with very minor gravel conglomerate. This unit represents a sequence of turbidite deposits.

The Crystal Creek Limestone represents a good marker horizon over the whole Crystalline to Vermont Creeks area. It can be followed from the ridge between Crystalline and Crystal Creeks to the northwest of the Ruth-Vermont Mine on the north wall of the Vermont Creek valley. It also marks a change in lithology from the dominantly shaly environment below the limestone marker to the turbidite sequences and generally more coarse clastics above the marker, (which were probably deposited in deeper water). Potential economic mineralization appears to be restricted to units stratigraphically below the limestone.

VI. DETAILED GEOLOGY

The 1979 grid was extended to the north from L 2+50 N to L 5+00 N; and to the south from L 3+50 S to L 6+00 S. Lines 2+50 S and L 3+00 S were extended from the base line to 2+00E.

Detailed geological mapping was carried out over the entire grid. Basic lithologies were identified rather than metamorphic zones as were previously mapped: ie argillite, phyllite, and schist were replaced by the single lithology of shale in the 1980 mapping. Outcrop exposures are generally confined to the roads made during previous drilling programs. The western portion of the grid has limited outcrop exposure.

Reconnaissance geological traverses were made on adjacent Norcen claim blocks and are presented on the 1:5000 scale "Local Geology" map.

The rock types identified on the grid represent the middle portion of the Horsethief Creek Group as described by Ressor (G.S.C. Memoir 369, Geology of the Lardeau Map Area, East Half, B.C., 1973). The rock types identified include conglomerate (gravel, pebble and boulder), arenite, wacke, shale, limestone, oolitic limestone, and quartz veins. A brief description of each is given below.

1. Conglomerate and Arenite

Clastic rocks ranging from fine grained arenites to pebble conglomerates (up to 5 centimetres) occur on the grid, with the bulk of the rocks being coarse grained arenites. Blue quartz clasts are ubiquitous in the arenites and gravel conglomerates. Quartzite, dolomite and shale clasts are also present in the conglomerates.

2. Wacke

There are minor amounts of wacke rocks in the sequences. These rocks are usually fairly quartz-rich but have a substantial fine grained matrix composed of chlorite and sericite with a mixture of fine grained feldspar.

3. Shale

Light to dark grey shale is the dominant lithology in the grid area. These shales have been metamorphosed to phyllites. Bedding is usually poorly defined but where identifiable, it ranges from massive to thinly laminated. Soft sediment deformation is often visible. Pyrite-marcasite is common in the shales with crystals occurring up to 2 centimetres. The concentration of pyrite parallel to bedding planes is common. Some shale units are calcareous, especially those adjacent to limestone beds.

4. Limestone

There are occasional outcrops of limestone within the grid area. The limestone is typically dense, fine grained and dark coloured when pure, and lighter coloured and shaly when impure. It is often interbedded with calcareous shales

and occasionally arenites. The thicker limestone beds within the grid area are never well exposed but it appears that they range up to about 3 metres in width. Pyrite cubes are commonly disseminated throughout the limestone.

In addition to the normal limestone beds, an oolitic limestone breccia outcrops in the central grid area and was intersected in diamond drill holes 80-2, 80-4, 79-5 and 79.7. This carbonate breccia consists of recrystallized oolites up to 3 millimetres in size. The breccia matrix is usually calcite. The breccia contains angular clasts up to 30 centimetres in size of the local (?) clastic beds. The oolitic limestone breccia unit with minor interbedded shale beds may approach 5 metres in total thickness.

The breccia unit may have formed in a channel or along a scarp. Oolite development requires a fairly shallow, high energy environment for formation. Hence, some sort of carbonate bank or platform environment was present. The large shale fragments in the breccia are not rounded but are deformed, suggesting slumping within the newly deposited unit.

The overall picture is one of slumping from a carbonate bank either into an incised channel or from the edge of a bank. The slumping may have been triggered by a coarse clastic influx as there are occasional non-shale fragments in the unit.

5. Structure

Most of the grid area covers the zone of tight folding to the west of the regional anticlinal axis encountered on the ridge between Crystal and Vermont Creeks. Over a distance of five hundred metres across the central area of the grid three anticlinal and two synclinal axes define a system of folds with a wavelength of about 150 metres that trend about $310^{\circ}A_z$. This is not quite parallel with the regional trend of 320° - $325^{\circ}A_z$ for major structures.

On a smaller scale there are minor tight folds concentrated in the synclinal axes as at 1+50 S 0+20 W and 0+52 S 030 W and homoclinal folds on the limbs of the local folds as at 1+80 S 0+40 E.

Foliation throughout the area is consistent from rock type to rock type, and generally trends around $310^{\circ}A_z$. The dip varies considerably but is always steep (60° E \rightarrow 60° W).

6. Trenching

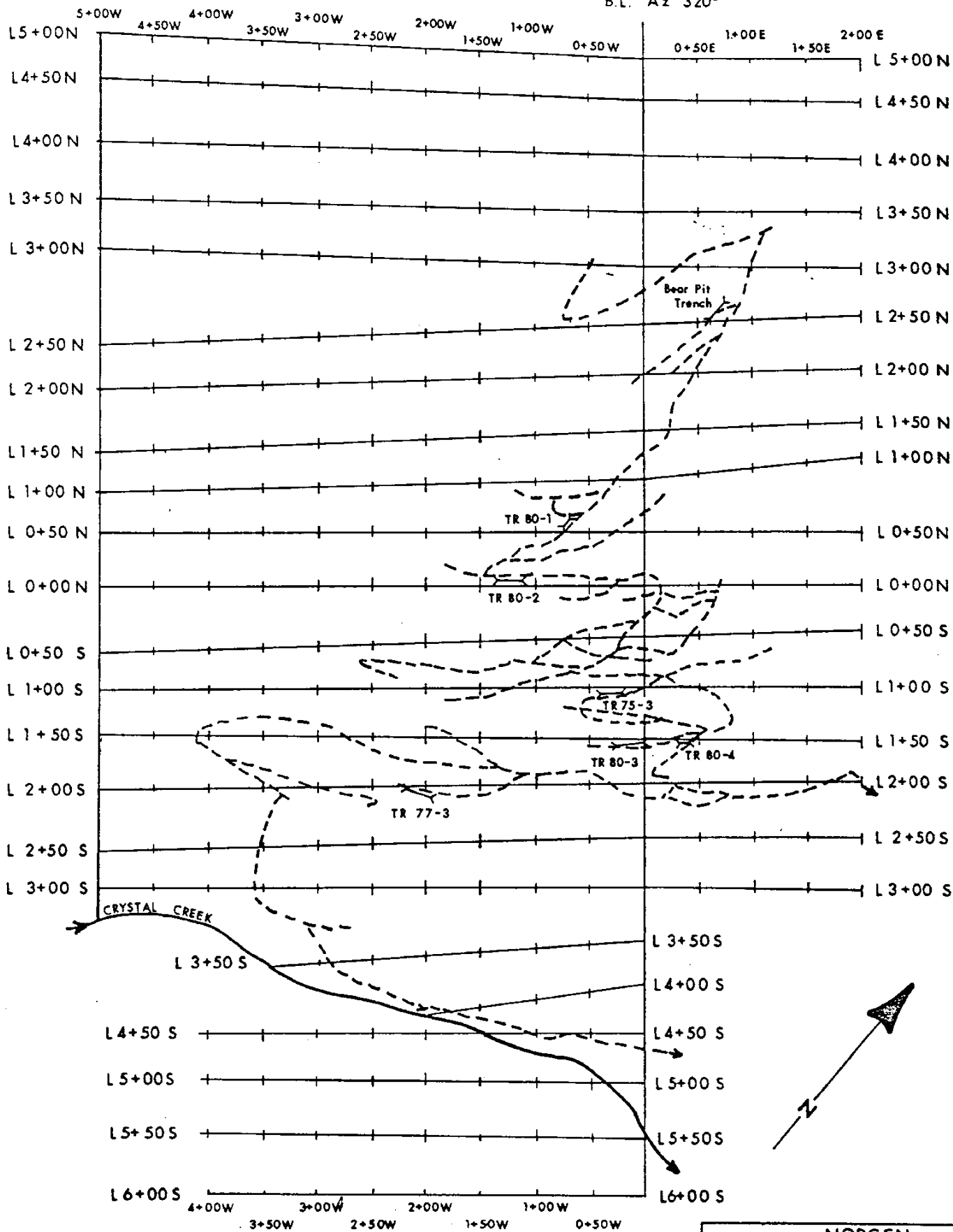
A number of trenches were dug or cleaned during the 1980 season. These included 80-1, 80-2, 80-3, 80-4, Bear Pit Trench, 77-3, 75-3 (see Trench Location Map).

Trench 80-1 revealed a complexly folded mineralized arenite with subsidiary sulphide bearing veins in the surrounding arenites and shales. The mineralized

arenite had weathered to a black almost earthy friable consistency which yielded an assay of 7.05% of combined zinc and lead with 2.56 oz silver/ton. A shale section with a 10 centimetre mineralized vein yielded 3.19% combined lead and zinc and 0.98 oz silver/ton. The rest of the 1 metre chip samples yielded results below 0.7% combined lead and zinc with little silver.

Trench 80-2 exposed easterly dipping arenites and assayed 1.3% combined lead and zinc and 0.12 oz silver/ton over 4 metres of which one metre assayed 2.25% combined lead and zinc and .3 oz. silver/ton.

Most of the exposed rock in the Bear Pit trench consisted of friable black weathered arenite and shale that averaged 1.6% combined lead and zinc and 0.21 oz silver/ton. Part of the arenite was highly calcareous and a limestone bed was encountered at the foot of the wall. Weathering and hillside creep combined to obscure the structural picture in this trench.



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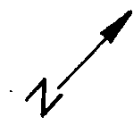
CRYSTAL CREEK PROJECT
BRITISH COLUMBIA
(Cochrane Oil & Gas Option)

TRENCH LOCATION MAP

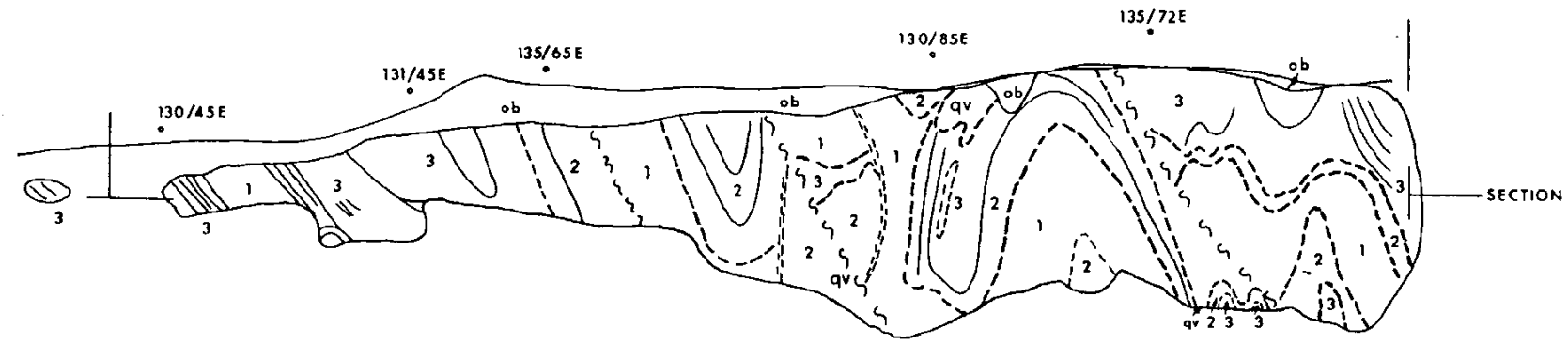
Scale 1:5,000
0 50 100 150 200 metres

NTS 82 K 15W Dec. 1980

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

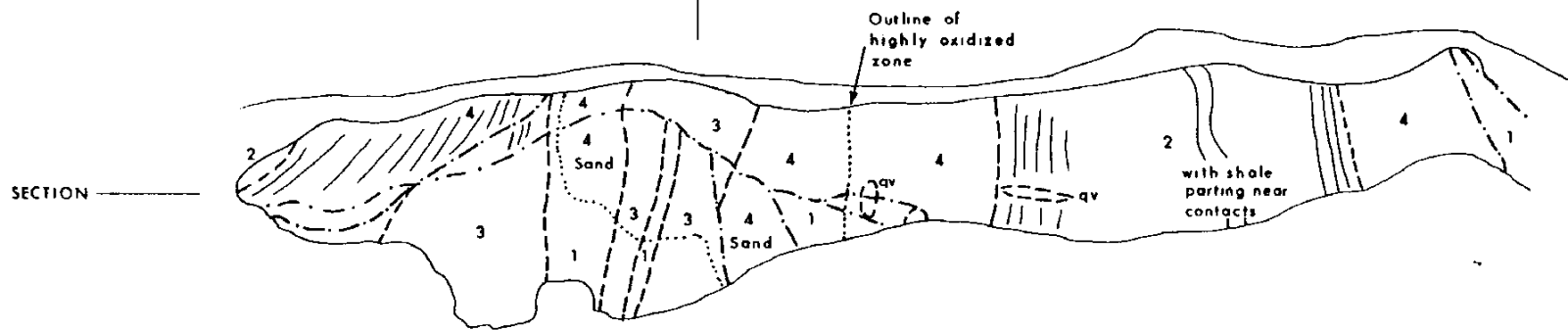
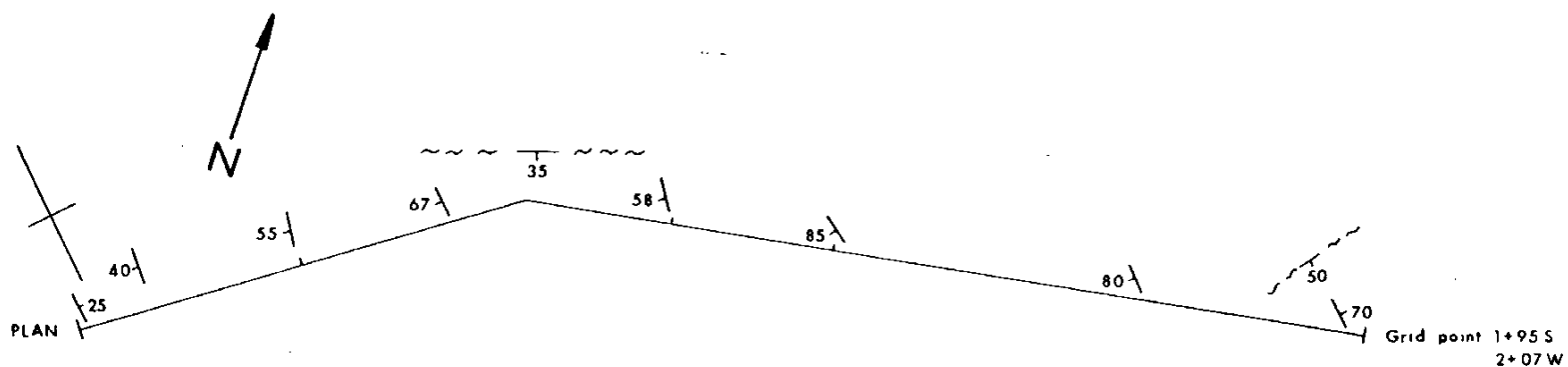


Grid point 1+135 0+39W



- 1 Coarse black orange weathered arenite, mineralized
- 2 Fine light grey—buff qtz arenite with limonite (mineralized occasionally along contact with 1)
- 3 Dark grey to black shale, pyritic
- qv Quartz vein
- Fault
- - - Contact
- Bedding
- ob Overburden
- == Shear

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(COCHRANE OIL & GAS OPTION)		
CRYSTAL CREEK PROJECT		
TRENCH 75-3		
Scale: 1:100	Contour Interval:	
Date: Dec. 1980	Interpreted by: A. SLINGSBY	
Map of	File Number:	KGH



- 1 Grey pyritic shale
- 2 Limestone, dark grey, micritic
- 3 Arenite, coarse, black-orange weathered
- 4 Black to dark grey thin shale, pyritic & highly weathered

- ~ ~ Fault
- Contact
- Bedding
- ob Overburden
- Shear
- qv Quartz vein
- Clay seam (fault)

Norcen
Energy Resources Limited

(COCHRANE OIL & GAS OPTION)

CRYSTAL CREEK PROJECT
TRENCH 77-3

Scale: 1:100

Contour Interval:

Date: Dec. 1980

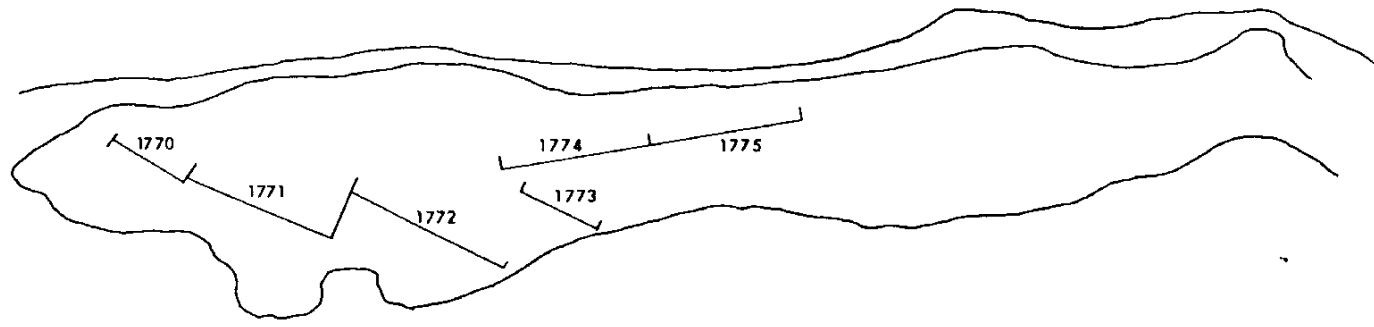
Interpreted by: A. SLINGSBY

Map of

File Number:

KGH

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20



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SAMPLE LOCATIONS
TRENCH 77-3
1 : 100

Scale:

Contour Interval:

Date: Dec. 1980

Interpreted by: A. SLINGSBY

Map of

File Number:

KGH

VII. DETAILED GEOCHEMICAL SURVEY

A total of 332 soil geochemical samples were collected at 25 metre intervals along the 1980 grid extensions (L 4+50 S to L 6+00 S; L 2+50 S and L+3+00 S from the base line to 2+00 E; and L 1+50 N to 1 5+00 N from 5+00 W to 2+00 E). The samples were collected from the B soil horizon and geochemically analyzed by atomic adsorption for the elements copper, lead, zinc, silver, manganese and iron.

The purpose of the geochemical sampling survey on the grid was to locate and define specific targets within the known area of zinc-lead-silver mineralization.

The results for each element are presented in map form in the accompanying map box.

VIII. GEOPHYSICAL SURVEY

A geophysical survey was contracted out to Glen E. White Geophysical Consulting and Services Ltd. of Vancouver. The survey was performed between July 2 and 6, 1980 and consisted of probing seven drill holes utilizing the borehole pulse electromagnetic technique, two test lines using the P.E.M. in standard horizontal loop mode and coverage of a single test line using the vector P.E.M. technique.

The test line coverage with the horizontal loop and vector pulse electromagnetic coverage did not provide evidence of conductivity within the area surveyed. Five of the twelve diamond drill holes of 1979 had caved and could not be surveyed with the pulse EM bore hole technique. The series of 'down hole pulse' electromagnetic surveys did not disclose any significant conductors.

A full report covering the geophysical surveying completed during the 1980 program is contained within Appendix B.

IX. DIAMOND DRILLING

Seven diamond drill holes totalling 530.03 metres (1739.0 feet) were completed between July 19 and August 8, 1980. The drilling was carried out by Cameron McCutcheon Drilling Limited of Vancouver, British Columbia, using one Longyear "Super 38" drill. A triple or split tube core tube was used to recover NQ 3 (1.75 inch diameter) core.

Core recovery averaged approximately 80% for the seven holes but was very poor within the target zones due to the extremely weathered and friable nature of these mineralized units.

A breakdown for the seven drill holes is given below.

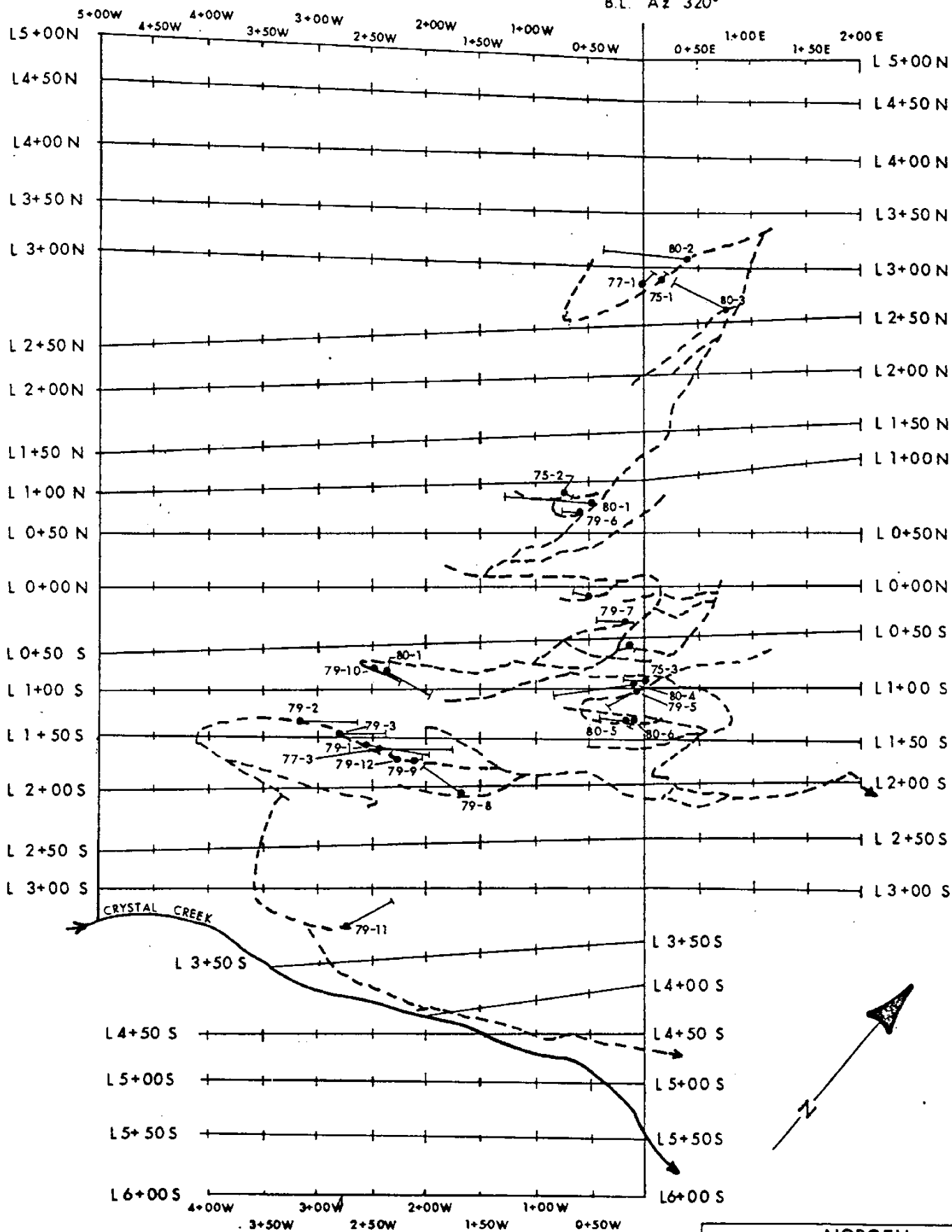
<u>Hole #</u>	<u>Bearing/ dip at collar</u>	<u>Bearing/ dip at planned depth</u>	<u>Depth metres</u>	<u>Depth (feet)</u>	<u>Average Core Recovery%</u>
CC-80-1	240°/-45°	238°/-45°	124.97	410	76
CC-80-2	234°/-45°	238°/-45°	100.58	330	74
CC-80-3	233°/-45°	255°/-50°	99.06	325	77
CC-80-4	226°/-45°	224°/-40°	99.36	326	87
CC-80-5	240°/-45°	241°/-51°	40.84	134	59
CC-80-6	0°/-90°	291°/-88°	30.78	101	86
CC-80-7	60°/-45°	71°/-48°	34.44	113	95
			<u>530.03</u>	<u>1739</u>	<u>79</u>

Our initial exploration target was a stratabound massive sulphide deposit hosted by sedimentary rocks. This model was based on the similarity of the mineralized core from Medesto's hole #77-3 to known massive sulphide deposits. Norcen's 1979 drill program and subsequent downhole geophysics in 1980 resulted in a revision of the exploration model. The potential for an economic ore body appeared restricted to a large tonnage low-medium grade deposit. The 1980 diamond drilling results were not encouraging.

It would therefore appear that the Crystal Creek property primarily contains only non-economic, sporadic vein-type mineralization.

A chart of the assay values for the samples selected from each drill hole is presented on the following pages.

B.L. Az 320°



NORCEN
ENERGY RESOURCES LIMITED

CRYSTAL CREEK PROJECT
BRITISH COLUMBIA
(Cochrane Oil & Gas Option)

DRILL HOLE LOCATION MAP

Scale 1:5,000
0 50 100 150 200 metres

NTS 82 K15W

<u>HOLE #</u>	<u>ASSAY TAG #</u>	<u>INTERVAL (metres)</u>	<u>SAMPLE WIDTH (metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton Ag</u>	<u>oz/ton Au</u>
80-1	1814	5.55-5.80	0.25	.01	.02	.01	.16	Tr
	1815	5.80-6.10	0.30	Tr	.02	.01	.18	Tr
	1816	6.10-6.35	0.25	Tr	.02	.01	.14	Tr
	1817	7.98-8.23	0.25	.01	.02	.02	.14	Tr
	1801	8.23-8.66	0.43	.01	.04	.02	.58	Tr
	1802	8.66-9.08	0.42	.01	.02	.03	.16	Tr
	1803	9.08-9.51	0.43	Tr	.02	.02	.76	Tr
	1804	9.51-9.94	0.43	Tr	.02	.01	.50	Tr
	1805	9.94-10.21	0.27	.01	.02	.01	.18	Tr
	1818	11.66-11.91	0.25	.01	.02	.01	.18	Tr
	1806	12.19-12.50	0.31	.01	.04	.02	.14	Tr
	1819	14.53-14.78	0.25	.01	.02	.05	.16	Tr
	1807	14.78-16.31	1.53	.01	.02	.11	.16	Tr
	1808	16.31-16.76	0.45	Tr	.02	.11	.14	Tr
	1809	16.76-17.10	0.34	.01	.02	.06	.14	Tr
	1820	17.10-17.31	0.21	.01	.02	.08	.16	Tr
	1810	17.98-18.29	0.31	.01	.02	.03	.14	Tr
	1821	18.35-18.60	0.25	.01	.02	.03	.14	Tr
	1811	18.60-19.09	0.48	.01	.02	.05	.16	Tr
	1812	19.08-19.51	0.43	Tr	.02	.04	.14	Tr
	1813	19.51-19.81	0.30	.01	.02	.02	.14	Tr
	1822	19.81-20.06	0.25	.01	.02	.02	.14	Tr
	1823	22.25-22.40	0.15	Tr	.02	.01	.12	Tr
	1824	22.56-23.16	0.6	.01	.02	.02	.10	Tr
	1825	23.16-23.76	0.6	Tr	.02	.01	.04	Tr
	1826	23.76-24.36	0.6	.01	.02	.01	.14	Tr

<u>HOLE</u> <u>#</u>	<u>ASSAY</u> <u>TAG #</u>	<u>INTERVAL</u> <u>(metres)</u>	<u>SAMPLE</u> <u>WIDTH</u> <u>(metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton</u> <u>Ag</u>	<u>oz/ton</u> <u>Au</u>
80-1	1827	24.36-23.16	0.25	.01	.02	.02	.04	Tr
	1828	24.75-25.00	0.25	.01	.02	.01	.12	Tr
	1829	25.00-25.60	0.60	.01	.02	.02	.02	Tr
	1830	25.60-25.76	0.70	.01	Tr	.02	.02	Tr
	1831	25.76-25.91	0.15	.01	Tr	.01	.06	Tr
	1832	25.91-26.82	0.91	.01	Tr	.01	.02	Tr
	1833	27.64-27.89	0.25	.01	.02	.01	.02	Tr
	1834	27.89-28.05	0.16	.01	.02	.01	.14	Tr
	1835	28.05-28.20	0.15	.01	Tr	.03	.04	Tr
	1836	28.20-28.50	0.30	.01	Tr	.01	.08	Tr
	1837	28.50-28.75	0.25	.02	.76	.03	.04	Tr
	1838	29.16-29.41	0.25	.01	Tr	.01	.02	Tr
	1839	29.41-29.87	0.46	.01	.26	.01	.04	Tr
	1840	29.87-30.12	0.25	.01	Tr	.03	.02	Tr
	1841	33.83-34.14	0.31	Tr	Tr	.01	.08	Tr
	1842	33.58-33.83	0.25	.01	Tr	.02	.06	Tr
	1843	34.14-34.21	0.07	.01	Tr	.01	.02	Tr
	1844	34.21-34.30	0.09	.01	Tr	.01	.12	Tr
	1845	34.30-34.36	0.06	.01	Tr	.01	.02	Tr
	1846	34.56-35.11	0.75	.01	Tr	.01	.02	Tr
	1847	35.11-35.36	0.25	.01	Tr	.01	.02	Tr
	1848	35.36-36.12	0.76	.01	.01	.02	.02	Tr
	1849	36.12-36.90	0.78	.01	Tr	.02	.28	Tr
	1850	36.90-37.15	0.25	Tr	Tr	.01	.08	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-1	1851	41.11- 41.36	0.25	.01	Tr	.01	.02	Tr
	1852	41.36- 41.54	0.18	.01	Tr	.02	.04	Tr
	1853	41.54- 41.76	0.22	.01	.02	.01	.02	Tr
	1854	41.76- 42.06	0.30	.01	Tr	.01	.02	Tr
	1855	42.06- 42.31	0.25	.01	.02	.01	.02	Tr
	1856	67.42- 67.67	0.25	.01	.02	.01	.10	Tr
	1857	67.67- 62.82	0.15	.01	.02	.01	.20	Tr
	1858	67.82- 68.07	0.25	.01	.02	.01	.24	Tr
	1859	122.75-123.0	0.25	.01	.02	.01	.02	Tr
	1860	123.0 -123.5	0.50	.01	.02	.01	.02	Tr
	1861	123.5 -124.0	0.50	.01	Tr	.01	.04	Tr
	1862	124.0 -124.5	0.50	Tr	Tr	.01	.02	Tr
	1863	124.5 -125.0	0.50	Tr	Tr	.01	.02	Tr
80-2	1864	1.27-1.52	0.25	.01	Tr	.02	.34	Tr
	1865	1.52-1.87	0.60	Tr	Tr	.02	.22	Tr
	1866	1.87-2.02	0.15	.01	Tr	.01	.42	Tr
	1867	2.30-2.55	0.25	.01	Tr	.02	.10	Tr
	1868	2.55-2.95	0.40	.01	.02	.02	.34	Tr
	1869	2.95-3.20	0.25	.01	TR2	.02	.24	Tr
	1870	3.50-3.75	0.25	.01	.02	.07	-36	Tr
	1871	3.75-4.20	0.45	Tr	.02	.03	.02	Tr
	1872	4.20-4.70	0.50	.01	.02	.01	.04	Tr
	1873	4.70-5.15	0.45	.01	.02	.01	.02	Tr
	1874	5.15-5.45	0.30	Tr	.02	Tr	.02	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-2	1875	5.45-5.85	0.40	.01	Tr	.01	.02	Tr
	1876	5.85-6.30	0.45	.01	.02	.01	.02	Tr
	1877	6.30-6.80	0.50	.01	Tr	.01	.04	Tr
	1878	6.80-7.12	0.32	.01	.02	.01	.02	Tr
	1879	7.12-7.37	0.25	.01	.02	.02	.02	Tr
	1880	7.89-8.14	0.25	.01	.02	.02	.08	Tr
	1881	8.14-8.64	0.50	Tr	.02	.02	.02	Tr
	1882	8.64-9.14	0.50	.01	.02	.01	.02	Tr
	1883	9.14-9.39	0.25	.01	Tr	.01	.02	Tr
	1884	10.93-11.18	0.25	Tr	Tr	.01	.02	Tr
	1885	11.18-11.78	0.60	.01	.02	.03	.02	Tr
	1886	11.78-12.38	0.60	.01	.02	.01	.04	Tr
	1887	12.38-13.11	0.73	.01	Tr	Tr	.22	Tr
	1888	13.11-13.36	0.25	.01	Tr	.04	.06	Tr
	1889	15.42-15.67	0.25	.01	Tr	.02	.10	Tr
	1890	15.67-17.07	1.40	.01	Tr	.02	.02	Tr
	1891	17.07-17.57	0.50	.01	Tr	.01	.02	Tr
	1892	17.57-18.07	0.50	.01	Tr	.02	.02	Tr
	1893	18.07-18.57	0.50	.01	.02	.03	.02	Tr
	1894	18.57-19.15	0.58	.01	Tr	.05	.08	Tr
	1895	19.15-19.40	0.25	.01	Tr	.01	.20	Tr
	1896	23.68-23.93	0.25	.01	Tr	.01	.02	Tr
	1897	23.93-24.48	0.55	.01	Tr	.01	.02	Tr
	1898	24.48-24.73	0.25	.01	Tr	.01	.02	Tr

<u>HOLE</u> <u>#</u>	<u>ASSAY</u> <u>TAG #</u>	<u>INTERVAL</u> <u>(metres)</u>	<u>SAMPLE</u> <u>WIDTH</u> <u>(metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton</u> <u>Ag</u>	<u>oz/ton</u> <u>Au</u>
80-2	1899	29.62-29.87	0.25	.01	Tr	.01	.02	Tr
	1900	29.87-30.37	0.50	.01	.12	.01	.08	Tr
	11001	30.37-30.87	0.50	.02	.02	.01	.28	Tr
	11002	30.87-32.31	1.44	.01	.02	.01	.02	Tr
	11003	32.31-32.81	0.50	.01	.02	.01	.22	Tr
	11004	32.81-33.31	0.50	.01	.02	.01	.30	Tr
	11005	33.31-33.81	0.50	.01	.04	.01	.24	Tr
	11006	33.81-34.31	0.50	.01	.02	.01	.52	Tr
	11007	34.31-34.81	0.50	.01	.02	.01	.24	Tr
	11008	34.81-35.31	0.50	.01	.02	.01	.20	Tr
	11009	35.31-35.81	0.50	.01	.02	.01	.12	Tr
	11010	35.81-36.31	0.50	.01	.02	.01	.16	Tr
	11011	36.31-36.81	0.50	.01	.02	.01	.76	Tr
	11012	36.81-37.31	0.50	.01	.02	.02	.12	Tr
	11013	37.31-37.80	0.49	.01	.02	.02	.04	Tr
	11014	37.80-38.05	0.25	.01	.02	.01	.80	Tr
	11015	39.57-39.82	0.25	.01	.02	.02	.76	Tr
	11016	39.82-40.07	0.25	.01	.02	.01	.70	Tr
	11017	40.07-40.32	0.25	.01	.02	.02	.04	Tr
	11018	40.74-40.99	0.25	.01	.02	.02	.80	Tr
	11019	40.99-41.44	0.45	.01	.02	.01	.02	Tr
	11020	41.44-41.57	0.13	.01	.02	.02	.02	Tr
	11021	41.57-41.82	0.25	.01	.02	.01	.04	Tr
	11022	41.82-42.07	0.25	.01	Tr	.01	.06	Tr

<u>HOLE #</u>	<u>ASSAY TAG #</u>	<u>INTERVAL (metres)</u>	<u>SAMPLE WIDTH (metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton Ag</u>	<u>oz/ton Au</u>
80-2	11023	44.92-45.17	0.25	.01	.02	.02	.02	Tr
	11024	45.17-45.67	0.25	Tr	Tr	.01	.02	Tr
	11025	45.67-46.17	0.50	.01	Tr	.01	.08	Tr
	11026	46.17-46.67	0.50	.01	.04	.01	.02	Tr
	11027	47.67-47.17	0.50	.01	.02	.01	.02	Tr
	11028	47.17-47.67	0.50	.01	.02	.02	.06	Tr
	11029	47.67-48.22	0.55	.01	.02	.01	.02	Tr
	11030	48.22-48.47	0.25	.01	.18	.01	.04	Tr
	11031	48.69-48.94	0.25	.01	.02	.01	.02	Tr
	11032	48.94-49.54	0.60	.01	.02	.01	.08	Tr
	11033	49.54-50.04	0.50	.01	.02	.02	.06	Tr
	11034	50.04-50.50	0.50	.01	.02	.02	.10	Tr
	11035	50.54-51.04	0.50	.01	.02	.02	.06	Tr
	11036	51.04-51.54	0.50	.01	.02	.01	.02	Tr
	11037	51.54-52.04	0.50	.01	.02	.02	.08	Tr
	11038	52.04-52.36	0.32	.01	.02	.02	.02	Tr
	11039	52.36-52.73	0.37	.01	.02	.02	.02	Tr
	11040	52.73-53.03	0.30	.01	.02	.01	.02	Tr
	11041	53.03-53.28	0.25	.01	.08	.03	.02	Tr
	11042	54.31-54.56	0.25	.02	.04	.02	.02	Tr
	11043	54.56-55.06	0.50	.01	.02	.01	.02	Tr
	11044	55.06-55.31	0.25	.01	.02	.02	.02	Tr
	11045	65.84-66.27	0.43	.01	.02	.03	.02	Tr
	11046	66.27-66.77	0.50	.01	.02	.01	.18	Tr

<u>HOLE</u> <u>#</u>	<u>ASSAY</u> <u>TAG #</u>	<u>INTERVAL</u> <u>(metres)</u>	<u>SAMPLE</u> <u>WIDTH</u> <u>(metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton</u> <u>Ag</u>	<u>oz/ton</u> <u>Au</u>
80-2	11047	66.77-67.36	0.59	.01	.02	.01	.04	Tr
	11048	67.36-68.17	0.81	.01	.02	.01	.02	Tr
	11049	68.17-68.32	0.15	.01	.02	.01	.02	Tr
	11050	68.32-68.88	0.56	.01	.02	.01	.12	Tr
	11051	68.88-69.28	0.40	.01	.02	.01	.32	Tr
	11052	69.28-69.46	0.18	.01	.02	.01	.14	Tr
	11053	69.46-70.41	0.95	.01	.02	.01	.04	Tr
	11054	70.41-71.50	1.09	.01	.02	.02	.08	Tr
	11055	71.50-74.68	3.18	.01	.02	.02	.02	Tr
	11056	74.68-74.93	0.25	.01	.02	.01	.10	Tr
	11057	75.29-75.63	0.34	.01	.02	.01	.06	Tr
	11058	75.63-76.04	0.41	.01	.02	.01	.02	Tr
	11059	76.04-76.14	0.10	.01	.02	.01	.12	Tr
	11060	76.14-76.54	0.50	.01	.02	.03	.02	Tr
	11061	76.54-76.70	0.16	.01	.02	.02	.04	Tr
	11062	76.70-76.87	0.17	.01	.02	.01	.02	Tr
	11063	76.87-78.12	1.25	.01	.02	.01	.04	Tr
	11064	78.12-78.48	0.36	Tr	.02	.01	.08	Tr
	11065	78.48-78.73	0.25	.01	.02	.02	.30	Tr
	11066	80.83-81.08	0.25	.02	.02	.08	.10	Tr
	11067	81.08-81.79	0.71	.01	.02	.02	.04	Tr
	11068	81.79-82.04	0.25	.01	Tr	.01	.10	Tr
	11069	82.96-83.21	0.25	.01	Tr	.01	.06	Tr
	11070	83.21-83.65	0.44	.01	.02	.02	.02	Tr

<u>HOLE #</u>	<u>ASSAY TAG #</u>	<u>INTERVAL (metres)</u>	<u>SAMPLE WIDTH (metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton Ag</u>	<u>oz/ton Au</u>
80-2	11071	83.65-84.12	0.47	.01	.02	.01	.04	Tr
	11072	84.12-84.37	0.25	.01	.02	.01	.02	Tr
80-3	11073	13.77-14.02	0.25	.01	.02	.10	.08	Tr
	11074	14.02-14.78	0.76	.01	.02	.25	.04	Tr
	11075	14.78-15.54	0.76	.01	.02	.26	.14	Tr
	11076	15.54-16.80	1.26	.01	.02	.06	.12	Tr
	11077	16.80-17.05	0.25	.01	.02	.11	.18	Tr
	11078	18.37-18.62	0.25	.01	.02	.14	.52	Tr
	11079	18.62-18.83	0.21	.01	Tr	.24	.04	Tr
	11080	18.83-19.36	0.53	.01	Tr	.07	.12	Tr
	11081	19.36-19.89	0.53	.02	.02	.04	.38	Tr
	11082	19.89-20.12	0.23	.01	.02	.01	.16	Tr
	11083	20.12-21.57	1.45	.01	.02	.12	.20	Tr
	11084	21.57-21.82	0.25	.01	Tr	.01	.08	Tr
	11085	23.72-23.97	0.25	.01	Tr	.01	.02	Tr
	11086	23.97-24.20	0.23	.01	Tr	.01	.06	Tr
	11087	24.20-24.45	0.25	.01	Tr	.01	.08	Tr
	11088	30.53-30.78	0.25	.02	Tr	.02	.01	Tr
	11089	30.78-30.98	0.20	Tr	Tr	.01	.04	Tr
	11090	30.98-31.18	0.20	.01	.02	.02	.38	Tr
	11091	31.26-32.38	1.12	.01	.02	.01	.24	Tr
	11092	32.38-32.63	0.25	.01	Tr	.01	.22	Tr
	11093	38.76-39.01	0.25	.01	Tr	.01	.16	Tr
	11094	39.01-39.51	0.50	.01	Tr	.01	.10	Tr

<u>HOLE #</u>	<u>ASSAY TAG #</u>	<u>INTERVAL (metres)</u>	<u>SAMPLE WIDTH (metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton Ag</u>	<u>oz/ton Au</u>
80-3	11095	39.51-40.08	0.57	.01	Tr	.01	.06	Tr
	11096	40.08-40.33	0.25	.01	Tr	.01	.02	Tr
	11097	41.16-41.41	0.25	.01	.02	.01	.14	Tr
	11098	41.41-41.91	0.50	.01	.02	.01	.04	Tr
	11099	41.91-42.41	0.50	.01	Tr	Tr	.02	Tr
	11100	42.41-42.91	0.50	.01	.02	.01	.06	Tr
	11101	42.91-43.40	0.49	.01	Tr	.01	.02	Tr
	11102	43.40-43.90	0.50	.01	Tr	Tr	.06	Tr
	11103	43.90-44.40	0.50	.01	Tr	.01	.02	Tr
	11104	44.40-44.90	0.50	.01	.02	.01	.02	Tr
	11105	44.90-45.40	0.50	.01	.02	.01	.04	Tr
	11106	45.40-45.90	0.50	.01	Tr	.01	.20	Tr
	11107	45.90-46.40	0.50	.01	.02	.01	.02	Tr
	11108	46.40-46.90	0.50	.01	.04	.01	.04	Tr
	11109	46.90-47.40	0.50	.01	Tr	.01	.02	Tr
	11110	47.40-47.90	0.50	.01	.02	.01	.02	Tr
	11111	47.90-48.34	0.44	.01	Tr	.01	.04	Tr
	11112	48.34-48.77	0.43	.01	Tr	.01	.02	Tr
	11113	48.77-49.07	0.30	.01	.02	.01	.02	Tr
	11114	49.07-49.32	0.25	.01	Tr	.02	.04	Tr
	11115	50.69-50.94	0.25	.01	Tr	.01	.02	Tr
	11116	50.94-51.19	0.25	.01	Tr	.02	.02	Tr
	11117	51.19-51.44	0.25	.01	.04	.02	.02	Tr
	11118	57.66-57.91	0.25	.01	Tr	.06	.04	Tr

<u>HOLE</u> <u>#</u>	<u>ASSAY</u> <u>TAG #</u>	<u>INTERVAL</u> <u>(metres)</u>	<u>SAMPLE</u> <u>WIDTH</u> <u>(metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton</u> <u>Ag</u>	<u>oz/ton</u> <u>Au</u>
80-3	11119	57.91-58.52	0.61	Tr	Tr	.01	.02	Tr
	11120	58.52-58.77	0.25	.01	.02	.15	.18	Tr
	11121	61.05-61.30	0.25	Tr	.04	.21	.36	.01
	11122	61.30-62.00	0.70	Tr	Tr	.02	.30	.01
	11123	62.00-62.25	0.25	.01	.02	.02	.06	Tr
	11124	62.35-62.70	0.35	.01	.04	.03	.08	Tr
	11125	62.70-62.95	0.25	.01	.20	.07	.10	Tr
	11126	63.25-63.50	0.25	.01	Tr	.09	Tr	.06
	11127	63.50-63.66	0.16	.07	9.59	7.62	.06	1.60
	11128	63.66-64.00	0.34	.01	.16	.37	Tr	.12
	11129	64.00-64.40	0.40	.01	.04	.03	Tr	.04
	11130	64.40-64.80	0.40	.01	Tr	.02	Tr	.12
	11131	64.80-64.95	0.15	.01	Tr	.05	.01	.06
	11132	64.95-65.25	0.30	Tr	Tr	.04	Tr	.04
	11133	65.25-65.50	0.25	.01	.02	.06	Tr	.02
	11134	65.68-65.93	0.25	Tr	.04	.04	.01	.02
	11135	65.93-66.33	0.40	.01	Tr	.02	Tr	.06
	11136	66.33-66.75	0.42	Tr	Tr	.01	Tr	.02
	11137	66.75-67.26	0.51	Tr	.06	.38	.01	.06
	11138	67.26-67.51	0.25	.01	.02	.07	.01	.02
	11139	70.70-70.95	0.25	Tr	.02	.01	Tr	.02
	11140	70.95-71.28	0.33	.01	Tr	.01	Tr	.02
	11141	71.28-71.60	0.32	.01	Tr	.01	.01	.02
	11142	71.60-71.88	0.28	.01	Tr	.01	Tr	.02

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-3	11143	71.88-72.13	0.25	.01	.02	.02	.01	Tr
	11144	76.35-76.60	0.25	.01	Tr	.01	Tr	Tr
	11145	76.60-77.00	0.40	.01	Tr	.30	.50	Tr
	11146	77.00-77.50	0.50	.01	.02	.14	.52	Tr
	11147	77.50-78.02	0.52	.01	.04	.04	.06	Tr
	11148	78.02-78.47	0.45	Tr	Tr	Tr	.04	Tr
	11149	78.47-79.00	0.53	.01	.02	.01	.22	Tr
	11150	79.00-79.50	0.50	.01	Tr	.03	.16	Tr
	11151	79.50-80.00	0.50	Tr	Tr	.01	.10	Tr
	11152	80.00-80.50	0.50	.01	Tr	.02	.24	Tr
	11153	80.50-81.00	0.50	.01	Tr	.02	.10	Tr
	11154	81.00-81.50	0.50	.01	Tr	.01	.04	Tr
	11155	81.50-82.00	0.50	.01	Tr	.01	.24	Tr
	11156	82.00-82.25	0.25	.01	Tr	.01	.04	Tr
	11157	82.97-83.22	0.25	.01	Tr	.01	.06	Tr
	11158	83.22-83.54	0.32	.01	Tr	.01	.12	Tr
	11159	83.54-83.79	0.25	.01	.02	.01		Tr
	11160	86.57-86.82	0.25	.01	.02	.02	.10	Tr
	11161	86.82-87.19	0.37	.16	.02	.02	.12	Tr
	11162	87.19-87.57	0.38	.01	Tr	.02	.06	Tr
11163	87.57-87.82	0.25	.01	Tr	.01	.08	Tr	
80-4	11164	2.13-3.10	0.97	.01	Tr	.03	.12	Tr
	11165	3.10-3.55	0.45	.01	Tr	.01	.10	Tr
	11166	3.55-4.20	0.65	.01	Tr	.01	.08	Tr

<u>HOLE #</u>	<u>ASSAY TAG #</u>	<u>INTERVAL (metres)</u>	<u>SAMPLE WIDTH (metres)</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>oz/ton Ag</u>	<u>oz/ton Au</u>
80-4	11167	4.20- 4.70	0.50	.01	Tr	.02	.12	Tr
	11168	4.70- 5.35	0.65	.01	Tr	.03	.16	Tr
	11169	5.35- 5.80	0.45	.01	Tr	.03	.06	Tr
	11170	5.80- 6.30	0.50	.01	Tr	.02	.02	Tr
	11171	6.30- 6.60	0.30	.02	.02	.03	.04	Tr
	11172	6.60- 6.75	0.15	.01	Tr	.03	.04	Tr
	11173	6.75- 7.06	0.31	.02	Tr	.04	.02	Tr
	11174	7.06- 7.50	0.44	.01	Tr	.02	.04	Tr
	11175	7.50- 8.00	0.50	.01	Tr	.03	.08	Tr
	11176	8.00- 8.54	0.54	.01	Tr	.01	.06	Tr
	11177	8.54- 9.40	0.86	.01	Tr	.01	.06	Tr
	11178	9.40- 9.55	0.15	.01	Tr	.02	.06	Tr
	11179	9.55- 9.80	0.25	.01	.02	.01	.02	Tr
	11180	10.30-10.55	0.25	.01	Tr	.01	.08	Tr
	11181	10.55-10.86	0.31	.01	Tr	.02	.06	Tr
	11182	10.86-11.11	0.25	.01	Tr	.02	.04	Tr
	11183	11.55-11.80	0.25	.01	Tr	.02	.18	Tr
	11184	11.80-11.89	0.09	.01	Tr	Tr	.14	Tr
	11185	11.89-12.14	0.25	.01	Tr	.01	.22	Tr
	11186	13.55-13.80	0.25	.01	Tr	.02	.16	Tr
	11187	13.80-13.93	0.13	.01	Tr	.09	.12	Tr
	11188	13.93-14.18	0.25	.01	Tr	.09	.14	Tr
	11189	14.25-14.50	0.25	.01	Tr	.02	.10	Tr
	11190	14.50-14.65	0.15	.01	Tr	.01	.20	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-4	11191	14.65-14.90	0.25	.01	Tr	.01	.06	Tr
	11192	15.30-15.55	0.25	.01	Tr	.01	.02	Tr
	11193	15.55-16.30	0.75	.01	.02	.10	.04	Tr
	11194	16.30-17.07	0.77	.01	.10	.34	.20	Tr
	11195	17.07-17.22	0.15	.01	Tr	.04	.18	Tr
	11196	17.22-18.21	0.99	.01	.02	.06	.12	Tr
	11197	18.21-18.37	0.16	.01	Tr	.07	.10	Tr
	11198	18.37-18.51	0.14	.01	Tr	.21	.06	Tr
	11199	18.51-18.61	0.10	.01	Tr	.10	.66	Tr
	11200	18.61-19.20	0.59	.01	Tr	.05	.16	Tr
	11201	19.20-19.47	0.27	.01	Tr	.02	.14	Tr
	11202	19.47-19.69	0.22	.01	Tr	.02	.02	Tr
	11203	19.69-20.05	0.36	.01	Tr	.05	.16	Tr
	11204	20.05-20.22	0.17	.01	Tr	.03	.02	Tr
	11205	20.22-20.47	0.25	.01	Tr	.01	.02	Tr
	11206	20.57-20.82	0.25	.01	Tr	.01	.04	Tr
	11207	20.82-20.87	0.05	.01	Tr	.05	.02	Tr
	11208	20.87-21.87	1.00	Tr	.02	.01	.06	Tr
	11209	21.87-22.45	0.58	Tr	.02	.01	.06	Tr
	11210	22.45-23.00	0.55	Tr	Tr	.01	.08	Tr
	11211	23.00-23.25	0.25	.01	Tr	.01	.66	Tr
	11212	46.04-46.29	0.25	Tr	Tr	.02	.10	Tr
	11213	46.29-46.81	0.52	.01	Tr	.02	.24	Tr
	11214	46.81-47.06	0.25	Tr	Tr	.02	.14	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-4	11215	82.81-83.06	0.25				.58	.01
	11216	83.06-84.06	1.00				.58	.01
	11217	84.06-84.85	0.79				.80	.01
	11218	84.85-85.07	0.22				.50	Tr
	11219	85.07-86.07	1.00				1.20	Tr
	11220	86.07-87.07	1.00				.88	.02
	11221	87.07-87.26	0.19				.66	Tr
	11222	87.26-87.43	0.17				.68	Tr
	11223	89.07-90.07	1.00				.58	Tr
	11224	90.07-91.07	1.00				.60	Tr
	11225	91.07-92.07	1.00				.52	Tr
	11226	92.07-93.07	1.00				.48	Tr
	11227	93.07-94.07	1.00				.44	Tr
	11228	94.07-95.07	1.00				.46	Tr
	11229	95.07-96.07	1.00				.46	Tr
80-5	11230	96.07-97.07	1.00				.84	Tr
	11231	97.07-98.07	1.00				.56	Tr
	11232	98.07-99.36	1.29				.02	Tr
	11233	1.52- 3.15	1.63	.01	.02	.08	.02	Tr
	11234	3.15- 3.96	0.81	.01	.02	.16	.04	Tr
	11235	3.96- 4.40	0.44	.01	.02	.05	.04	Tr
	11236	4.40- 4.88	0.48	.01	.02	.05	.12	Tr
	11237	4.88- 5.19	0.31	.01	Tr	.02	.06	Tr
	11238	5.19- 5.29	0.10	.01	Tr	.02	.24	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-5	11239	5.29- 5.39	0.10	.01	.02	.03	.32	Tr
	11240	5.39- 5.64	0.25	.01	.02	.04	.04	Tr
	11241	5.74- 5.99	0.25	.01	Tr	.02	.02	Tr
	11242	5.99- 6.40	0.41	.01	.02	.03	.02	Tr
	11243	6.40- 7.87	0.47	Tr	Tr	.03	.04	Tr
	11244	7.87- 7.92	0.05	Tr	.02	.02	.02	Tr
	11245	7.92- 7.98	0.06	Tr	.02	.03	.10	Tr
	11246	7.98- 9.45	1.47	.01	.02	.03	.16	Tr
	11247	9.45- 9.80	0.35	Tr	Tr	.11	.02	Tr
	11248	9.80- 9.86	0.06	Tr	.02	.03	.04	Tr
	11249	9.86-10.06	0.20	Tr	.02	.05	.02	Tr
	11250	10.06-10.29	0.23	.01	Tr	.09	.04	Tr
	11251	10.29-10.80	0.51	Tr	.02	.09	.02	Tr
	11252	10.80-10.88	0.08	.01	Tr	.07	.02	Tr
	11253	11.28-11.59	0.31	.01	Tr	.18	.34	Tr
	11254	11.59-11.74	0.15	Tr.	Tr	.07	.06	Tr
	11255	11.74-11.96	0.22	.01	.02	.24	.22	Tr
	11256	11.96-12.70	0.74	.01	.02	.21	.56	Tr
	11257	12.70-12.95	0.25	.01	Tr	.27	.08	Tr
	11258	38.31-38.56	0.25	.02	.02	.05	.04	Tr
	11259	38.56-38.96	0.40	.01	.04	.04	.04	Tr
	11260	38.96-39.37	0.41	.01	.02	.02	.28	Tr
	11261	39.37-39.62	0.25	.01	Tr	.02	.20	Tr
80-6	11262	1.94- 2.60	0.66	.01	.02	.12	.34	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-6	11263	2.60- 3.20	0.60	.01	Tr	.22	.02	Tr
	11264	3.20- 3.80	0.60	.01	.04	.61	.02	Tr
	11265	3.80- 4.40	0.60	.01	.02	.39	.06	Tr
	11266	4.40- 4.98	0.58	.01	.02	.17	.02	Tr
	11267	4.98- 5.33	0.35	.01	.02	.19	.10	Tr
	11268	5.33- 5.80	0.47	Tr	Tr1	.01	.02	Tr
	11269	5.80- 6.20	0.40	.01	.02	.06	.02	Tr
	11270	6.20- 6.65	0.45	.01	.02	.04	.26	Tr
	11271	6.65- 6.84	0.19	.01	.02	.03	.18	Tr
	11272	6.84- 7.09	0.25	.01	.02	.03	.02	Tr
	11273	7.27- 7.52	0.25	.01	.02	.06	.02	Tr
	11274	7.52- 8.00	0.48	Tr	.02	.12	.06	Tr
	11275	8.00- 8.42	0.42	Tr	Tr	.08	.02	Tr
	11276	8.42- 8.85	0.43	.01	.02	.03	.52	Tr
	11277	8.85- 9.10	0.25	.01	.02	.04	.06	Tr
	11278	15.49-15.74	0.25	.01	.02	.09	.48	Tr
	11279	15.74-16.03	0.29	Tr	.06	.16	.22	Tr
	11280	16.03-16.42	0.39	.01	Tr	.28	.18	Tr
	11281	16.42-17.30	0.88	Tr	Tr	.17	.24	Tr
	11282	17.30-18.20	0.90	.01	.02	.25	.28	Tr
	11283	18.20-18.45	0.25	.01	.02	.26	.06	Tr
	11284	19.25-19.50	0.25	Tr	Tr	.21	.04	Tr
	11285	19.50-19.95	0.45	Tr	.02	.04	.06	Tr
	11286	19.95-20.42	0.47	Tr	.02	.03	.04	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-6	11287	20.42-20.67	0.25	.01	Tr	.16	.04	Tr
80-7	11288	2.00- 2.08	0.08	.01	Tr	.02	.56	Tr
	11289	2.08- 2.60	0.52	.01	.02	.01	.26	Tr
	11290	2.60- 3.10	0.50	.01	.02	.01	.20	Tr
	11291	3.10- 3.60	0.50	.01	.02	.01	.02	Tr
	11292	3.60- 4.10	0.50	.01	.02	.01	.04	Tr
	11293	4.10- 4.70	0.60	.01	.02	.01	.02	Tr
	11294	4.70- 5.35	0.65	Tr	.02	Tr	.54	Tr
	11295	5.35- 5.85	0.50	.01	.02	Tr	.30	Tr
	11296	5.85- 6.50	0.65	.01	.02	.01	.42	Tr
	11297	6.50- 6.84	0.34	Tr	.02	.01	.14	Tr
	11298	6.84- 7.12	0.28	.01	.02	.02	.16	Tr
	11299	7.12- 7.60	0.48	Tr	.02	.01	.06	Tr
	11300	7.60- 8.10	0.50	.01	.02	.01	.02	Tr
	11301	8.10- 8.80	0.70	.01	.02	Tr	.04	Tr
	11302	8.80- 9.45	0.65	.01	.02	.01	.06	Tr
	11303	9.45- 9.75	0.30	.01	.02	.01	.12	Tr
	11304	9.88-10.13	0.25	.01	.02	.01	.04	Tr
	11305	10.13-10.60	0.47	.01	.02	.01	.22	Tr
	11306	10.60-11.09	0.49	.01	.02	.01	.16	Tr
	11307	11.09-11.35	0.26	.01	.02	.02	.02	Tr
	11308	11.40-11.65	0.25	.01	.02	.10	.10	.005
	11309	11.65-12.25	0.60	.01	.02	.02	.02	Tr
	11310	12.25-12.75	0.50	.01	.02	.36	.36	Tr

HOLE #	ASSAY TAG #	INTERVAL (metres)	SAMPLE WIDTH (metres)	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
80-7	11311	12.75-13.27	0.52	.01	.02	.01	.02	Tr
	11312	13.27-13.41	0.14	.01	.02	Tr	.12	Tr
	11313	13.41-13.51	0.10	.01	Tr	Tr	.02	Tr
	11314	13.51-13.75	0.24	.01	.02	.01	.02	Tr
	11315	13.75-13.95	0.20	.01	.02	.02	.02	Tr
	11316	13.95-14.52	0.57	.01	.02	.02	.02	Tr
	11317	14.52-14.77	0.25	.01	.02	Tr	.02	Tr
	11318	18.20-18.45	0.25	.01	.02	.01	.02	Tr
	11319	18.45-18.86	0.41	.01	Tr	.01	.02	Tr
	11320	18.86-19.11	0.25	.01	.02	.01	.06	Tr
	11321	25.24-25.56	0.32	.01	.02	.01	.02	Tr
	11322	25.56-25.70	0.14	Tr	.02	Tr	.02	Tr
	11323	25.70-25.85	0.15	.01	.02	.01	.02	Tr
	11324	25.85-26.42	0.57	.01	.02	.01	.08	.005
	11325	26.42-26.67	0.25	.01	.06	.13	.04	Tr
	11326	26.75-26.82	0.07	.04	5.01	2.25	8.12	.005
	11327	26.82-27.29	0.47	.01	.04	.01	.02	Tr
	11328	27.29-27.58	0.29	.01	.02	.01	.02	Tr
	11329	27.74-27.95	0.21	.01	.02	.02	.02	Tr
	11330	27.95-28.50	0.55	.01	.02	.01	.02	Tr
	11331	28.50-29.00	0.50	.01	.02	.01	.08	Tr
	11332	29.00-29.50	0.50	Tr	.02	.01	.02	Tr
	11333	29.50-30.00	0.50	Tr	.02	Tr	1.18	.005
	11334	30.00-30.40	0.40	.01	.02	.01	.02	Tr
	11335	30.40-30.78	0.38	.01	.02	.01	.70	.005
	11336	30.78-31.02	0.24	.01	.02	.02	.16	.005

X. CONCLUSIONS AND RECOMMENDATIONS

The 1980 Crystal Creek field program commenced May 13th and ended August 11. Exploration included linecutting, geological mapping and prospecting, geochemical soil sampling, geophysical surveying, trenching, and diamond drilling. Seven diamond drill holes totalling 530.03 metres (1,739 feet) were completed between July 19th and August 8th, 1980.

The 1980 drilling program did not encounter any significant mineralization. The 1979 and 1980 exploration program has adequately tested the potential for massive sulphide and disseminated mineralization of economic interest on the gridded area. It is recommended that no further work be performed on the detailed grid area.

The regional portion of the 1980 exploration program on the Crystal Creek property located numerous geochemical anomalies. For the most part these anomalies are due to mineralization related to axial areas of folds. These anomalies were strongest along the Vermont Anticline which controls the Ruth Vermont deposit. The geochemistry would seem to indicate some possibility of similar deposits within the axial area. However, our exploration to date has not upgraded the area. Other geochemical highs were proved to be related to occurrences similar to that at Warren Creek and have no economic potential. In view of this it is recommended that all lands in the Crystal Creek property be returned to the original owners.

STATEMENT OF EXPENDITURES

Cost of geological mapping, geophysical consulting, geochemistry, diamond drilling and assays on the V group of mineral claims, Vowell Creek area, Golden Mining Division, B. C. from June 20th to August 12, 1980.

SALARIES

R. Laird (12 days @ \$125/day)	\$	1 500.00
P. Callander (6 days @ \$125/day)	\$	750.00
L. Hettinga (6 days @ \$90/day)	\$	540.00
R. Wasylyshyn (12 days @ \$90/day)	\$	1 080.00

FIELD COSTS

Food and accommodation 36 mandays @ \$41/day	\$	1 476.00
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TRANSPORTATION

Truck Rental 30 days @ \$23.50/day	\$	705.00
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GEOPHYSICAL CONSULTING

Downhole geophysics	\$	1 235.18
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ASSAYS

160 soil samples @ \$13.20/sample	\$	2 112.00
310 drill core assays @ \$13.20 sample	\$	4 092.00

DRILLING

Diamond drilling 371.53 metres @ \$132.11/metre	\$	49 082.83
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REPORT PREPARATION

20 days @ \$125/day	\$	<u>2 500.00</u>
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TOTAL \$ 65 073.01

CERTIFICATE

I, R. J. Laird of Calgary, Alberta hereby certify that:

- 1) I hold an Honours Bachelor of Science (Co-op) degree in Geology from the University of Waterloo, Waterloo, Ontario and a Master of Science (Applied) degree in Mineral Exploration from McGill University in Montreal, Quebec and I have practised my profession in exploration continuously since graduation.
- 2) I have based conclusions and recommendations contained in this report on my professional experience in mineral exploration. All field work conducted on the property was carried out under my direct supervision.

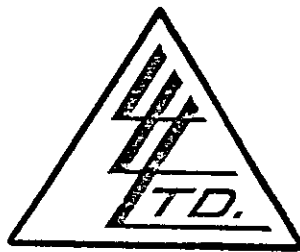
Calgary, Alberta

R. J. Laird M. Sc (A)

APPENDIX A

ASSAY CERTIFICATES

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7
 ATTN: J. GILLAN



File No. 19748
 Date August 1st, 1980
 Samples Core

Certificate of
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LORING LABORATORIES LTD.

PAGE 1

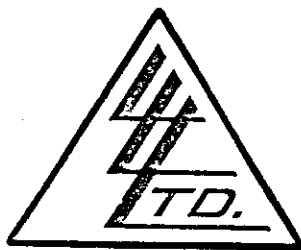
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<u>"Core Samples"</u>					
SO-1 ↓ 1801	Trace	.58	.01	.04	.02
1802	Trace	.16	.01	.02	.03
1803	Trace	.76	Trace	.02	.02
1804	Trace	.50	Trace	.02	.01
1805	Trace	.18	.01	.02	.01
1806	Trace	.14	.01	.04	.02
1807	Trace	.16	.01	.02	.11
1808	Trace	.14	Trace	.02	.11
1809	Trace	.14	.01	.02	.06
1810	Trace	.14	.01	.02	.03
1811	Trace	.16	.01	.02	.05
1812	Trace	.14	Trace	.02	.04
1813	Trace	.14	.01	.02	.02
1814	Trace	.16	.01	.02	.01
1815	Trace	.18	Trace	.02	.01
1816	Trace	.14	Trace	.02	.01
1817	Trace	.14	.01	.02	.02
1818	Trace	.18	.01	.02	.01
1819	Trace	.16	.01	.02	.05

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 unless specific arrangements
 made in advance.

A. L. McLeod
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19748
 Date August 1st, 1980
 Samples Core

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PAGE 2

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER	% Cu	% Pb	% Zn
1820	Trace	.16	.01	.02	.08
1821	Trace	.14	.01	.02	.03
1822	Trace	.14	.01	.02	.02
1823	Trace	.12	Trace	.02	.01
1824	Trace	.10	.01	.02	.02
1825	Trace	.04	Trace	.02	.01
1826	Trace	.14	.01	.02	.01
1827	Trace	.04	.01	.02	.02
1828	Trace	.12	.01	.02	.01
1829	Trace	.02	.01	.02	.02
1830	Trace	.02	.01	Trace	.02
1831	Trace	.06	.01	Trace	.01
1832	Trace	.02	.01	Trace	.01
1833	Trace	.02	.01	.02	.01
1834	Trace	.14	.01	.02	.01
1835	Trace	.04	.01	Trace	.03
1836	Trace	.08	.01	Trace	.01
1837	Trace	.04	.02	.76	.03
1838	Trace	.02	.01	Trace	.01
1839	Trace	.04	.01	.26	.01
1840	Trace	.02	.01	Trace	.03

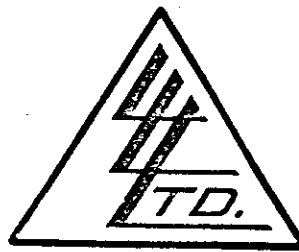
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.

Pulps Retained one month
 unless specific arrangements
 made in advance.

C. M. Isaac
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 GARY, Alberta
 2P 2X7



File No. 19748
 Date August 1st, 1980
 Samples Core

ATTN: J. GILLAN

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PAGE 3

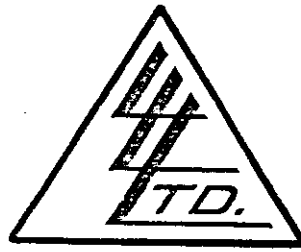
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1842	Trace	.06	.01	Trace	.02
1843	Trace	.02	.01	Trace	.01
1844	Trace	.12	.01	Trace	.01
1845	Trace	.02	.01	Trace	.01
1846	Trace	.02	.01	Trace	.01
1847	Trace	.02	.01	Trace	.01
1848	Trace	.02	.01	.10	.02
1849	Trace	.28	.01	Trace	.02
1850	Trace	.08	Trace	Trace	.01
1851	Trace	.02	.01	Trace	.01
1852	Trace	.04	.01	Trace	.02
1853	Trace	.02	.01	.02	.01
1854	Trace	.02	.01	Trace	.01
1855	Trace	.02	.01	.02	.01
1856	Trace	.10	.01	.02	.01
1857	Trace	.20	.01	.02	.01
1858	Trace	.24	.01	.02	.01
1859	Trace	.02	.01	.02	.01
1860	Trace	.02	.01	.02	.01

I *Hereby* **Certify** THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 ulps Retained one month
 unless specific arrangements
 made in advance.

Ed McFarlane
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7



File No. 19748
 Date August 1st, 1980
 Samples Core

ATTN J. GILLAN

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PAGE 4

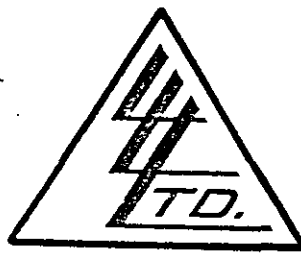
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1861	Trace	.04	.01	Trace	.01
1862	Trace	.02	Trace	Trace	.01
1863	Trace	.02	Trace	Trace	.01

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulp Retained one month
 unless specific arrangements
 made in advance.

C. M. J. Mac
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: G. MCWILLIAMS



File No. 19821
 Date August 8th, 1980
 Samples Core

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PAGE 1

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER	% Cu	% Pb	% Zn
<u>"Core Samples"</u>					
RC-2 ↓ 1864	Trace	.34	.01	Trace	.02
1865	Trace	.22	Trace	Trace	.02
1866	Trace	.42	.01	Trace	.01
1867	Trace	.10	.01	Trace	.02
1868	Trace	.34	.01	.02	.02
1869	Trace	.24	.01	Trace	.02
1870	Trace	.36	.01	.02	.07
1871	Trace	.02	Trace	.02	.03
1872	Trace	.04	.01	.02	.01
1873	Trace	.02	.01	.02	.01
1874	Trace	.02	Trace	.02	Trace
1875	Trace	.02	.01	Trace	.01
1876	Trace	.02	.01	.02	.01
1877	Trace	.04	.01	Trace	.01
1878	Trace	.02	.01	.02	.01
1879	Trace	.02	.01	.02	.02
1880	Trace	.08	.01	.02	.02
1881	Trace	.02	Trace	.02	.02
1882	Trace	.02	.01	.02	.01

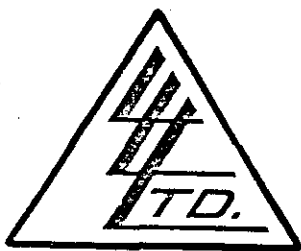
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
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Slips Retained one month
 unless specific arrangements
 made in advance.

G. McWilliams
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: G. MCWILLIAMS



File No. 19821
 Date August 8th, 1980
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PAGE 2

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER	% Cu	% Pb	% Zn
1883	Trace	.02	.01	Trace	.01
1884	Trace	.02	Trace	Trace	.01
1885	Trace	.02	.01	.02	.03
1886	.010	.04	.01	.02	.01
1887	.010	.22	.01	Trace	Trace
1888	Trace	.06	.01	Trace	.04
1889	Trace	.10	.01	Trace	.02
1890	Trace	.02	.01	Trace	.02
1891	Trace	.02	.01	Trace	.01
1892	Trace	.02	.01	Trace	.02
1893	Trace	.02	.01	.02	.03
1894	.010	.08	.01	Trace	.05
1895	Trace	.20	.01	Trace	.01
1896	Trace	.02	.01	Trace	.01
1897	Trace	.02	.01	Trace	.01
1898	Trace	.02	.01	Trace	.01
1899	Trace	.02	.01	Trace	.01
1900	Trace	.08	.01	.12	.01

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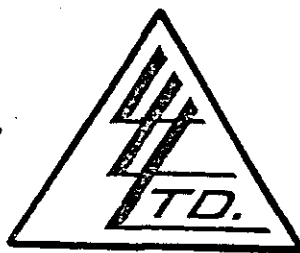
Rejects Retained one month.

ulps Retained one month
 unless specific arrangements
 made in advance.

ed m^a jace

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7
 ATTN: J. GILLAN



File No. 19825
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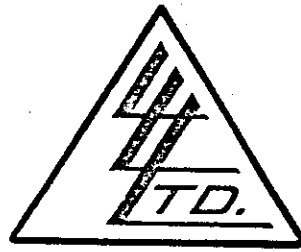
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11002 A	.01	.02	.01
11003 A	.01	.02	.01
11004 A	.01	.02	.01
11005 A	.01	.04	.01
11006 A	.01	.02	.01
11007 A	.01	.02	.01
11008 A	.01	.02	.01
11009 A	.01	.02	.01
11010 A	.01	.02	.01
11011 A	.01	.02	.01
11012 A	.01	.02	.02
11013 A	.01	.02	.02
11014 A	.01	.02	.01
11015 A	.01	.02	.02
11016 A	.01	.02	.01
11017 A	.01	.02	.02
11018 A	.01	.02	.02
11019 A	.01	.02	.01

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Samples Retained one month
 unless specific arrangements
 made in advance.

edmcjase
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

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 ASSAY of
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PAGE 13

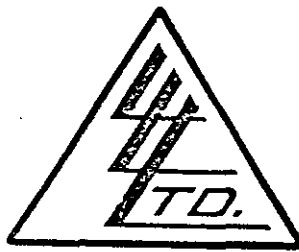
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11002 A	Trace	.02
11003 A	Trace	.22
11004 A	.010	.30
11005 A	Trace	.24
11006 A	Trace	.52
11007 A	Trace	.24
11008 A	Trace	.20
11009 A	Trace	.12
11010 A	Trace	.16
11011 A	Trace	.76
11012 A	Trace	.12
11013 A	Trace	.04
11014 A	Trace	.80
11015 A	Trace	.76
11016 A	Trace	.70
11017 A	Trace	.04
11018 A	Trace	.80
11019 A	Trace	.02
11020 A	Trace	.02

I **Hereby Certify** THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 2X7
 ATTN J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

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PAGE 2

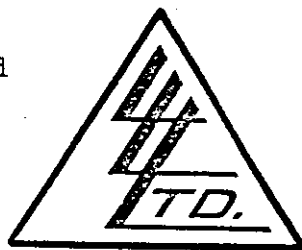
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11021 A	.01	.02	.01
11022 A	.01	Trace	.01
11023 A	.01	.02	.02
11024 A	Trace	Trace	.01
11025 A	.01	Trace	.01
11026 A	.01	.04	.01
11027 A	.01	.02	.01
11028 A	.01	.02	.02
11029 A	.01	.02	.01
11030 A	.01	.18	.01
11031 A	.01	.02	.01
11032 A	.01	.02	.01
11033 A	.01	.02	.02
11034 A	.01	.02	.02
11035 A	.01	.02	.02
11036 A	.01	.02	.01
11037 A	.01	.02	.02
11038 A	.01	.02	.02
11039 A	.01	.02	.02

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Reps Retained one month
 unless specific arrangements
 made in advance.

A. M. J. Oade
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr. 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
LORING LABORATORIES LTD.

PAGE 14

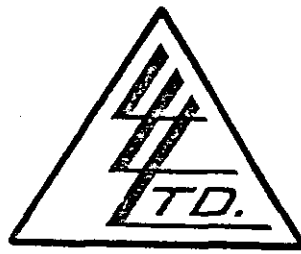
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11021 A	Trace	.04
11022 A	Trace	.06
11023 A	Trace	.02
11024 A	Trace	.02
11025 A	Trace	.08
11026 A	Trace	.02
11027 A	Trace	.02
11028 A	Trace	.06
11029 A	Trace	.02
11030 A	Trace	.04
11031 A	Trace	.02
11032 A	Trace	.08
11033 A	Trace	.06
11034 A	Trace	.10
11035 A	Trace	.06
11036 A	Trace	.02
11037 A	Trace	.08
11038 A	Trace	.02
11039 A	Trace	.02
11040 A	Trace	.02
11041 A	Trace	.02

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7



File No. 19825
 Date August 11th, 1980
 Samples Core

ATTN: J. GILLAN

Certificate of
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PAGE 3

SAMPLE No.	% Cu	% Pb	% Zn
11040 A	.01	.02	.01
11041 A	.01	.08	.03
11042 A	.02	.04	.02
11043 A	.01	.02	.01
11044 A	.01	.02	.02
11045 A	.01	.02	.03
11046 A	.01	.02	.01
11047 A	.01	.02	.01
11048 A	.01	.02	.01
11049 A	.01	.02	.01
11050 A	.01	.02	.01
11051 A	.01	.02	.01
11052 A	.01	.02	.01
11053 A	.01	.02	.01
11054 A	.01	.02	.02
11055 A	.01	.02	.02
11056 A	.01	.02	.01
11057 A	.01	.02	.01
11058 A	.01	.02	.01
11059 A	.01	.02	.01

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

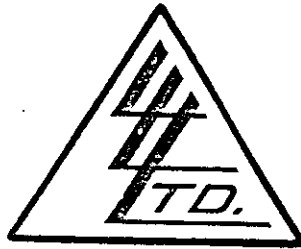
Rejects Retained one month.

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 made in advance.

Ed Loring

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 ALBERTA, Alberta
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 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
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SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11042 A	Trace	.02
11043 A	Trace	.02
11044 A	Trace	.02
11045 A	Trace	.02
11046 A	Trace	.18
11047 A	Trace	.04
11048 A	Trace	.02
11049 A	Trace	.02
11050 A	Trace	.12
11051 A	Trace	.32
11052 A	Trace	.14
11053 A	Trace	.04
11054 A	Trace	.08
11055 A	Trace	.02
11056 A	Trace	.10
11057 A	Trace	.06
11058 A	Trace	.02
11059 A	Trace	.12
11060 A	Trace	.02
11061 A	Trace	.04
11062 A	Trace	.02

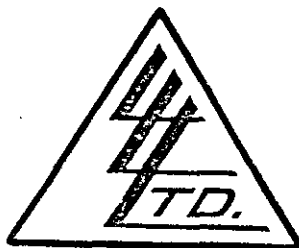
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
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 made in advance.

Edna A. Ace

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
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 ATTN: J. GILLAN



File No. 19825
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 Samples Core

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PAGE 4

SAMPLE No.	% Cu	% Pb	% Zn
DDU 80-2 11060 A	.01	.02	.03
11061 A	.01	.02	.02
11062 A	.01	.02	.01
11063 A	.01	.02	.01
11064 A	Trace	.02	.01
11065 A	.01	.02	.02
11066 A	.02	.02	.08
11067 A	.01	.02	.02
11068 A	.01	Trace	.01
11069 A	.01	Trace	.01
11070 A	.01	.02	.02
80-2 11071 A	.01	.02	.01
11072 A	.01	.02	.01
80-2 11073 A	.01	.02	.10
11074 A	.01	.02	.25
11075 A	.01	.02	.26
11076 A	.01	.02	.06
11077 A	.01	.02	.11
11078 A	.01	.02	.14
11079 A	.01	Trace	.24

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

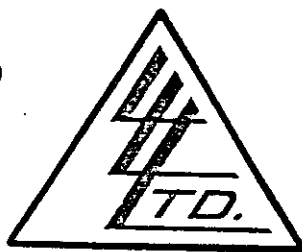
Rejects Retained one month.

Reprints Retained one month
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 made in advance.

A. M. Isaac

Licensed Assayer of British Columbia

To: NORCEN ENERGY RESOURCES LIMITED
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

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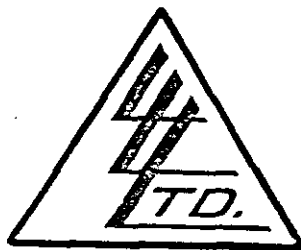
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11063 A	Trace	.04
11064 A	Trace	.08
11065 A	Trace	.30
11066 A	Trace	.10
11067 A	Trace	.04
11068 A	Trace	.10
11069 A	Trace	.06
11070 A	Trace	.02
11071 A	Trace	.04
11072 A	Trace	.02
11073 A	Trace	.08
11074 A	Trace	.04
11075 A	Trace	.14
11076 A	Trace	.12
11077 A	Trace	.18
11078 A	Trace	.52
11079 A	Trace	.04
11080 A	Trace	.12
11081 A	Trace	.38
11082 A	Trace	.16
11083 A	Trace	.20

I **Hereby Certify** THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 ulps Retained one month
 unless specific arrangements
 made in advance.

James J. Mac
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
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PAGE 5

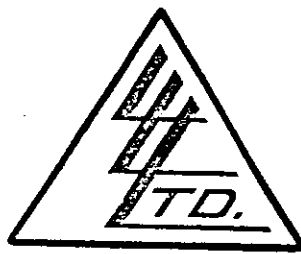
SAMPLE No.	% Cu	% Pb	% Zn
11080 A	.01	Trace	.07
11081 A	.02	.02	.04
11082 A	.01	.02	.01
11083 A	.01	.02	.12
11084 A	.01	Trace	.01
11085 A	.01	Trace	.01
11086 A	.01	Trace	.01
11087 A	.01	Trace	.01
11088 A	.02	Trace	.02
11089 A	Trace	Trace	.01
11090 A	.01	.02	.02
11091 A	.01	.02	.01
11092 A	.01	Trace	.01
11093 A	.01	Trace	.01
11094 A	.01	Trace	.01
11095 A	.01	Trace	.01
11096 A	.01	Trace	.01
11097 A	.01	.02	.01
11098 A	.01	.02	.01
11099 A	.01	Trace	Trace

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Samples Retained one month
 unless specific arrangements
 made in advance.

Ed McFadden
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
ASSAY of
LORING LABORATORIES LTD.

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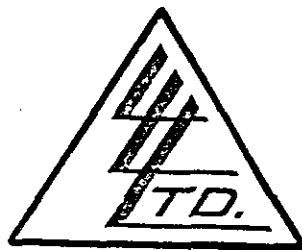
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11084 A	Trace	.08
11085 A	Trace	.02
11086 A	Trace	.06
11087 A	Trace	.08
11088 A	Trace	.01
11089 A	Trace	.04
11090 A	Trace	.38
11091 A	Trace	.24
11092 A	Trace	.22
11093 A	Trace	.16
11094 A	Trace	.10
11095 A	Trace	.06
11096 A	Trace	.02
11097 A	Trace	.14
11098 A	Trace	.04
11099 A	Trace	.02
11100 A	Trace	.06
11101 A	Trace	.02
11102 A	Trace	.06
11103 A	Trace	.02
11104 A	Trace	.02

I *Hereby Certify* THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulp Retained one month
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

PAGE 6

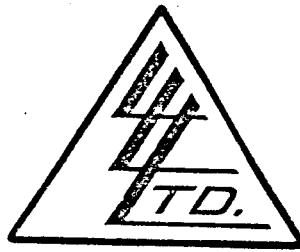
SAMPLE No.	% Cu	% Pb	% Zn
11100 A	.01	.02	.01
11101 A	.01	Trace	.01
11102 A	.01	Trace	Trace
11103 A	.01	Trace	.01
11104 A	.01	.02	.01
11105 A	.01	.02	.01
11106 A	.01	Trace	.01
11107 A	.01	.02	.01
11108 A	.01	.04	.01
11109 A	.01	Trace	.01
11110 A	.01	.02	.01
11111 A	.01	Trace	.01
11112 A	.01	Trace	.01
11113 A	.01	.02	.01
11114 A	.01	Trace	.02
11115 A	.01	Trace	.01
11116 A	.01	Trace	.02
11117 A	.01	.04	.02
11118 A	.01	Trace	.06
11119 A	Trace	Trace	.01

I **Hereby Certify** THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Slips Retained one month
 unless specific arrangements
 made in advance.

ad Mc Isaac
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

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SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11105 A	Trace	.04
11106 A	Trace	.20
11107 A	Trace	.02
11108 A	Trace	.04
11109 A	Trace	.02
11110 A	Trace	.02
11111 A	Trace	.04
11112 A	Trace	.02
11113 A	Trace	.02
11114 A	Trace	.04
11115 A	Trace	.02
11116 A	Trace	.02
11117 A	Trace	.02
11118 A	Trace	.04
11119 A	Trace	.02
11120 A	Trace	.18
11121 A	.010	.36
11122 A	.010	.30
11123 A	Trace	.06
11124 A	Trace	.08
11125 A	Trace	.10

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

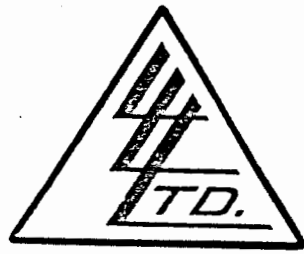
Rejects Retained one month.

Impurities Retained one month
 unless specific arrangements
 made in advance.

James J. MacFarlane

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7



File No. 19825
 Date August 11th, 1980
 Samples Core

ATTN: J. GILLAN

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

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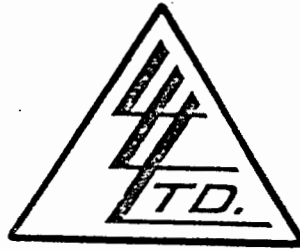
SAMPLE No.	% Cu	% Pb	% Zn
11120 A	.01	.02	.15
11121 A	Trace	.04	.21
11122 A	Trace	Trace	.02
11123 A	.01	.02	.02
11124 A	.01	.04	.03
11125 A	.01	.20	.07
11126 A	.01	Trace	.09
11127 A	.07	9.59	7.62
11128 A	.01	.16	.37
11129 A	.01	.04	.03
11130 A	.01	Trace	.02
11131 A	.01	Trace	.05
11132 A	Trace	Trace	.04
11133 A	.01	.02	.06
11134 A	Trace	.04	.04
11135 A	.01	Trace	.02
11136 A	Trace	Trace	.01
11137 A	Trace	.06	.38
11138 A	.01	.02	.07
11139 A	Trace	.02	.01

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Slips Retained one month
 unless specific arrangements
 made in advance.

J. Gillan
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr., 715- 5th Avenue S.W.
 CALGARY, Alberta
 2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
ASSAY of
LORING LABORATORIES LTD.

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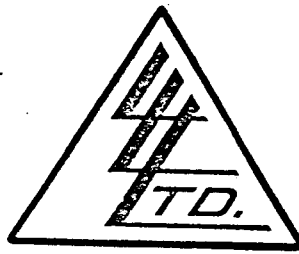
SAMPLE No.	% Sb
<p><u>"Core Sample"</u> 11127 A</p>	<p>3.24</p> <p style="text-align: center;">GOLD & SILVER TO FOLLOW</p> <p>I <i>Hereby Certify</i> THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES</p>

Rejects Retained one month.
 unless specific arrangements
 made in advance.

C. L. MacIsaac

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
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SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11126 A	Trace	.06
11127 A	.060	1.60
11128 A	Trace	.12
11129 A	Trace	.04
11130 A	Trace	.12
11131 A	.010	.06
11132 A	Trace	.04
11133 A	Trace	.02
11134 A	.010	.02
11135 A	Trace	.06
11136 A	Trace	.02
11137 A	.010	.06
11138 A	.010	.02
11139 A	Trace	.02
11140 A	Trace	.02
11141 A	.010	.02
11142 A	Trace	.02
11143 A	.010	.02
11144 A	Trace	.42
11145 A	Trace	.50
11146 A	Trace	.52

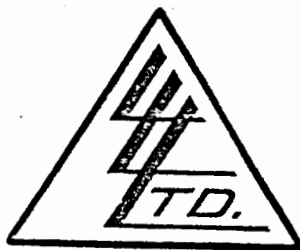
I *Hereby Certify* THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.

Residuals Retained one month
 unless specific arrangements
 made in advance.

Adrian J. ...
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7



File No. 19825
 Date August 11th, 1980
 Samples Core

ATTN: J. GILLAN

Certificate of
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SAMPLE No.	% Cu	% Pb	% Zn
11140 A	.01	Trace	.01
11141 A	.01	Trace	.01
11142 A	.01	Trace	.01
11143 A	.01	.02	.02
11144 A	.01	Trace	.01
11145 A	.01	Trace	.30
11146 A	.01	.02	.14
11147 A	.01	.04	.04
11148 A	Trace	Trace	Trace
11149 A	.01	.02	.01
11150 A	.01	Trace	.03
11151 A	Trace	Trace	.01
11152 A	.01	Trace	.02
11153 A	.01	Trace	.02
11154 A	.01	Trace	.01
11155 A	.01	Trace	.01
11156 A	.01	Trace	.01
11157 A	.01	Trace	.01
11158 A	.01	Trace	.01
11159 A	.01	.02	.01

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

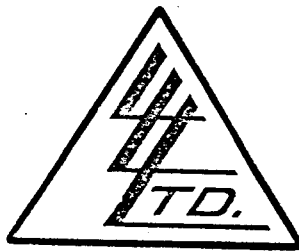
Rejects Retained one month.

Reprints Retained one month
 unless specific arrangements
 made in advance.

adm J. J. J. J.

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Ave. S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
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LORING LABORATORIES LTD.

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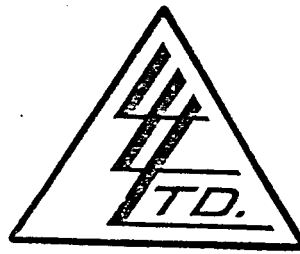
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11147 A	Trace	.06
11148 A	Trace	.04
11149 A	Trace	.22
11150 A	Trace	.16
11151 A	Trace	.10
11152 A	Trace	.24
11153 A	Trace	.10
11154 A	Trace	.04
11155 A	Trace	.24
11156 A	Trace	.04
11157 A	Trace	.06
11158 A	Trace	.12
11160 A	Trace	.10
11161 A	Trace	.12
11162 A	Trace	.06
11163 A	Trace	.08
11164 A	Trace	.12
11165 A	Trace	.10
11166 A	Trace	.08
11167 A	Trace	.12
11168 A	Trace	.16

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 ulps Retained one month
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P. 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

PAGE 9

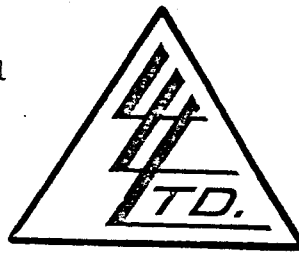
SAMPLE No.	% Cu	% Pb	% Zn
11160 A	.01	.02	.02
11161 A	.16	.02	.02
11162 A	.01	Trace	.02
11163 A	.01	Trace	.01
11164 A	.01	Trace	.03
11165 A	.01	Trace	.01
11166 A	.01	Trace	.01
11167 A	.01	Trace	.02
11168 A	.01	Trace	.03
11169 A	.01	Trace	.03
11170 A	.01	Trace	.02
11171 A	.02	.02	.03
11172 A	.01	Trace	.03
11173 A	.02	Trace	.04
11174 A	.01	Trace	.02
11175 A	.01	Trace	.03
11176 A	.01	Trace	.01
11177 A	.01	Trace	.01
11178 A	.01	Trace	.02
11179 A	.01	.02	.01

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Samples Retained one month
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

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SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11169 A	Trace	.06
11170 A	Trace	.02
11171 A	Trace	.04
11172 A	Trace	.04
11173 A	Trace	.02
11174 A	Trace	.04
11175 A	Trace	.08
11176 A	Trace	.06
11177 A	Trace	.04
11178 A	Trace	.06
11179 A	Trace	.02
11180 A	Trace	.08
11181 A	Trace	.06
11182 A	Trace	.04
11183 A	Trace	.18
11184 A	Trace	.14
11185 A	Trace	.22
11186 A	Trace	.16
11187 A	Trace	.12
11188 A	Trace	.14
11189 A	Trace	.10

I *Hereby Certify* THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

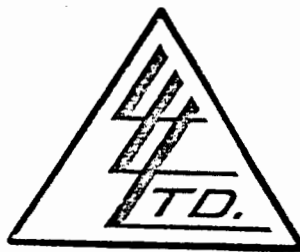
Rejects Retained one month.

Assays Retained one month
 unless specific arrangements
 made in advance.

[Signature]

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

PAGE 10

SAMPLE No.	% Cu	% Pb	% Zn
11180 A	.01	Trace	.01
11181 A	.01	Trace	.02
11182 A	.01	Trace	.02
11183 A	.01	Trace	.02
11184 A	.01	Trace	Trace
11185 A	.01	Trace	.01
11186 A	.01	Trace	.02
11187 A	.01	Trace	.09
11188 A	.01	Trace	.09
11189 A	.01	Trace	.02
11190 A	.01	Trace	.01
11191 A	.01	Trace	.01
11192 A	.01	Trace	.01
11193 A	.01	.02	.10
11194 A	.01	.10	.34
11195 A	.01	Trace	.04
11196 A	.01	.02	.06
11197 A	.01	Trace	.07
11198 A	.01	Trace	.21
11199 A	.01	Trace	.10

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

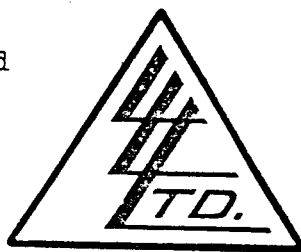
Rejects Retained one month.

Reprints Retained one month
 unless specific arrangements
 made in advance.

Edm Jase

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
ASSAY of
LORING LABORATORIES LTD.

PAGE 22

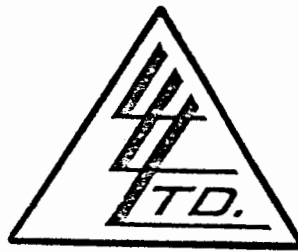
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11190 A	Trace	.20
11191 A	Trace	.06
11192 A	Trace	.02
11193 A	Trace	.04
11194 A	Trace	.20
11195 A	Trace	.18
11196 A	Trace	.12
11197 A	Trace	.10
11198 A	Trace	.06
11199 A	Trace	.66
11200 A	Trace	.16
11201 A	Trace	.14
11202 A	Trace	.02
11203 A	Trace	.16
11204 A	Trace	.02
11205 A	Trace	.02
11206 A	Trace	.04
11207 A	Trace	.02
11208 A	Trace	.06
11209 A	Trace	.06
11210 A	Trace	.08

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulps Retained one month
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7
 ATTN: J. GILLAN



File No. 19825
 Date August 11th, 1980
 Samples Core

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

PAGE 11

SAMPLE No.	% Cu	% Pb	% Zn
35-2 11200 A	.01	Trace	.05
11201 A	.01	Trace	.02
11202 A	.01	Trace	.02
11203 A	.01	Trace	.05
11204 A	.01	Trace	.03
11205 A	.01	Trace	.01
11206 A	.01	Trace	.01
11207 A	.01	Trace	.05
11208 A	Trace	.02	.01
11209 A	Trace	.02	.01
11210 A	Trace	Trace	.01
11211 A	.01	Trace	.01
11212 A	Trace	Trace	.02
11213 A	.01	Trace	.02
11214 A	Trace	Trace	.02

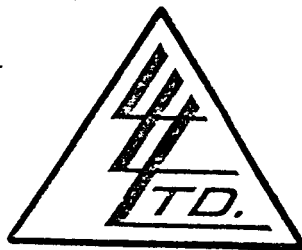
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 ulps Retained one month
 nless specific arrangements
 made in advance.

Edm. E. Joac

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
27th flr. 715 - 5th Avenue S.W.
CALGARY, Alberta
T2P 2X7
ATTN: J. GILLAN



File No. 19825
Date August 11th, 1980
Samples Core

Certificate of
ASSAY of
LORING LABORATORIES LTD.

PAGE 23

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11211 A	Trace	.66
11212 A	Trace	.10
11213 A	Trace	.24
11214 A	Trace	.14

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.

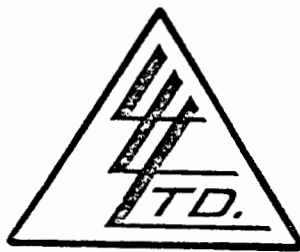
Residuals Retained one month
unless specific arrangements
made in advance.

[Signature]

Licensed Assayer of British Columbia

To: NORCEN ENERGY RESOURCES LIMITED,
 27th Flr., 715 - 5th Avenue S.W.,
 Calgary, Alberta T2P 2X7

File No. 19861
 Date August 14, 1980
 Samples Core



Certificate of
 ASSAY of

LORING LABORATORIES LTD.

ATTN: John Gillan

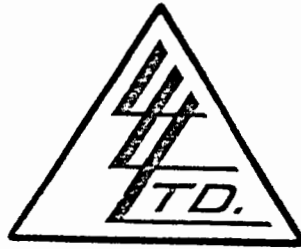
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
<u>"Core Samples"</u>		
<u>CC-DDH-80-4</u>		
11215	.010	.58
11216	.010	.58
11217	.010	.80
11218	Trace	.50
11219	Trace	1.20
11220	.020	.88
11221	Trace	.66
11222	Trace	.68
11223	Trace	.58
11224	Trace	.60
11225	Trace	.52
11226	Trace	.48
11227	Trace	.44
11228	Trace	.46
11229	Trace	.46
11230	Trace	.84
11231	Trace	.56
11232	Trace	.02

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulp Retained one month
 unless specific arrangements
 made in advance.

Ed M. F. J. A. C.
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7



File No. 19944
 Date August 21st, 1980
 Samples Core

ATTN: T. TURNER

Certificate of
ASSAY OF
LORING LABORATORIES LTD.

PAGE 1

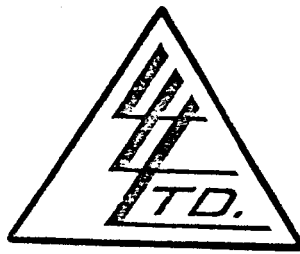
SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
<u>"Core Samples"</u>			
20-5 ↓ 11233	.01	.02	.08
11234	.01	.02	.16
11235	.01	.02	.05
11236	.01	.02	.05
11237	.01	Trace	.02
11238	.01	Trace	.02
11239	.01	.02	.03
11240	.01	.02	.04
11241	.01	Trace	.02
11242	.01	.02	.03
11243	Trace	Trace	.03
11244	Trace	.02	.02
11245	Trace	.02	.03
11246	.01	.02	.03
11247	Trace	Trace	.11
11248	Trace	.02	.03
11249	Trace	.02	.05
11250	.01	Trace	.09
11251	Trace	.02	.09
11252	.01	Trace	.07
11253	.01	Trace	.18
11254	Trace	Trace	.07
11255	.01	.02	.24
11256	.01	.02	.21
11257	.01	Trace	.27
11258	.02	.02	.05
11259	.01	.04	.04
11260	.01	.02	.02

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 ulps Retained one month
 unless specific arrangements
 made in advance.

adinae
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th Flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7
 ATTN: T. TURNER



File No. 19944
 Date August 21st, 1980
 Samples Core

Certificate of
 ASSAY of
LORING LABORATORIES LTD.

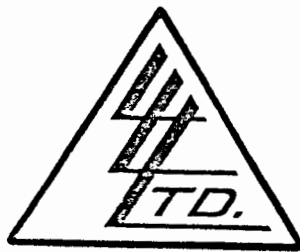
PAGE 3

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
<u>"Core Samples"</u>		
11233	Trace	.02
11234	Trace	.04
11235	Trace	.04
11236	Trace	.12
11237	Trace	.06
11238	Trace	.24
11239	Trace	.32
11240	Trace	.04
11241	Trace	.02
11242	Trace	.02
11243	Trace	.04
11244	Trace	.02
11245	Trace	.10
11246	Trace	.16
11247	Trace	.02
11248	Trace	.04
11249	Trace	.02
11250	Trace	.04
11251	Trace	.02
<p>I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES</p>		

Rejects Retained one month.
 ulps Retained one month
 nless specific arrangements
 made in advance.

Ed McJannet
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T.P. 2X7
 ATTN: T. TURNER



File No. 19944
 Date August 21st, 1980
 Samples Core

Certificate of
 ASSAY of
LORING LABORATORIES LTD.

PAGE 4

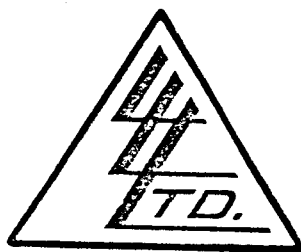
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11252	Trace	.02
11253	Trace	.34
11254	Trace	.06
11255	Trace	.22
11256	Trace	.56
11257	Trace	.08
11258	Trace	.04
11259	Trace	.04
80-5 ↑ 11260	Trace	.28
11261	Trace	.20
11262	Trace	.34
↓ 11263	Trace	.02
80-6 11264	Trace	.02
11265	Trace	.06
11266	Trace	.02
11267	Trace	.10
11268	Trace	.02
11269	Trace	.02
11270	.005	.26
11271	.005	.18

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Samples Retained one month
 unless specific arrangements
 made in advance.

E. L. McIsaac
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 12P 2X7
 ATTN T. TURNER



File No. 19944
 Date August 21st, 1980
 Samples Core

**Certificate of
 ASSAY of
 LORING LABORATORIES LTD.**

PAGE 2

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
80-5 ↑ 11261	.01	Trace	.02
11262	.01	.02	.12
11263	.01	Trace	.22
80-6 ↓ 11264	.01	.04	.61
11265	.01	.02	.39
11266	.01	.02	.17
11267	.01	.02	.19
11268	Trace	Trace	.01
11269	.01	.02	.06
11270	.01	.02	.04
11271	.01	.02	.03
11272	.01	.02	.03
11273	.01	.02	.06
11274	Trace	.02	.12
11275	Trace	Trace	.08
11276	.01	.02	.03
11277	.01	.02	.04
11278	.01	.02	.09
11279	Trace	.06	.16
11280	.01	Trace	.28
11281	Trace	Trace	.17
11282	.01	.02	.25
11283	.01	.02	.26
11284	Trace	Trace	.21
11285	Trace	.02	.04
11286	Trace	.02	.03
↑ 11287	.01	Trace	.16

GOLD & SILVER TO FOLLOW

I *Hereby* **Certify** THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

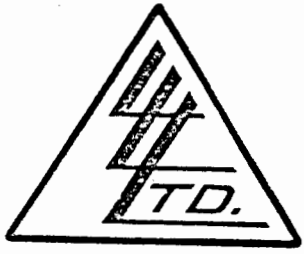
Rejects Retained one month.

Imps Retained one month
 unless specific arrangements
 made in advance.

E. L. MacIsaac

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 P 2X7
 ATTN: T. TURNER



File No. 19944
 Date August 21st, 1980
 Samples Core

Certificate of
ASSAY of
LORING LABORATORIES LTD.

PAGE 5

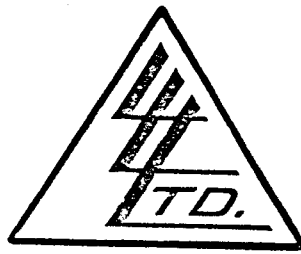
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11272	Trace	.02
11273	Trace	.02
11274	Trace	.06
11275	Trace	.02
11276	Trace	.52
11277	Trace	.06
11278	Trace	.48
11279	Trace	.22
11280	Trace	.18
11281	Trace	.24
11282	Trace	.28
11283	Trace	.06
11284	Trace	.04
11285	Trace	.06
11286	Trace	.04
11287	Trace	.04

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 ulps Retained one month
 nless specific arrangements
 made in advance.

C. L. McFarlane
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr, 715 - 5th Avenue S.W.
 CALGARY, Alberta
 12P 2X7
 ATTN: T. TURNER



File No. 19966
 Date August 25th, 1980
 Samples Core

**Certificate of
 ASSAY of
 LORING LABORATORIES LTD.**

PAGE 1

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
<u>"Core Samples"</u>			
11288 2.00-2.08	.01	Trace	.02
11289 2.08-2.60	.01	.02	.01
11290 2.60-3.10	.01	.02	.01
11291 3.10-3.60	.01	.02	.01
11292 3.60-4.10	.01	.02	.01
11293 4.10-4.70	.01	.02	.01
11294 4.70-5.35	Trace	.02	Trace
11295 5.35-5.85	.01	.02	Trace
11296 5.85-6.50	.01	.02	.01
11297 6.50-6.84	Trace	.02	.01
11298 6.84-7.12	.01	.02	.02
11299 7.12-7.60	Trace	.02	.01
11300 7.60-8.10	.01	.02	.01
11301 8.10-8.80	.01	.02	Trace
11302 8.80-9.45	.01	.02	.01
11303 9.45-9.75	.01	.02	.01
11304 9.88-10.13	.01	.02	.01
11305 10.13-10.60	.01	.02	.01
11306 10.60-11.09	.01	.02	.01
11307 11.09-11.35	.01	.02	.02
11308 11.40-11.65	.01	.02	.01
11309 11.65-12.25	.01	.02	.01
11310 12.25-12.75	.01	.02	.01
11311 12.75-13.27	.01	.02	.01
11312 13.27-13.41	.01	.02	Trace
11313 13.41-13.51	.01	Trace	Trace
11314 13.51-13.75	.01	.02	.01
11315 13.75-13.95	.01	.02	.02

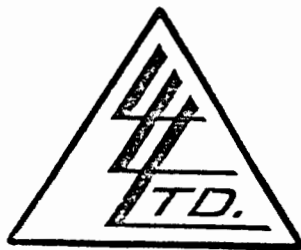
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulp Retained one month
 unless specific arrangements
 made in advance.

E. L. Mc Isaac

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 CP 2X7



File No. 19966
 Date August 25th, 1980
 Samples Core

ATTN: T. TURNER

Certificate of
 ASSAY of
LORING LABORATORIES LTD.

PAGE 3

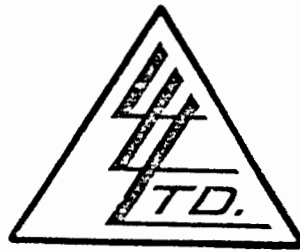
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
<u>"Core Samples"</u>		
11288 2.00- 2.08	Trace	.56
11289 2.08- 2.60	Trace	.26
11290 2.60- 3.10	Trace	.20
11291 3.10- 3.60	Trace	.02
11292 3.60- 4.10	Trace	.04
11293 4.10- 4.70	Trace	.02
11294 4.70- 5.35	Trace	.56
11295 5.35- 5.85	Trace	.30
11296 5.85- 6.50	Trace	.42
11297 6.50- 6.84	Trace	.14
11298 6.84- 7.12	Trace	.16
11299 7.12- 7.60	Trace	.06
11300 7.60- 8.10	Trace	.02
11301 8.10- 8.80	Trace	.04
11302 8.80- 9.45	Trace	.06
11303 9.45- 9.75	Trace	.12
11304 9.80-10.13	Trace	.04
11305 10.13-10.60	Trace	.22
11306 10.60-11.09	Trace	.16

I **Hereby Certify** THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 ulps Retained one month
 unless specific arrangements
 made in advance.

Ed McJannet
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 2P. 2X7



File No. 19966
 Date August 25th, 1980
 Samples Core

ATTN: T. TURNER

Certificate of
 ASSAY of
LORING LABORATORIES LTD.

PAGE 4

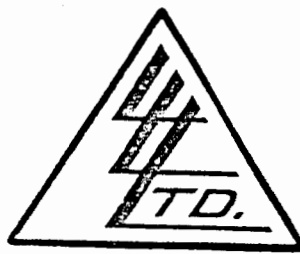
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11307 11.09-11.35	Trace	.02
11308 11.40-11.65	.005	.10
11309 11.65-12.25	Trace	.02
11310 12.25-12.75	Trace	.36
11311 12.75-13.27	Trace	.02
11312 13.27-13.41	Trace	.12
11313 13.41-13.51	Trace	.02
11314 13.51-13.75	Trace	.02
11315 13.75-13.95	Trace	.02
11316 13.95-14.52	Trace	.02
11317 14.52-14.77	Trace	.02
11318 18.20-18.45	Trace	.02
11319 18.45-18.86	Trace	.02
11320 18.86-19.11	Trace	.06
11321 25.24-25.56	Trace	.02
11322 25.56-25.70	Trace	.02
11323 25.70-25.85	Trace	.02
11324 25.85-26.42	.005	.08
11325 26.42-26.67	Trace	.04
11326 26.75-26.82	.005	8.12
11327 26.82-27.29	Trace	.02

I **Hereby Certify** THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 unless specific arrangements
 made in advance.

E. L. MacIsaac
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr. 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: T. TURNER



File No. 19966
 Date August 25th, 1980
 Samples Core

Certificate of
 ASSAY of
LORING LABORATORIES LTD.

PAGE 2

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
11316	13.95-14.52	.01	.02
11317	14.52-14.77	.01	Trace
11318	18.20-18.45	.01	.01
11319	18.45-18.86	.01	Trace
11320	18.86-19.11	.01	.01
11321	25.24-25.56	.01	.01
11322	25.56-25.70	Trace	Trace
11323	25.70-25.85	.01	.01
11324	25.85-26.42	.01	.01
11325	26.42-26.67	.01	.06
11326	26.75-26.82	.04	5.01
11327	26.82-27.29	.01	.04
11328	27.29-27.58	.01	.02
11329	27.74-27.95	.01	.02
11330	27.95-28.50	.01	.02
11331	28.50-29.00	.01	.02
11332	29.00-29.50	Trace	.02
11333	29.50-30.00	Trace	.02
11334	30.00-30.40	.01	.02
11335	30.40-30.78	.01	.02
11336	30.78-31.02	.01	.02

GOLD & SILVER TO FOLLOW

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.

Reprints Retained one month
 unless specific arrangements
 made in advance.

E. L. McJoane

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
7th flr, 715 - 5th Avenue S.W.

File No. 19966

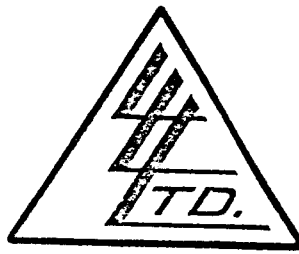
Date August 25th, 1980

Samples Core

CALGARY, Alberta

2P. 2X7

ATTN: T. TURNER



Certificate of
ASSAY of
LORING LABORATORIES LTD.

PAGE 5

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER
11328 27.29-27.58	Trace	.02
11329 27.74-27.95	.005	.02
11330 27.95-28.50	Trace	.02
11331 28.50-29.00	Trace	.08
11332 29.00-29.50	Trace	.02
11333 29.50-30.00	.005	1.18
11334 30.00-30.40	Trace	.02
11335 30.40-30.78	.005	.70
11336 30.78-31.02	.005	.16

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

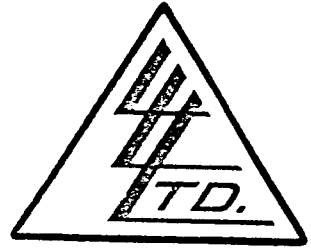
Rejects Retained one month.

Refrigerated samples Retained one month

unless specific arrangements
made in advance.

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr., 715 - 5th Avenue S.W.
 GARY, Alberta
 2P 2X7
 ATTN: J. GILLAN



File No. 19748
 Date August 1st, 1980
 Samples Rock Chip

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

PAGE 5

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER	% Cu	% Pb	% Zn
<u>"Chip Samples"</u>					
1764	Trace	2.28	.04	6.79	3.99
1765	Trace	.06	.01	1.70	.24
1766	Trace	2.48	.04	2.96	1.45
1767	Trace	.22	.01	.20	.53
1768	Trace	5.64	.05	4.40	4.59
1769	Trace	2.00	.05	1.46	1.60
1770	Trace	.10	.01	.06	.32
1771	Trace	1.66	.03	1.92	5.69
1772	Trace	.44	.02	.96	4.61
1773	Trace	8.38	.16	5.39	2.92
1774	Trace	10.84	.12	9.39	1.40
1775	Trace	.06	.01	.12	.46
1942	Trace	.10	.03	.44	14.80
1943	Trace	.04	.02	.10	4.49
1944	Trace	.06	.01	.02	.08
1945	.010	.36	.36	-	-
1946	.010	7.78	.20	16.37	20.92
1947	.280	3.88	.16	38.12	4.60

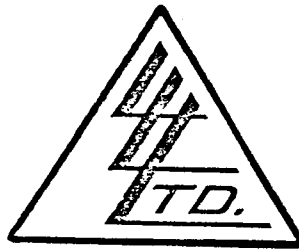
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulps Retained one month
 unless specific arrangements
 made in advance.

C. J. M. J. Ode

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 7th flr, 715 - 5th Avenue S.W.
 GARY, Alberta
 2P. 2X7
 ATTN J. GILLAN



File No. 19748
 Date August 1st, 1980
 Samples Rock Chip

Certificate of
ASSAY of
LORING LABORATORIES LTD.

PAGE 6

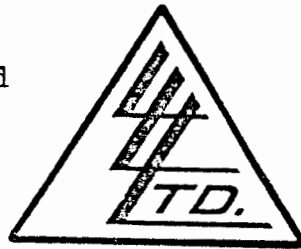
SAMPLE No.	% MoS2	% Sb	% WO3	% Sn	% Bi
<i>RIDGE SAMPLES</i>					
<u>"Chip Samples"</u>					
1942	-	-	.018	-	-
1943	-	-	.004	-	-
1944	.005	-	.016	-	-
1945	-	-	-	-	-
1946	-	2.18	.002	.059	.003
1947	-	22.50	.002	.071	.002

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 unless specific arrangements
 made in advance.

ALM Joac
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19624
 Date July 16th, 1980
 Samples Chips

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

PAGE 1

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER	% Cu	% Pb	% Zn
<u>"Chip Samples"</u>					
80-1-1	Trace	.02	.01	.04	.27
80-1-2	.010	.98	.07	2.82	.37
80-1-3	Trace	.04	.01	.06	.34
80-1-4	Trace	.02	.02	.30	.31
80-1-5	Trace	.06	.06	.38	.35
80-1-6	Trace	.02	.01	.02	.41
80-1-7	Trace	.04	.01	Trace	.52
80-1-8	Trace	.04	.01	.06	.51
80-1-9	Trace	1.72	.01	.06	.64
80-1-10	Trace	2.56	.03	3.80	3.25
80-1-11	Trace	.04	.01	.08	.23
80-1-12	Trace	.80	.01	.04	.24
80-2-13	Trace	.02	.01	.04	.18
80-2-14	Trace	.04	.01	Trace	.06
80-2-15	Trace	.04	.02	.58	.28
80-2-16	Trace	.02	.01	.50	.29
80-2-17	Trace	.30	.02	.80	1.45
80-2-18	Trace	.10	.02	.60	.68
80-2-19	Trace	.02	.01	.02	.04

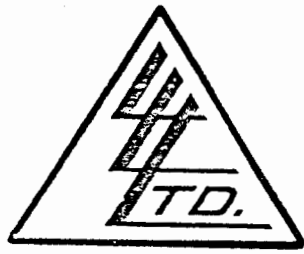
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Samples Retained one month
 unless specific arrangements
 made in advance.

E. L. Macfarlane

Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN



File No. 19624
 Date July 16th, 1980
 Samples Chips

Certificate of
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PAGE 2

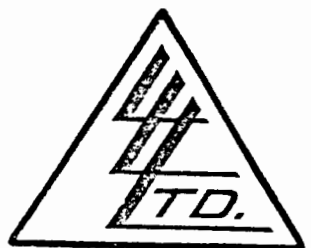
SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER	% Cu	% Pb	% Zn
80-2-20	Trace	.02	.01	.02	.03
1934	Trace	.12	Trace	Trace	.01
1726	Trace	.04	.01	Trace	.02
1940 Ridge	.010	-	-	-	-
1941 Ridge	Trace	-	-	-	-

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

To: Norcen Energy Resources Limited
 27th flr., 715 - 5th Avenue S.W.
 CALGARY, Alberta
 T2P 2X7
 ATTN: J. GILLAN

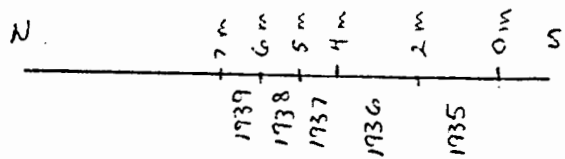


File No. 19624
 Date July 16th, 1980
 Samples Chips

Certificate of
ASSAY of
LORING LABORATORIES LTD.

PAGE 3

SAMPLE No.	OZ./TON GOLD	OZ./TON SILVER	% Pb	% Zn
<u>Soil & Gossan Sample</u>				
1935 2m BEAR PIT	-	.36	.50	1.69
1936 2m TRENCH	-	.30	.30	1.25
1937 1m	-	.16	.36	1.24
1938 1m	-	.12	1.02	.64
1939 1m	-	.10	.24	.66



I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Chips Retained one month
 unless specific arrangements
 made in advance.

[Signature]
 Licensed Assayer of British Columbia

APPENDIX B

GEOPHYSICAL REPORT ON VECTOR PULSE ELECTROMAGNETIC
SURVEY BY GLEN WHITE GEOPHYSICAL CONSULTING & SERVICES LTD.

NORCEN ENERGY RESOURCES LTD.
GEOPHYSICAL REPORT

On A

PULSE ELECTROMAGNETIC SURVEY
CRYSTAL CREEK PROJECT

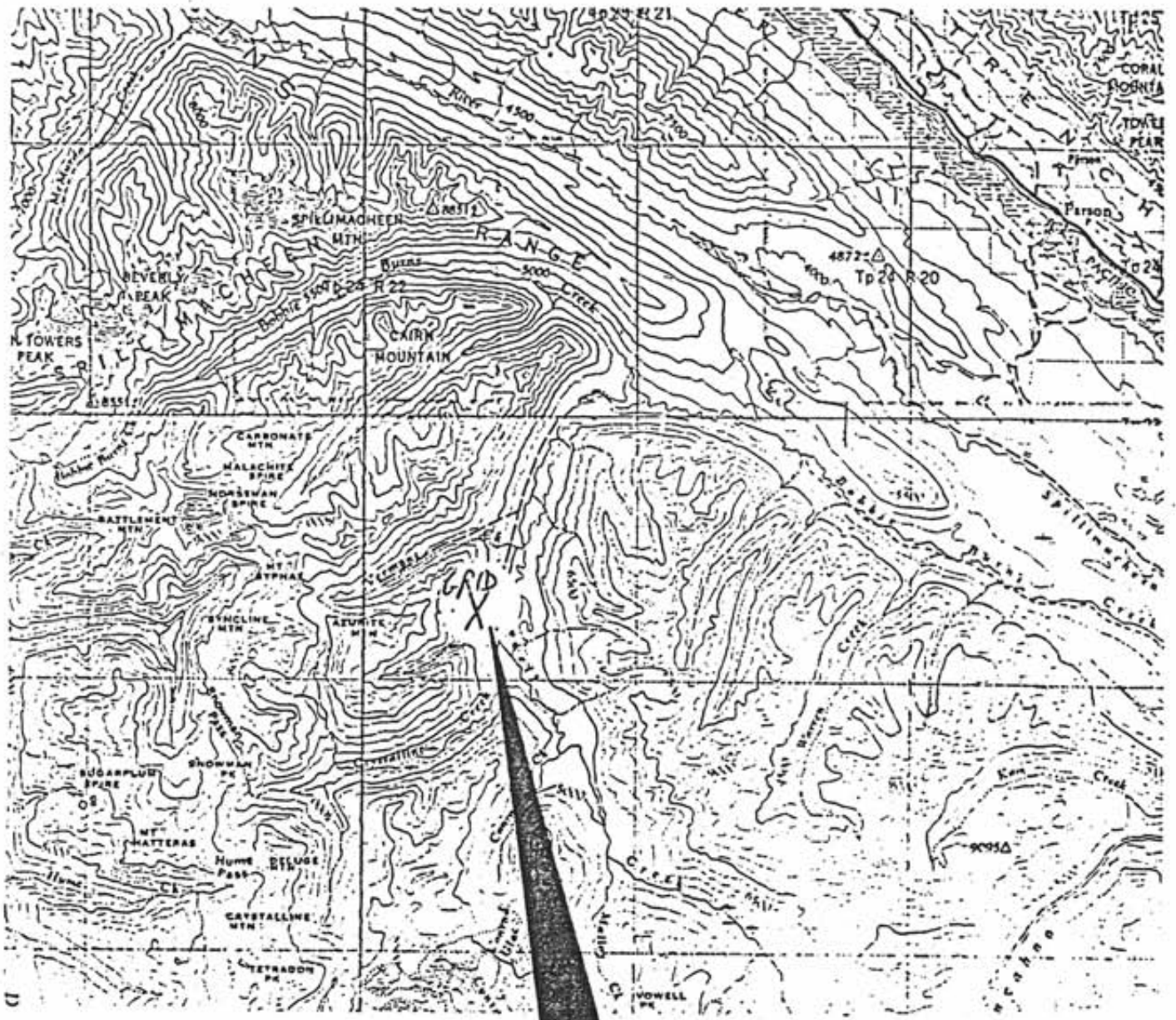
Lat. $50^{\circ}55'N$ Long. $115^{\circ}56'W$ N.T.S. 82 K/15

AUTHORS: Cliff Candy, B.Sc., Geophysicist

Glen E. White, B.Sc., P. Eng.,
Consulting Geophysicist

DATE OF WORK: July 2 - 6, 1980

DATE OF REPORT: July 18, 1980



LOCATION MAP
NORCEN ENERGY
RESOURCES LTD
GOLDEN

N.T.S. B2 K/15

Glen E. White
 geophysical consulting
 &
 mapping ltd

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Cliff Candy, B.Sc.....	10
Glen E. White, B.Sc., P. Eng.....	11
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- Figure 1 - Location Map
- Figure 2 - Borehole and Loop Location Map
- Figures 3 - 21, Borehole Log Plots
- Figures 22, 23 - Horizontal Loop Profiles
- Figures 24, 25 - Vector Pulse All Component Plots

INTRODUCTION

During July of 1980, Glen E. White Geophysical Consulting & Services Ltd. conducted a program of pulse electromagnetometer surveys on the Crystal Creek Project on behalf of Norcen Energy Resources Ltd. The program consisted of the testing of seven boreholes utilizing the borehole pulse EM technique, two test lines using the PEM in standard horizontal loop mode and coverage of a single test line using the vector PEM technique. The program has as its objective the detection of conductive bodies from the two surface surveys and detection of conductors intersected or in the vicinity of the boreholes. The surveys were carried out with the assistance of Norcen Energy Resources personnel, G. Robb and R. Wasylushyn. This report follows a report on a vector pulse electromagnetometer survey on this property dated August 31, 1979.

LOCATION AND ACCESS

The survey area is located some 25 miles (35 km) due south of Golden, B. C. on the eastern flank of Azunte Mountain along Vowell Creek. Lat. $50^{\circ}55'N$, Longitude $115^{\circ}56'W$, N.T.S. 82 K/15, Golden Mining Division, B. C. The property is timbered and has a number of areas of steep topography.

Access to the property is from Parson on Highway 93 for a distance of 50 km along all weather logging roads and then 3 km on a cat road which requires a 4x4. Travelling time from Golden is approximately two hours.

VECTOR PULSE ELECTROMAGNETIC SURVEY

The pulse electromagnetometer system is a time domain E.M. system which can be used in the borehole mode, standard horizontal loop mode or deep penetrating vector mode.

The primary field for the horizontal loop survey is obtained from a transmit loop 9 meters in diameter laid out horizontally on the ground and energized by a pulse of 20 amps at 24 volts with an on-off time of 10.8 ms. The receiver coil is generally spaced 25 - 100 m from the transmitter loop. Both are moved simultaneously from station to station. The secondary field signal from the receiver coil is sampled and averaged for 11 seconds and then stored for readout. Eight samples of the secondary field are obtained with increasing window widths during the primary field off time. Time synchronization is by radio link or cable.

The eight channels of secondary field information are equivalent to a wide spectrum of frequencies from approximately $2K_z$ to $16K_z$ which allows for determination of overburden effects and penetration of conductive overburden. Since the time derivative of the secondary field is measured directly during the primary field off time, the pulse method is relatively free of geometrical restrictions, such as topography interference and coil alignment.

The primary field for the vector EM technique is obtained from a LSL (Large Scale Loop) of 150 m (492 ft.) per side which is energized with a current of 25 amps at 24 volts. A resultant vector can be obtained by vector addition of the horizontal and vertical components of the secondary field. A right angle to this resultant points to the eddy current position. See Appendix for diagrams. Additionally, detailed conductor information can be obtained from the analysis of the individual component information.

BOREHOLE PULSE ELECTROMAGNETIC SURVEY

The borehole pulse EM system is a time domain downhole EM instrument capable of detecting intersected or off-hole conductive mineralization in boreholes to depths of some 300 m in its standard configuration. The borehole pulse EM utilizes a special downhole receiver coil and winch gear in conjunction with the PEM receiver electronics and 500 watt transmitter apparatus normally employed in ground PEM surveys.

The primary field is produced by a 150 m square surface loop which is driven by the PEM transmitter with a 20 amp reversing pulsed current of 10.8 ms or 21.6 ms on to off time. The receiver obtains eight samples of the time derivative of the secondary field at times, on the 10.8 ms time base, ranging from .15 to 8.85 ms after primary field shut off. Due to the fact that these samples are obtained during the primary field off time, the effect of transmitter loop to receiver coil geometry is removed. Thus, transmitter loop to conductor geometries may be varied to obtain conductor attitude and position information. A complete survey of a given borehole may entail logging the hole from five transmitter loop setups. One of these loops would be approximately centered over the area of interest with the remaining four loops away from and distributed around the borehole.

When a conductor response is observed in a borehole log from a single transmitter loop, the nature of this anomaly allows the determination of the relative location of the conductive source. The response can indicate whether the borehole is intersecting the center of the conductor, the margin of a conductor, with the bulk of conductive material away from the hole, or whether the conductor is entirely off-hole. In the case of a dike-like or tabular conductor, the magnitude of the anomaly obtained is proportional to the angle that the primary field cuts

the conductor. Thus, the degree to which coupling is obtained to the conductor in coverage of a borehole from several loop setups will provide accurate information on the attitude and position of the conductive mineralization. Model study curves for various conductor to borehole geometries are employed in this interpretation from Dennis Woods M. A. thesis Queen's University, 1975. If the conductor tends towards a more spheroidal shape, the anomaly character will change, as well as its magnitude, when the primary field angle is altered. This occurs because the eddy currents are not constrained to flow within a conductive sheet. Thus, multiple transmitter loop coverage can also provide information on the shape of a conductive body.

DISCUSSION OF RESULTS

Twelve diamond drill holes were tested for depth with the dummy probe in the course of the survey. Of these, five holes were caved and could not be used in the pulse EM borehole survey. The probed depths and attitudes of the boreholes used in the survey are summarized in the following table:

<u>Diamond Drill Hole</u>	<u>Probed Depth</u> (meters)	<u>Azimuth</u> (degrees)	<u>Dip</u> (degrees)
79-1	10.5	- caved -	
79-2	120.0	035	64
79-3	20.9	- caved -	
79-4	41.0	270	50
79-5	38.0	210	50
79-6	17.0	240	65
79-7	51.0	205	53
79-8	1.0	- caved -	
79-9	22.2	- caved -	
79-10	60.0	280	84
79-11	130.0	030	70
79-12	6.2	- caved -	

The positions of the drill holes relative to the transmitter loops are depicted in plan on Figure 2 and at the top left of borehole log plot Figures 3 - 21.

Drill Hole 79-2

This drill hole was one of two deeper holes probed in this survey. The pulse EM logs of this hole from transmitter loops 'C' and 'E' exhibit a very low amplitude background response. These responses indicate that the lithology in the area is generally very resistive. The background levels observed from transmitter loop 'D' are somewhat higher, possibly due to orientation of the primary field lines in a direction which provides optimum coupling to the lithology.

No responses indicative of conductors were observed in the PEM logs of the hole. The trend to positive values seen at shallow depths from transmitter loop 'C' is an "overload" effect from the unattenuated primary field near the surface. (Figure 3).

Drill Hole 79-4

No conductive responses were observed in the survey of this drill hole from the three transmitter loop setups. These transmitter loops can be expected to provide three quite separate primary field orientations in the vicinity of the borehole. Thus, electromagnetic coupling from at least one of the loops would have been obtained, should a tabular conductive body have been present. Again, the background values are indicative of a resistive whole rock response.

Drill Hole 79-5

The survey of ddh 79-5 did not detect the presence of conductors in the vicinity of the borehole. The background values observed are uniform and of low amplitude.

Drill Hole 79-6

This drill hole had an original total depth of 37.8 m but was found to have caved at a depth of 17 m. The hole was logged from transmitter loop 'C' and found to be conductively barren in this brief test. It was not relogged from transmitter loops 'D' and 'E'.

Drill Hole 79-7

The pulse EM logs of dth 79-7 are uniformly of low background amplitude and do not contain anomalous features. This borehole while outside of, and away from, the three transmitter loops can be considered to have been confidently tested. Thus, a tabular body of worst case orientation to the primary field lines of one transmitter loop should be detectable from another of the loops.

Drill Hole 79-10

No evidence of conductive responses are observed in the pulse EM logs of this drill hole. Logs of the hole from transmitter loops 'C' and 'D' exhibit an increase in positive values of the early channels near the top of the drill hole. This "overload" effect is due to the proximity of the drill hole to the high primary field strengths near the edges of these two loops.

Drill Hole 79-11

A weak small scale conductive anomaly is observed in the pulse EM logs of this drill hole from the three transmitter loops. This anomaly is seen as a small negative feature in the logs from the two nearer transmitter loops 'C' and 'E' and as a more broad positive response in the log from loop 'D'.

The causative source is probably a small of-hole tabular conductive body occurring at approximately 115 m depth. The polarity reversal observed in the log from the more distant transmitter loop 'D' may be due to the primary field from this loop energizing the conductor from its underside. This being the case, it can be inferred that the conductor would dip at approximately 20° , generally into the mountainside, towards loop 'D'. Unfortunately, there is insufficient differentiation amongst the anomalies on each of the logs to arrive at an inference regarding the position of the body relative to the drill hole.

Horizontal Loop PEM Test Lines 'A' and 'B'

Two test lines were surveyed utilizing the PEM in its horizontal loop mode with a separation of 75 m. This method, which does not have the deep search capabilities of the vector PEM technique, did not detect the presence of conductors in these test lines. The responses obtained are illustrated in Figures 22 and 23.

Vector PEM Line 300M

The data obtained in the survey of this single line using the vector PEM technique did not disclose the presence of conductors in the area covered. The survey was non-optimal, however, due to the unfavourable location of transmitter loop 'D'. The primary field lines approach an angle of 90° to the survey line resulting in poor coupling to features in the strike angle range that the line is intended to test. Thus, some noise of near surface origin is evident in the horizontal component. The vertical and horizontal component responses are depicted in Figures 24 and 25.

Geologic examination of some areas of the property indicated the presence of a weathered conductive limestone decay product. As well, an occurrence of graphite was located. The presence of these conductive materials may account for some of the conductive responses observed in the vector pulse EM survey of August, 1979. As well, these near surface conductive elements may provide an explanation of the high level of geologic noise present in the component data of this 1979 survey.

SUMMARY AND CONCLUSIONS

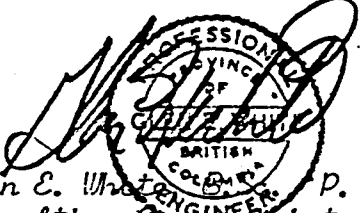
During July of 1980, Glen E. White Geophysical Consulting & Services Ltd. conducted a program of pulse electromagnetometer surveys on behalf of Norcen Energy Resources Ltd. These surveys entailed the logging of seven Diamond drill holes and the coverage of three test lines. The test line coverage with the horizontal loop and vector pulse EM coverage did not provide evidence of conductors in the areas surveyed. The series of downhole pulse EM surveys disclosed a weak conductor in drill hole 79-11 at approximately 115 m depth. An approximate dip of 20° to the northeast can be inferred from coupling polarity evidence.

Several of the diamond drill holes, notably 79-4, are known to have intersected sulphide mineralization. These zones of mineralization are not detected in the borehole pulse EM surveys. The sulphide mineralization in this situation may, therefore, not be sufficiently conductive or present in sufficient volume to be detectable with this electromagnetic method.

Respectfully submitted,
 GLEN E. WHITE GEOPHYSICAL
 CONSULTING & SERVICES LTD.

Cliff Candy

Cliff Candy, B.Sc.
 Geophysicist


 Glen E. White P. Eng.
 Consulting Geophysicist

STATEMENT OF QUALIFICATIONS

Name: *CMTOL, Clifford, E.*
Profession: *Geophysicist*
Education: *B.Sc., Geophysics*
University of British Columbia
Professional
Associations: *Society of Exploration Geophysicists*
Experience: *Two years Geophysicist with Glen E. White*
Geophysical Consulting & Services Ltd.,
with work in B. C., Yukon, Saskatchewan, Quebec
southwestern U. S. A. and Ireland.

STATEMENT OF QUALIFICATIONS

NAME: WHITE, Glen E., P. Eng.

PROFESSION: Geophysicist

EDUCATION: B.Sc. Geophysics - Geology
University of British Columbia

PROFESSIONAL ASSOCIATIONS: Registered Professional Engineer,
Province of British Columbia

Associate member of Society of Exploration Geophysicists.

Past President of B. C. Society of Mining Geophysicists.

EXPERIENCE: Pre-Graduate experience in Geology - Geochemistry - Geophysics with Anaconda American Brass.

Two years Mining Geophysicist with Sulmac Exploration Ltd. and Airborne Geophysics with Spartan Air Services Ltd.

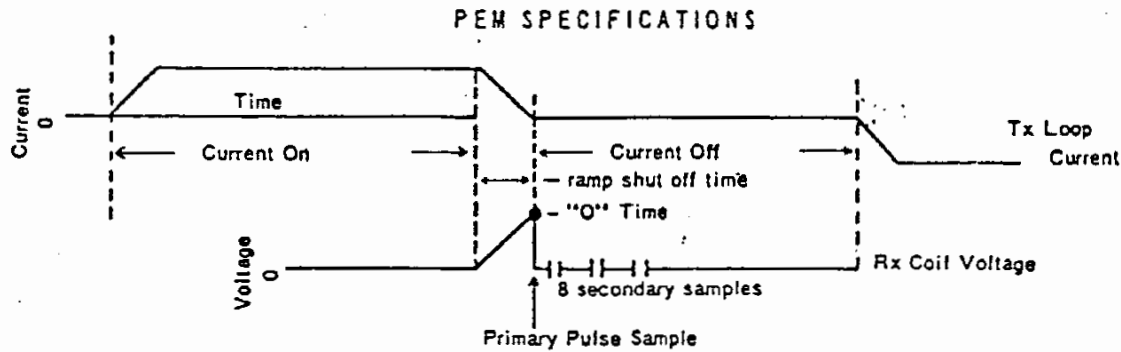
One year Mining Geophysicist and Technical Sales Manager in the Pacific north-west for W. P. McGill and Associates.

Two years Mining Geophysicist and supervisor Airborne and Ground Geophysical Divisions with Geo-X Surveys Ltd.

Two years Chief Geophysicist Tri-Con Exploration Surveys Ltd.

Nine years Consulting Geophysicist.

Active experience in all Geologic provinces of Canada.



Current Off time: 9.4 ms

Current on time: 10.8 ms

Current shut off (ramp) time: 1.4 ms

Sample times (zero to centre of sample): .15ms, .45ms, .85ms, 1.45ms, 2.45ms, 3.75ms, 5.85ms, 8.85ms.

Sample width: 100 μ s

Zero time set at drop off point of primary pulse

TRANSMITTER — Transmitter power and loop size may be increased to obtain increased penetration. Weight, portability and power capabilities of the control instrument are the limiting factors. The standard transmitter is designed to be carried by two men.

- Loop diameter — minimum 4 meters (13 feet)
- Loop current — 15 to 20 amps
- Loop applied voltage — 24 volts
- Loop output — minimum 4500 amps x meter²
- Loop weight — 11.8 kilos (26 lb)
- Control unit weight — 10 kilos (22 lb)
- Control unit dimensions — 20.5cm x 25.5cm x 36.5cm (8" x 10" x 14.5")
- Battery supply weight — 18.1 kilos (40 lb)
- Battery supply — 2 of 12 volt, 14 to 20 ampere hour
- Timing control by radio synchronization

RECEIVER

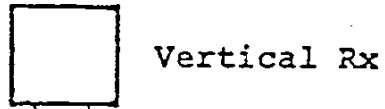
- Receive coil dimensions: 55cm x 15cm (22" x 6")
- Receive coil weight: 4.5 kilos (10 lb)
- Pre-amplifier in coil
- Pre-amplifier batteries: 2 of 9 volt
- Receive coil tripod mounted
- Receiver measuring instrument dimensions: 28cm x 18cm x 21.5cm (11" x 7" x 9")
- Receiver measuring instrument weight: 6.3 kilos (14 lb)
- Timing control by radio synchronization
- Primary sample width: 100 μ s
- Primary sample can be swept through primary pulse by means of a time calibrated pot
- Zero time set at primary pulse drop-off
- Secondary samples (eight of them) width: 100 μ s
- Secondary samples time (zero to middle of sample): (1) .15ms (2) .45ms (3) .85ms (4) 1.45ms (5) 2.45ms (6) 3.75ms (7) 5.85ms (8) 8.85ms
- Automatic sampling for 5 seconds then all samples automatically stored
- Sample read out by means of meter
- Continuous sampling possible by switching function switch to "Continuous"
- Noise can be monitored by switching function switch to "Noise"
- Battery supply: 24 volt rechargeable, 2 of 12 volt Gel GC 12-15

BOREHOLE PULSE EM SPECIFICATIONS

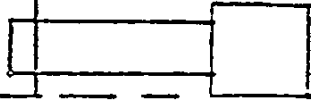
With a minor modification the standard surface PEM transmitter and receiver control units can be used for borehole surveys to depths of 300 meters. Extra equipment required is a borehole probe, cable, reel, wire counter and wire for the transmit loop. A motor generator is optional for a continuous transmit signal.

- Borehole Probe:** Outside Diameter — 2.9 cm
Length — 163. cm
Weight — 3.6 kg
Pressure tested to 2000 PSI (1320 M Pasc)
Pre-amplifier with self contained rechargeable Ni-Cad power supply.
- Probe Cable:** O.D. 0.51 cm twisted pair shielded
Weight — 4.5 kg / 100M
- Cable Reel:** Slip ring connector
Hand or power (variable speed drill) geared winding, removable spool from frame.
- Wire Counter:** Choice of metric or feet read-out on a counter.
Pulley and counter mounting are attached to the drill hole casing pipe.
- Transmit Loop:** A single turn of wire 100M² (or larger), with a total resistance of approximately 1 Ohm (usually No. 10 copper) is required for the standard PEM transmitter.
- Motor-Generator:** Packframe mounted.
Engine — Briggs and Stratton, 4 cycle
Generator — 24V, D.C.
Total weight — 18 kg.
Gas tank — separate pack mounted.

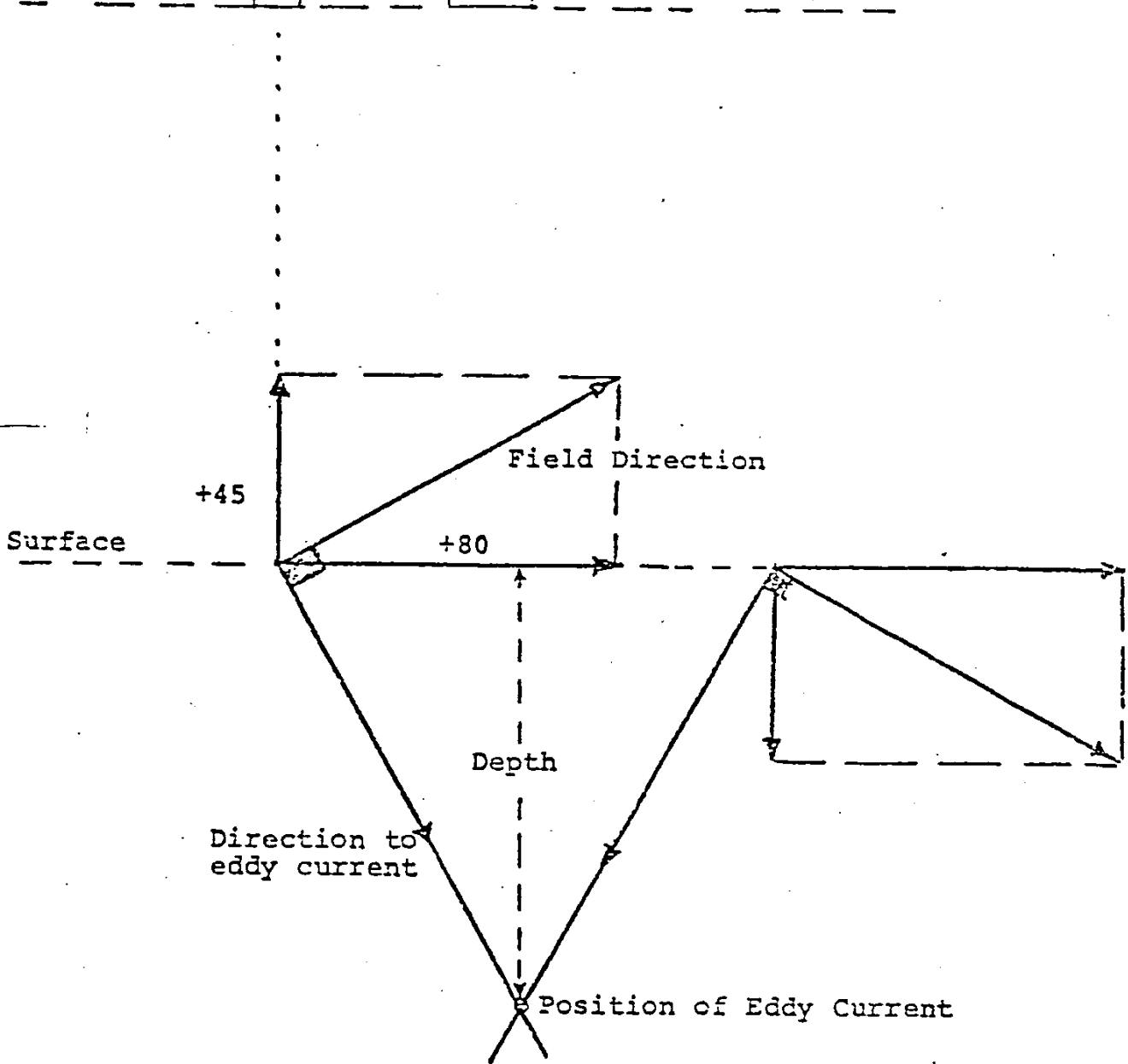
A complete set of interpretation curves is available
(Dennis Woods, M.A. thesis, Queen's University, Kingston, Ontario — 1975).



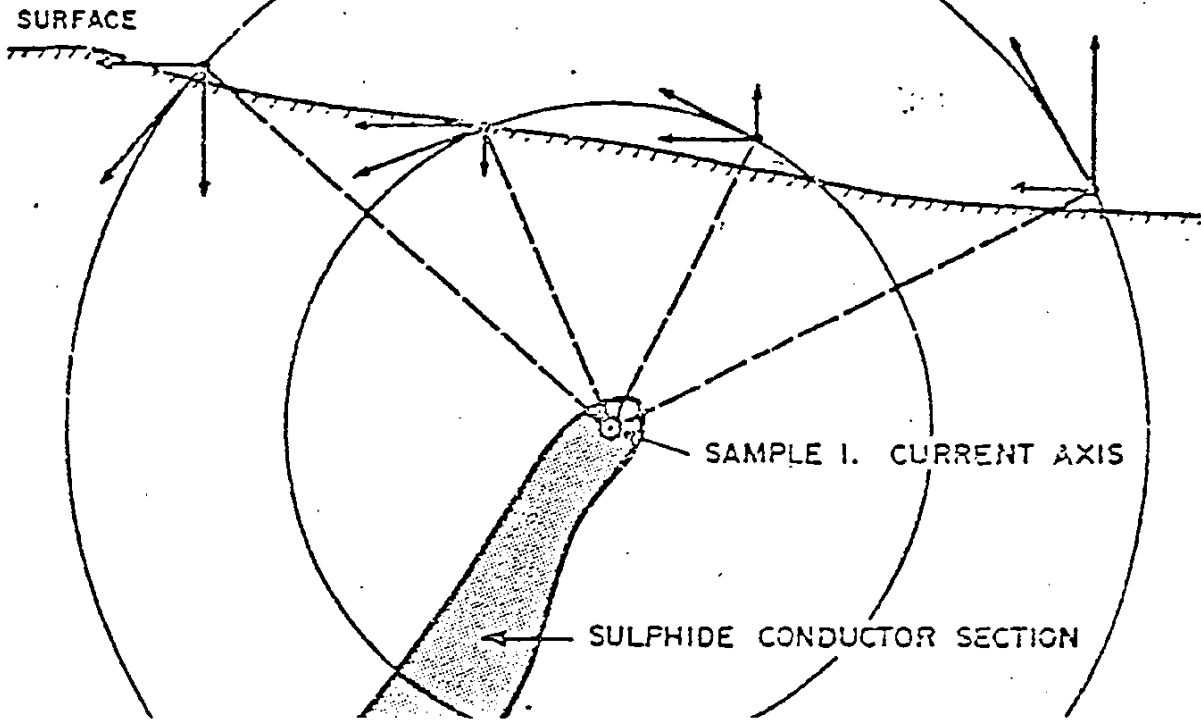
Vertical Rx



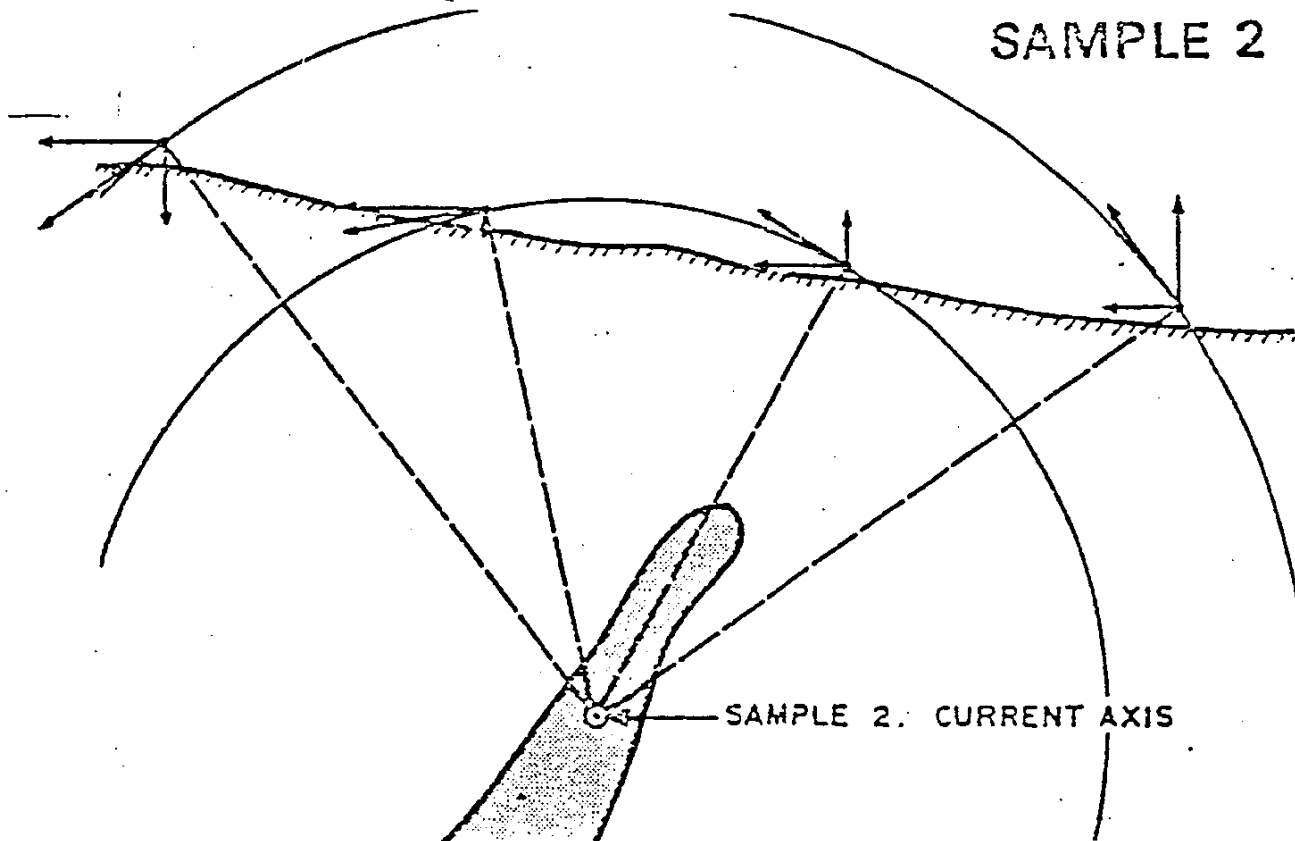
Horizontal Rx



SAMPLE 1



SAMPLE 2



Location of the Current Path in the Conductor

VPEN DATA SHEET
PROJECT NORCEN

Date July 4th / 60
OPERATOR C.C.

Page 12 of _____
LOOP D

1.45 215
Line Base 10 115
LIND 16
5:1

LINE	STATION	VERTICAL COMPONENT								HORIZONTAL COMPONENT								EL	G	L	ID	HG
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8					
77-Z 77-Y	51	5	0	0	0	-1	0	-1	0									20				
	45	5	0	0	0	-1	0	-1	0													
	40	5	0	0	0	-1	0	-1	-1													
	35	5	0	0	0	-1	0	-1	0													
	30	5	0	0	0	-1	0	-1	-1													
	25	5	0	0	0	-1	0	-1	0													
	20	5	1	0	0	-1	0	-1	0													
	15	5	0	0	0	-1	0	-1	0													
	10	5	0	0	0	-1	0	-1	0													
5	5	0	0	0	-1	0	-1	0														

VPEM DATA SHEET

Date 5/7/80

Page 21 of

PROJECT Norco Test A+B OPERATOR CC

LOOP X

Time Base 10ms

LINE	STATION	VERTICAL COMPONENT								HORIZONTAL COMPONENT								EL	G	L	ID	HG
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8					
A	250	4	-1	-1	0	-2	-1	-1	-1													
	50	7	-1	-1	0	-1	-1	-1	-1	bat 79-1												
	75	6	-1	-1	0	-2	-1	-2	-1													
	100	7	-1	-1	0	-1	-1	0	2													
	125	4	-1	-1	0	-1	-1	-1	0	L.L. 79-8												
	150	5	0	-1	0	-2	-1	-1	-1													
	175	4	-1	-1	0	-1	-1	-1	-1													
	200	4	-1	-1	0	-1	0	0	0													
	225	5	-1	-1	-1	-1	-1	-1	-1	ALL 79-2												
	250	4	-2	-2	-2	-3	-3	-2	-1													
B	25	3	-1	-1	-1	-2	-1	-1	-1													
	50	3	-1	-1	-1	-2	-1	-1	-1													
	75	3	-2	-3	-2	-2	-1	-2	-2													
	100	4	-1	-1	0	-1	0	-1	-1													
	125	5	-1	-1	0	-2	-1	-1	-1													
	150	6	0	-1	0	-1	0	-1	0													
	175	5	-1	-1	1	-1	-1	-1	-1													
	200	4	0	-1	-1	-1	-1	-1	0													
	225	5	0	-1	0	-1	0	0	0													
	250	7	0	-1	0	-1	0	-1	-1													

VPEM DATA SHEET

PROJECT NORCEN Line 300N

Date July 5th / 80

Page 22 of

OPERATOR CL

LOOP D

Time Base 10 M/S

LINE	STATION	VERTICAL COMPONENT								HORIZONTAL COMPONENT								EL	G	L	ID	HG
		1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8					
300N	50W	-75	-31	-12	-5	-4	-3	-2	-2	-76	-7	-3	0	-1	-1	-1	-1	97			NE	
	75W	-85	-30	-11	-4	-3	-2	-1	-1	-26	-4	-3	-1	-3	-3	-3	-3	1				
	100N	-91	-32	-10	-3	-3	-1	-1	0	-98	-7	-2	0	0	0	0	0	1				
	125W	-100	-32	-11	-3	-2	-1	-1	-1	-84	-5	-1	-1	-1	-1	-1	-1	1				
	150W	-132	-29	-10	-4	-4	-2	-2	-1	-73	-1	1	1	0	0	0	0	1				
	175W	-120	-34	-10	-3	-2	-1	-1	-1	-86	-1	0	0	-1	6	5	-1	1				
	200W	-140	-32	-12	-3	-3	-1	-1	-1	-75	-1	1	0	-2	-1	-1	-1	1				
	225W	-150	-35	-10	-3	3	-1	-1	-1	-68	-3	0	1	-1	1	1	-1	1				
	250W	-100	-51	-12	-4	-4	-3	-3	-3	-10	-2	0	0	-1	-1	-1	-1	1				
	275W	-180	-36	-10	-3	-3	-2	-2	-3	-25	-5	5	0	0	-1	-1	-1	1				
	300W	-67	-80	-12	-4	-3	-1	0	0	-90	-4	1	0	0	0	0	0	1				

Booth 2-4

2-2-2

1-1-1

1-1-1

3-3



2

Borehole P.5/A

DDH F9-2

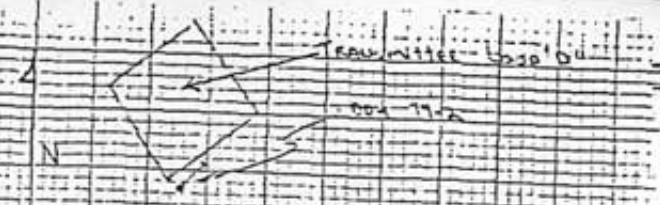
Depth 300

Location

July 1983

Scale 350

Fig 4



Station 5-44

Sta 59-4

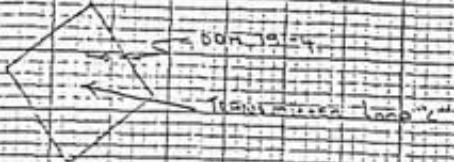
Sec 17, T12N, R10E

July 1930

Cont. 360

Fig. 6

N



Boat No. PEM

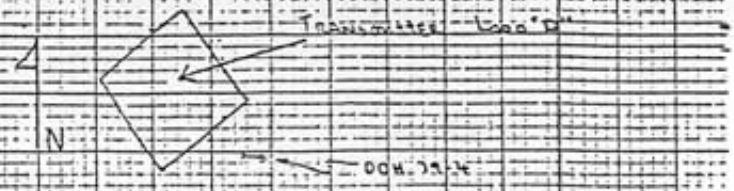
Date 7/4

Loc. 1000 ft. deep
1000 yds. long

July 1950

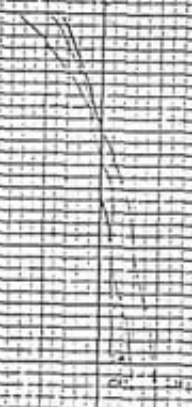
Site 320

Fig 7



Co. 20

200
VERTICAL 1.500
HORIZONTAL 1.500
Fig 190
Fig 8



Basalt - M
dth 74-5
July 1989
Con 520
Fig 9



Barthel 214
DDH 70-5
Güte 1000
Korn 1000
Wahl 170
Güte 320
Fig. 0



20 20 10 20 10 20

10 (20-20)

20

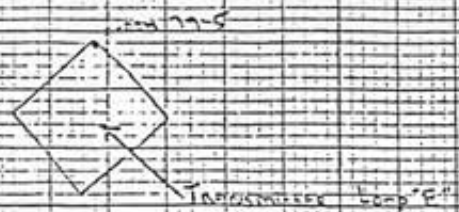
DH 77-5

LOCATION OF LOCATION

DATE

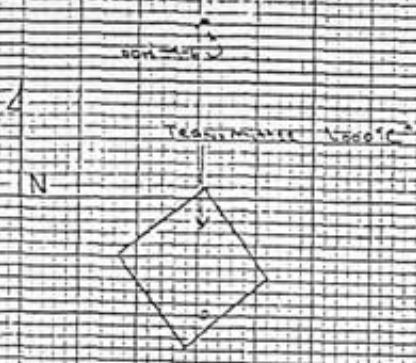
FIG. 11

N



(cont.)

Uzbekistan P-11
dzh 72-6
Sukh...
horizontal...
July 1980
E-12

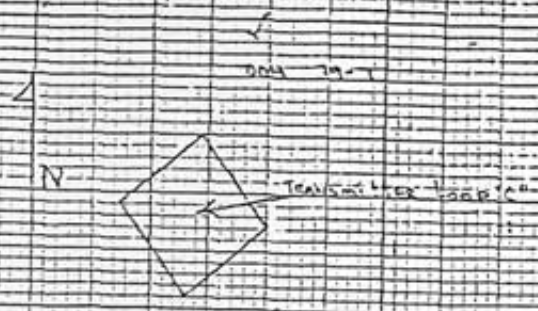


...
...

...

...

Boysen PCH
ddh 79 f
date received 1/20/00
res. 303d. age. com
July 1998
Gen 140
Fruit 5



collar

TRANSITION LOOP

DMA 79-1

N

collar

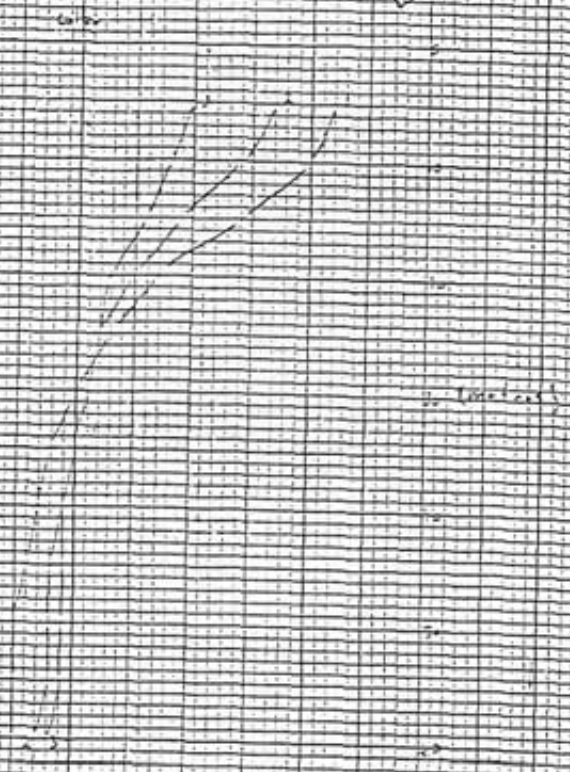
collar

Operator PEM
DDH 79-7
Date, vertical 3:50
horizontal 4:20
July 1980
Gain 160
Front



Local 200

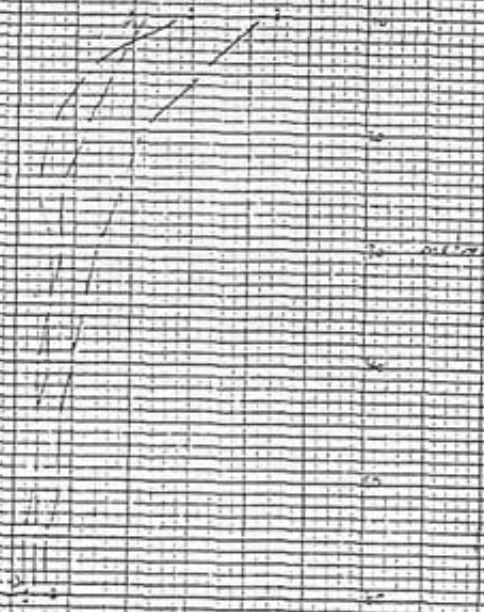
Booth hole PEM
Date 19-9
Scale vertical 1:500
horizontal 1:500
Date 1985
Page 160
Fig. 10



Barometer 28.1
 DDH 79-10
 Date 11/20
 Gr. 169
 P. 111

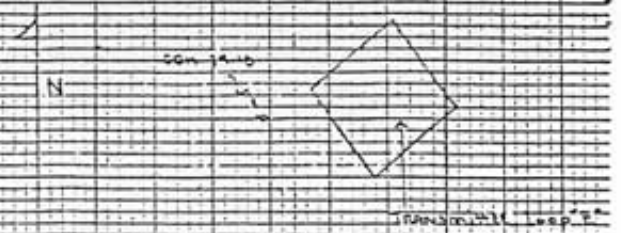


100.00



100.00 100.00 100.00 100.00 100.00

DATE: 10/10/50
BY: [unclear]
PROJECT: [unclear]
FIG. 10

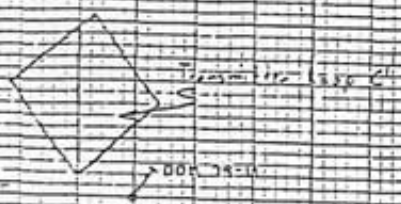


collyer

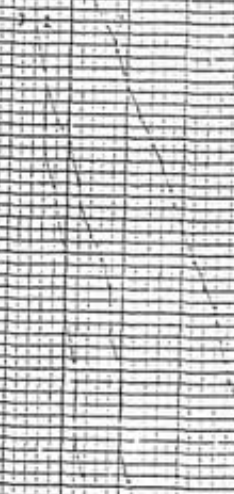
10 (meters)

Revised PFA
date 10-11
size 1000
horizontal layer
July 1920
C-150
E-10

N



1000
1000



1000 1000

1000 1000

Coordinate PEN

DDN 79 11

Scale vertical 1:500
horizontal 1:1000

Date 1920

Gen 150

Fluo 0



DDN 79 11

later plan by [unclear]

✓
✓

✓
✓

✓
✓

✓
✓

✓
✓

✓
✓

11111

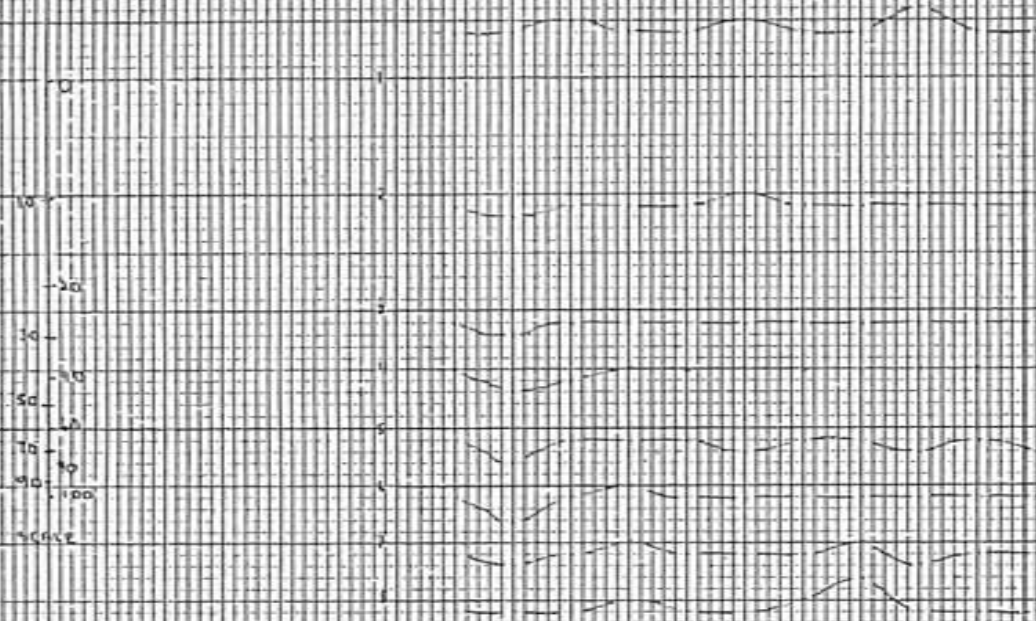
11111

Profile Line 101, Horizontal Loop PEM, Frequency = 75

SRM 11500
July 1980
R. W. S.

3000 2000 1000 000

NR 752 NR 753 NR 754

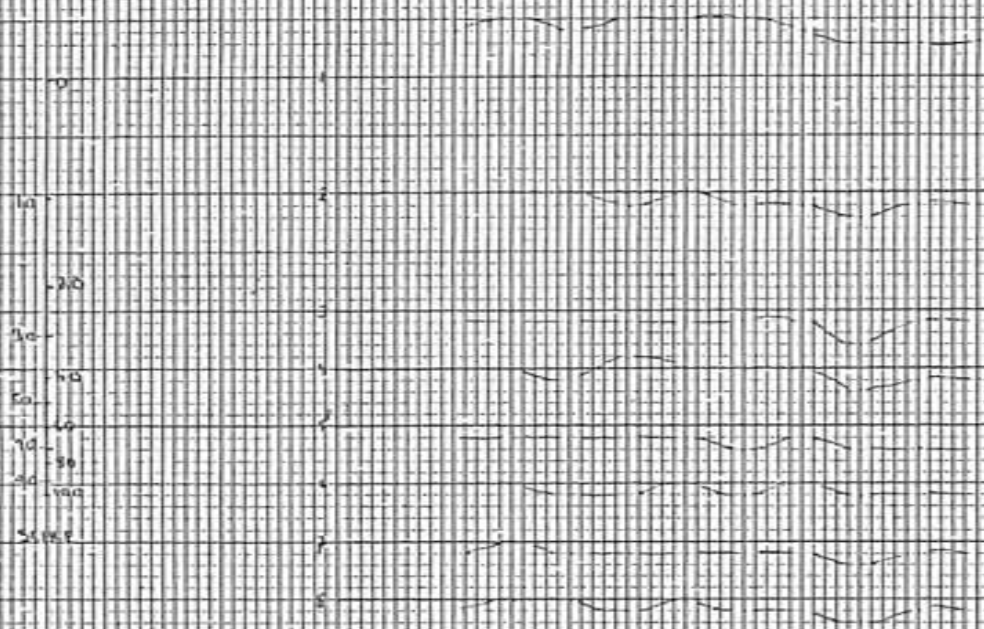


Top Line 60° , 1000 ft. deep PEN. S.W. 1/4 Sec. 28.

Scale 1:2500

July 1980 2000 2000 2000 2000

Sta. 23



V.P.E.M. No. 2500
Scale 1:2500
Total 1780
Pic 34

Loop 1
Loop 2
Loop 3
Loop 4



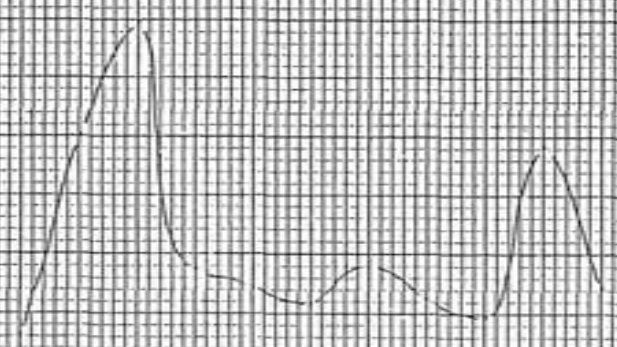
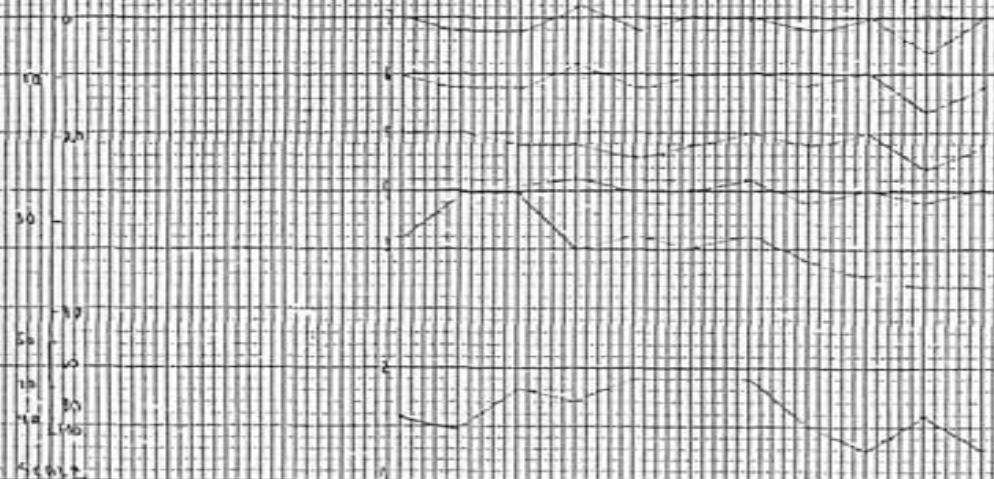
VPBM Horizontal Component - Line 3000 N

SCALE 1:2500

July 1980

Fig. 25

1000 2000 3000 4000 5000



APPENDIX C

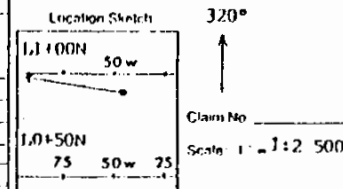
DIAMOND DRILL LOGS

DIAMOND DRILL RECORD

Hole No. CC-80-1

Hole No. <u>CC-80-1</u>	Length <u>125 m</u>	Commenced <u>July 19, 1980</u>	Dip <u>-45°</u>
Property <u>Crystal Creek B.C.</u>	Bearing <u>238°</u>	Completed <u>July 25, 1980</u>	
Township <u>N15 85 K15</u>	Dip <u>-45° at 125 m</u>	Drilling Co. <u>Cameron McCutcheon</u>	Core Test <u>Depth</u> <u>Trig</u> <u>True</u>
Location <u>NIS 85 K15</u>	Objective <u>Weathered surface exposure: Limestone unit</u>	Core Size <u>N03 1.75"</u>	<u>Propari test at 125 m</u> <u>238°/-45°</u>
Logged By <u>R. J. Ialred</u>		Casing Left in Hole <u>Casing and shoe removed</u>	<u>Planned Orientation 240/45</u>
Core Location <u>Calgary</u>			

Remarks Average core recovery for 80-1: 76% DRILLING HUD WAS NOT USED. TOTAL WATER LOSS AT 23 m. CAVE-IN AT 50.6 m. 33% CORE RECOVERY FROM 41.5-50.6



Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	%	%	%	oz/ton	oz/ton
From (m)	To (m)										
0	3.05	CASING	1814	5.55	5.00	0.25	.01	.02	.01	.16	.Tr
3.05	5.79	SHALE black, fine grained, minor pyrite, phyllitic, hematized	1815	5.00	6.10	0.30	.Tr	.02	.01	.18	.Tr
			1816	6.10	6.35	.25	.Tr	.02	.01	.14	.Tr
			1817	7.98	8.23	0.25	.01	.02	.02	.14	.Tr
5.79	6.10	ARENITE calcareous, hematized, grey, minor blue quartz eyes	1801	8.23	8.66	0.43	.01	.04	.02	.58	.Tr
			1802	8.66	9.08	0.42	.01	.02	.03	.16	.Tr
6.10	8.23	SHALE calcareous, hematized, black, phyllitic	1803	9.08	9.51	0.43	.Tr	.02	.02	.76	.Tr
			1804	9.51	9.94	0.43	.Tr	.02	.01	.50	.Tr
8.23	10.21	ARENITE calcareous, hematized, grey	1805	9.94	10.21	0.27	.01	.02	.01	.18	.Tr
			1818	11.66	11.91	0.25	.01	.02	.01	.18	.Tr
10.21	14.78	SHALE calcareous from 10.21 - 10.82	1806	12.19	12.50	0.31	.01	.04	.02	.14	.Tr
		11.28 - 14.78	1819	14.53	14.78	0.25	.01	.02	.05	.16	.Tr
		grey + black, hematized, 5% pyrite cubes from 12.50 - 13.11	1807	14.70	16.31	1.53	.01	.02	.11	.16	.Tr
		calcareous areas are strongest with strongest hematization	1808	16.31	16.76	0.45	.Tr	.02	.11	.14	.Tr
		Bedding at 60° to core axis at 10.35 m; 90° at 12.00	1809	16.76	17.10	0.34	.01	.02	.06	.14	.Tr
14.78	17.07	ARENITE calcareous, extensively hematized, grey	1820	17.10	17.31	0.21	.01	.02	.08	.16	.Tr
			1810	17.98	18.29	0.31	.01	.02	.03	.14	.Tr
17.07	18.59	SHALE calcareous, hematized, black	1821	18.35	18.60	0.25	.01	.02	.03	.14	.Tr
			1811	18.60	19.08	0.48	.01	.02	.05	.16	.Tr
18.59	19.81	ARENITE calcareous, extensively hematized, grey	1812	19.08	19.51	0.43	.Tr	.02	.04	.14	.Tr
			1813	19.51	19.81	0.30	.01	.02	.02	.14	.Tr
19.81	22.56	LIMBY SHALE weakly hematized, black, pyritic, contorted laminations from 20.42 to 21.95. Quartz vein from 20.42 - 20.57 m and from 22.56 - 22.66 m	1822	19.81	20.06	0.25	.01	.02	.02	.14	.Tr
			1823	22.25	22.40	0.15	.Tr	.02	.01	.12	.Tr

DIAMOND DRILL RECORD

Hole No. CC-00-1
Sheet No. 3 of 3

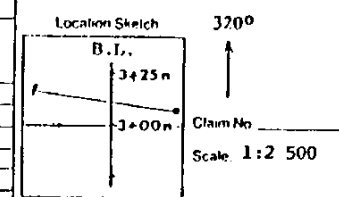
Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	% Cu	% Pb	% Zn	oz/ton Ag	oz/ton Au
From (m)	To (m)										
39.01	41.36	INTERBEDDED BLACK SHALE AND GREY ARENACEOUS SHALE white speckled shale minor pyrite, 8 cm quartz vein at 40.08 m. Bedding at 85° to core axis at 40 m.	1851	41.1	41.36	0.25	.01	Tr	.01	.02	Tr
41.36	41.54	ARENITE grey, coarse grained (2-3 mm) with blue quartz eyes	1852	41.36	41.54	0.18	.01	Tr	.02	.04	Tr
41.54	41.76	SHALE white speckled black shale	1853	41.54	41.76	0.22	.01	.02	.01	.02	Tr
41.76	42.06	ARENITE grey, coarse grained (2-3 mm) with blue quartz eyes	1854	41.76	42.06	0.30	.01	Tr	.01	.02	Tr
42.06	44.47	INTERBEDDED BLACK AND GREY SHALE 5% pyrite from 43.59 - 44.47 m	1855	42.06	44.47	0.25	.01	.02	.01	.02	Tr
44.47	44.50	CLAY Brown									
44.50	67.67	SHALE grey black, minor pyrite, white speckled shale, minor quartz at 47.05 m rusty. Soft shale mud at 50.60 m. Minor pyrite. Bedding at 70° to core axis at 53 m	1856	44.50	67.67	0.25	.01	.02	.01	.10	Tr
67.67	67.82	ARENITE light grey, fine grained, arenite to a quartz arenite	1857	67.67	67.82	0.18	.01	.02	.01	.20	Tr
67.82	122.99	SHALE black, possible fault gouge at 78.33 m 1 cm wide - 3 cm quartz vein at 81.69 m - possible fault gouge at 84.58 m 2 cm wide - 10 cm of light grey brown clay at 87.17 m - 15 cm of ground quartz at 103.50 m - very soft section shale from 111.48 m to 113.39 m - Bedding at 50° at 71 m; 50° at 77 m; 35° at 83 m; 50° at 91 m; 45° at 98 m; 30° at 118 m; 25° at 122 m	1858	67.82	68.07	0.25	.01	.02	.01	.24	Tr
			1859	122.75	123.00	0.25	.01	.02	.01	.02	Tr
122.99	124.97	ARENITE quartz arenite, light grey, fine grained, minor quartz veining throughout	1860	123.00	123.50	0.50	.01	.02	.01	.02	Tr
			1861	123.50	124.00	0.50	.01	Tr	.01	.04	Tr
			1862	124.00	124.50	0.50	Tr	Tr	.01	.02	Tr
124.97		END OF HOLE	1863	124.50	125.00	0.50	Tr	Tr	.01	.02	Tr

DIAMOND DRILL RECORD

Hole No **CC-80-2**

Hole No CC-80-2	Length 100.58 m	Commenced July 26, 1980	Dip Collar -45°
Property Crystal Creek	Bearing 238°	Completed July 29, 1980	Rich Test Depth 100.58 m
Township NTS 85 K15	Dip -45°	Drilling Co Cameron McCutcheon	True 238°/45°
Location 3+06 N 0+32 E	Objective Limestone Unit: Rn-Dr111 of 75-1	Core Size RQ3 1.75"	Tropari Test at 100.58 m
Logged By R. J. Laird		Casing Left in Hole Casing and Shoe Removed	Planned Orientation: 236°/45°
Core Location Calgary			

Remarks **Average Core Recovery for 80-2: 74% . CAVE FROM 50.3 m to 65.8 m**



Foolage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Z Cu	Z Pb	Z Zn	oz/ton Ag	oz/ton Au
From (m)	To (m)										
0	1.02	CASING									
1.02	1.52	SHALE hematized, grey, pyritic, calcareous	1864	1.27	1.52	0.25	.01	Tr	.34		Tr
1.52	1.87	LIMEY ARENITE grey, fine grained, calcareous, hematized, pyritic. Bedding at 45° to core axis at 1.75 m	1865	1.52	1.87	0.60	Tr	Tr	.22		Tr
1.87	2.55	SHALE black, pyritic, hematized, calcareous	1866	1.87	2.02	0.15	.01	Tr	.42		Tr
2.55	2.95	ARENITE grey, fine grained, hematized, calcareous	1867	2.30	2.55	0.25	.01	Tr	.10		Tr
			1868	2.55	2.95	0.40	.01	.02	.34		Tr
2.95	3.75	SHALE black, fine grained, hematized, pyritic, calcareous	1869	2.95	3.20	0.25	.01	Tr	.24		Tr
3.75	5.45	LINESTONE grey, fine grained, pyritic, partially hematized	1870	3.50	3.75	0.25	.01	.02	.36		Tr
			1871	3.75	4.20	0.45	Tr	.02	.02		Tr
5.45	5.85	SHALE, black, hematized, calcareous	1872	4.20	4.70	0.50	.01	.02	.04		Tr
			1873	4.70	5.15	0.45	.01	.02	.02		Tr
5.85	7.12	LINESTONE, grey, fine grained, hematized, pyritic	1874	5.15	5.45	0.30	Tr	.02	.02		Tr
			1875	5.45	5.85	0.40	.01	Tr	.02		Tr
7.12	8.14	SHALE black, fine grained, pyritic, calcareous, hematized	1876	5.85	6.30	0.45	.01	.02	.02		Tr
			1877	6.30	6.80	0.50	.01	Tr	.04		Tr
8.14	9.14	LINESTONE, grey, fine grained, weakly hematized	1878	6.80	7.12	0.32	.01	.02	.02		Tr
			1879	7.12	7.37	0.25	.01	.02	.02		Tr
9.14	11.18	SHALE black, pyritic, hematized, calcareous, arenaceous. Bedding at 80° to core axis at 10.75 m	1880	7.89	8.14	0.25	.01	.02	.08		Tr
			1881	8.14	8.64	0.50	Tr	.02	.02		Tr
			1882	8.64	9.14	0.50	.01	.02	.02		Tr
			1883	9.14	9.39	0.25	.01	Tr	.02		Tr
			1884	9.93	11.18	0.25	Tr	Tr	.02		Tr

DIAMOND DRILL RECORD

Hole No. CC-80-2

Sheet No. 2/4

Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Σ Cu	Σ Pb	Σ Zn	oz/tm Ag	oz/ton Au
From (m)	To (m)										
11.18	12.38	LIMESTONE grey, fine grained, weakly hematized, pyritic, minor quartz veins	1885	11.18	11.78	0.60	.01	.02	.03	.02	Tr
12.38	13.11	ARENITE grey-brown, fine grained, hematized, pyritic, calcareous	1886	11.78	12.38	0.60	.01	.02	.01	.04	.010
			1887	12.38	13.11	0.73	.01	Tr	Tr	.22	.010
13.11	15.67	SHALE black, hematized, pyritic, calcareous. Bedding at 90° to core axis at 13.8 m	1888	13.11	13.36	0.25	.01	Tr	.04	.06	Tr
			1889	15.42	15.67	0.25	.01	Tr	.02	.10	Tr
15.67	19.15	LIMESTONE grey, fine grained, pyritic	1890	15.67	17.07	1.40	.01	Tr	.02	.02	Tr
			1891	17.07	17.57	0.50	.01	Tr	.01	.02	Tr
			1892	17.57	18.07	0.50	.01	Tr	.02	.02	Tr
19.15	23.93	SHALE black, hematized calcareous, arenaceous. Bedding at 75° to core axis at 21.5 m; 85° at 23.5 m.	1893	18.07	18.57	0.50	.01	.02	.03	.02	Tr
			1894	18.57	19.15	0.58	.01	Tr	.05	.08	.010
			1895	19.15	19.40	0.25	.01	Tr	.01	.20	Tr
23.93	24.48	ARENITE grey, fine grained, calcareous, weakly hematized	1896	23.68	23.93	0.25	.01	Tr	.01	.02	Tr
			1897	23.93	24.48	0.55	.01	Tr	.01	.02	Tr
24.48	29.87	SHALE grey and black, partially hematized, calcareous. Bedding at 75° to core axis at 28.8 m.	1898	24.48	24.73	0.25	.01	Tr	.01	.02	Tr
			1899	29.62	29.87	0.25	.01	Tr	.01	.02	Tr
29.87	37.80	ARENITE grey, fine grained, pyritic, calcareous	1900	29.87	30.37	0.50	.01	.12	.01	.08	Tr
			11001	30.37	30.87	0.50	.02	.02	.01	.28	Tr
			11002	30.87	32.31	1.44	.01	.02	.01	.02	Tr
37.80	39.82	SHALE black, fine grained, phyllitic, hematized, calcareous	11003	32.31	32.81	0.50	.01	.02	.01	.22	Tr
			11004	32.81	33.31	0.50	.01	.02	.01	.30	.010
39.82	40.07	ARENITE grey, fine grained, calcareous, pyritic	11005	33.31	33.81	0.50	.01	.04	.01	.24	Tr
			11006	33.81	34.31	0.50	.01	.02	.01	.52	Tr
40.07	40.99	SHALE, black, pyritic. Calcareous, grey-brown pyritic arenite from 40.47-40.80 m Grey and black arenaceous shale from 40.80-40.99 m	11007	34.31	34.81	0.50	.01	.02	.01	.24	Tr
			11008	34.81	35.31	0.50	.01	.02	.01	.20	Tr
			11009	35.31	35.81	0.50	.01	.02	.01	.12	Tr
40.99	41.44	ARENITE grey, fine grained, pyritic	11010	35.81	36.31	0.50	.01	.02	.01	.16	Tr
			11011	36.31	36.81	0.50	.01	.02	.01	.26	Tr
41.44	41.57	SHALE laminated grey and black shale, fine-grained	11012	36.81	37.31	0.50	.01	.02	.02	.12	Tr
			11013	37.31	37.80	0.49	.01	.02	.02	.04	Tr
41.57	41.82	ARENITE grey, fine grained, calcareous, very minor pyrite	11014	37.80	38.05	0.25	.01	.02	.01	.80	Tr
			11015	39.57	39.82	0.25	.01	.02	.02	.26	Tr
41.82	45.17	SHALE grey and black laminated shale, pyritic calcareous from 43.32-43.75. Bedding at 75° to core axis at 43.75 m.	11016	39.82	40.07	0.25	.01	.02	.01	.70	Tr
			11017	40.07	40.32	0.25	.01	.02	.02	.04	Tr
			11018	40.74	40.99	0.25	.01	.02	.02	.80	Tr
45.17	48.22	ARENITE grey, fine grained, hematized, calcareous, pyritic	11019	40.99	41.44	0.45	.01	.02	.01	.02	Tr
			11020	41.44	41.57	0.13	.01	.02	.02	.02	Tr
48.22	48.94	SHALE black and grey laminated shale	11021	41.57	41.82	0.25	.01	.02	.01	.04	Tr
			11022	41.82	42.07	0.25	.01	Tr	.01	.06	Tr
			11023	44.92	45.17	0.25	.01	.02	.02	.02	Tr
			11024	45.17	45.67	0.50	Tr	Tr	.01	.02	Tr

DIAMOND DRILL RECORD

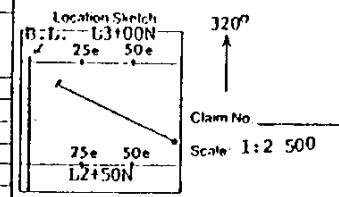
Fouage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Z Cu	Z Pb	Z Zn	oz/ton Ag	oz/ton Au
From (m)	To (m)										
48.94	52.36	ARENITE grey, medium grained, calcareous, hematized	11025	45.67	46.17	0.50	.01	Tr	.01	.08	Tr
			11026	46.17	46.67	0.50	.01	.04	.01	.02	Tr
			11027	46.67	47.17	0.50	.01	.02	.01	.02	Tr
52.36	52.73	SHALE black and grey laminated shale, phyllitic, hematized	11028	47.17	47.67	0.50	.01	.02	.02	.06	Tr
			11029	47.67	48.22	0.55	.01	.02	.01	.02	Tr
52.73	53.03	ARENITE grey, fine grained, pyritic, calcareous, hematized	11030	48.22	48.47	0.25	.01	.02	.01	.04	Tr
			11031	48.47	48.94	0.25	.01	.10	.01	.02	Tr
53.03	54.56	SHALE black, pyritic, phyllitic. Bedding at 80° at 53.5 m	11032	48.94	49.54	0.60	.01	.02	.01	.08	Tr
			11033	49.54	50.05	0.50	.01	.02	.02	.06	Tr
54.56	55.06	ARENITE grey, fine grained, pyritic, calcareous, weakly hematized	11034	50.04	50.54	0.50	.01	.02	.02	.10	Tr
			11035	50.54	51.04	0.50	.01	.02	.02	.06	Tr
55.06	66.27	SHALE black, phyllitic, calcareous. Black and grey laminated shale from 55.06-59.64 m. Clay and shale chips from 59.64 - 61.26 m. Bedding at 35° to core axis at 58.5,	11036	51.04	51.54	0.50	.01	.02	.01	.02	Tr
			11037	51.54	52.04	0.50	.01	.02	.02	.08	Tr
			11038	52.04	52.36	0.32	.01	.02	.02	.02	Tr
			11039	52.36	52.73	0.37	.01	.02	.02	.02	Tr
66.27	68.17	ARENITE partially hematized, grey, fine grained, calcareous	11040	52.73	53.03	0.30	.01	.02	.01	.02	Tr
			11041	53.03	53.28	0.25	.01	.02	.01	.02	Tr
68.17	68.32	SHALE black, partially hematized	11042	53.28	54.56	0.25	.02	.08	.02	.02	Tr
			11043	54.56	55.06	0.50	.01	.04	.01	.02	Tr
68.32	68.88	ARENITE grey, fine grained, hematized calcareous	11044	55.06	55.31	0.25	.01	.02	.01	.02	Tr
			11045	55.31	66.27	0.43	.01	.02	.01	.02	Tr
68.88	69.28	SHALE black, phyllitic, partially hematized. Clay and shale chips from 68.88 m - 68.95 m. Quartz vein from 68.95-68.99 m.	11046	66.27	66.77	0.50	.01	.02	.01	.18	Tr
			11047	66.77	67.36	0.59	.01	.02	.01	.04	Tr
			11048	67.36	68.17	0.81	.01	.02	.01	.02	Tr
69.28	69.46	ARENITE grey, calcareous, hematized	11049	68.17	68.43	0.15	.01	.02	.01	.02	Tr
			11050	68.32	68.88	0.56	.01	.02	.01	.12	Tr
69.46	70.41	SHALE black, phyllitic, partially hematized	11051	68.88	69.28	0.40	.01	.02	.01	.32	Tr
			11052	69.28	69.46	0.18	.01	.02	.01	.14	Tr
70.41	74.68	ARENITE red-brown, medium grained, hematized, calcareous, minor quartz veining	11053	69.46	70.41	0.95	.01	.02	.01	.04	Tr
			11054	70.41	71.50	1.09	.01	.02	.02	.08	Tr
74.68	75.63	SHALE black, phyllitic, partially hematized. Bedding at 50° at 75m	11055	71.50	74.68	3.18	.01	.02	.02	.02	Tr
			11056	74.93	74.93	0.25	.01	.02	.01	.10	Tr
75.63	76.04	ARENITE grey brown hematized, calcareous. 15 cm quartz vein at 45° to core axis	11057	75.63	75.63	0.34	.01	.02	.01	.06	Tr
			11058	76.04	76.04	0.41	.01	.02	.01	.02	Tr
76.04	76.14	SHALE grey, phyllitic	11059	76.14	76.14	0.10	.01	.02	.01	.12	Tr
76.14	76.54	ARENITE light grey, calcareous, 2 cm. wide quartz vein parallel to core axis	11060	76.54	76.54	0.50	.01	.02	.03	.02	Tr
76.54	76.70	SHALE black, phyllitic	11061	76.70	76.70	0.16	.01	.02	.02	.04	Tr

DIAMOND DRILL RECORD

Hole No. CC-80-3

Hole No. CC-80-3	Length 99.06 m	Commenced July 29, 1980	Dip Collar 45°
Property Crystal Creek	Bearing 264°	Completed August 1, 1980	Etch Test Depth Hdq True
Township NTS 85 K15	Dip 50°	Drilling Co. Cameron McCutcheon	255°/50°
Location 2 + 61 N 0 + 71 E	Objective Weathered Surface	Curr Size NQ3 1.75"	Tripart Test at 99.06 m
Logged By R. J. Laird	Exposure: Limestone Unit	Casing Left in Hole Casing and Shoe Removed	Planned Orientation: 235°/45°
Core Location Calgary			

Remarks Average Core Recovery for CC-80-3: 77%



Fracture		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Z Cu	Z Pb	Z Zn	oz/ton Ag	oz/ton Au
From (m)	To (m)										
0	3.05	CASING									
3.05	14.02	SHALE black, pyritic, hematized	11073	13.77	14.02	0.25	.01	.02	.10	.08	Tr
14.02	15.54	SAND AND MUD dark brown, contains shale chips	11074	14.02	14.78	0.76	.01	.02	.25	.04	Tr
15.54	16.80	LINESTONE grey, fine grained pyritic, hematized	11075	14.78	15.54	0.76	.01	.02	.26	.14	Tr
16.80	18.62	SHALE grey-brown, hematized	11076	15.54	16.80	1.26	.01	.02	.06	.12	Tr
18.62	18.83	SAND, MUD, SHALE CHIPS	11077	16.80	17.05	0.25	.01	.02	.11	.18	Tr
18.83	19.89	SHALE brown, hematized, pyritic	11078	18.37	18.62	0.25	.01	.02	.14	.52	Tr
19.89	20.12	LINESTONE, grey, fine grained, pyritic	11079	18.62	18.83	0.21	.01	Tr	.24	.04	Tr
20.12	21.57	SAND, MUD, SHALE CHIPS	11080	18.83	19.36	0.53	.01	Tr	.07	.12	Tr
21.57	23.97	SHALE, brown hematized, calcareous from 22.16-22.86 m. Arenaceous from 23.37-23.97 m	11081	19.36	19.89	0.53	.02	.02	.04	.38	Tr
23.97	24.20	LINESTONE grey, fine grained, pyritic, partially hematized	11082	19.89	20.12	0.23	.01	.02	.01	.16	Tr
24.20	30.78	SHALE, grey, phyllitic, partially hematized. Calcareous from 24.20-26.82 m	11083	20.12	21.57	1.45	.01	.02	.12	.20	Tr
30.78	30.90	ARENITE brown, fine grained, hematized, calcareous	11084	21.57	21.82	0.25	.01	Tr	.01	.00	Tr
			11085	23.72	23.97	0.25	.01	Tr	.01	.02	Tr
			11086	23.97	24.20	0.23	.01	Tr	.01	.06	Tr
			11087	24.20	24.45	0.25	.01	Tr	.01	.00	Tr
			11088	30.53	30.78	0.25	.02	Tr	.02	.01	Tr
			11089	30.78	30.90	0.20	Tr	Tr	.01	.04	Tr

DIAMOND DRILL RECORD

Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Z Cu	Z Pb	Z Zn	oz/ton Ag	oz/ton Au
From (m)	To (m)										
30.98	31.18	SHALE, black, fine grained, phyllitic	11090	30.98	31.18	0.20	.01	.02	.07	.38	Tr
31.18	31.26	QUARTZ VEIN, rusty									
31.26	32.38	ARENITE fine-grained, brown, calcareous, hematized	11091	31.26	32.38	1.12	.01	.02	.01	.24	Tr
32.38	39.01	SHALE grey and brown, hematized, calcareous from 37.45-38.30 m	11092	32.38	32.63	0.25	.01	Tr	.01	.22	Tr
			11093	38.76	39.01	0.25	.01	Tr	.01	.16	Tr
39.01	40.08	ARENITE brown, fine grained, hematized	11094	39.01	39.51	0.50	.01	Tr	.01	.10	Tr
			11095	39.51	40.08	0.57	.01	Tr	.01	.06	Tr
40.08	41.41	SHALE grey, fine grained, hematized, calcareous from 40.08-40.23 m. 2 cm wide quartz vein at 40.15 m at 45° to core axis	11096	40.08	40.33	0.25	.01	Tr	.01	.02	Tr
			11097	41.16	41.41	0.25	.01	.02	.01	.14	Tr
			11098	41.41	41.91	0.50	.01	.02	.01	.04	Tr
41.41	48.34	ARENITE grey, fine grained, hematized minor pyrite present. Calcareous from: 41.66-42.98 m 43.68-48.34 m	11099	41.91	42.41	0.50	.01	Tr	Tr	.02	Tr
			11100	42.41	42.91	0.50	.01	.02	.01	.06	Tr
			11101	42.91	43.40	0.49	.01	Tr	.01	.02	Tr
			11102	43.40	43.90	0.50	.01	Tr	Tr	.06	Tr
48.34	48.77	SHALE grey and black arenaceous shale, partially hematized, pyritic	11103	43.90	44.40	0.50	.01	Tr	.01	.02	Tr
			11104	44.40	44.90	0.50	.01	.02	.01	.02	Tr
48.77	49.07	ARENITE brown, fine grained, pyritic, hematized, calcareous	11105	44.90	45.40	0.50	.01	.02	.01	.04	Tr
			11106	45.40	45.90	0.50	.01	Tr	.01	.20	Tr
49.07	50.94	SHALE grey and black laminated shale, pyritic. Bedding at 30° to core axis at 50.5 m	11107	45.90	46.40	0.50	.01	.02	.01	.02	Tr
			11108	46.40	46.90	0.50	.01	.04	.01	.04	Tr
			11109	46.90	47.40	0.50	.01	Tr	.01	.02	Tr
50.94	51.19	ARENITE light grey, fine grained, pyritic, calcareous, hematized	11110	47.40	47.90	0.50	.01	.02	.01	.02	Tr
			11111	47.90	48.34	0.44	.01	Tr	.01	.04	Tr
51.19	57.91	SHALE grey and black laminated shale from 51.19-56.47 m, pyritic. Bedding at 35° to core axis at 54 m. Grey arenaceous shale from 56.47-57.91 m; hematized, calcareous	11112	48.34	48.77	0.43	.01	Tr	.01	.02	Tr
			11113	48.77	49.07	0.30	.01	.02	.01	.02	Tr
			11114	49.07	49.37	0.25	.01	Tr	.02	.04	Tr
			11115	50.69	50.94	0.25	.01	Tr	.01	.02	Tr
57.91	58.52	ARENITE grey, fine grained, hematized, calcareous	11116	50.94	51.19	0.25	.01	Tr	.02	.02	Tr
			11117	51.19	51.44	0.25	.01	.04	.02	.02	Tr
58.52	61.30	SHALE brown and black, hematized, calcareous	11118	57.66	57.91	0.25	.01	Tr	.06	.04	Tr
			11119	57.91	58.52	0.61	Tr	Tr	.01	.02	Tr
61.30	62.00	ARENITE grey, fine grained, hematized, pyritic, calcareous	11120	58.52	58.77	0.25	.01	.02	.15	.18	Tr
			11121	61.05	61.30	0.25	Tr	.04	.21	.36	.01
62.00	62.25	SHALE grey, medium grained pyritic	11122	61.30	62.00	0.70	Tr	Tr	.02	.30	.01
			11123	62.00	62.25	0.25	.01	.02	.02	.06	Tr

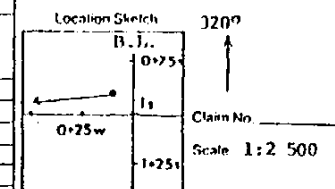
DIAMOND DRILL RECORD

Folage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Σ Sh	Σ Cu	Σ Pb	Σ Zn	Ag	As	Te	Au
From (m)	To (m)													
62.25	62.35	QUARTZ VEIN 30° to core axis												
62.35	62.70	ARENITE grey, fine grained, pyritic. Possible fault gouge from 62.50-62.53 m	11124	62.35	62.70	0.35		.01	.04	.03	.08	Tr		
62.70	63.50	SHALE grey-brown, medium grained, arenaceous, hematized, calcareous	11125	62.70	62.95	0.25		.01	.20	.07	.10	Tr		
			11126	63.25	63.50	0.25		.01	Tr	.09	Tr	.06		
63.50	63.66	SAND AND SHALE CHIPS brown, yellow and green staining, due to Sh	11127	63.50	63.66	0.16	3.24	.07	9.59	7.62	.06	1.60		
63.66	64.00	SHALE brown, fine grained, hematized, calcareous	11128	63.66	64.00	0.34		.01	.16	.37	Tr	.12		
64.00	64.80	ARENITE grey, medium grained, pyritic, hematized, calcareous	11129	64.00	64.40	0.40		.01	.04	.03	Tr	.04		
			11130	64.40	64.80	0.40		.01	Tr	.02	Tr	.12		
64.80	64.95	SHALE grey, fine grained	11131	64.80	64.95	0.15		.01	Tr	.05	.01	.06		
64.95	65.25	ARENITE grey, medium grained, partially hematized, slightly calcareous	11132	64.95	65.25	0.30		Tr	Tr	.04	Tr	.04		
			11133	65.25	65.50	0.25		.01	.02	.06	Tr	.12		
65.25	65.93	SHALE black, fine grained, pyritic. 1 cm wide quartz vein at 65.83 m at 30° to core axis. Bedding at 40° to core axis at 65.25 m.	11134	65.68	65.93	0.25		Tr	.04	.04	.01	.06		
65.93	67.26	ARENITE grey, medium grained, pyritic, hematized, calcareous. Minor SPIALERITE at 67.05 m (1cm)	11135	65.93	66.33	0.40		.01	Tr	.02	Tr	.06		
			11136	66.33	66.75	0.42		Tr	Tr	.01	Tr	.02		
			11137	66.75	67.26	0.51		Tr	.06	.38	.01	.06		
67.26	70.95	SHALE grey and black, pyritic, hematized, calcareous. Bedding at 20° to core axis at 68.80.	11138	67.26	67.51	0.25		.01	.02	.07	.01	.02		
			11139	70.70	70.95	0.25		Tr	.02	.01	Tr	.02		
70.95	71.28	ARENITE grey, medium grained, minor pyrite	11140	70.95	71.28	0.33		.01	Tr	.01	Tr	.02		
71.28	71.60	SHALE grey, fine grained, minor pyrite	11141	71.28	71.60	0.32		.01	Tr	.01	.01	.02		
71.60	71.88	ARENITE grey, medium grained, pyritic	11142	71.60	71.88	0.28		.01	Tr	.01	Tr	.02		
71.88	76.60	SHALE black and grey laminated shale. Quartz arenite from 74.74-74.94 m. Quartz vein from 73.80 m-74.20 m. 2 cm quartz and calcite vein at 75.87 m at 90° to core axis. Bedding at 25° to core axis at 75.5 m	11143	71.88	72.13	0.25		.01	.02	.02	.01	.02		
			11144	76.35	76.60	0.25		.01	Tr	.01	Tr	.42		

DIAMOND DRILL RECORD

Hole No. CC-80-4

Hole No.	CC-80-4	Length	99.36 m	Commenced	August 1, 1980	Dip	Collar	45°
Property	CRYSTAL CREEK, B.C.	Bearing	224°	Completed	August 4, 1980	Etch Test	Depth	100
Township		Dip	40°	Drilling Co.	Cameron McCutcheon	Depth	100	True
Location	NTS 85 K15 0191 S 0110 W	Objective	Weathered Surface	Core Size	NQ3 1.75"	Tropical Test at 99.36 m 224°/40°		
Logged By	R. J. Laird	Exposure: Arcuate Unit		Casing Left in Hole	Casing and Shoe Removed	Planned Orientation: 225°/45°		
Core Location	Calgary							
Remarks	Average Core Recovery for 80-4: 87% Total mud loss near 46 m.							



Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Z Cu	Z Pb	Z Zn	Z Ag	Z Au
From	To										
0	2.13	CASING									
2.13	6.30	ARENITE grey, medium-grained, hematized, calcareous, minor pyrite present	11164	2.13	3.10	0.97	.01	Tr	.03	.12	Tr
			11165	3.10	3.55	0.45	.01	Tr	.01	.10	Tr
6.30	6.60	SHALE grey and black, fine grained hematized	11166	3.55	4.20	0.65	.01	Tr	.01	.08	Tr
			11167	4.20	4.70	0.50	.01	Tr	.02	.12	Tr
6.60	6.75	ARENITE brown, fine grained, hematized	11168	4.70	5.35	0.65	.01	Tr	.03	.16	Tr
			11169	5.35	5.80	0.45	.01	Tr	.03	.06	Tr
6.75	7.06	SHALE black, fine grained, hematized	11170	5.80	6.30	0.50	.01	Tr	.02	.02	Tr
			11171	6.30	6.60	0.30	.02	.02	.03	.04	Tr
7.06	8.54	ARENITE brown, fine grained, hematized	11172	6.60	6.75	0.15	.01	Tr	.03	.04	Tr
			11173	6.75	7.06	0.31	.02	Tr	.04	.02	Tr
8.54	9.40	SHALE grey, fine grained, hematized, minor pyrite	11174	7.06	7.50	0.44	.01	Tr	.02	.04	Tr
			11175	7.50	8.00	0.50	.01	Tr	.03	.08	Tr
9.40	9.55	ARENITE grey, fine grained, hematized, minor pyrite	11176	8.00	8.54	0.54	.01	Tr	.01	.06	Tr
			11177	8.54	9.40	0.86	.01	Tr	.01	.04	Tr
9.55	10.55	SHALE black and grey laminated shale, pyritic, hematized. Bedding at 70° to core axis at 9.7 m.	11178	9.40	9.55	0.15	.01	Tr	.02	.06	Tr
			11179	9.55	9.80	0.25	.01	.02	.01	.02	Tr
			11180	10.30	10.55	0.25	.01	Tr	.01	.08	Tr
10.55	10.86	ARENITE, brown, fine grained, hematized, minor pyrite present.	11181	10.55	10.86	0.31	.01	Tr	.02	.06	Tr
10.86	11.80	SHALE grey, medium-grained, pyritic, hematized from 10.86-11.03; 11.62-11.80. Graded bedding at 11.2 m indicates beds are facing right side up.	11182	10.86	11.11	0.25	.01	Tr	.02	.04	Tr
			11183	11.55	11.80	0.25	.01	Tr	.02	.18	Tr
11.80	11.89	ARENITE brown, fine grained, hematized	11184	11.80	11.89	0.09	.01	Tr	Tr	.14	Tr

DIAMOND DRILL RECORD

Footage		DESCRIPTION	Sample No.	(m) From	(m) To	(m) Length	Σ Cu	Σ Pb	Σ Zn	oz/ton AR	oz/ton Au
From (m)	To (m)										
11.89	13.80	SHALE grey and black laminated shale, minor arenite, hematized Quartz vein from 13.65-13.72 m, rusty	11185	11.89	12.14	0.25	.01	Tr	.01	.22	Tr
13.80	13.93	ARENITE brown, medium grained, hematized	11186	13.55	13.80	0.25	.01	Tr	.02	.16	Tr
			11187	13.80	13.93	0.13	.01	Tr	.09	.12	Tr
13.93	14.50	SHALE grey and black laminated shale, weakly hematized, minor pyrite	11188	13.93	14.18	0.25	.01	Tr	.09	.14	Tr
14.50	14.65	ARENITE grey, medium grained, hematized	11189	14.25	14.50	0.25	.01	Tr	.02	.10	Tr
			11190	14.50	14.65	0.15	.01	Tr	.01	.20	Tr
14.65	15.55	SHALE white speckled black shale, fine-grained, pyritic	11191	14.65	14.90	0.25	.01	Tr	.01	.06	Tr
15.55	17.07	ARENITE grey, fine grained, pyritic, hematized, contains fine-grained disseminated GALENA	11192	15.30	15.55	0.25	.01	Tr	.01	.02	Tr
			11194	16.30	17.07	0.77	.01	.10	.36	.20	Tr
17.07	17.22	SHALE black, fine grained, pyritic, phyllitic	11195	17.07	17.22	0.15	.01	Tr	.04	.18	Tr
17.22	18.21	ARENITE grey, fine grained, hematized, calcareous. 5 cm quartz vein at 17.22 and at 18.21 m	11196	17.22	18.21	0.99	.01	.02	.06	.12	Tr
18.21	18.37	SHALE black, fine grained, phyllitic, hematized	11197	18.21	18.37	0.16	.01	Tr	.07	.10	Tr
18.37	18.51	ARENITE brown, fine grained, pyritic hematized	11198	18.37	18.51	0.14	.01	Tr	.21	.06	Tr
18.51	18.61	SHALE black, fine grained. Fault gouge from 18.59-18.61 m	11199	18.51	18.61	0.10	.01	Tr	.10	.66	Tr
18.61	19.20	ARENITE brown, fine grained, hematized, pyritic	11200	18.61	19.20	0.59	.01	Tr	.05	.16	Tr
19.20	19.47	SHALE black and brown arenaceous shale, laminated, hematized, pyritic	11201	19.20	19.47	0.27	.01	Tr	.02	.02	Tr
19.47	19.69	ARENITE grey, medium grained, hematized, calcareous, minor pyrite	11202	19.47	19.69	0.22	.01	Tr	.02	.02	Tr
19.69	20.05	SHALE, black, fine grained, hematized, calcareous, fault gouge from 20.03-20.05m	11203	19.69	20.05	0.36	.01	Tr	.05	.16	Tr
20.05	20.22	ARENITE grey, fine grained, hematized, calcareous, minor pyrite	11204	20.05	20.22	0.17	.01	Tr	.03	.02	Tr
20.22	20.82	SHALE black, fine grained, calcareous, pyritic	11205	20.22	20.47	0.25	.01	Tr	.01	.02	Tr
			11206	20.57	20.82	0.25	.01	Tr	.01	.04	Tr
20.82	20.87	ODOLITIC LIMESTONE BRECCIA grey, pyritic, partially hematized	11207	20.82	20.87	0.05	.01	Tr	.05	.02	Tr

DIAMOND DRILL RECORD

Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	%	%	%	oz/Ton	oz/Ton
From (m)	To (m)										
86.62	87.26	ARENITE grey, coarse grained (up to 2 mm)	11221	87.07	87.26					.66	Tr
87.26	87.43	SHALE black and grey laminated shale, fine grained	11222	87.26	87.43					.68	Tr
87.43	99.36	ARENITE grey, coarse grained (1-5 mm), weakly hematized, minor pyrite and arsenopyrite. Graded bedding indicates beds are right side up.	11223	89.07	90.07					.58	Tr
			11224	90.07	91.07					.60	Tr
			11225	91.07	92.07					.52	Tr
		NOTE: D-6 cat ran over the last 2 core boxes (from 90.22-99.36 m)	11226	92.07	93.07					.48	Tr
			11227	93.07	94.07					.44	Tr
			11228	94.07	95.07					.46	Tr
			11229	95.07	96.07					.46	Tr
		END OF HOLE	11230	96.07	97.97					.84	Tr
			11231	97.07	98.07					.56	Tr
			11232	98.07	99.36					.02	Tr

DIAMOND DRILL RECORD

File No. CC-80-5

File No. CC-80-5	Length 40.84 m	Commenced August 4, 1980	Dip 65°
Property Crystal Creek, B.C.	Bearing 241°	Completed August 5, 1980	Location Sketch B.L. 25w L1100E 57 25w 25e L1150g 370° Scale 1: 2 500
Township NTS R5 K15	Dip 51°	Drilling Co. Cameron McCutcheon	
Location 1 F 25 S 0 F 10 W	Objective Weathered Surface	Core Size NQ3 1.75"	Etch Test Depth Rtg True
Logged by R. J. Laird	Exposure: Arenite Unit	Casing Left in Hole Casing and Shoe Removed	Tropical Test at 40.84 m: 241°/51°
Core Location Calgary			Planned Orientation: 240°/45°

Remarks Average Core Recovery for 80-5: 59%

Footage		DESCRIPTION	Sample No.	(m) From	(m) To	(m) Length	%	%	%	oz/ton	oz/ton
From (m)	To (m)										
0	1.52	CASING									
1.52	4.63	ARENITE and arenaceous shale, grey, fine grained, pyritic, hematized, calcareous	11233	1.52	3.15	1.63	.01	.02	.08	.02	Tr
			11234	3.15	3.96	0.81	.01	.02	.16	.04	Tr
4.63	4.88	SHALE grey, fine grained	11235	3.96	4.40	0.44	.01	.02	.05	.04	Tr
			11236	4.40	4.88	0.48	.01	.02	.05	.12	Tr
4.88	5.19	QUARTZ ARENITE, grey, medium grained, minor pyrite. Partially hematized for the initial and final 4 cm of the unit.	11237	4.88	5.19	0.31	.01	Tr	.02	.06	Tr
5.19	5.29	SHALE grey and black laminated shale, fine grained, pyritic. Bedding at 80° to core axis.	11238	5.19	5.29	0.10	.01	Tr	.02	.24	Tr
5.29	5.39	ARENITE grey, fine grained, pyritic, hematized.	11239	5.29	5.39	0.10	.01	.02	.03	.32	Tr
5.39	5.99	SHALE grey and black laminated shale, pyritic	11240	5.39	5.64	0.25	.01	.02	.04	.04	Tr
			11241	5.74	5.99	0.25	.01	Tr	.02	.02	Tr
5.99	6.40	ARENITE with minor shale, grey, pyritic, hematized, weakly calcareous	11242	5.99	6.40	0.41	.01	.02	.03	.02	Tr
6.40	7.92	SHALE black, fine grained, minor quartz veining	11243	6.40	7.87	0.47	Tr	Tr	.03	.04	Tr
			11244	7.87	7.92	0.05	Tr	.02	.02	.02	Tr
7.92	7.98	ARENITE grey, medium grained, extensively hematized	11245	7.92	7.98	0.06	Tr	.02	.03	.10	Tr
7.98	9.45	SHALE white speckled black shale, fine grained, 5 cm. wide quartz vein at 9.40 m	11246	7.98	9.45	1.47	.01	.02	.03	.16	Tr
9.45	9.80	ARENITE grey, medium grained, hematized, pyritic	11247	9.45	9.80	0.35	Tr	Tr	.11	.02	Tr
			11248	9.80	9.86	0.06	Tr	.02	.03	.04	Tr
9.80	10.29	SHALE white speckled black shale, fine grained, pyritic, 10 cm. wide quartz vein from 10.19-10.29 m. at 15° to core axis. Bedding at 45° to axis.	11249	9.86	10.06	0.20	Tr	.02	.05	.02	Tr
			11250	10.06	10.29	0.23	.01	Tr	.09	.04	Tr

DIAMOND DRILL RECORD

Forage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Z Cu	Z Pb	Z Zn	oz/ton Ag	oz/ton Au
From (m)	To (m)										
10.29	10.88	ARENITE grey, medium grained, hematized, pyritic, Quartz vein from 11.24-11.28m	11251	10.29	10.80	0.51	Tr	.02	.09	.02	Tr
10.88	11.59	SHALE Interbedded black and grey arenaceous shale, hematized, pyritic	11252	10.80	10.88	0.08	.01	Tr	.07	.02	Tr
			11253	11.28	11.59	0.31	.01	Tr	.18	.34	Tr
11.59	11.74	ARENITE grey, fine grained, pyritic, weakly hematized, weakly calcareous	11254	11.59	11.74	0.15	Tr	Tr	.07	.06	Tr
11.74	11.96	SHALE black, fine grained	11255	11.74	11.96	0.22	.01	.02	.24	.22	Tr
11.96	12.70	ARENITE grey, medium grained, pyritic, hematized, calcareous from 12.50-12.70 m	11256	11.96	12.70	0.74	.01	.02	.21	.56	Tr
12.70	38.56	SHALE grey and black laminated shale, fine grained. Quartz veins from 20.98-21.15 m. Bedding at: 80° to core axis at 16.85 m 80° at 20.50 m 80° at 32.0 m 80° at 38.2 m	11257	12.70	12.95	0.25	.01	Tr	.27	.08	Tr
38.56	39.37	QUARTZ ARENITE grey, fine grained, hematized weakly calcareous. There are minor laminations of grey and black shale in the arenite unit.	11258	38.31	38.56	0.25	.02	.02	.05	.04	Tr
			11259	38.56	38.96	0.40	.01	.04	.04	.04	Tr
			11260	38.96	39.37	0.41	.01	.02	.02	.28	Tr
39.37	40.84	SHALE white speckled black shale, fine grained, weakly hematized from 39.90-40.57m.	11261	39.37	39.62	0.25	.01	Tr	.02	.20	Tr
		END OF HOLE									

DIAMOND DRILL RECORD

Hole No. CC-80-6

Hole No. <u>CC-80-6</u>	Length <u>30.78 m</u>	Commenced <u>August 6, 1980</u>	Dip Collar <u>90°</u>												
Property <u>Crystal Creek, B.C.</u>	Bearing <u>291°</u>	Completed <u>August 6, 1980</u>	<table border="1"> <tr> <th>Eth Test</th> <th>Depth</th> <th>Intg</th> <th>True</th> </tr> <tr> <td colspan="4">Tropical Test at 30.78 m: 291°/88°</td> </tr> <tr> <td colspan="4">Planned Orientation: -/90°</td> </tr> </table>	Eth Test	Depth	Intg	True	Tropical Test at 30.78 m: 291°/88°				Planned Orientation: -/90°			
Eth Test	Depth	Intg		True											
Tropical Test at 30.78 m: 291°/88°															
Planned Orientation: -/90°															
Township	Dip <u>88°</u>	Drilling Co. <u>Cameron McCutcheon</u>													
Location <u>NTS 85 K15</u>	Objective <u>Weathered Surface</u>	Core Size <u>NQ3 1.75"</u>													
<u>1 + 25 S 0 + 9 W</u>	Exposure: <u>Arenite Unit</u>	Casing Left in Hole <u>Casing and Shoe Removed</u>													
Logged By <u>R. J. Laird</u>															
Core Location <u>Calgary</u>															

Remarks Average Core Recovery for 80-6: 86%

Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	Z Cu	Z Pb	Z Zn	oz/ton Ag	oz/ton Au
From (m)	To (m)										
0	1.94	CASING									
1.94	4.98	ARENITE and arenaceous shale, grey, fine-medium grained, hematized, calcareous	11262	1.94	2.60	0.66	.01	.02	.12	.34	Tr
			11263	2.60	3.20	0.60	.01	Tr	.22	.02	Tr
4.98	5.33	SHALE grey, medium grained, hematized. Bedding at 50° to core axis at 5.1 m.	11264	3.20	3.80	0.60	.01	.04	.61	.02	Tr
			11265	3.80	4.40	0.60	.01	.02	.39	.06	Tr
5.33	6.20	QUARTZ ARENITE grey, medium grained, pyritic, hematized, calcareous	11266	4.40	4.98	0.58	.01	.02	.17	.02	Tr
			11267	4.98	5.33	0.35	.01	.02	.19	.10	Tr
6.20	6.65	SHALE arenaceous, grey, medium grained, hematized	11268	5.33	5.80	0.47	Tr	Tr	.01	.02	Tr
			11269	5.80	6.20	0.40	.01	.02	.06	.02	Tr
6.65	6.84	QUARTZ ARENITE grey, medium grained, hematized, calcareous	11270	6.20	6.65	0.45	.01	.02	.04	.26	.005
			11271	6.65	6.84	0.19	.01	.02	.03	.18	.005
6.84	7.52	SHALE black and grey laminated shale, fine grained, hematized, pyritic. Bedding at 40° to core axis at 7.25 m.	11272	6.84	7.09	0.25	.01	.02	.03	.02	Tr
			11273	7.27	7.52	0.25	.01	.02	.06	.02	Tr
7.52	8.85	QUARTZ ARENITE grey, fine grained, pyritic, hematized, calcareous. Minor black shale at 7.92-7.95; 8.02-8.05. Bedding at 40° to core axis 8.02.	11274	7.52	8.00	0.48	Tr	.02	.12	.06	Tr
			11275	8.00	8.42	0.42	Tr	Tr	.08	.02	Tr
			11276	8.42	8.85	0.43	.01	.02	.03	.52	Tr
8.85	12.10	ARENACEOUS SHALE grey, fine grained, pyritic, weakly hematized from 8.85-8.90 and from 9.40-9.67. Bedding at 35° to core axis at 10.0 m.	11277	8.85	9.10	0.25	.01	.02	.04	.06	Tr
12.10	15.74	SHALE black and grey laminated shale, fine grained, pyritic, weakly hematized. Bedding at 60° to core axis at 14.0 m.	11278	15.49	15.74	0.25	.01	.02	.09	.48	Tr
15.74	16.03	ARENITE brown, medium grained, pyritic, hematized	11279	15.74	16.03	0.29	Tr	.06	.16	.22	Tr

DIAMOND DRILL RECORD

Hole No. CC-80-7

Hole No. <u>CC-80-7</u>	Length <u>34.44 m</u>	Commenced <u>August 7, 1980</u>	Dip Collar <u>45°</u>
Property <u>Crystal Creek</u>	Draining <u>71°</u>	Completed <u>August 8, 1980</u>	Location Sketch
Township <u>M5S 85K15</u>	Dip <u>48°</u>	Drilling Co. <u>Cameron McCutcheon</u>	
Location <u>0 + 89 S 2 + 14 W</u>	Objective <u>To test for possible E-W extension of mineralization found in 1979 holes</u>	Core Size <u>NQ3 1.75"</u>	
Logged by <u>R. J. Laird</u>	Casing Left in Hole <u>Casing and shoe removed</u>	Depth <u>34.44 m</u>	Claim No. _____
Core Location <u>Calgary</u>		Planned orientation: <u>60°/45°</u>	Scale: <u>1:2 500</u>
Remarks <u>Average core recovery for 80-7: 95%</u>			

Footage		DESCRIPTION	Sample No	(m) From	(m) To	(m) Length	% Cu	% Pb	% Zn	gZn/Lb	gZn/ton
From (m)	To (m)										
0	2.00	CASING									
2.00	2.08	SHALE, black, fine grained, rusty	11288	2.00	2.08	0.08	.01	Tr	.02	.56	Tr
2.08	6.04	LIMESTONE 1. massive, very fine grained, grey, pyritic from 2.08 - 2.22 m	11289	2.08	2.60	0.52	.01	.02	.01	.26	Tr
		2.38 - 2.64 m	11290	2.60	3.10	0.50	.01	.02	.01	.20	Tr
		6.00 - 6.84 m	11291	3.10	3.60	0.50	.01	.02	.01	.02	Tr
		2. massive, medium grained, grey, pyritic: from 2.22 - 2.38 m	11292	3.60	4.10	0.50	.01	.02	.01	.04	Tr
		4.94 - 6.00 m	11293	4.10	4.70	0.60	.01	.02	.01	.02	Tr
		3. fine grained, laminated limestone and shale, grey pyritic, contorted bedding, Bedding at 80° to core axis at 2.65 m	11294	4.70	5.35	0.65	Tr	.02	Tr	.56	Tr
		this unit occurs from 2.64 - 4.94 m	11295	5.35	5.85	0.50	.01	.02	Tr	.30	Tr
			11296	5.85	6.50	0.65	.01	.02	.01	.42	Tr
6.84	7.12	SHALE grey and black laminated shale, fine grained, pyritic, hematized, calcareous	11297	6.50	6.84	0.34	Tr	.02	.01	.14	Tr
			11298	6.84	7.12	0.28	.01	.02	.02	.16	Tr
7.12	9.45	QUARTZ ARENITE grey, fine grained, pyritic calcareous, Contains minor shale laminations, hematized from 9.20 - 9.45 m	11299	7.12	7.60	0.48	Tr	.02	.01	.06	Tr
			11300	7.60	8.10	0.50	.01	.02	.01	.02	Tr
9.45	10.13	SHALE black and grey laminated shale fine grained, pyritic, contorted bedding, bedding at 30° to core axis at 9.9 m	11301	8.10	8.80	0.70	.01	.02	Tr	.04	Tr
			11302	8.80	9.45	0.65	.01	.02	.01	.06	Tr
10.13	11.09	ARENITE brown, fine grained, pyritic, hematized	11303	9.45	9.75	0.30	.01	.02	.01	.12	Tr
			11304	9.88	10.13	0.25	.01	.02	.01	.04	Tr
11.09	11.65	SHALE grey and black laminated shale, fine grained, arenaceous, hematized, minor pyrite	11305	10.13	10.60	0.47	.01	.02	.01	.22	Tr
			11306	10.60	11.09	0.49	.01	.02	.01	.16	Tr
			11307	11.09	11.35	0.26	.01	.02	.02	.02	Tr
11.65	13.27	QUARTZ ARENITE grey medium grained, pyritic, calcareous, hematized from 11.65 - 12.00 m	11308	11.60	11.65	0.25	.01	.02	.01	.10	.005
			11309	11.65	12.25	0.60	.01	.02	.01	.02	Tr
			11310	12.25	12.75	0.50	.01	.02	.01	.36	Tr
13.27	13.41	SHALE grey and black laminated shale, fine grained, pyritic, contorted bedding	11311	12.75	13.27	0.52	.01	.02	.01	.02	Tr
			11312	13.27	13.41	0.14	.01	.02	Tr	.12	Tr
13.41	13.51	QUARTZ ARENITE grey, fine grained, pyritic, hematized	11313	13.41	13.51	0.10	.01	Tr	Tr	.02	Tr

APPENDIX D

GEOCHEMISTRY STATISTICS

BARRINGER RESOURCES INC.

STANDARD STATISTICAL PACKAGE

MORGEN-ENERGY-RESOURCES-LTD.

715 - 5TH AVE. S.W.

CALGARY, ALBERTA

T2P-2X7

SOIL SAMPLES

VARIABLE	MEAN	STD DEV	MIN	MAX	RANGE	NO. SAMPLES
AD	.319E+00	.250E+00	.100E+00	.210E+01	.200E+01	599
CU	.271E+02	.244E+02	.200E+01	.230E+03	.228E+03	935
FE	.341E+05	.119E+05	.210E+04	.112E+06	.110E+06	935
MN	.344E+03	.478E+03	.140E+02	.700E+04	.699E+04	935
PK	.224E+02	.543E+02	.100E+01	.112E+04	.112E+04	934
ZN	.650E+02	.434E+02	.400E+01	.776E+03	.772E+03	935

CORRELATION MATRIX

SAMPLE SIZE = 958

	AG	CU	FE	MN	PB	ZN
AG	1.000					
CU	.065	1.000				
FE	-.060	.458	1.000			
MN	.026	.426	.307	1.000		
PB	.272	.391	.227	.471	1.000	
ZN	.157	.295	.356	.376	.409	1.000

BARRINGER RESOURCES INC.

STANDARD STATISTICAL PACKAGE

NORCEN-ENERGY-RESOURCES-LTD.

715 - 5TH AVE. S.W.

CALGARY, ALBERTA

T2P-2X7

SOIL SAMPLES

NOTE: ALL DATA LOG(10) TRANSFORMED

VARIABLE	MEAN	STD DEV	MIN	MAX	RANGE	NO. SAMPLES
AD	.249E+00	.194E+01	.100E+00	.210E+01	.200E+01	596
CU	.218E+02	.189E+01	.200E+01	.230E+03	.220E+03	935
FE	.319E+05	.147E+01	.210E+04	.112E+06	.110E+06	935
HI	.238E+03	.219E+01	.140E+02	.700E+04	.699E+04	935
PB	.152E+02	.203E+01	.200E+01	.112E+04	.112E+04	932
ZN	.574E+02	.168E+01	.400E+01	.776E+03	.772E+03	935

CORRELATION MATRIX

SAMPLE SIZE = 958

	AG	CU	FE	MN	PB	ZN
AG	1.000					
CU	.050	1.000				
FE	-.045	.572	1.000			
MN	-.026	.388	.465	1.000		
PB	.210	.616	.415	.513	1.000	
ZN	.032	.582	.712	.602	.505	1.000

NO 00180-0057 ANALYSIS DATE: 09/07/80 MATRIX: PE

FILE: 10-0457

SAMPLE NO	AI 205 Z	FI 205 Y	CAO Z	PRO Y	1102 Y	0902 Z	FA20 Z	K20 Z	P205 Y
1106-0	22.8	8.76	.277	2.87	.402	.0021	.771	4.13	.13
2001-0	10.9	7.35	.124	.969	.202	.0203	.315	2.93	.10
2002-0	5.73	5.09	.512	.570	.0590	.110	.623	.932	.03
2003-0	11.3	7.19	1.05	2.10	.203	.229	.060	1.01	.06
2004-0	22.3	10.6	1.05	3.03	.533	.370	1.25	3.23	.11
5001-0	29.8	11.1	.213	3.30	.590	.119	1.06	3.50	.15
5002-0	21.8	9.20	.110	2.01	.571	.0673	.900	4.07	.09
5003-0	23.6	10.4	.000	2.19	.060	.110	1.05	3.17	.13
5004-0	7.09	0.76	1.37	.007	.103	.0071	1.00	.722	.02
1107-0	10.1	5.13	.119	2.97	.305	.0113	1.97	2.10	.05
1108-0	10.6	7.00	.090	2.00	.590	.0522	1.25	1.23	.05
1109-0	13.1	0.79	.070	1.50	.093	.0305	1.19	2.00	.03
2005-0	10.3	13.3	3.29	3.19	.022	.095	.755	1.63	.02
2006-0	15.6	10.7	3.19	3.10	.020	.761	.750	2.33	.06
2007-0	9.16	0.70	20.0	9.52	.100	2.12	.336	2.00	.10
2008-0	20.1	6.31	.169	1.90	.597	.0510	1.29	4.53	<.01
2009-0	20.1	0.77	.061	3.10	.565	.0513	1.12	3.50	.05
2010-0	20.5	12.0	.509	2.06	.313	2.20	1.02	3.03	.20
3001-0	0.61	0.03	.001	1.30	.100	.0570	2.02	.607	.63
3002-0	.625	1.12	.022	.0355	.0030	.0100	<.003	.102	<.01
3003-0	.592	2.02	.065	.0004	.0029	.0150	<.003	.110	.52
3004-0	.060	3.90	.000	.0277	.0033	.0536	<.003	.075	<.01
3005-0	1.95	30.5	.003	.0525	.0232	.0091	.010	.065	<.01
3006-0	0.60	6.20	2.16	1.07	.0505	.120	.105	.903	.67
5005-0	0.71	1.06	.770	.210	.0035	.0113	1.72	.005	.01
5006-0	19.3	0.60	.102	2.02	.016	.102	1.30	3.11	.00
5007-0	0.56	0.65	.070	1.20	.350	.010	2.09	1.05	.00
5008-0	22.7	0.03	.100	2.30	.023	.105	1.21	3.66	.15

WD 10100-0457 ANALYSIS DATE: 09/07/80 MATRIX: DF

FILE: 10-0457

SAMPLE ID	HF PPM	CO PPM	CU PPM	CR PPM	CD PPM	PH PPM	PI PPM	AG PPM
1106-0	2.0	<1	385	31	14.9	<5	6.8	<5
2001-6	1.2	<1	2730	80	27.3	35	26	<5
2002-0	.7	<1	1890	57	27.7	30	88	<5
2003-0	.9	<1	1140	86	60.1	<5	57	<5
2004-0	2.1	<1	322	86	85.5	15	85	<5
5001-6	2.0	<1	178	30	35.7	<5	70	<5
5002-0	2.0	<1	818	25	30.1	500	71	<5
5003-0	2.0	<1	541	29	33.9	<5	75	<5
5004-6	.7	7	1090	26	23.2	<5	36	<5
1107-0	1.3	<1	1120	20	7.1	<5	53	<5
1109-0	.6	<1	1700	36	23.1	15	60	<5
1108-0	1.5	<1	3130	29	9.1	<5	81	<5
2005-0	1.2	<1	502	30	87.6	10	88	<5
2006-0	1.6	<1	576	33	82.0	20	77	<5
2007-6	.9	10	80.9	17	5.1	78	32	<5
2008-0	3.5	<1	369	<3	8.1	10	40	<5
2009-0	2.5	<1	189	18	25.1	<5	58	<5
2010-0	2.0	<1	82.7	67	57.9	5	110	<5
3001-0	.8	<1	1120	23	9.5	25	37	<5
3002-0	.1	36	1480	23	833	41000	13	862
3003-0	.1	882	887	17	2000	10000	15	892
3004-0	.2	83	8560	68	9560	17200	87	263
3005-0	.4	<1	1100	152	98.3	1450	152	12
3006-0	.7	<1	1250	25	37.6	830	39	<5
5005-6	.2	<1	1500	28	8.9	165	17	<5
5006-0	2.1	<1	855	31	25.8	80	68	<5
5007-0	.6	<1	1240	31	2.9	75	59	<5
5008-0	2.5	<1	223	22	32.2	115	58	<5

BU 00100-0457 ANALYSIS DATE: 09/07/80 MATRIX: DF

FILE:10-0457

SAMPLE ID	SR PPM	TD PPM	ZR PPM	V PPM	ZO PPM	MO PPM
1100-6	68.5	23	90	100	95	<50
2001-9	91.0	20	56	120	27	40
2002-9	20.0	10	15	99.7	20	30
2003-9	80.9	10	89	105	72	40
2004-6	125	20	90	110	116	30
5001-8	110	22	97	110	112	<50
5002-2	35.5	19	119	120	110	<50
5003-2	115	25	90	115	102	<50
5004-9	80.2	12	22	75.0	55	<50
1107-0	67.0	0	85	100	59	<50
1109-0	35.5	9	55	115	52	<50
1100-0	85.5	20	82	155	36	<50
2005-0	83.0	15	86	111	152	<50
2006-0	121	15	90	106	87	<50
2007-0	270	11	57	45.0	91	<50
2008-0	100	10	93	122	77	<50
2009-0	110	10	95	130	95	<50
2010-0	157	15	81	100	100	50
5001-0	56.7	9	23	75.5	50	<50
5002-6	17.0	<6	<5	72.9	5090	<50
5003-1	60.0	<6	<5	56.3	86000	<50
5004-0	6.2	<6	<5	205	5990	<50
5005-0	13.0	<6	10	88.2	217	<50
5006-1	97.5	<6	10	77.9	86	<50
5007-1	19.2	<6	10	69.1	35	<50
5008-0	30.9	17	75	106	87	<50
5009-0	50.2	12	21	99.9	55	<50
5000-0	130	17	91	97.0	115	<50

WD NO180-P62

ANALYSIS DATE: 04/11/80 MATRIX: F

FILE: T0-0062

SAMPLE ID	AL2O3 %	FE2O3 %	CaO %	MgO %	TiO2 %	MnO %	Na2O %	K2O %	P2O5 %
1272-R	2.14	1.73	11.7	.207	.0556	.286	.054	.466	.39
1273-R	2.40	2.56	39.4	.639	.0705	.325	.058	.559	.50
1276-R	7.37	7.31	.738	.147	.0470	.211	.322	1.85	.03
3007-R	.736	1.45	5.93	2.99	.0045	1.35	<.003	.161	.00
3008-R	.206	.506	.339	.0652	<.0002	.0117	<.003	.028	<.01
3009-R	7.64	5.35	.345	.227	.0580	.104	.411	1.66	.05
3010-R	1.30	.717	42.0	.604	.0138	.0197	<.003	.325	.03
6003-R	10.3	5.63	1.02	1.93	.351	.0569	1.77	1.50	.04
6004-R	22.7	9.30	.255	2.43	.547	.0459	1.16	5.43	.19

SAMPLE ID	BE PPM	CO PPM	CR PPM	CU PPM	CI PPM	PH PPM	NI PPM
1272-R	.3	<7	764	13	18.7	485	17
1273-R	.5	<7	407	10	25.6	2070	23
1276-R	1	<7	980	23	68.7	3520	39
3007-R	<.1	<7	865	29	718	72500	35
3008-R	<.1	38	848	<3	3960	65000	5
3009-R	1.0	<7	1870	25	115	8250	67
3010-R	.2	<7	376	<3	17.2	1000	13
6003-R	1	<7	1560	26	15.8	335	48
6004-R	3.0	<7	258	25	18.6	100	50

SAMPLE ID	SR PPM	TH PPM	ZR PPM	V PPM	ZN PPM	MO PPM	AG PPM
1272-R	100	8	21	45.2	109	40	<5
1273-R	329	15	21	31.6	76	100	8
1276-R	39.8	9	22	78.2	23	<30	8
3007-R	106	17	7	41.1	1440	150	326
3008-R	5.7	<6	<3	11.2	1340	60	508
3009-R	43.0	<6	20	101	402	<30	12
3010-R	3440	<6	8	19.8	58	<30	<5
6003-R	41.6	<6	51	136	148	<30	<5
6004-R	92.3	27	75	114	85	40	<5