

NORCEN ENERGY RESOURCES LIMITED  
ASSESSMENT REPORT  
GEOCHEMICAL PROGRAM  
GROUP XXIV  
GOLDEN MINING DISTRICT  
BRITISH COLUMBIA

CLAIMS: WC6, WC5  
LOCATION: 45 km south of Golden, British Columbia  
LATITUDE: 50° 52' N  
LONGITUDE: 116° 44' W

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT

8298  
part 4  
of 5

L. Smith, P. Geol.  
A. Slingsby

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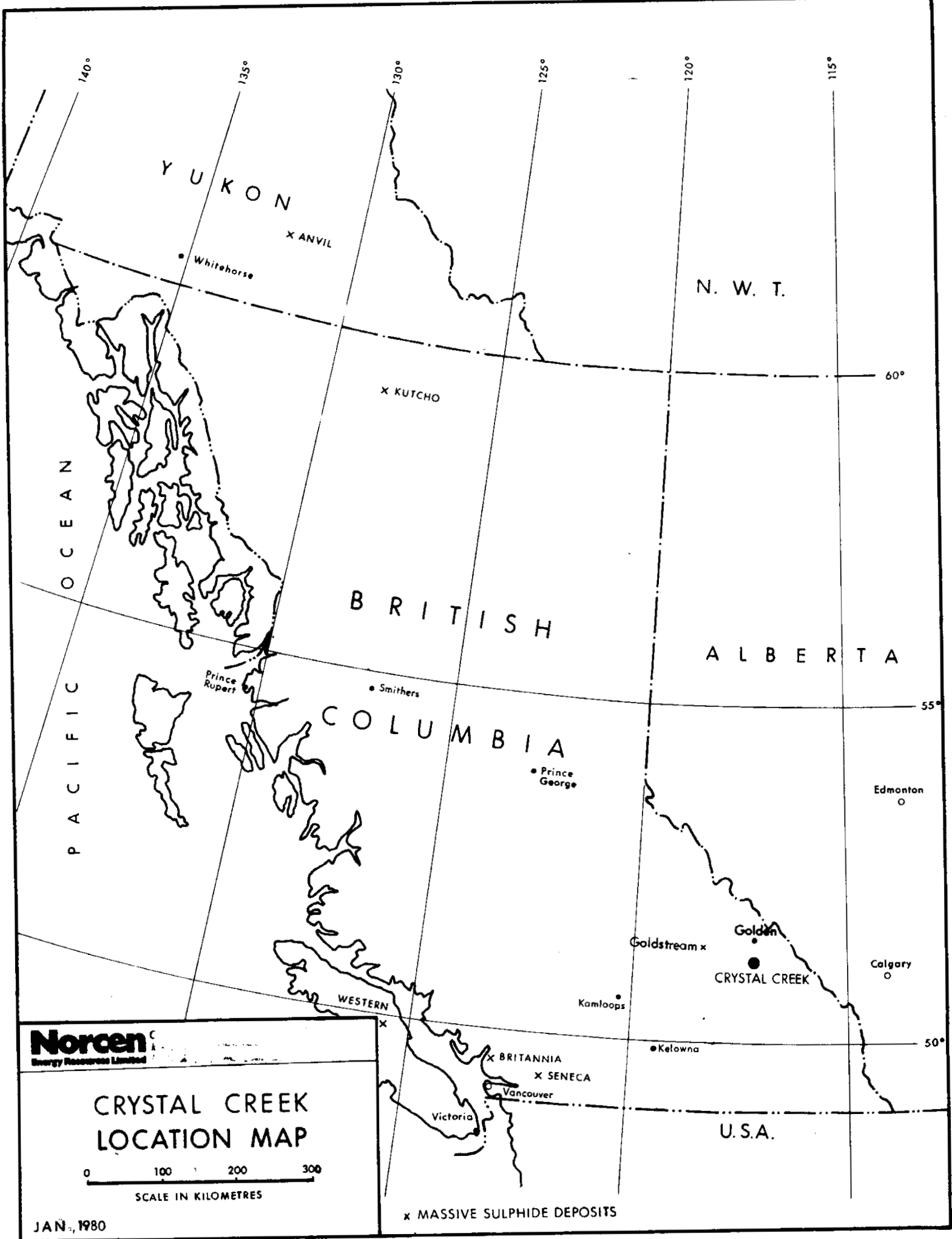
## SUMMARY

A total of 958 soil samples, 96 stream sediment samples and 26 rock samples were collected during a reconnaissance geochemical survey of the Crystal Creek property. The soil and stream sediments were analyzed for their content of iron, manganese, lead, zinc, copper and silver. Rock samples were analyzed by induction coupled argon plasma spectrometry for nine major oxides and 15 minor and trace elements. Of these samples 42 soil, and 5 rock samples were taken within the boundaries of Group XXIV. An 1:20,000 orthophoto produced from 1976 Energy, Mines and Resources aerial photograph by North West Survey Corporation International Ltd. of Edmonton, Alberta, was used for control of sampling points. The samples were taken on June 12, 13 and 17, 1980.

Soil samples were taken from B horizon where available. Notes as to topograph, vegetation, drainage, soil types, etc. were taken. Stream samples were taken where available. Rock samples were taken where soil was not available or where the rock appeared to have an anomalous metal content. The samples are generally of shale.

## LOCATION AND ACCESS

The claims are located in the Purcell Mountains approximately 45 kilometres south of Golden, British Columbia. Access to the property is by paved highway 95 to Parson, British Columbia and hence by 52 kilometres of logging road along Bobby Burns and Vowell Creeks.



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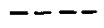
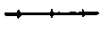


**CRYSTAL CREEK  
LOCATION MAP**

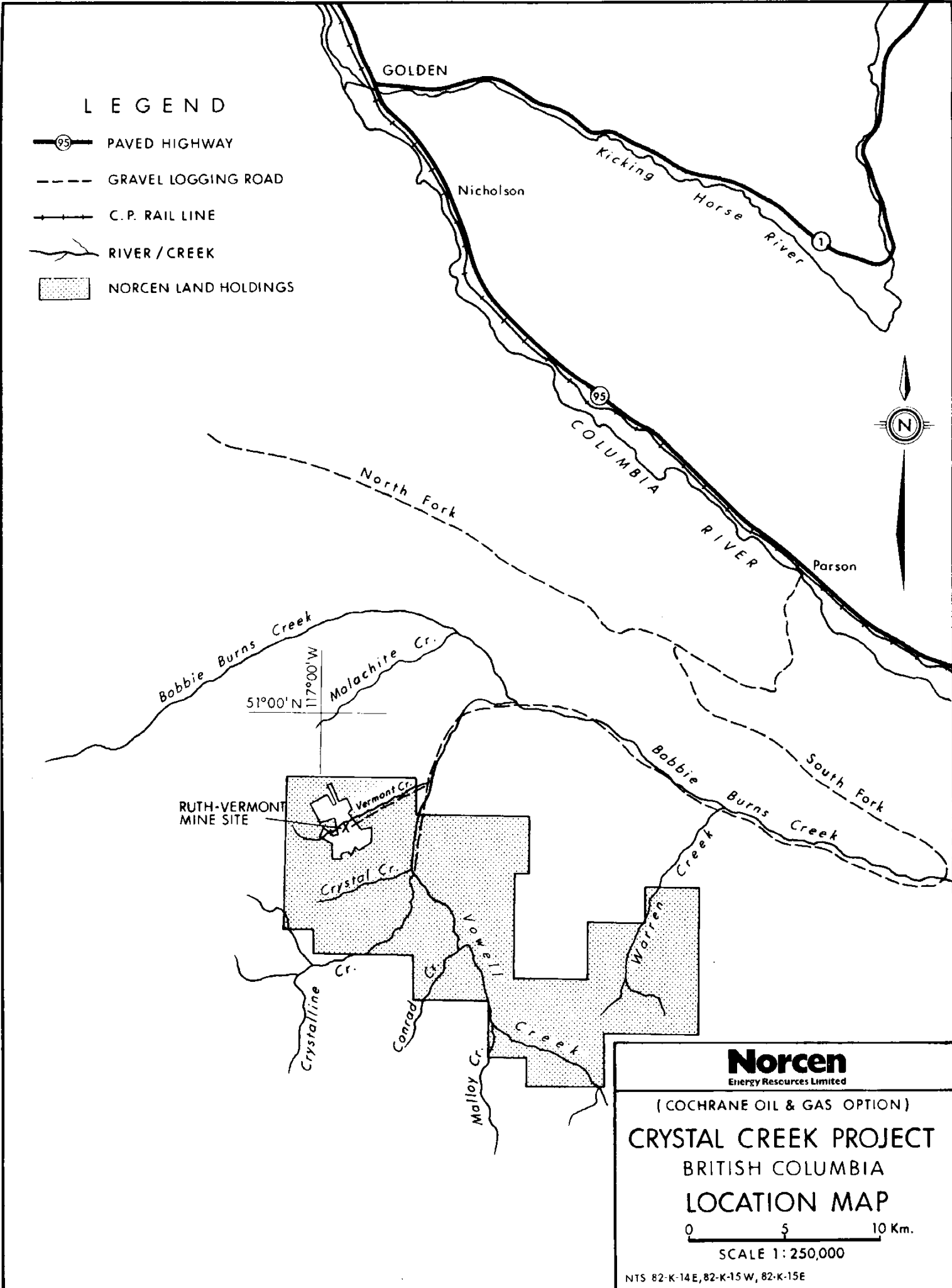
0 100 200 300  
SCALE IN KILOMETRES

JAN., 1980

x MASSIVE SULPHIDE DEPOSITS

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**

0 5 10 Km.

SCALE 1: 250,000

NTS 82-K-14E, 82-K-15W, 82-K-15E

CLAIMS STATUS

The WC5 and WC6 claims form part of the Crystal Creek property. They have been grouped together to form Group XXIV.

Claim Name	Record Number	Recorded Date	# of Units
WC 5	310	June 18, 1979	20
WC 6	311	June 18, 1979	12



## GEOCHEMICAL SAMPLING

A total of 42 soil samples and 5 rock samples were collected on Group XXIV. All samples were sent to Barringer Magenta Limited of No. 105 3750 19th Street N.E., Calgary, Alberta. The soil and sediment samples were analyzed for lead, zinc, silver, copper, iron and manganese by atomic absorption. The rock samples were analyzed by induction coupled argon plasma spectrometry for nine oxides;  $TiO_2O_3$ ,  $MnO$ ,  $CaO$ ,  $Na_2O$ ,  $K_2O$ ,  $P_2O_5$ ,  $MgO$  and  $Fe_2O_3$  and fifteen minor and trace elements.

Statistical analysis of the data for the entire property produced the following means and standard deviations:

### Soils

	Mean	Standard Deviation
Ag(ppm)	.319	.25
Cu(ppm)	27.1	24.4
Pb(ppm)	22.4	54.3
Zn(ppm)	65.0	43.4
Mn(ppm)	344	478
Fe (%)	3.41	1.19

Stream Sediments

	Mean	Standard Deviation
Ag (ppm)	.206	.132
Cu (ppm)	33.0	22.8
Pb (ppm)	13.5	8.7
Zn (ppm)	52.0	31.3
Mn (ppm)	372	192
Fe (ppm)	4.15	1.28

Analysis of the soil samples from Group XXIV showed that the area is high in metal content, particularly iron and copper. The values for lead are somewhat depressed, as are silver. Both copper and iron are well above average contents with numerous anomalous samples.

ITEMIZED STATEMENT OF EXPENDITURES

A. SALARIES

A. Slingsby - Project Preparation - April 18	\$ 125 00
Supervision - June 17	125 00
R. Laird - Geochemical Sampling - June 12, 13, 17	375 00
R. Pryde - Geochemical Sampling - June 12, 13, 17	270 00
B. Wasylyshyn - Geochemical Sampling - June 13, 17	180 00

B. ACCOMMODATION AND MEALS

9 man days @ \$41/day	369 00
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C. TRANSPORTATION

Helicopter 3.0 hrs. @ \$408/hr	1 224 00
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D. ASSAYING AND ORTHOPHOTO

42 soils @ \$6/sample	252 00
5 rocks @ \$20/sample	100 00
32 units (photo) @ \$10/unit	<u>320 00</u>

TOTAL EXPENDITURES	\$3 340 00
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STATEMENT OF QUALIFICATIONS

I, Laurie James Smith, of the City of Calgary in the Province of Alberta, do hereby state:

1. I am a graduate of the University of Calgary with a B Sc degree in Geology.
2. I have been involved in all phases of geological exploration in many areas of Canada (British Columbia, Alberta, Saskatchewan, Northwest Territories, Ontario, Quebec, Nova Scotia and New Brunswick) since graduation.
3. I supervised the geochemical soil sampling on Group XXIV.
4. I am a member of the Association of Professional Engineers, Geologists, and Geophysicists of Alberta.
5. I am the holder of valid Free Miners License Number 197331.

Laurie J. Smith

APPENDIX I

ASSAY CERTIFICATES



BARRINGER MAGENTA LIMITED  
 OFFICES & MINERALS  
 LABORATORY:  
 3750 - 19th ST., N.E., SUITE 105  
 CALGARY, ALBERTA T2E 6V2  
 PHONE (403) 276-9701  
 TELEX 03-827584

AUTHORITY: ART SLINGSBY

02/SEP/80  
 PAGE 1 OF 4  
 WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
 715-5TH AVE. S.W.  
 CALGARY, ALBERTA  
 T2P 2X7

SAMPLE GROUP #24

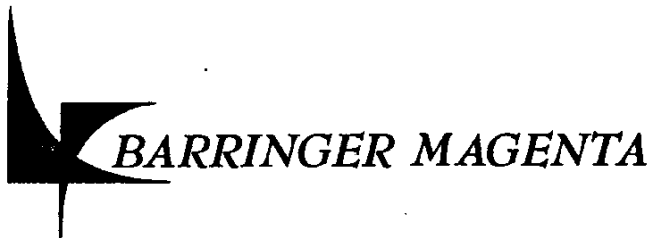
\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
 SOIL

SAMPLE NUMBER	AG PPM	CU PPM	FE %	MN PPM	PB PPM
3285	N D	230.	5.39	185.	107.
3286	N D	61.	6.15	665.	40.
3287	N D	45.	6.43	495.	15.
3288	N D	39.	5.38	425.	13.
3289	N D	42.	4.77	410.	15.
3290	N D	41.	4.9	470.	12.
3291	N D	63.	5.93	560.	20.
3292	.2	24.	4.05	125.	8.
3293	.1	17.	4.96	535.	8.
3294	.3	14.	1.79	395.	9.
3295	N D	17.	4.04	175.	11.
3296	N D	45.	5.61	595.	25.
3297	N D	69.	6.21	860.	39.
3298	N D	74.	8.49	725.	28.
3299	N D	22.	4.41	510.	15.
3300	.3	10.	2.34	380.	8.
5038	.1	45.	3.85	478.	12.
5039	.3	54.	3.1	784.	23.
5040	.1	91.	4.7	697.	19.
5041	.3	22.	3.15	322.	7.
5044	N D	57.	4.4	645.	19.
5045	.3	41.	4.	589.	19.
5046	.4	34.	3.65	712.	21.
5047	.4	56.	4.15	828.	33.
5048	.5	57.	3.85	593.	20.
5049	.1	29.	6.13	350.	12.
5050	.2	40.	4.19	2500.	25.
5051	.1	46.	4.48	810.	25.
5052	.1	75.	5.72	875.	55.
5053	.2	62.	6.48	700.	28.

\*P=QUESTIONABLE PRECISION; \*I=INTERFERENCE; IS=INSUFFICIENT SAMPLE  
 NA=NOT ANALYZED; ND=NOT DETECTED; MS=MISSING SAMPLE; T=TRACE



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AUTHORITY: ART SLINGSBY

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 WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
 715-5TH AVE. S.W.  
 CALGARY, ALBERTA  
 T2E 2X7

SAMPLE GROUP #24

\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:  
 SOIL

SAMPLE NUMBER	AG PPM	CU PPM	FE %	MN PPM	PB PPM
5054	.2	38.	6.01	835.	14.
5055	.2	48.	6.02	595.	29.
5056	.2	48.	6.87	670.	17.
5057	N D	39.	3.03	425.	13.
5066	.4	46.	4.52	750.	50.
5067	.2	92.	4.49	715.	46.
5068	.4	135.	4.9	815.	21.
5069	.2	130.	6.55	780.	39.
5070	.5	110.	4.78	550.	32.
5071	.7	130.	3.28	720.	84.
5072	.3	41.	4.56	450.	25.
5073	.4	22.	2.23	325.	10.

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 NA=NOT ANALYZED; ND=NOT DETECTED; MS=MISSING SAMPLE; T=TRACE



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WORK ORDER # NORCEN

NORCEN ENERGY RESOURCES  
715-5TH AVE. S.W.  
CALGARY, ALBERTA  
T2P 2X7

SAMPLE GROUP #24

\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:

SOIL

SAMPLE NUMBER	ZN PPM
3285	101.
3286	105.
3287	97.
3288	88.
3289	88.
3290	92.
3291	105.
3292	32.
3293	59.
3294	32.
3295	57.
3296	86.
3297	91.
3298	104.
3299	71.
3300	32.
5038	81.
5039	64.
5040	98.
5041	57.
5044	90.
5045	85.
5046	79.
5047	89.
5048	77.
5049	63.
5050	86.
5051	88.
5052	97.
5053	95.





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NORCEN ENERGY RESOURCES  
 715-5TH AVE. S.W.  
 CALGARY, ALBERTA  
 T2P 2X7

SAMPLE GROUP #24

\*\*\*FINAL REPORT\*\*\*

G E O C H E M I C A L L A B O R A T O R Y R E P O R T

SAMPLE TYPE:

SOIL

SAMPLE NUMBER	ZN PPM
5054	83.
5055	92.
5056	93.
5057	86.
5066	87.
5067	95.
5068	94.
5069	89.
5070	98.
5071	86.
5072	74.
5073	41.

WO NO:RO-0457 ANALYSIS DATE: 09/07/80 MATRIX: RF

FILE:10-0457

SAMPLE ID	AL2O3 %	FE2O3 %	CAO %	MGO %	TIO2 %	MRO2 %	NA2O %	K2O %	P2O5 %
1146-R	22.8	8.76	.277	2.87	.402	.0821	.771	4.13	.13
2001-R	10.9	7.35	.124	.989	.282	.0243	.315	2.93	.14
2002-R	5.73	5.04	.512	.570	.0590	.110	.623	.932	.03
2003-R	11.3	7.19	1.05	2.14	.243	.229	.464	1.41	.06
2004-R	22.3	10.6	1.45	3.63	.533	.374	1.25	3.23	.11
5001-R	24.8	11.1	.213	3.34	.598	.119	1.06	3.58	.15
5002-R	21.8	9.20	.114	2.81	.571	.0673	.900	4.07	.09
5003-R	23.6	10.3	.044	2.19	.460	.118	1.05	3.17	.13
5004-R	7.84	4.76	1.37	.407	.103	.0871	1.40	.722	.02
1187-R	14.1	5.13	.119	2.97	.385	.0313	1.97	2.14	.05
1189-R	10.6	7.40	.090	2.48	.394	.0522	1.25	1.23	.05
1194-R	13.1	4.79	.078	1.58	.693	.0385	1.19	2.04	.03
2005-R	14.3	13.3	3.29	3.19	.422	.695	.755	1.63	.02
2006-R	15.6	10.7	3.19	3.18	.420	.761	.750	2.33	.06
2007-R	9.16	8.74	20.4	9.52	.166	2.12	.336	2.40	.18
2008-R	26.1	6.31	.164	1.98	.547	.0514	1.24	4.53	<.01
2009-R	24.1	8.77	.061	3.14	.565	.0513	1.12	3.58	.05
2010-R	24.5	12.8	.584	2.46	.313	2.28	1.02	3.83	.20
3001-R	8.61	4.03	.081	1.34	.126	.0574	2.82	.647	.03
3002-R	.625	1.12	.022	.0355	.0034	.0188	<.003	.102	<.01
3003-R	.592	2.82	.865	.0804	.0029	.0150	<.003	.118	.52
3004-R	.464	3.98	.048	.0277	.0033	.0536	<.003	.075	<.01
3005-R	1.95	38.5	.003	.0325	.0232	.0091	.019	.465	<.01
3006-R	4.60	6.28	2.16	1.07	.0545	.124	.185	.903	.07
5005-R	4.71	1.96	.774	.216	.0435	.0813	1.72	.405	.01
5006-R	19.3	8.64	.102	2.42	.416	.142	1.30	3.11	.00
5007-R	9.56	4.65	.470	1.24	.356	.0610	2.09	1.05	.04
5008-R	22.7	8.03	.168	2.38	.423	.105	1.21	3.66	.15

WD NO:R0-0457 ANALYSIS DATE: 09/07/80 MATRIX: HF

FILE:T0-0457

SAMPLE ID	HF PPM	CO PPM	CR PPM	CU PPM	CI PPM	PH PPM	NI PPM	AG PPM
1146-R	2.0	<7	345	31	14.9	<5	68	<5
2001-R	1.2	<7	2240	40	27.4	35	26	<5
2002-R	.7	<7	1890	57	27.7	30	44	<5
2003-R	.9	<7	1180	46	68.1	<5	57	<5
2004-R	2.1	<7	322	46	45.5	15	95	<5
5001-R	2.4	<7	178	30	35.7	<5	78	<5
5002-R	2.0	<7	414	25	30.1	500	71	<5
5003-R	2.4	<7	341	29	43.9	<5	73	<5
5004-R	.7	7	1090	26	23.2	<5	36	<5
1187-R	1.3	<7	1120	28	7.1	<5	53	<5
1189-R	.6	<7	1700	36	23.1	15	60	<5
1190-R	1.5	<7	1150	29	9.1	<5	41	<5
2005-R	1.2	<7	502	38	47.6	10	88	<5
2006-R	1.6	<7	576	33	82.0	20	77	<5
2007-R	.9	10	84.9	17	5.1	70	32	<5
2008-R	3.5	<7	369	<4	8.1	10	40	<5
2009-R	2.5	<7	189	18	25.1	<5	58	<5
2010-R	2.9	<7	82.7	67	57.9	5	118	<5
3001-R	.4	<7	1120	23	9.5	25	37	<5
3002-R	.1	36	1480	23	833	41000	13	462
3003-R	.1	442	887	17	2000	10000	15	493
3004-R	.2	43	4560	64	9560	17200	47	263
3005-R	.4	<7	1100	152	94.3	1450	152	12
3006-R	.7	<7	1250	25	37.6	430	39	<5
5005-R	.2	<7	1580	24	8.9	165	17	<5
5006-R	2.1	<7	455	31	25.8	40	64	<5
5007-R	.6	<7	1240	31	2.4	75	39	<5
5008-R	2.5	<7	224	22	32.2	115	58	<5

WD MU:80-0457 ANALYSIS DATE: 09/07/80 MATRIX: HF

FILE:T0-0457

SAMPLE ID	SR PPM	TH PPM	ZR PPM	V PPM	ZN PPM	MO PPM
1146-R	68.3	23	80	100	93	<30
2001-R	41.8	20	56	124	27	40
2002-R	28.4	14	13	99.7	28	30
2003-R	48.9	18	49	103	12	40
2004-R	123	28	94	114	116	30
5001-R	110	22	97	118	112	<30
5002-R	83.3	19	119	120	114	<30
5003-R	115	25	94	113	102	<30
5004-R	40.2	12	22	73.9	33	<30
1187-R	67.8	8	45	104	39	<30
1189-R	43.3	9	33	113	52	<30
1194-R	43.3	28	42	153	36	<30
2005-R	83.0	13	46	111	132	<30
2006-R	121	15	90	106	87	<30
2007-R	274	11	37	45.4	41	<30
2008-R	149	14	93	122	77	<30
2009-R	114	18	93	118	95	<30
2010-R	137	15	81	100	184	30
3001-R	56.7	9	23	75.5	34	<30
3002-R	17.8	<6	<3	72.9	5090	<30
3003-R	64.0	<6	<3	36.3	86800	<30
3004-R	6.2	<6	<3	205	3990	<30
3005-R	13.8	<6	10	48.2	217	<30
3006-R	47.5	<6	10	77.9	86	<30
5005-R	19.2	<6	14	69.1	33	<30
5006-R	80.9	17	75	106	87	<30
5007-R	38.2	12	21	99.9	53	<30
5008-R	139	17	91	97.6	113	<30