

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

CLAIMS: Cog 1, Cog 2, Cog 3  
LOCATION: 45 km south of Golden, British Columbia  
LATITUDE: 50° 56' N  
LONGITUDE: 116° 59' W

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
No.

8297  
part 2  
of 3

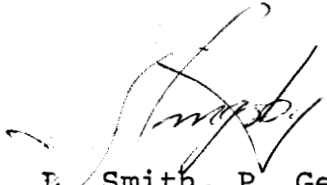
  
L. Smith, P. Geol.  
A. Slingsby

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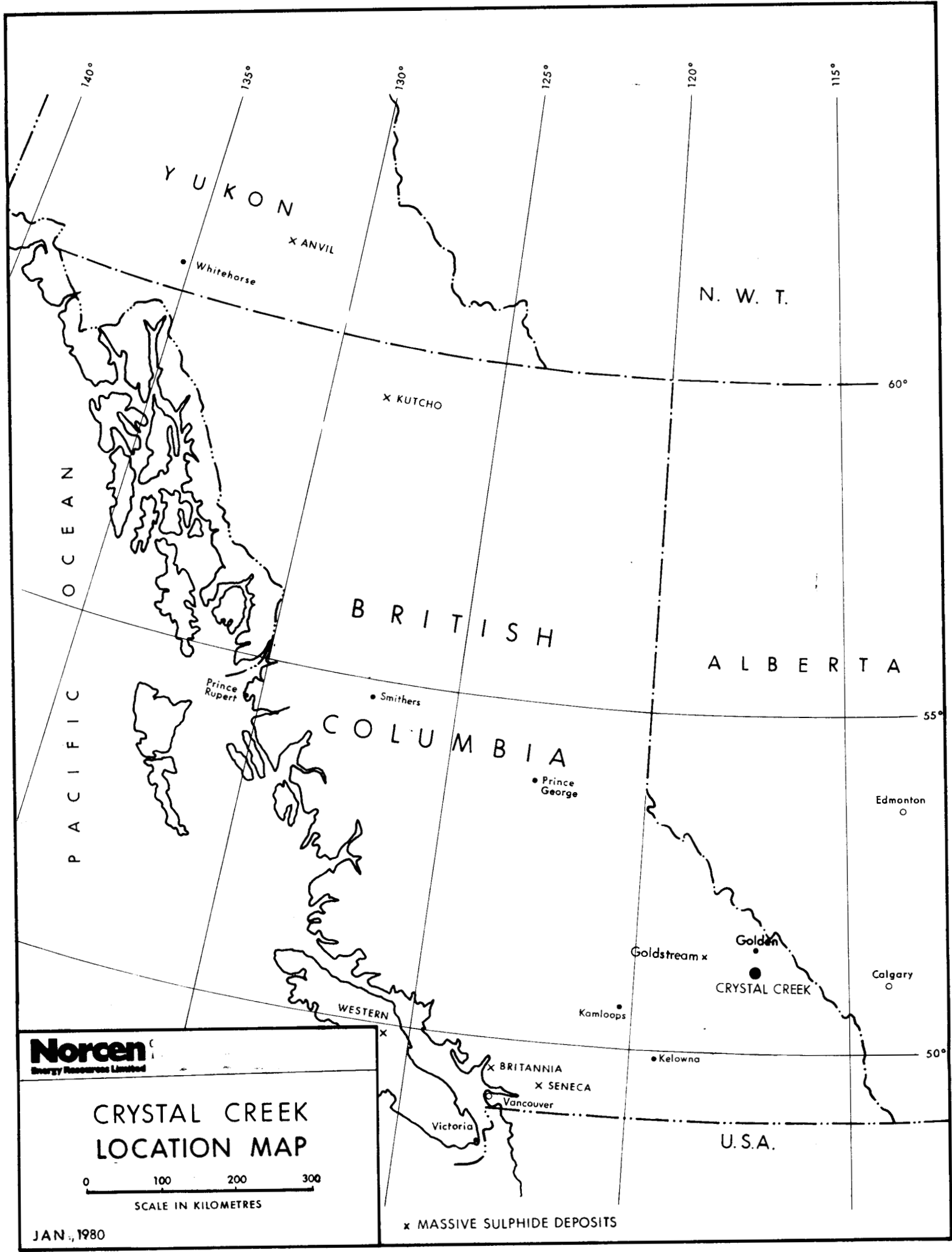
## SUMMARY

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 34 soil and 3 stream sediment samples were taken within the boundaries of Group VI. An 1:20,000 orthophoto produced from 1976 Energy, Mines and Resources aerial photographs was used for control of sampling points. The samples were taken on May 30, June 9, 12 and 13.

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.



**Norcen**  
Energy Resources Limited

### CRYSTAL CREEK LOCATION MAP



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

GOLDEN

Nicholson

Kicking Horse River

1

COLUMBIA RIVER

Parson

North Fork

Bobbie Burns Creek

51°00'N

Malachite Cr.

RUTH-VERMONT MINE SITE

Vermont Cr.

Crystal Cr.

Bobbie Burns Creek South Fork

Crystalline Cr.

Conrad Cr.

Malloy Cr.

Woolwell Cr.

Warren



**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 Cog 1, Cog 2 and Cog 3 claims form part of the Crystal Creek property. They have been grouped together to form Group VI.

Claim Name	Record Number	Recorded Date	# of Units
Cog 1	320	June 18, 1979	12
Cog 2	321	June 18, 1979	8
Cog 3	322	June 18, 1979	18



## GEOCHEMICAL SAMPLING

A total of 4 soil samples and 3 stream sediment samples were collected on Group VI. 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.

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 stream sediment samples showed them to be very enriched in copper, lead, iron and manganese but depleted in zinc. The soil samples showed a number of strong anomalies on the north side of Vermont Creek, many coincident with each other. The abundance of known showings in this area makes this not surprising.

One sample, 4153, was taken from the tailing ponds located in the valley.

ITEMIZED STATEMENT OF EXPENDITURES

A. SALARIES

A. Slingsby - Project Preparation April 2	\$ 125 00
- Report Writing - June 14	125 00
P. Collender - Geochemical Sampling - June 9,12,13	375 00
T. Bojczyszyn - Geochemical Sampling - May 30	125 00
L. Hettinga - Geochemical Sampling - June 9. 12, 13	270 00
D. Desjardins - Geochemical Sampling - May 30	90 00

B. ACCOMMODATION AND MEALS

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

Truck Rental 2 days @ \$23.50/day	47 00
Helicopter 2 hrs @ \$408/hr	816 00

D. ASSAYING AND ORTHOPHOTO

34 soil @ \$6/sample	204 00
3 stream @ \$5/sample	15 00
38 unit (photo) @ \$10/unit	380 00

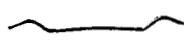
TOTAL EXPENDITURES	<u>\$2 931 00</u>
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STATEMENT OF QUALIFICATIONS

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 VI.
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) 276-8701  
 TELEX: 03-827584

AUTHORITY: ART SLINGSBY

28/AUG/80  
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 WORK ORDER # NORCEN

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

SAMPLE GROUP #6

\*\*\*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
3216	N D	11.	2.75	280.	23.
3217	N D	20.	4.57	1520.	65.
3218	N D	33.	3.16	395.	23.
3219	N D	20.	2.79	240.	21.
3220	N D	60.	3.99	373.	24.
3221	N D	25.	3.93	264.	28.
3249	.5	50.	3.6	545.	48.
3250	.4	148.	4.	1692.	144.
3251	.7	52.	3.55	524.	75.
3252	.7	31.	3.9	254.	30.
3253	.6	32.	3.	395.	41.
3254	.4	43.	3.65	295.	140.
3255	.9	51.	3.8	719.	82.
3256	1.1	63.	5.05	2295.	606.
3257	1.6	82.	5.8	820.	296.
3258	N D	36.	4.35	335.	27.
3259	N D	39.	3.43	275.	42.
3260	N D	30.	3.49	175.	44.
3261	N D	<del>135.</del>	4.04	730.	78.
3262	N D	135.	5.62	555.	93.
3263	N D	44.	3.75	495.	40.
3264	N D	27.	2.49	275.	18.
3265	N D	105.	4.26	430.	53.
3266	N D	25.	6.16	3250.	56.
3267	N D	25.	6.4	365.	54.
3268	.2	38.	3.3	205.	21.
3269	.1	21.	3.63	625.	58.
4148	.4	28.	4.2	150.	38.
4149	.8	41.	4.5	181.	38.
4150	.1	18.	3.1	110.	25.

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



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

SAMPLE GROUP #6

\*\*\*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
4152	.4	29.	3.6	160.	25.
4153	N D	220.	7.3	4100.	1120.
4155	.8	28.	4.7	3700.	900.

\*P=QUESTIONABLE PRECISION; \*I=INTERFERENCE; IS=INSUFFICIENT SAMPLE  
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NORCEN ENERGY RESOURCES  
 715-5TH AVE. S.W.  
 CALGARY, ALBERTA  
 T2P 2X7

SAMPLE GROUP #6

\*\*\*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
3216	52.
3217	95.
3218	65.
3219	76.
3220	78.
3221	97.
3249	150.
3250	98.
3251	89.
3252	82.
3253	75.
3254	77.
3255	96.
3256	280.
3257	360.
3258	73.
3259	77.
3260	39.
3261	102.
3262	126.
3263	92.
3264	67.
3265	100.
3266	105.
3267	46.
3268	80.
3269	76.
4148	78.
4149	75.
4150	54.





**BARRINGER MAGENTA**

AUTHORITY: ART SLINGSBY

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

SAMPLE GROUP #6

\*\*\*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
4152	54.
4153	168.
4155	500.



**BARRINGER MAGENTA**

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NORCEN ENERGY RESOURCES  
715-5TH AVE. S.W.  
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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

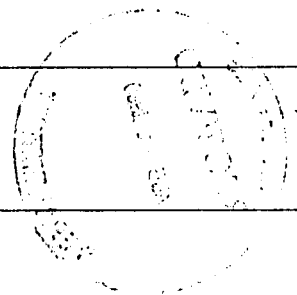
SAMPLE TYPE:  
STREAM SEDIMENT

SAMPLE NUMBER	ZN PPM
S	
4147	12.
4151	14.
4154	12.

• WO NO: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	72	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	44.2	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	99	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	97.5	<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	30.2	12	21	99.9	53	<30
5008-R	139	17	91	97.6	113	<30



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

FILE:T0-0457

SAMPLE ID	BF PPM	CD PPM	CR PPM	CO PPM	CU PPM	PH PPM	NI PPM	AG PPM
1146-R	2.0	<7	385	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	33.9	<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
1194-R	1.5	<7	1130	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	<3	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	807	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	2.9	75	39	<5
5008-R	2.5	<7	224	22	32.2	115	58	<5

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

FILE:T0-0457

SAMPLE ID	AL2O3 %	FE2O3 %	CAO %	MGO %	TIO2 %	MNO2 %	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	5.09	.512	.570	.0590	.110	.623	.932	.03
2003-R	11.3	7.19	1.65	2.14	.243	.229	.464	1.41	.06
2004-R	22.3	10.6	1.45	3.03	.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	9.24	.114	2.81	.571	.0673	.900	4.07	.09
5003-R	23.6	10.3	.084	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	1.85	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	.169	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-P	24.5	12.8	.584	2.46	.313	2.28	1.02	3.83	.20
3001-R	8.61	4.93	.081	1.34	.126	.0574	2.82	.647	.03
3002-R	.625	4.12	.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	.09
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