GEOLOGICAL SURVEY OF CANADA
MINERAL RESOURCES DIVISION
ANALYTICAL CHEMISTRY SECTION
ICP - EMISSION SPECTROMETRY LABORATORY

803854
Sulphurets

****
* REPORT OF ANALYSIS *
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DATE: 19-APR-89
REPORT NO. 227-88
SUBMITTED BY: KIRKHAM R.
PROJECT NO. 6117059
METHOD: ICP-MJ1 , ICP-TR1 , Ag & Pb by AA.
FeO , H2O(t) , CO2 , C , S(t) and LOI by chemical methods.

ESTIMATE OF VALIDITY OF RESULTS

ELEMENT	+/-	(ABSOLUTE	+	RELATIVE)
*SiO2	+/-	(0.4 %	+	2% OF CONC.)
*TiO2		0.02	+	"
*Al2O3		0.2	+	"
*Fe2O3(t)		0.1	+	"
*MnO		0.01	+	"
*MgO		0.1	+	"
*CaO		0.1	+	"
*Na2O		0.1	+	"
*K2O		0.1	+	"
FeO		0.2	+	5% OF CONC.
H2O(t)		0.1	+	5% OF CONC.
CO2		0.1	+	3% OF CONC.
C				
*P2O5		0.02	+	1% OF CONC.
*S(t)		0.04	+	5% OF CONC.
*LOI				
*Ba	+/-	(20 PPM	+	5% OF CONC.)
Be	+/-	(0.5 PPM	+	5% OF CONC.)
Co	+/-	(5 PPM	+	5% OF CONC.)
Cr	+/-	(10 PPM	+	5% OF CONC.)
Cu	+/-	(10 PPM	+	5% OF CONC.)
La	+/-	(10 PPM	+	5% OF CONC.)
Ni	+/-	(10 PPM	+	5% OF CONC.)
Pb	+/-	(20 PPM	+	10% OF CONC.)
Sr	+/-	(2 PPM	+	5% OF CONC.)
V	+/-	(5 PPM	+	5% OF CONC.)
Y	+/-	(5 PPM	+	5% OF CONC.)
Yb	+/-	(0.5 PPM	+	5% OF CONC.)
Zn	+/-	(5 PPM	+	5% OF CONC.)
Zr	+/-	(10 PPM	+	5% OF CONC.)

* MAJORS BY XRF METHOD EXCEPT FOR THOSE SAMPLES WITH REPORTED S(t) > 5%, FOR THESE, MAJORS BY ICP.

ANALYST(S)..STAFF..... VERIFIED.....

ANALYTICAL CHEMISTRY SECTION
ICP-ES LABORATORY

DATE: 18 APRIL 89

REPORT OF ANALYSIS

NAME: KIRKHAM R.

PROJECT: 6117059

REQN. NO: 227-88

		KQ-88-25	—	26	27A	27B	27C	27D	27E
LAB. NO.		1	2	3	4	5	6	7	8
SAMPLE NO:		104B8895 00	104B8895 01	104B8895 02	104B8895 03	104B8895 04	104B8895 05	104B8895 06	104B8895 07
SIO2	% :	68.7	88.8	62.0	68.2	70.3	65.5	57.5	62.4
TIO2	% :	0.44	0.13	0.49	0.60	0.51	0.55	0.55	0.63
AL2O3	% :	13.4	5.00	12.5	11.8	15.3	17.2	15.6	14.7
FE2O3T	% :	7.10	1.90	6.90	6.50	5.30	4.70	5.10	7.50
FE2O3	% :		0.0	1.2	1.5			1.0	1.4
FEO	% :		3.7	5.1	4.5			3.7	5.5
MNO	% :	0.01	0.00	0.21	0.18	0.02	0.02	0.23	0.27
MGO	% :	0.57	0.27	1.76	1.18	0.55	0.63	1.52	1.85
CAO	% :	0.49	0.0	6.41	4.14	0.03	1.20	7.40	3.88
NA2O	% :	0.10	0.10	0.50	1.10	1.20	1.50	2.00	2.10
K2O	% :	4.05	1.30	1.31	1.61	2.81	3.85	2.05	1.52
H2OT	% :		1.1	3.5	2.5			2.9	3.2
CO2T	% :	0.2	0.1	4.8	3.1	0.1	0.2	5.6	2.9
P2O5	% :	0.32	0.05	0.17	0.12	0.02	0.80	0.21	0.19
S	% :	4.84	0.74	0.02	0.00	1.89	2.01	0.01	0.01
BA	ppm :	1600	860	1300	1600	2500	2700	1900	1700
AG	ppm :	0	800	0	0	0	0	0	0
BE	ppm :	1.3	0.4	0.9	0.8	1.2	1.4	1.3	1.0
CO	ppm :	7	1	10	9	2	3	9	8
CR	ppm :	16	6	13	12	9	8	15	13
CU	ppm :	16	460	83	11	9	13	20	9
LA	ppm :	7	0	11	18	6	14	18	27
NB	ppm :	35	20	17	18	23	33	39	27
NI	ppm :	0	1	5	6	0	0	22	30
PB	ppm :	11	4000	18	6	11	20	5	3
RB	ppm :	200	0	41	54	87	97	61	43
SR	ppm :	51	28	190	120	260	160	330	270
V	ppm :	180	55	110	120	120	110	120	160
Y	ppm :	54	28	60	60	18	42	53	48
YB	ppm :	1.2	1.2	1.0	1.4	0.7	1.9	1.6	1.3
ZN	ppm :	57	3400	52	94	29	14	120	85
ZR	ppm :	53	37	92	100	110	120	130	110
TOTALS		100.4	100.0	100.2	100.8	98.3	98.5	100.5	100.8

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY 27F 28A 28B 28C 28D 28E 28F HQ8829

LAB. NO.		9	10	11	12	13	14	15	16
SAMPLE NO:		104B8895 08	104B8895 09	104B8895 10	104B8895 11	104B8895 12	104B8895 13	104B8895 14	104B8895 15
SIO2	% :	60.3	57.2	54.3	58.6	57.2	58.2	56.2	89.5
TIO2	% :	0.53	0.61	0.76	0.44	0.70	0.80	0.78	0.12
AL2O3	% :	16.3	15.6	19.2	16.4	17.8	17.9	15.5	4.80
FE2O3T	% :	5.90	6.20	7.50	3.90	6.40	4.80	13.0	1.70
FE2O3	% :	4.7	1.0	0.8		1.1	0.9		0.0
FEO	% :	1.1	4.7	6.0		4.8	3.5		2.4
MNO	% :	0.20	0.19	0.14	0.15	0.22	0.21	0.07	0.00
MGO	% :	1.68	2.07	2.72	1.09	2.13	1.11	0.49	0.24
CAO	% :	5.47	6.93	3.64	5.98	3.70	5.62	0.76	0.0
NA2O	% :	2.80	2.00	0.70	2.00	4.70	2.20	1.49	0.10
K2O	% :	2.15	1.65	2.79	2.80	1.47	2.60	2.94	1.25
H2OT	% :	2.2	3.3	4.6		3.0	3.0		1.1
CO2T	% :	3.0	5.1	2.7	4.5	2.7	4.0	0.7	0.2
P2O5	% :	0.22	0.23	0.28	0.23	0.25	0.38	0.28	0.05
S	% :	0.00	0.00	0.78	2.92	0.27	0.02	7.99	0.55
BA	ppm :	1800	1500	2200	3200	1400	1300	1900	850
AG	ppm :	0	0	0	0	0	0	0	740
BE	ppm :	1.3	0.9	1.2	1.0	0.9	1.2	1.6	0.4
CO	ppm :	12	10	12	12	8	6	24	2
CR	ppm :	10	10	11	11	19	15	16	7
CU	ppm :	7	7	12	24	14	26	82	390
LA	ppm :	20	9	13	8	11	10	25	3
NB	ppm :	29	27	34	23	36	32		24
NI	ppm :	2	5	0	0	10	8	0	5
PB	ppm :	14	3	2	5	1	0	18	4000
RB	ppm :	75	49	87	91	46	87		0
SR	ppm :	600	240	250	280	280	350	170	0
V	ppm :	110	100	120	100	150	150	180	56
Y	ppm :	61	53	29	50	34	64	33	29
YB	ppm :	1.9	1.5	2.3	1.5	1.5	2.3	2.9	1.2
ZN	ppm :	83	69	9	30	83	62	45	2400
ZR	ppm :	130	110	130	91	120	150	130	33
TOTALS		100.9	100.8	99.7	99.4	100.2	100.7	100.5	100.2

COMMENTS:

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* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY 29A 30A 30B — 30C — 30D KQ-88-30E

LAB. NO.		17	18	19	20	21	22	23	24
SAMPLE NO:		104B8895 16	104B8895 17	104B8895 18	104B8895 19	104B8895 20	104B8895 21	104B8895 22	104B8895 23
SIO2	% :	58.6	72.7	62.6	49.8	71.5	78.2	58.9	67.5
TIO2	% :	0.68	0.30	0.45	0.42	0.32	0.30	0.58	0.32
AL2O3	% :	18.8	15.9	14.7	3.60	15.0	11.5	15.8	14.5
FE2O3T	% :	5.30	2.40	5.20	8.50	2.80	3.30	5.50	3.10
FE2O3	% :		1.3		3.7			0.9	0.2
FEO	% :		1.0		4.3			4.1	2.6
MNO	% :	0.12	0.05	0.10	0.16	0.02	0.02	0.15	0.11
MGO	% :	1.74	0.64	1.83	15.7	1.25	0.64	4.84	1.96
CAO	% :	2.47	0.11	3.97	21.2	0.82	0.13	2.55	3.12
NA2O	% :	3.30	0.90	3.30	0.20	4.70	0.00	3.90	1.10
K2O	% :	3.71	4.30	2.11	0.0	1.95	3.67	3.80	3.32
H2OT	% :		2.5		0.8			2.9	2.6
CO2T	% :	1.8	0.3	3.2	0.3	0.6	0.2	1.9	2.5
P2O5	% :	0.32	0.09	0.12	0.00	0.09	0.21	0.24	0.09
S	% :	1.25	0.10	1.26	0.00	1.12	1.48	0.04	0.06
BA	ppm :	1900	1400	750	80	570	1400	1200	730
AG	ppm :	0	0	0	0	0	0	0	0
BE	ppm :	1.2	1.1	1.1	0.4	1.0	0.9	1.4	1.3
CO	ppm :	10	8	12	43	8	5	16	10
CR	ppm :	10	32	69	570	35	10	49	33
CU	ppm :	16	16	21	9	5	13	39	23
LA	ppm :	17	9	10	4	10	7	17	13
NB	ppm :	28	17	17	7	22	21	34	22
NI	ppm :	0	11	26	99	9	0	35	16
PB	ppm :	16	7	10	5	2	11	11	4
RB	ppm :	150	160	80	20	66	150	71	120
SR	ppm :	290	57	330	45	310	15	370	190
V	ppm :	120	73	110	210	80	180	120	90
Y	ppm :	29	32	30	22	27	34	59	21
YB	ppm :	2.3	0.7	0.7	0.4	0.7	0.9	1.6	0.9
ZN	ppm :	22	12	34	23	30	29	31	29
ZR	ppm :	140	97	130	42	100	52	150	94
TOTALS		98.4	100.4	99.0	100.3	100.3	99.8	100.9	100.1

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY

	30F	30G	31A	31B	31C	31D	32	KQ-88-33A
LAB. NO.	25	26	27	28	29	30	31	32
SAMPLE NO:	104B8895 24	104B8895 25	104B8895 26	104B8895 27	104B8895 28	104B8895 29	104B8895 30	104B8895 31
SIO2 % :	55.3	72.1	58.2	51.3	60.5	55.1	52.8	66.2
TIO2 % :	0.63	0.31	0.59	0.74	0.84	0.63	2.09	0.38
AL2O3 % :	17.3	14.7	15.7	17.5	23.3	16.6	16.5	12.8
FE2O3T % :	6.20	1.90	7.20	5.80	5.00	7.20	10.1	7.90
FE2O3 % :	0.8	0.5	2.9	1.0	1.3	1.6	3.2	2.0
FEO % :	4.9	1.3	3.9	4.3	3.3	5.0	6.2	5.3
MNO % :	0.15	0.05	0.23	0.26	0.05	0.21	0.13	0.12
MGO % :	1.80	0.49	1.38	2.65	0.56	2.13	3.47	1.89
CAO % :	5.74	1.74	5.30	7.99	0.03	6.41	5.71	0.97
NA2O % :	2.50	3.30	3.10	3.70	0.70	0.90	5.30	0.80
K2O % :	3.12	2.48	1.84	1.69	4.79	3.05	1.33	2.62
H2OT % :	3.0	1.6	2.6	3.1	4.1	3.6	2.3	3.0
CO2T % :	4.4	1.5	3.9	5.9	0.2	4.8	0.2	0.6
P2O5 % :	0.21	0.09	0.26	0.31	0.07	0.26	0.73	0.25
S % :	0.20	0.01	0.01	0.01	0.07	0.05	0.04	0.57
BA ppm :	1100	870	1700	1700	2500	1600	1200	21000
AG ppm :	0	0	0	0	0	0	0	0
BE ppm :	1.2	1.2	1.1	1.2	1.7	1.4	2.2	0.7
CO ppm :	17	6	12	11	8	19	27	17
CR ppm :	110	29	11	15	19	18	34	13
CU ppm :	36	13	10	22	18	9	17	29
LA ppm :	13	8	16	19	29	23	48	11
NB ppm :	16	13	25	38	47	22	26	21
NI ppm :	51	1	0	0	0	0	15	0
PB ppm :	6	10	10	7	6	10	20	8
RB ppm :	120	86	53	56	160	110	63	130
SR ppm :	360	200	240	220	180	190	800	1000
V ppm :	170	160	98	130	100	150	100	120
Y ppm :	33	39	67	65	27	65	31	25
YB ppm :	1.3	0.6	2.0	2.4	2.6	2.1	0.9	1.1
ZN ppm :	58	6	99	82	38	77	120	110
ZR ppm :	110	100	120	140	130	110	360	130
TOTALS	100.2	100.3	100.1	100.7	100.2	100.6	100.3	99.7

COMMENTS:

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* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

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ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY 33B 33C 33D 33E 33F 33G 34 KQ-88-

LAB. NO.		33	34	35	36	37	38	39	40
SAMPLE NO:		104B8895 32	104B8895 33	104B8895 34	104B8895 35	104B8895 36	104B8895 37	104B8895 38	104B8895 39
SIO2	% :	88.1	83.3	90.4	76.1	74.1	72.1	78.3	50.0
TIO2	% :	0.39	0.21	0.13	0.41	0.30	0.33	0.29	0.42
AL2O3	% :	6.70	7.60	4.70	6.73	11.3	14.2	11.4	3.60
FE2O3T	% :	1.10	3.50	1.80	7.00	6.30	4.40	3.30	8.50
FE2O3	% :	0.8							3.8
FEO	% :	0.3							4.2
MNO	% :	0.01	0.01	0.00	0.02	0.02	0.04	0.02	0.16
MGO	% :	0.28	0.52	0.29	0.38	0.54	0.84	0.65	15.8
CAO	% :	0.0	0.11	0.0	0.40	0.48	0.52	0.13	21.3
NA2O	% :	0.00	0.30	0.00	0.12	0.00	0.40	0.10	0.20
K2O	% :	2.03	2.42	1.47	2.27	3.54	4.28	3.66	0.0
H2OT	% :	1.0							0.8
CO2T	% :	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.3
P2O5	% :	0.03	0.12	0.04	0.25	0.28	0.25	0.21	0.00
S	% :	0.21	2.49	1.24	5.07	4.34	3.03	1.35	0.00
BA	ppm :	880	1600	480	790	1200	2000	1400	60
AG	ppm :	0	19	0	0	12	0	0	0
BE	ppm :	0.5	0.6	0.4	0.7	0.9	0.9	0.8	0.3
CO	ppm :	1	7	4	13	12	11	5	45
CR	ppm :	5	8	6	13	10	12	9	580
CU	ppm :	14	190	20	86	200	27	11	1
LA	ppm :	5	8	2	7	11	11	8	2
NB	ppm :	38	21	16		28	31	17	17
NI	ppm :	0	0	0	0	0	0	0	84
PB	ppm :	12	11	10	12	17	34	11	6
RB	ppm :	93	100	68		140	180	150	16
SR	ppm :	3	26	0	11	28	28	8	62
V	ppm :	110	98	61	120	140	110	170	210
Y	ppm :	22	24	23	6	39	44	30	21
YB	ppm :	0.6	0.7	0.3	0.6	0.9	1.2	1.1	0.7
ZN	ppm :	3	810	7	31	67	190	23	22
ZR	ppm :	69	37	70	52	42	58	51	51
TOTALS		100.0	100.9	100.2	98.9	101.5	100.8	99.7	100.7

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
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ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY 34A — 50A — 50B — KQ-88-50C 50D

LAB. NO.		41	42	43	44	45	46	47	48
SAMPLE NO:		104B8895 40	104B8895 41	104B8895 98	104B8895 99	104B8896 00	104B8896 01	104B8896 02	104B8896 03
SIO2	% :	77.8	66.8	72.8	50.0	70.3	70.9	82.0	71.3
TIO2	% :	0.35	0.59	0.56	0.41	0.58	0.53	0.41	0.52
AL2O3	% :	10.2	18.0	15.8	3.60	16.1	13.9	9.90	13.8
FE2O3T	% :	3.90	3.90	3.20	8.40	4.20	5.90	2.70	5.90
FE2O3	% :				3.7				
FEO	% :				4.2				
MNO	% :	0.01	0.08	0.01	0.15	0.02	0.01	0.01	0.01
MGO	% :	0.61	1.53	0.68	15.7	0.73	0.52	0.56	0.51
CAO	% :	0.0	0.12	0.11	21.4	0.20	0.33	0.07	0.32
NA2O	% :	0.20	0.10	0.10	0.20	0.10	0.10	0.00	0.10
K2O	% :	4.18	5.15	4.52	0.0	4.81	3.84	3.07	3.81
H2OT	% :				0.8				
CO2T	% :	0.1	0.1	0.2	0.3	0.2	0.1	0.1	0.1
P2O5	% :	0.03	0.22	0.17	0.00	0.17	0.33	0.09	0.32
S	% :	2.83	2.07	1.27	0.00	2.84	4.14	1.66	3.93
BA	ppm :	6200	1800	1200	80	1300	1000	830	
AG	ppm :	5	0	0	0	0	0	0	0
BE	ppm :	0.8	1.5	1.2	0.3	1.2	1.1	0.9	1.1
CO	ppm :	5	13	4	45	8	11	4	11
CR	ppm :	14	17	11	560	13	13	11	12
CU	ppm :	24	13	8	2	13	16	21	16
LA	ppm :	6	14	13	2	17	10	7	10
NB	ppm :	27	32	43	0	49	41	34	35
NI	ppm :	0	0	0	80	0	0	0	0
PB	ppm :	19	38	13	1	13	6	25	8
RB	ppm :	160	200	190	8	190	150	140	150
SR	ppm :	70	21	54	50	36	51	21	60
V	ppm :	120	110	120	200	120	95	150	94
Y	ppm :	25	62	44	15	63	45	20	47
YB	ppm :	1.2	1.6	1.4	0.6	2.0	1.3	0.7	1.3
ZN	ppm :	48	60	20	18	33	35	16	35
ZR	ppm :	68	130	100	63	110	84	61	81
TOTALS		100.9	98.9	99.6	100.6	100.4	100.8	100.7	100.7

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY		51	55A	55B	55C	55D	55E	55F	KQ-88-56A
LAB. NO.		49	50	51	52	53	54	55	56
SAMPLE NO:		104B8896 04	104B8896 05	104B8896 06	104B8896 07	104B8896 08	104B8896 09	104B8896 10	104B8896 11
SIO2	% :	56.0	54.8	58.6	48.3	47.6	46.9	47.5	60.7
TIO2	% :	0.61	0.65	0.63	1.43	0.85	0.88	1.50	0.55
AL2O3	% :	16.4	14.4	11.1	16.8	16.0	17.4	16.8	16.5
FE2O3T	% :	6.60	6.90	6.70	10.4	10.2	9.10	8.60	7.70
FE2O3	% :	0.9	1.2	1.8	3.7	2.4	1.2	1.6	
FEO	% :	5.1	5.1	4.4	6.0	7.0	7.1	6.3	
MNO	% :	0.14	0.09	0.12	0.19	0.18	0.16	0.24	0.04
MGO	% :	3.09	5.33	6.06	4.62	8.96	5.34	3.11	1.94
CAO	% :	5.13	5.08	7.58	8.03	10.4	5.34	6.82	0.22
NA2O	% :	2.60	3.40	3.30	4.10	2.40	2.20	3.30	4.50
K2O	% :	2.53	2.03	1.02	2.07	0.86	4.59	4.88	5.25
H2OT	% :	3.4	3.5	2.4	3.1	3.5	4.3	3.1	
CO2T	% :	3.8	4.1	2.7	1.1	0.2	4.0	5.7	0.1
P2O5	% :	0.22	0.30	0.35	0.88	0.15	0.29	0.58	0.31
S	% :	0.16	0.06	0.07	0.29	0.02	0.41	0.01	1.72
BA	ppm :	550	990	880	910	450	4300	1800	2500
AG	ppm :	0	0	0	0	0	0	0	0
BE	ppm :	1.1	1.2	0.8	1.9	0.4	0.9	1.7	1.0
CO	ppm :	19	21	24	27	41	23	18	10
CR	ppm :	94	220	350	30	260	55	14	71
CU	ppm :	20	66	47	42	53	58	95	300
LA	ppm :	13	13	7	39	5	8	23	2
NB	ppm :	36	16	22	47	6	24	32	26
NI	ppm :	28	83	110	18	100	0	0	0
PB	ppm :	6	6	6	7	2	7	3	7
RB	ppm :	91	53	62	82	68	69	69	120
SR	ppm :	300	510	450	1100	610	420	640	190
V	ppm :	160	170	190	240	220	200	280	290
Y	ppm :	42	42	40	64	50	49	44	17
YB	ppm :	1.4	1.5	1.3	2.1	1.8	1.4	1.4	0.5
ZN	ppm :	52	78	64	97	54	75	73	38
ZR	ppm :	110	110	88	200	55	82	160	95
TOTALS		100.3	100.3	100.4	100.9	100.7	100.7	101.8	99.9

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY

	56B	56C	56D	57A	57B	57C	57D	KQ-88-—
LAB. NO.	57	58	59	60	61	62	63	64
SAMPLE NO:	104B8896 12	104B8896 13	104B8896 14	104B8896 15	104B8896 16	104B8896 17	104B8896 18	104B8896 19
SIO2 % :	62.8	54.9	75.7	68.7	59.8	58.7	63.4	49.5
TIO2 % :	0.47	0.29	0.29	0.13	0.41	0.34	0.43	0.42
AL2O3 % :	13.6	10.9	10.5	15.6	17.2	18.3	15.4	3.50
FE2O3T % :	3.70	5.90	3.80	2.40	4.80	4.30	6.40	8.40
FE2O3 % :	0.6		0.8		2.7	2.4		3.7
FEO % :	2.8		2.7		1.9	1.7		4.2
MNO % :	0.10	0.29	0.02	0.01	0.09	0.10	0.06	0.15
MGO % :	1.71	1.77	0.67	0.52	1.31	0.75	0.73	15.5
CAO % :	3.70	8.71	0.40	0.10	2.50	2.70	0.66	21.3
NA2O % :	0.90	1.70	0.40	3.00	3.60	4.80	3.80	0.10
K2O % :	8.61	3.79	7.34	8.21	8.07	6.88	7.13	0.0
H2OT % :	1.4		0.8		0.9	0.9		0.8
CO2T % :	2.5	6.7	0.1	0.1	1.0	1.9	0.2	0.3
P2O5 % :	0.12	0.35	0.26	0.07	0.25	0.20	0.34	0.00
S % :	0.49	2.89	0.73	1.06	0.08	0.01	1.32	0.00
BA ppm :	1800	4300	1200	1400	4600	4500	1000	60
AG ppm :	0	0	0	0	0	0	2	0
BE ppm :	0.9	2.0	1.4	1.9	1.7	1.5	1.7	0.3
CO ppm :	12	13	9	7	10	7	16	43
CR ppm :	38	19	12	8	10	8	12	550
CU ppm :	730	530	970	1000	280	79	4100	0
LA ppm :	8	9	4	0	10	19	6	0
NB ppm :	23	34	33	18	37	38	48	9
NI ppm :	0	0	0	0	0	0	0	78
PB ppm :	8	14	8	4	18	6	11	0
RB ppm :	160	120	150	160	120	120	130	11
SR ppm :	220	290	94	120	890	620	110	58
V ppm :	480	250	800	490	250	150	770	190
Y ppm :	29	34	7	21	26	44	42	5
YB ppm :	0.9	1.7	0.5	0.2	0.9	1.1	0.9	0.4
ZN ppm :	120	43	6	2	42	8	76	18
ZR ppm :	91	110	39	110	160	110	59	49
TOTALS	100.2	98.8	101.0	100.2	100.4	100.3	100.5	99.6

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY		57E	—	58A	58B	58C	58D	59A	KQ-88-59B
LAB. NO.		65	66	67	68	69	70	71	72
SAMPLE NO:		104B8896 20	104B8896 21	104B8896 22	104B8896 23	104B8896 24	104B8896 25	104B8896 26	104B8896 27
SIO2	% :	62.1	65.2	65.8	65.4	62.9	63.4	55.1	56.8
TIO2	% :	0.38	0.34	0.35	0.35	0.37	0.38	0.42	0.41
AL2O3	% :	14.8	16.2	16.3	16.5	17.6	17.1	15.2	15.0
FE2O3T	% :	4.60	2.60	3.80	2.70	3.40	3.20	8.20	5.60
FE2O3	% :	1.2	1.2	1.5	1.3	2.1	2.1		
FEO	% :	3.1	1.3	2.1	1.3	1.2	1.0		
MNO	% :	0.11	0.08	0.09	0.08	0.08	0.05	0.18	0.17
MGO	% :	2.30	1.11	1.37	1.11	1.32	1.16	2.96	3.03
CAO	% :	2.78	1.90	0.83	1.80	2.19	2.00	2.81	4.26
NA2O	% :	1.60	4.10	3.40	4.10	4.60	4.20	2.20	1.30
K2O	% :	7.77	5.94	6.80	5.95	5.41	5.36	6.50	6.80
H2OT	% :	1.7	1.1	1.3	1.1	1.2	1.5		
CO2T	% :	1.9	1.1	0.3	1.0	0.7	1.4	1.9	3.0
P2O5	% :	0.33	0.18	0.17	0.17	0.18	0.18	0.36	0.31
S	% :	0.45	0.01	0.07	0.01	0.01	0.03	3.78	1.89
BA	ppm :	3300	3500	2700	3400	3100	3600	2800	2900
AG	ppm :	0	0	0	0	0	1	0	0
BE	ppm :	1.3	1.4	1.1	1.4	1.5	1.6	0.8	0.9
CO	ppm :	9	7	7	7	6	7	19	15
CR	ppm :	11	13	9	12	9	9	21	21
CU	ppm :	880	110	910	110	54	10	630	880
LA	ppm :	6	9	11	9	9	10	5	6
NB	ppm :	26	43	35	31	43	45	22	26
NI	ppm :	0	0	0	0	0	0	0	0
PB	ppm :	1	3	3	2	3	9	6	5
RB	ppm :	180	110	120	110	100	110	120	150
SR	ppm :	200	570	430	580	700	570	260	290
V	ppm :	250	140	230	140	130	110	240	250
Y	ppm :	33	43	43	34	33	46	28	25
YB	ppm :	0.7	1.2	1.0	1.2	1.2	1.3	0.9	0.8
ZN	ppm :	25	13	21	11	18	14	38	30
ZR	ppm :	48	120	120	120	160	120	56	53
TOTALS		101.0	100.2	100.8	100.6	100.3	100.3	100.0	99.0

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY 72A 72B 72C 72D 72E — 72F KQ-88-—

LAB. NO.		73	74	75	76	77	78	79	80
SAMPLE NO:		104B8896 74	104B8896 75	104B8896 76	104B8896 77	104B8896 78	104B8896 79	104B8896 80	104B8896 81
SIO2	% :	57.7	55.0	59.4	61.2	55.5	55.2	59.3	55.7
TIO2	% :	0.46	0.40	0.51	0.35	0.41	0.61	0.39	0.41
AL2O3	% :	17.1	15.0	17.2	16.9	15.7	14.2	13.3	12.1
FE2O3T	% :	4.80	4.50	1.80	3.80	5.20	6.10	7.50	6.00
FE2O3	% :	2.7	0.9	0.6	1.9		1.4		
FEO	% :	1.9	3.2	1.1	1.7		4.2		
MNO	% :	0.08	0.23	0.07	0.08	0.19	0.15	0.09	0.27
MGO	% :	1.12	2.71	1.15	1.11	1.90	3.89	1.73	1.93
CAO	% :	4.70	6.84	4.43	2.95	5.31	7.71	2.08	6.51
NA2O	% :	4.70	2.20	2.80	4.70	1.70	3.50	1.10	3.30
K2O	% :	5.15	5.68	8.08	5.39	7.37	1.76	7.32	4.74
H2OT	% :	1.2	2.3	1.2	1.2		2.8		
CO2T	% :	3.0	5.0	3.1	2.0	3.9	4.2	4.1	7.0
P2O5	% :	0.23	0.21	0.26	0.19	0.27	0.29	0.31	0.15
S	% :	0.07	0.41	0.07	0.05	1.93	0.39	3.16	2.35
BA	ppm :	5400	2400	3800	4300	2500	620	2000	1100
AG	ppm :	0	0	0	0	0	0	0	0
BE	ppm :	1.6	1.1	1.0	1.4	1.7	1.4	0.9	2.0
CO	ppm :	9	11	6	8	8	19	23	15
CR	ppm :	10	14	6	9	9	250	36	30
CU	ppm :	110	940	290	43	280	40	3000	2500
LA	ppm :	14	4	8	13	14	14	5	11
NB	ppm :	28	31	26	37	36	36	37	53
NI	ppm :	0	0	0	0	0	82	0	0
PB	ppm :	3	6	5	7	16	10	11	170
RB	ppm :	100	130	160	110	170	38	130	110
SR	ppm :	780	180	370	660	400	350	220	210
V	ppm :	150	200	280	130	180	150	290	630
Y	ppm :	40	60	55	34	59	42	34	47
YB	ppm :	1.2	1.6	1.6	1.1	1.5	1.2	1.0	1.3
ZN	ppm :	0	29	12	8	20	60	34	240
ZR	ppm :	160	75	110	150	97	97	61	73
TOTALS		100.8	100.5	100.5	100.3	99.8	100.5	101.0	101.0

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY—		73A	73B	73C	73D	73E	74A	KQ-8874B
LAB. NO.		81	82	83	84	85	86	87	88
SAMPLE NO:		104B8896 82	104B8896 83	104B8896 84	104B8896 85	104B8896 86	104B8896 87	104B8896 88	104B8896 89
SIO2	% :	53.8	54.1	57.4	60.2	73.0	57.5	63.7	94.1
TIO2	% :	0.43	0.46	0.48	0.49	0.05	0.56	0.49	0.05
AL2O3	% :	15.7	16.3	17.3	17.0	14.2	16.8	15.9	1.70
FE2O3T	% :	9.60	7.20	6.80	6.30	1.00	4.70	3.80	1.90
FE2O3	% :					0.7	0.4		0.6
FEO	% :					0.3	3.9		1.2
MNO	% :	0.09	0.09	0.07	0.04	0.01	0.07	0.08	0.05
MGO	% :	2.83	4.04	2.86	1.70	0.19	1.88	0.95	0.18
CAO	% :	2.14	2.66	0.48	0.49	0.01	1.58	1.03	0.20
NA2O	% :	2.50	3.30	1.40	2.80	2.90	4.80	1.90	0.00
K2O	% :	8.01	6.98	9.70	8.12	8.07	5.40	8.62	0.79
H2OT	% :					0.4	0.9		0.3
CO2T	% :	1.1	1.9	0.1	0.1	0.1	3.8	0.7	0.2
P2O5	% :	0.41	0.37	0.42	0.45	0.01	0.25	0.11	0.02
S	% :	2.60	1.93	1.27	2.59	0.02	0.88	2.30	0.99
BA	ppm :	2300	2000	4300	3200	1100	1200	2100	300
AG	ppm :	0	0	0	0	0	0	0	0
BE	ppm :	0.7	1.3	1.4	1.2	3.5	1.8	1.6	0.1
CO	ppm :	42	27	15	13	1	22	11	8
CR	ppm :	73	94	20	20	3	36	47	8
CU	ppm :	5100	1000	740	620	120	3100	680	3900
LA	ppm :	6	5	4	9	2	13	15	3
NB	ppm :	25	27	27	41	39	41	26	3
NI	ppm :	4	0	0	0	0	16	0	4
PB	ppm :	17	15	18	25	20	25	43	27
RB	ppm :	150	230	210	180	140	150	190	86
SR	ppm :	190	240	170	130	86	200	86	11
V	ppm :	320	250	410	340	140	230	330	62
Y	ppm :	37	40	19	31	15	47	37	0
YB	ppm :	1.3	1.1	1.1	1.2	0.2	1.6	1.1	0.2
ZN	ppm :	48	44	65	43	9	460	64	85
ZR	ppm :	46	49	67	59	150	130	140	48
TOTALS		100.0	99.7	98.9	100.7	100.1	99.3	100.0	100.8

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FED,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FED(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 19-APR-89

ICP-ES LABORATORY 74C 74D 74E 74F 74G 74H 75A KQ-88-75B

LAB. NO.		89	90	91	92	93	94	95	96
SAMPLE NO:		104B8896 90	104B8896 91	104B8896 92	104B8896 93	104B8896 94	104B8896 95	104B8896 96	104B8896 97
SIO2	% :	66.2	64.8	61.2	55.1	55.5	41.8	85.3	86.5
TIO2	% :	0.08	0.13	0.39	0.40	0.30	0.22	0.17	0.09
AL203	% :	14.9	18.1	17.3	11.9	9.70	8.71	5.70	3.30
FE203T	% :	1.80	2.40	2.40	6.10	8.00	27.7	4.70	6.00
FE203	% :		0.2			5.9			
FEO	% :		2.0			1.9			
MNO	% :	0.13	0.01	0.17	0.28	0.24	0.05	0.01	0.01
MGO	% :	0.55	1.00	0.74	1.92	3.05	0.88	0.26	0.13
CAO	% :	2.91	0.0	1.97	6.60	8.09	0.79	0.01	0.0
NA2O	% :	0.70	2.50	2.50	3.10	0.80	0.21	0.10	0.10
K2O	% :	10.0	8.89	9.50	4.93	6.56	6.10	1.57	0.70
H2OT	% :		1.3			1.0			
CO2T	% :	2.5	0.1	1.5	7.2	6.5	0.7	0.1	0.1
P2O5	% :	0.02	0.03	0.35	0.15	0.05	0.12	0.05	0.00
S	% :	1.10	0.65	1.31	2.36	0.11	20.0	3.54	4.71
BA	ppm :	1000	1600	3200	1100	3800	1500	410	500
AG	ppm :	0	0	0	4	0	7	0	0
BE	ppm :	1.8	3.1	2.3	2.2	5.2	1.6	0.4	0.2
CO	ppm :	4	3	9	18	19	7	7	8
CR	ppm :	7	4	25	34	12	2	8	9
CU	ppm :	160	140	1000	2700	370	980	1100	580
LA	ppm :	16	1	17	14	10	84	5	2
NB	ppm :	22	40	49	52	26		10	21
NI	ppm :	0	0	0	0	0	0	0	0
PB	ppm :	33	14	29	160	18	150	35	26
RB	ppm :	200	210	200	110	150		43	72
SR	ppm :	120	49	150	210	410	37	8	9
V	ppm :	120	340	540	670	950	680	58	39
Y	ppm :	26	9	27	47	35	10	23	33
YB	ppm :	0.7	0.3	0.8	1.5	1.3	0.7	0.4	0.6
ZN	ppm :	28	16	25	250	84	68	460	67
ZR	ppm :	110	150	58	74	130	34	33	23
TOTALS		101.1	99.9	99.9	100.6	100.3	107.6	101.7	101.8

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY 75C — 75D — 75E 76A 76B KQ-88-76C

LAB. NO.		97	98	99	100	101	102	103	104
SAMPLE NO:		104B8896 98	104B8896 99	104B8897 00	104B8897 01	104B8897 02	104B8897 03	104B8897 04	104B8897 05
SIO2	% :	83.2	49.5	69.8	76.7	66.9	60.1	64.9	85.0
TIO2	% :	0.12	0.42	0.31	0.41	0.11	0.53	0.38	0.20
AL2O3	% :	3.90	3.60	7.83	11.5	4.57	14.1	18.0	7.00
FE2O3T	% :	4.80	8.50	8.73	4.60	16.6	5.30	5.50	3.10
FE2O3	% :		3.7				1.1		
FEO	% :		4.3				3.8		
MNO	% :	0.02	0.16	0.02	0.01	0.02	0.22	0.01	0.01
MGO	% :	0.37	15.6	0.45	0.45	0.36	1.82	0.51	0.26
CAO	% :	0.16	21.1	0.74	0.02	0.43	7.92	0.12	0.47
NA2O	% :	0.10	0.20	0.33	0.10	0.21	0.70	3.20	0.10
K2O	% :	0.93	0.0	1.99	3.26	1.23	2.11	3.39	1.87
H2OT	% :		0.9				3.2		
CO2T	% :	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0.2
P2O5	% :	0.14	0.01	0.65	0.04	0.53	0.20	0.27	0.61
S	% :	3.99	0.00	6.90	3.28	12.8	0.03	2.18	1.92
BA	ppm :	18000	70	2000	1300	24000	2100	3200	850
AG	ppm :	8	0	0	0	0	0	1	79
BE	ppm :	0.3	0.4	0.6	1.4	0.4	0.9	1.2	0.6
CO	ppm :	9	48	21	7	19	11	8	5
CR	ppm :	9	590	19	36	10	16	11	8
CU	ppm :	260	3	820	27	550	21	43	100
LA	ppm :	2	2	8	18	0	11	10	8
NB	ppm :	8	3		25		24	26	15
NI	ppm :	0	91	0	0	0	0	0	0
PB	ppm :	210	13	65	27	94	18	11	32
RB	ppm :	69	5		120		73	120	74
SR	ppm :	2500	62	62	47	390	230	200	28
V	ppm :	39	220	170	93	59	110	160	120
Y	ppm :	15	16	7	35	5	43	23	24
YB	ppm :	0.5	0.7	0.8	2.5	0.5	1.2	1.1	0.8
ZN	ppm :	210	24	130	38	2200	62	17	28
ZR	ppm :	59	63	29	110	11	100	62	40
TOTALS		99.9	99.9	98.2	100.7	106.5	96.3	98.9	100.9

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 18 APRIL 89

ICP-ES LABORATORY 76D 77A 77B 77C 78 79A KQ-88-80

LAB. NO.		105	106	107	108	109	110	111	112
SAMPLE NO:		104B8897 06	104B8897 07	104B8897 08	104B8897 09	104B8897 10	104B8897 11	227-88-1 11	227-88-1 12
SIO2	% :	76.4	56.8	84.5	62.0	86.0	57.6	71.2	83.6
TIO2	% :	0.41	0.91	0.21	0.38	0.05	0.58	0.52	0.21
AL2O3	% :	11.6	19.1	6.60	13.2	1.90	17.7	15.6	7.70
FE2O3T	% :	4.70	7.90	2.40	4.10	5.40	6.40	5.30	3.40
FE2O3	% :			1.2	0.8				
FEO	% :			1.1	3.0				
MNO	% :	0.01	0.12	0.06	0.15	0.00	0.08	0.02	0.01
MGO	% :	0.45	1.35	0.40	1.38	0.28	2.75	0.55	0.52
CAO	% :	0.01	2.04	0.43	6.82	0.0	2.72	0.02	0.11
NA2O	% :	0.10	2.40	0.10	2.70	0.00	6.80	1.20	0.10
K2O	% :	3.30	3.77	1.95	2.01	0.49	2.28	2.87	2.46
H2OT	% :			1.4	2.3				
CO2T	% :	0.1	1.0	0.4	5.2	0.2	1.3	0.1	0.1
P2O5	% :	0.05	0.37	0.07	0.09	0.02	0.26	0.02	0.11
S	% :	3.37	3.32	0.50	0.02	2.06	1.63	1.84	2.69
BA	ppm :	1300	2000	420	510	150	1300	2400	1500
AG	ppm :	2	0	8	0	68	1	0	20
BE	ppm :	1.4	2.3	0.7	0.9	0.2	1.5	1.1	0.6
CO	ppm :	7	18	5	12	2	19	3	7
CR	ppm :	36	24	25	42	9	60	8	7
CU	ppm :	27	55	200	18	220	88	8	190
LA	ppm :	17	22	5	11	7	21	7	7
NB	ppm :	38	43	9	25	7	29	30	29
NI	ppm :	0	0	8	13	0	35	0	0
PB	ppm :	19	16	690	17	30	11	10	6
RB	ppm :	130	120	75	80	70	44	79	100
SR	ppm :	45	260	22	360	0	560	240	33
V	ppm :	92	200	69	78	21	300	130	100
Y	ppm :	33	30	44	19	13	59	21	25
YB	ppm :	2.4	3.2	0.6	0.8	0.5	2.1	1.1	0.6
ZN	ppm :	27	51	2000	18	27	81	25	830
ZR	ppm :	110	160	49	110	53	110	96	34
TOTALS		100.7	99.4	99.3	100.2	96.5	100.4	99.5	101.3

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

ANALYTICAL CHEMISTRY SECTION DATE: 19-APR-89

ICP-ES LABORATORY 80A

LAB. NO.		113	114	115
SAMPLE NO:		227-88-1 13	227-88-1 14	227-88-1 15
SIO2	% :	60.0	57.5	42.2
TIO2	% :	0.54	0.45	0.23
AL2O3	% :	16.3	17.0	9.10
FE2O3T	% :	7.70	4.70	28.0
FE2O3	% :		2.5	
FEO	% :		2.0	
MNO	% :	0.04	0.08	0.05
MGO	% :	1.92	1.09	0.91
CAO	% :	0.22	4.66	0.82
NA2O	% :	4.40	4.70	0.22
K2O	% :	5.26	5.17	6.44
H2OT	% :		1.2	
CO2T	% :	0.1	3.1	0.7
P2O5	% :	0.31	0.23	0.13
S	% :	1.66	0.09	20.2
BA	ppm :	2500	5300	1600
AG	ppm :	1	0	7
BE	ppm :	1.1	1.6	1.6
CO	ppm :	11	11	7
CR	ppm :	70	10	0
CU	ppm :	300	110	1000
LA	ppm :	5	17	88
NB	ppm :	16	28	
NI	ppm :	0	0	0
PB	ppm :	4	5	150
RB	ppm :	120	110	
SR	ppm :	190	790	39
V	ppm :	310	160	710
Y	ppm :	20	48	11
YB	ppm :	0.6	1.5	0.9
ZN	ppm :	32	3	65
ZR	ppm :	97	160	27
TOTALS		98.8	100.4	109.4

COMMENTS:

* ALL ANALYSIS BY ICP,EXCEPT FEO,H2OT,CO2T,CO2,C,S AND LOI BY CHEMICAL METHODS.
* FE2O3 IS CALCULATED USING FE2O3=FE2O3T(ICP)-1.11134*FEO(VOLUMETRIC).
* ICP-MJ1 DATA ARE OBTAINED ON 0.5 G OF SAMPLE FUSED WITH LITHIUM METABORATE, DISSOLVED IN 5% HNO3 AND DILUTED TO 250 ML.

* ICP-TR1 DATA ARE OBTAINED ON 1.0 G OF SAMPLE (ACID + FUSION OF RESIDUE) DISSOLVED IN 10% HCL AND DILUTED TO 100 ML.

FILE NAME : KIRKHAM.R.
ROCKS
227-88

ELEMENT REPORT OF COMPLETED ANALYSIS
FILE NUMBER : 22788

DATE : 21 Jun 1989
PAGE : 1
SET : 1 OF 1

SAMPLE	NAME	E - M - A F DIONEX1 PYROHYDROL PPM 50	E - M - A CL DIONEX1 PYROHYDROL PPM 100	E - M - A S-TOTAL DIONEX1 PYROHYDROL PPM 50
104B889500	KQ-88-25	1046.	< 100.	49199.
104B889501	—	243.	100.	7864.
104B889502	26	426.	166.	407.
104B889503	27A	322.	109.	85.
104B889504	27B	302.	< 100.	18406.
104B889505	KQ-88-27C	764.	< 100.	18664.
104B889506	27D	488.	148.	130.
104B889507	27E	424.	< 100.	141.
104B889508	27F	502.	107.	55.
104B889509	28A	429.	< 100.	< 50.
104B889510	28B	496.	< 100.	7879.
104B889511	28C	752.	< 100.	30316.
104B889512	28D	362.	< 100.	3156.
104B889513	28E	443.	< 100.	327.
104B889514	28F	399.	< 100.	81818.
104B889515	29	249.	147.	6193.
104B889516	29A	677.	169.	12336.
104B889517	30A	459.	104.	1133.
104B889518	30B	343.	< 100.	12210.
104B889519	—	< 50.	< 100.	< 50.
104B889520	30C	288.	< 100.	10782.
104B889521	—	630.	113.	14140.
104B889522	30D	713.	< 100.	581.
104B889523	30E	448.	108.	673.
104B889524	30F	475.	< 100.	2089.
104B889525	30G	233.	148.	88.
104B889526	31A	376.	< 100.	105.
104B889527	KQ-88-31B	503.	< 100.	180.
104B889528	31C	324.	< 100.	902.
104B889529	31D	555.	< 100.	484.
104B889530	32	1180.	156.	511.
104B889531	33A	590.	105.	6570.
104B889532	33B	249.	< 100.	2247.
104B889533	33C	198.	< 100.	11634.
104B889534	33D	486.	101.	24914.
104B889535	33E	479.	< 100.	54305.
104B889536	33F	680.	131.	47277.
104B889537	33G	673.	< 100.	31739.
104B889538	34	609.	< 100.	13361.
104B889539	—	54.	< 100.	< 50.

FILE NAME : KIRKHAM.R.
ROCKS
227-88

ELEMENT REPORT OF COMPLETED ANALYSIS
FILE NUMBER : 22788

DATE : 21 Jun 1989
PAGE : 2
SET : 1 OF 1

SAMPLE	NAME	E - M - A F DIONEX1 PYROHYDROL PPM 50	E - M - A CL DIONEX1 PYROHYDROL PPM 100	E - M - A S-TOTAL DIONEX1 PYROHYDROL PPM 50
104B889540	KQ-88-34A	449.	120.	29257.
104B889541	—	530.	< 100.	21324.
104B889598	50A	670.	< 100.	11209.
104B889599	—	< 50.	< 100.	< 50.
104B889600	50B	780.	< 100.	27000.
104B889601	—	733.	< 100.	41467.
104B889602	50C	541.	< 100.	15871.
104B889603	50D	708.	< 100.	41109.
104B889604	51	484.	< 100.	1961.
104B889605	55A	690.	< 100.	765.
104B889606	55B	497.	< 100.	787.
104B889607	55C	1078.	124.	2692.
104B889608	55D	270.	< 100.	310.
104B889609	55E	434.	< 100.	3844.
104B889610	55F	735.	150.	207.
104B889611	56A	1346.	< 100.	15573.
104B889612	56B	865.	120.	7300.
104B889613	KQ-88-56C	1794.	< 100.	30503.
104B889614	56D	779.	< 100.	7215.
104B889615	57A	559.	195.	9904.
104B889616	57B	665.	472.	885.
104B889617	57C	703.	323.	203.
104B889618	57D	739.	< 100.	11978.
104B889619	—	< 50.	< 100.	< 50.
104B889620	57E	1693.	< 100.	4417.
104B889621	—	558.	150.	878.
104B889622	58A	843.	231.	159.
104B889623	58B	777.	< 100.	147.
104B889624	58C	677.	137.	143.
104B889625	58D	922.	107.	377.
104B889626	59A	995.	152.	38787.
104B889627	59B	770.	< 100.	12014.
104B889674	72A	674.	< 100.	901.
104B889675	72B	1052.	< 100.	4161.
104B889676	72C	892.	< 100.	876.
104B889677	72D	517.	186.	615.
104B889678	72E	1209.	< 100.	17666.
104B889679	—	752.	< 100.	4535.
104B889680	KQ-88-72F	1177.	< 100.	32282.
104B889681	—	2154.	< 100.	23311.

FILE NAME : KIRKHAM.R.
ROCKS
227-88

ELEMENT REPORT OF COMPLETED ANALYSIS
FILE NUMBER : 22788

DATE : 21 Jun 1989

SET : 1 OF 1

SAMPLE	NAME	E - M - A F DIONEX1 PYROHYDROL PPM 50	E - M - A CL DIONEX1 PYROHYDROL PPM 100	E - M - A S-TOTAL DIONEX1 PYROHYDROL PPM 50
104B889682	KQ-88-72G	3727.	107.	25901.
104B889683	73A	5093.	127.	19222.
104B889684	73B	2487.	< 100.	13226.
104B889685	73C	1726.	< 100.	24904.
104B889686	73D	111.	244.	237.
104B889687	73E	2367.	< 100.	8716.
104B889688	74A	4319.	< 100.	22288.
104B889689	74B	670.	151.	9348.
104B889690	74C	1234.	< 100.	11163.
104B889691	74D	3188.	< 100.	6867.
104B889692	74E	2502.	< 100.	12777.
104B889693	74F	2157.	< 100.	24686.
104B889694	74G	3164.	< 100.	1246.
104B889695	74H	3068.	< 100.	216966.
104B889696	KQ-88-75A	488.	112.	35362.
104B889697	75B	250.	< 100.	48410.
104B889698	75C	489.	< 100.	41053.
104B889699	—	155.	< 100.	51.
104B889700	75D	1276.	< 100.	71210.
104B889701	—	521.	< 100.	34410.
104B889702	75E	989.	< 100.	154509.
104B889703	76A	517.	< 100.	540.
104B889704	76B	563.	105.	21308.
104B889705	76C	587.	107.	19767.
104B889706	76D	571.	< 100.	35594.
104B889707	77A	782.	< 100.	34089.
104B889708	77B	381.	< 100.	5363.
104B889709	77C	317.	< 100.	444.
104B889710	KQ-88-78	90.	149.	20251.
104B889711	79A	654.	< 100.	16977.