

NAME

No.

MENZIE CREEK - WHOLE ROCK ANALYSES

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CYPRUS ANVIL MINING CORPORATION

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## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1129	1135	1912	113A	1481
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	1048	1049	1050	1051	1052
SI O2	48.47	48.96	47.32	52.22	53.88
TI O2	2.44	.53	2.63	1.17	1.43
AL2 O3	15.00	15.14	17.29	20.43	18.17
FE2 O3	13.85	13.70	16.98	12.33	11.94
FE O	-.01	-.01	-.01	-.01	-.01
MN O	.17	.14	.08	.02	.02
MG O	9.23	9.17	8.49	3.30	7.82
CA O	5.87	9.06	1.75	5.84	1.11
NA2 O	3.78	2.82	4.77	.36	4.33
K2 O	.89	.06	.30	3.84	.85
P2 O5	.29	.41	.38	.50	.45
S	.02	.10	.57	.04	.03
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	100.09	100.86	100.05	100.03

## TRACE ELEMENT CHEMISTRY (PPM)

BA	1953.00	146.00	1160.00	706.00	2928.00
CU	66.00	52.00	144.00	52.00	13.00
PB	6.00	10.00	20.00	10.00	25.00
ZN	94.00	97.00	82.00	68.00	78.00
CO	0.	0.	0.	0.	0.
AG	0.	0.	0.	0.	0.
CR	190.00	240.00	90.00	130.00	20.00
V	290.00	200.00	288.00	182.00	220.00
CO	46.00	62.00	64.00	57.00	58.00
NI	68.00	182.00	72.00	96.00	22.00
MB	3.00	4.00	4.00	4.00	5.00
RB	15.00	5.00	3.00	48.00	17.00
SR	214.00	197.00	74.00	39.00	45.00
ZR	160.00	195.00	222.00	442.00	365.00
Y	15.00	14.00	14.00	26.00	36.00

		GEOCHEMICAL DATA (PERCENT)				GROUP 1
SPECIMEN ID	1458	1505	1617	830		
ROCK TYPE	MCV	MCV	MCV	MCV		
SEQUENCE NO	1053	1054	1055	1056		
SI O2	49.37	49.85	50.92	47.23		
TI O2	1.15	1.25	2.66	1.56		
AL2 O3	15.76	15.35	12.99	17.01		
FE2 O3	12.67	15.13	12.99	15.21		
FE O	-.01	-.01	-.01	-.01		
MT O	.09	.13	.15	.10		
MG O	5.29	6.53	6.18	8.03		
CA O	9.48	7.40	9.07	4.67		
NA2 O	5.40	3.54	4.23	4.01		
K2 O	.50	.49	.52	1.32		
P2 O5	.30	.33	.30	.86		
S	.14	.07	.02	.06		
L.O.I.	0.	0.	0.	0.		
TOTAL	100.15	100.07	100.03	100.06		

UNIT 5C

## TRACE ELEMENT CHEMISTRY (PPM)

BA	931.00	2627.00	600.00	515.00
CU	117.00	145.00	100.00	53.00
PB	9.00	8.00	10.00	4.00
ZN	90.00	144.00	110.00	75.00
CD	0.	0.	0.	0.
AG	0.	0.	0.	0.
CR	215.00	65.00	185.00	10.00
V	275.00	285.00	193.00	150.00
CO	54.00	52.00	52.00	53.00
NI	125.00	47.00	98.00	13.00
MB	4.00	4.00	4.00	3.00
RB	12.00	9.00	9.00	19.00
SR	282.00	264.00	333.00	506.00
ZR	156.00	175.00	188.00	241.00
Y	27.00	31.00	27.00	21.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4197	4198	4219	4474	4505
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2016	2017	2018	2020	2021
SI O2	48.75	50.12	47.78	48.75	50.67
TI O2	1.59	2.39	1.27	1.78	2.57
AL2 O3	16.97	14.73	13.63	18.67	15.82
FE2 O3	2.67	2.54	2.75	3.13	3.37
FE O	7.30	9.34	8.72	8.63	10.15
MN O	.15	.21	.16	.15	.12
MG O	6.48	7.68	7.61	9.49	5.02
CA O	10.28	8.09	13.21	3.45	7.27
NA2 O	2.88	4.00	4.44	4.64	4.28
K2 O	2.67	.52	.11	.49	.27
P2 O5	.25	.38	.33	.63	.47
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	99.99	100.00	100.01	100.01	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CJ	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	94.00	160.00	120.00	115.00	185.00
Y	0.	0.	0.	0.	5.00

		GEOCHEMICAL DATA (PERCENT)				GROUP 2
SPECIMEN ID	4506	4648	4663	4692	4955	
ROCK TYPE	MCV	MCV	MCV	MCV	MCV	
SEQUENCE NO	2022	2023	2024	2025	2026	
SI O2	49.18	48.10	48.83	48.01	46.26	
TI O2	3.48	1.55	2.78	2.73	1.86	
AL2 O3	15.06	15.93	15.86	13.97	11.14	
FE2 O3	1.84	1.76	5.15	3.27	2.76	
FE O	10.24	9.05	9.45	9.11	9.95	
MN O	.15	.16	.19	.15	.13	
MG O	5.74	9.52	5.36	6.33	15.10	
CA O	8.61	8.59	9.66	10.69	10.78	
NA2 O	3.89	3.41	2.31	4.58	1.08	
K2 O	1.33	1.66	0.	.71	.60	
P2 O5	.47	.28	.41	.45	.35	
S	-.01	-.01	-.01	-.01	-.01	
L.O.I.	0.	0.	0.	0.	0.	
TOTAL	99.99	100.01	100.00	100.00	100.01	

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	190.00	135.00	160.00	175.00	145.00
Y	10.00	0.	6.00	0.	0.

## GEOCHEMICAL DATA (PERCENT)

## GROUP 2

SPECIMEN ID	4957	5009	5329	5535	5549
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2027	2090	2091	2092	2093
SI O2	47.64	49.56	46.77	49.17	44.12
TI O2	3.87	2.95	4.20	4.04	.63
AL2 O3	16.93	15.82	15.13	14.70	10.64
FE2 O3	5.22	5.75	7.04	4.87	2.40
FE O	8.99	7.59	8.41	8.90	8.45
MN O	.16	.19	.18	.16	.21
MG O	5.33	5.90	5.78	5.80	24.20
CA O	6.06	10.02	6.73	7.76	8.45
NA2 O	4.70	1.69	4.10	3.11	.37
K2 O	.52	.11	1.05	.98	.16
P2 O5	.59	.43	.61	.52	.40
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	100.01	100.00	100.01	100.03

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
KB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	245.00	180.00	240.00	220.00	105.00
Y	17.00	0.	15.00	12.00	0.

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	5573	5623	5764	5794	6331
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2094	2095	2096	2097	2098
SI O2	43.77	47.61	51.97	46.51	49.03
TI O2	2.33	1.55	.97	3.61	2.76
AL2 O3	16.88	14.05	16.17	14.89	16.56
FE2 O3	2.15	4.13	3.67	2.98	2.33
FE O	8.09	4.54	9.70	9.57	11.04
MN O	.16	.12	.13	.09	.15
MG O	9.20	7.85	7.22	5.50	12.12
CA O	10.94	14.98	5.50	8.59	2.49
NA2 O	2.10	.52	4.10	1.09	2.92
K2 O	3.90	3.92	.16	6.53	.16
P2 O5	.49	.72	.41	.64	.44
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	99.99	100.00	100.00	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	175.00	180.00	175.00	250.00	180.00
Y	0.	6.00	0.	8.00	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1129	1135 <i>high modal plagi</i>	1912	1138	1481
ROCK TYPE	MCV <i>biotite tremolite</i>	MCV <i>altered with CO3</i>	MCV <i>high plagi No CaO</i>	MCV <i>amphibole CO3</i>	MCV
SEQUENCE NO	1048 <i>pyroxene phenos</i>	1049 <i>plagi phenos</i>	1050 <i>no phenos</i>	1051 <i>epi volcanic clastic</i>	1052 <i>no phenos</i>
SI O2	46.28	44.49	45.39	48.45	51.13
TI O2	2.33	.48	2.52	1.08	1.35
AL2 O3	14.33	13.76	16.59	18.96	17.24
FE2 O3	13.22	12.45	16.28	11.44	11.33
FE O	-.01	-.01	-.01	-.01	-.01
MN O	.16	.13	.08	.02	.02
MG O	8.82	8.34	8.14	3.06 <i>high K2O</i>	7.42
CA O	5.61	8.23	1.68	5.42	1.05
NA2 O	3.61	2.56	4.58	.33 <i>&amp; low Na2O</i>	4.11
K2 O	.85	.05	.28	3.56	.80
P2 O5	.28	.37	.37	.46	.45
S	.02	.09	.83	.04	.03
L.O.I.	4.49	9.05	3.24	7.18	5.08
TOTAL	100.00	100.00	99.98	100.00	99.99

## TRACE ELEMENT CHEMISTRY (PPM)

BA	1953.00	146.00	1160.00	706.00	2928.00
CU	66.00	52.00	144.00	52.00	13.00
PB	6.00	10.00	20.00	10.00	25.00
ZN	94.00	97.00	82.00	68.00	78.00
CO	0.	0.	0.	0.	0.
AG	0.	0.	0.	0.	0.
CR	190.00	240.00	90.00	130.00	20.00
V	290.00	200.00	288.00	182.00	220.00
CO	46.00	62.00	64.00	57.00	38.00
NI	68.00	182.00	72.00	96.00	22.00
MB	3.00	4.00	4.00	4.00	3.00
KB	15.00	5.00	3.00	48.00	17.00
SR	214.00	197.00	74.00	39.00	45.00
ZR	160.00	195.00	222.00	442.00	365.00
Y	15.00	14.00	14.00	26.00	36.00

*note low CaO  
+ high Na2O*

## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1458	1505	1617	830
ROCK TYPE	MCV <sup>??</sup> <i>stipnomelane</i>	MCV <sup>biotite</sup> <sup>CO<sub>3</sub></sup>	MCV	MCV <sup>50</sup>
SEQUENCE NO	1053 <i>plag phenos</i>	1054 <i>no phenos</i>	1055 <i>plag + pyroxene phenos</i>	1056
SI O2	44.96	45.86	49.44	44.77
TI O2	1.04	1.15	2.58	1.48
AL2 O3	14.35	14.12	12.61	16.12
FE2 O3	11.54	13.92	12.61	14.42
FE O	.01	.01	.01	.01
MN O	.08	.12	.15	.09
MG O	4.82	6.01	6.00	7.61
CA O	8.63	6.81	8.81	4.43
NA2 O	4.92	3.25	4.10	3.81
K2 O	.45	.45	.50	1.25
P2 O5	.27	.30	.29	.81
S	.13	.06	.02	.06
L.O.I.	8.80	7.95	2.88	5.15
TOTAL	99.99	100.00	99.99	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	931.00	2627.00	600.00	515.00
CU	117.00	145.00	100.00	53.00
PB	9.00	8.00	10.00	4.00
ZN	90.00	144.00	110.00	75.00
CD	0.	0.	0.	0.
AG	0.	0.	0.	0.
CR	215.00	65.00	185.00	10.00
V	275.00	285.00	193.00	150.00
CO	54.00	52.00	52.00	53.00
NI	125.00	47.00	98.00	13.00
MB	4.00	4.00	4.00	3.00
RB	12.00	9.00	9.00	19.00
SR	282.00	264.00	333.00	506.00
ZR	156.00	175.00	188.00	241.00
Y	27.00	31.00	27.00	21.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4197	4198	4219	4474	4505
ROCK TYPE	MCV <i>alund with scoria</i>	MCV	MCV <i>tremolite much CO<sub>2</sub></i>	MCV <i>not volcanic</i>	MCV <i>abundant CO<sub>2</sub></i>
SEQUENCE NO	2016 <i>plag + pyroxene phenos</i>	2017 <i>plag + pyroxene phenos</i>	2018 <i>highly altered</i>	2020 <i>amorphous diabase</i>	2021 <i>no phenos</i>
SI O2	47.33	48.48	45.02	45.19	47.38
TI O2	1.55	2.31	1.20	1.65	2.40
AL2 O3	16.48	14.25	12.85	17.50	14.79
FE2 O3	2.60	2.46	2.59	2.90	3.15
FE O	7.09 <i>high K<sub>2</sub>O (scoria?)</i>	9.03	8.22	8.00	9.50
MN O	.15	.20	.15	.14	.11
MG O	6.29 <i>(scoria?)</i>	7.43	7.17	8.80	4.70 <i>low Mg</i>
CA O	9.99	7.83	12.45	3.20	6.80
NA2 O	2.80	3.86	4.18	4.30	4.00
K2 O	2.60	.50	.10	.45	.25
P2 O5	.24	.37	.31	.58	.44
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	2.90	3.26	5.78	7.30	6.50
TOTAL	100.02	99.98	100.02	100.01	100.02

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	94.00	160.00	120.00	115.00	185.00
Y	0.	0.	0.	0.	5.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4506	4648	4663	4692	4955
ROCK TYPE	MCV	MCV	MCV	MCV CO <sub>3</sub>	MCV
SEQUENCE NO	2022	2023	2024	2025	2026
	<i>plag + pyroxene phenos</i>	<i>remolite possible feeder Meta diabase</i>	<i>plag phenos (pyroxene)</i>	<i>plag (+pyroxene) phenos</i>	<i>plag phenos highly altered CO<sub>3</sub></i>
SI O2	48.00	46.47	46.42	44.07	38.74
TI O2	3.40	1.50	2.65	2.50	1.56
AL2 O3	14.70	15.39	15.07	12.82	9.33
FE2 O3	1.80	1.70	4.89	3.00	2.31
FE O	10.00	8.74	8.98	8.36	8.33
MN O	.15	.15	.18	.14	.11
MG O	5.60	9.19	5.09	5.81	12.64
CA O	8.40	8.29	9.18	9.81	9.03
NA2 O	3.80	3.30	2.20	4.21	.90
K2 O	1.30	1.60	0.	.65	.50
P2 O5	.46	.27	.39	.41	.29
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	2.40	3.40	4.94	8.21	16.26
TOTAL	100.01	100.00	99.99	99.99	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	190.00	135.00	160.00	175.00	145.00
Y	10.00	0.	6.00	0.	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4957	5009	5329	5535	5549
ROCK TYPE	MCV	MCV <i>highly altered</i>	MCV <i>altered CO<sub>2</sub></i>	MCV <i>altered CO<sub>2</sub></i>	MCV <i>biotite tremolite</i>
SEQUENCE NO	2027	2090	2091	2092	2093
	<i>plagioclase pyroxene matrix</i>	<i>plagioclase pyroxene phenocrysts</i>	<i>no phenocrysts</i>	<i>no phenocrysts</i>	<i>not metavolcanic</i>
SI O2	45.69	46.86	44.41	47.55	42.33
Ti O2	3.71	2.79	3.99	3.90	.60
AL2 O3	16.23	14.96	14.37	14.21	10.21
FE2 O3	5.01	5.43	6.69	4.70	2.30
FE O	8.62	7.18	7.98	8.61	8.11
Mn O	.15	.18	.17	.15	.20
Mg O	5.11	5.58	5.49	5.61	23.22 <i>high MgO</i>
Ca O	5.81	9.47	6.39	7.51	8.11
Na2 O	4.51	1.60	3.89	3.00	.35
K2 O	.50	.10	1.00	.95	.15
P2 O5	.56	.41	.58	.50	.38
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	4.11	5.43	5.04	3.30	4.05
TOTAL	100.01	99.99	100.00	99.99	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MR	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	245.00	180.00	240.00	220.00	105.00
Y	17.00	0.	15.00	12.00	0.

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	5573	5623	5764	5794	6331
ROCK TYPE	MCV <i>altered CO<sub>3</sub></i>	MCV <i>hornblende</i>	MCV <i>altered high CO<sub>3</sub></i>	MCV <i>highly altered CO<sub>3</sub></i>	MCV <i>CO<sub>3</sub></i>
SEQUENCE NO	2094 <i>elastic?</i>	2095 <i>plg phenos</i>	2096 <i>epiclastic</i>	2097 <i>no phenos</i>	2098 <i>no phenos</i>
SI O2	37.60	46.28	48.30	40.77	45.62
TI O2	2.00	1.51 <i>high CaO</i>	.90	3.16	2.57
AL2 O3	14.50	13.65	15.03	13.05	15.41
FE2 O3	1.85	4.02 <i>high K<sub>2</sub>O</i>	3.41	2.61	2.17
FE O	6.95	4.42	9.02	8.38 <i>high</i>	10.27
MN O	.14	.12	.12	.08	.14
MG O	7.90 <i>high K<sub>2</sub>O</i>	7.63 <i>sericite</i>	6.71	4.82 <i>K<sub>2</sub>O - sericite</i>	11.28 <i>low CaO</i>
CA O	9.40	14.56	5.11	7.53	2.32
Na2 O	1.80	.50	3.81	.95	2.72
K2 O	3.35	3.81	.15	5.72	.15
P2 O5	.42	.70	.38	.56	.41
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	14.10	2.81	7.06	12.35	6.95
TOTAL	100.01	100.01	100.00	99.98	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
KB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	175.00	180.00	175.00	250.00	180.00
Y	0.	6.00	0.	8.00	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1129	1135	1912	1138	1481
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	1048	1049	1050	1051	1052
SI O2	46.28	44.49	45.39	48.45	51.13
TI O2	2.33	.48	2.52	1.08	1.35
AL2 O3	14.33	13.76	16.59	18.96	17.24
FE2 O3	13.22	12.45	16.28	11.44	11.33
FE O	-.01	-.01	-.01	-.01	-.01
MN O	.16	.13	.08	.02	.02
MG O	8.82	8.34	8.14	3.06	7.42
CA O	5.61	8.23	1.68	5.42	1.05
NA2 O	3.61	2.56	4.58	.33	4.11
K2 O	.85	.05	.28	3.56	.80
P2 O5	.28	.37	.37	.46	.43
S	.02	.09	.83	.04	.03
L.O.I.	4.49	9.05	3.24	7.18	5.08
TOTAL	100.00	100.00	99.98	100.00	99.99

## TRACE ELEMENT CHEMISTRY (PPM)

BA	1953.00	146.00	1160.00	706.00	2928.00
CU	66.00	52.00	144.00	52.00	13.00
PB	6.00	10.00	20.00	10.00	25.00
ZN	94.00	97.00	82.00	68.00	78.00
CD	0.	0.	0.	0.	0.
AG	0.	0.	0.	0.	0.
CR	190.00	240.00	90.00	130.00	20.00
V	290.00	200.00	288.00	182.00	220.00
CO	46.00	62.00	64.00	57.00	38.00
NI	68.00	182.00	72.00	96.00	22.00
MB	3.00	4.00	4.00	4.00	3.00
RB	15.00	5.00	3.00	48.00	17.00
SR	214.00	197.00	74.00	39.00	45.00
ZR	160.00	195.00	222.00	442.00	365.00
Y	15.00	14.00	14.00	26.00	36.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4197	4198	4219	4474	4505
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2016	2017	2018	2020	2021
SI O2	47.33	48.48	45.02	45.19	47.38
TI O2	1.55	2.31	1.20	1.65	2.40
AL2 O3	16.48	14.25	12.85	17.50	14.79
FE2 O3	2.60	2.46	2.59	2.90	3.15
FE O	7.09	9.03	8.22	8.00	9.50
MN O	.15	.20	.15	.14	.11
MG O	6.29	7.43	7.17	8.80	4.70
CA O	9.99	7.83	12.45	3.20	6.80
NA2 O	2.80	3.86	4.18	4.30	4.00
K2 O	2.60	.50	.10	.45	.25
P2 O5	.24	.37	.31	.58	.44
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	2.90	3.26	5.78	7.30	6.50
TOTAL	100.02	99.98	100.02	100.01	100.02

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	94.00	160.00	120.00	115.00	185.00
Y	0.	0.	0.	0.	5.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4506	4648	4663	4692	4955
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2022	2023	2024	2025	2026
SI O2	48.00	46.47	46.42	44.07	38.74
TI O2	3.40	1.50	2.65	2.50	1.56
AL2 O3	14.70	15.39	15.07	12.82	9.33
FE2 O3	1.80	1.70	4.89	3.00	2.31
FE O	10.00	8.74	8.98	8.36	8.33
MN O	.15	.15	.18	.14	.11
MG O	5.60	9.19	5.09	5.81	12.64
CA O	8.40	8.29	9.18	9.81	9.03
NA2 O	3.80	3.30	2.20	4.21	.90
K2 O	1.30	1.60	0.	.65	.50
P2 O5	.46	.27	.39	.41	.29
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	2.40	3.40	4.94	8.21	16.26
TOTAL	100.01	100.00	99.99	99.99	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	190.00	135.00	160.00	175.00	145.00
Y	10.00	0.	6.00	0.	0.

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4957	5009	5329	5535	5549
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2077	2090	2091	2092	2093
SI O2	45.69	46.86	44.41	47.55	42.33
Ti O2	3.71	2.79	3.99	3.90	.60
AL2 O3	16.23	14.96	14.37	14.21	10.21
FE2 O3	5.01	5.43	6.69	4.70	2.30
FE O	8.62	7.18	7.98	8.61	8.11
MN O	.15	.18	.17	.15	.20
MG O	5.11	5.58	5.49	5.61	23.22
CA O	5.81	9.47	6.39	7.51	8.11
NA2 O	4.51	1.60	3.89	3.00	.35
K2 O	.50	.10	1.00	.95	.15
P2 O5	.56	.41	.58	.50	.38
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	4.11	5.43	5.04	3.30	4.05
TOTAL	100.01	99.99	100.00	99.99	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MR	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	245.00	180.00	240.00	220.00	105.00
Y	17.00	0.	15.00	12.00	0.

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	5573	5623	5764	5794	6331
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2094	2095	2096	2097	2098
SI O2	37.60	46.28	48.30	40.77	45.62
TI O2	2.00	1.51	.90	3.16	2.57
AL2 O3	14.50	13.65	15.05	13.05	15.41
FE2 O3	1.85	4.02	3.41	2.61	2.17
FE O	6.95	4.42	9.02	8.38	10.27
MN O	.14	.12	.12	.08	.14
MG O	7.90	7.63	6.71	4.82	11.28
CA O	9.40	14.56	5.11	7.53	2.32
NA2 O	1.80	.50	3.81	.95	2.72
K2 O	3.35	3.81	.15	5.72	.15
P2 O5	.42	.70	.38	.56	.41
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	14.10	2.81	7.06	12.35	6.95
TOTAL	100.01	100.01	100.00	99.98	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	175.00	180.00	175.00	250.00	180.00
Y	0.	6.00	0.	8.00	0.

## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1129	1135	1912	1138	1481
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	1048	1049	1050	1051	1052
SI O2	48.47	48.96	47.32	52.22	53.88
TI O2	2.44	.53	2.63	1.17	1.43
AL2 O3	15.00	15.14	17.29	20.43	18.17
FE2 O3	13.85	13.70	16.98	12.33	11.94
FE O	-.01	-.01	-.01	-.01	-.01
MN O	.17	.14	.08	.02	.02
MG O	9.23	9.17	8.49	3.30	7.82
CA O	5.87	9.06	1.75	5.84	1.11
NA2 O	3.78	2.82	4.77	.36	4.33
K2 O	.89	.06	.30	3.84	.85
P2 O5	.29	.41	.38	.50	.45
S	.02	.10	.87	.04	.03
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	100.09	100.86	100.05	100.03

## TRACE ELEMENT CHEMISTRY (PPM)

BA	1953.00	146.00	1160.00	706.00	2928.00
CU	66.00	52.00	144.00	52.00	13.00
PB	6.00	10.00	20.00	10.00	25.00
ZN	94.00	97.00	82.00	68.00	78.00
CD	0.	0.	0.	0.	0.
AG	0.	0.	0.	0.	0.
CR	190.00	240.00	90.00	130.00	20.00
V	290.00	200.00	288.00	182.00	220.00
CO	46.00	62.00	64.00	57.00	38.00
NI	68.00	182.00	72.00	96.00	22.00
MB	3.00	4.00	4.00	4.00	3.00
RB	15.00	5.00	3.00	48.00	17.00
SR	214.00	197.00	74.00	39.00	45.00
ZR	160.00	195.00	222.00	442.00	365.00
Y	15.00	14.00	14.00	26.00	36.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4197	4198	4219	4474	4505
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2016	2017	2018	2020	2021
SI O2	48.75	50.12	47.78	48.75	50.67
TI O2	1.59	2.39	1.27	1.78	2.57
AL2 O3	16.97	14.73	13.63	18.67	15.82
FE2 O3	2.67	2.54	2.75	3.13	3.37
FE O	7.30	9.34	8.72	8.63	10.15
MN O	.15	.21	.16	.15	.12
MG O	6.48	7.68	7.61	9.49	5.02
CA O	10.28	8.09	13.21	3.45	7.27
NA2 O	2.86	4.00	4.44	4.64	4.28
K2 O	2.67	.52	.11	.49	.27
P2 O5	.25	.38	.33	.63	.47
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	99.99	100.00	100.01	100.01	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CJ	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	94.00	160.00	120.00	115.00	185.00
Y	0.	0.	0.	0.	5.00

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4506	4648	4663	4692	4955
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2022	2023	2024	2025	2026
SI O2	49.18	48.10	48.83	48.01	46.26
TI O2	3.48	1.55	2.78	2.73	1.86
AL2 O3	15.06	15.93	15.86	13.97	11.14
FE2 O3	1.84	1.76	5.15	3.27	2.76
FE O	10.24	9.05	9.45	9.11	9.95
MN O	.15	.16	.19	.15	.13
MG O	5.74	9.52	5.36	6.33	15.10
CA O	8.61	8.59	9.66	10.69	10.78
NA2 O	3.89	3.41	2.31	4.58	1.08
K2 O	1.33	1.66	0.	.71	.60
P2 O5	.47	.28	.41	.45	.35
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	99.99	100.01	100.00	100.00	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	190.00	135.00	160.00	175.00	145.00
Y	10.00	0.	6.00	0.	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4957	5009	5329	5535	5549
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2027	2090	2091	2092	2093
SI O2	47.64	49.56	46.77	49.17	44.12
TI O2	3.87	2.95	4.20	4.04	.63
AL2 O3	16.93	15.82	15.13	14.70	10.64
FE2 O3	5.22	5.75	7.04	4.87	2.40
FE O	8.99	7.59	8.41	8.90	8.45
MN O	.16	.19	.18	.16	.21
MG O	5.33	5.90	5.78	5.80	24.20
CA O	6.06	10.02	6.73	7.76	8.45
NA2 O	4.70	1.69	4.10	3.11	.37
K2 O	.52	.11	1.05	.98	.16
P2 O5	.59	.43	.61	.52	.40
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	100.01	100.00	100.01	100.03

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
MO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
KB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	245.00	180.00	240.00	220.00	105.00
Y	17.00	0.	15.00	12.00	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	5573	5623	5764	5794	6331
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2094	2095	2096	2097	2098
SI O2	43.77	47.61	51.97	46.51	49.03
Ti O2	2.33	1.55	.97	3.61	2.76
AL2 O3	16.88	14.05	16.17	14.89	16.56
FE2 O3	2.15	4.13	3.67	2.98	2.33
FE O	8.09	4.54	9.70	9.57	11.04
Mn O	.16	.12	.13	.09	.15
Mg O	9.20	7.85	7.22	5.50	12.12
CA O	10.94	14.98	5.50	8.59	2.47
NA2 O	2.10	.52	4.10	1.09	2.92
K2 O	3.90	3.92	.16	6.53	.16
P2 O5	.49	.72	.41	.64	.44
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	99.99	100.00	100.00	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	175.00	180.00	175.00	250.00	180.00
Y	0.	6.00	0.	8.00	0.

## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1129	1135	1912	1138	1481
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	1048	1049	1050	1051	1052
SI O2	46.28	44.49	45.39	48.45	51.13
TI O2	2.33	.48	2.52	1.08	1.35
AL2 O3	14.33	13.76	16.59	18.96	17.24
FE2 O3	13.22	12.45	16.28	11.44	11.33
FE O	-.01	-.01	-.01	-.01	-.01
MN O	.16	.13	.08	.02	.02
MG O	8.82	8.34	8.14	3.06	7.42
CA O	5.61	8.23	1.68	5.42	1.05
NA2 O	3.61	2.56	4.58	.33	4.11
K2 O	.85	.05	.28	3.56	.80
P2 O5	.28	.37	.37	.46	.43
S	.02	.09	.83	.04	.03
L.O.I.	4.49	9.05	3.24	7.18	5.08
TOTAL	100.00	100.00	99.98	100.00	99.99

## TRACE ELEMENT CHEMISTRY (PPM)

BA	1953.00	146.00	1160.00	706.00	2928.00
CU	66.00	52.00	144.00	52.00	13.00
PB	6.00	10.00	20.00	10.00	25.00
ZN	94.00	97.00	82.00	68.00	78.00
CD	0.	0.	0.	0.	0.
AG	0.	0.	0.	0.	0.
CR	190.00	240.00	90.00	130.00	20.00
V	290.00	200.00	288.00	182.00	220.00
CO	46.00	62.00	64.00	57.00	38.00
NI	68.00	182.00	72.00	96.00	22.00
MB	3.00	4.00	4.00	4.00	3.00
RB	15.00	5.00	3.00	48.00	17.00
SR	214.00	197.00	74.00	39.00	45.00
ZR	160.00	195.00	222.00	442.00	365.00
Y	15.00	14.00	14.00	26.00	36.00

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## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1458	1505	1617	830
ROCK TYPE	MCV	MCV	MCV	MCV
SEQUENCE NO	1053	1054	1055	1056
SI O2	44.96	45.86	49.44	44.77
TI O2	1.04	1.15	2.58	1.48
AL2 O3	14.35	14.12	12.61	16.12
FE2 O3	11.54	13.92	12.61	14.42
FE O	-.01	-.01	-.01	-.01
MN O	.08	.12	.15	.09
MG O	4.82	6.01	6.00	7.61
CA O	8.63	6.81	8.81	4.43
NA2 O	4.92	3.25	4.10	3.81
K2 O	.45	.45	.50	1.25
P2 O5	.27	.30	.29	.81
S	.13	.06	.02	.06
L.O.I.	8.80	7.95	2.88	5.15
TOTAL	99.99	100.00	99.99	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	931.00	2627.00	600.00	515.00
CU	117.00	145.00	100.00	53.00
PB	9.00	8.00	10.00	4.00
ZN	90.00	144.00	110.00	75.00
CD	0.	0.	0.	0.
AG	0.	0.	0.	0.
CR	215.00	65.00	185.00	10.00
V	275.00	285.00	193.00	150.00
CO	54.00	52.00	52.00	53.00
NI	125.00	47.00	98.00	13.00
MB	4.00	4.00	4.00	3.00
RB	12.00	9.00	9.00	19.00
SR	282.00	264.00	333.00	506.00
ZR	156.00	175.00	188.00	241.00
Y	27.00	31.00	27.00	21.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4197	4198	4219	4474	4505
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2016	2017	2018	2020	2021
SI O2	47.33	48.48	45.02	45.19	47.38
TI O2	1.55	2.31	1.20	1.65	2.40
AL2 O3	16.48	14.25	12.85	17.50	14.79
FE2 O3	2.60	2.46	2.59	2.90	3.15
FE O	7.09	9.03	8.22	8.00	9.50
MN O	.15	.20	.15	.14	.11
MG O	6.29	7.43	7.17	8.80	4.70
CA O	9.99	7.83	12.45	3.20	6.80
NA2 O	2.80	3.86	4.18	4.30	4.00
K2 O	2.60	.50	.10	.45	.25
P2 O5	.24	.37	.31	.58	.44
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	2.90	3.26	5.78	7.30	6.50
TOTAL	100.02	99.98	100.02	100.01	100.02

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	94.00	160.00	120.00	115.00	185.00
Y	0.	0.	0.	0.	5.00

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4506	4648	4663	4692	4955
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2022	2023	2024	2025	2026
SI O2	48.00	46.47	46.42	44.07	38.74
TI O2	3.40	1.50	2.65	2.50	1.56
AL2 O3	14.70	15.39	15.07	12.82	9.33
FE2 O3	1.80	1.70	4.89	3.00	2.31
FE O	10.00	8.74	8.98	8.36	8.33
MN O	.15	.15	.18	.14	.11
MG O	5.60	9.19	5.09	5.81	12.64
CA O	8.40	8.29	9.18	9.81	9.03
NA2 O	3.80	3.30	2.20	4.21	.90
K2 O	1.30	1.60	0.	.65	.50
P2 O5	.46	.27	.39	.41	.29
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	2.40	3.40	4.94	8.21	16.26
TOTAL	100.01	100.00	99.99	99.99	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	190.00	135.00	160.00	175.00	145.00
Y	10.00	0.	6.00	0.	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4957	5009	5329	5535	5549
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2027	2090	2091	2092	2093
SI O2	45.69	46.86	44.41	47.55	42.33
Ti O2	3.71	2.79	3.99	3.90	.60
AL2 O3	16.23	14.96	14.37	14.21	10.21
FE2 O3	5.01	5.43	6.69	4.70	2.30
FE O	8.62	7.18	7.98	8.61	8.11
MN O	.15	.18	.17	.15	.20
MG O	5.11	5.58	5.49	5.61	23.22
CA O	5.81	9.47	6.39	7.51	8.11
NA2 O	4.51	1.60	3.89	3.00	.35
K2 O	.50	.10	1.00	.95	.15
P2 O5	.56	.41	.58	.50	.38
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	4.11	5.43	5.04	3.30	4.05
TOTAL	100.01	99.99	100.00	99.99	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	245.00	180.00	240.00	220.00	105.00
Y	17.00	0.	15.00	12.00	0.

## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	5573	5623	5764	5794	6331
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2094	2095	2096	2097	2098
SI O2	37.60	46.28	48.30	40.77	45.62
TI O2	2.00	1.51	.90	3.16	2.57
AL2 O3	14.50	13.65	15.03	13.05	15.41
FE2 O3	1.85	4.02	3.41	2.61	2.17
FE O	6.95	4.42	9.02	8.38	10.27
MN O	.14	.12	.12	.08	.14
MG O	7.90	7.63	6.71	4.82	11.28
CA O	9.40	14.56	5.11	7.53	2.32
NA2 O	1.80	.50	3.81	.95	2.72
K2 O	3.35	3.81	.15	5.72	.15
P2 O5	.42	.70	.38	.56	.41
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	14.10	2.81	7.06	12.35	6.95
TOTAL	100.01	100.01	100.00	99.98	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	175.00	180.00	175.00	250.00	180.00
Y	0.	6.00	0.	8.00	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1129	1135	19.2	1138	1481
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	1048	1049	1050	1051	1052
S1 O2	48.47	48.96	47.32	52.22	53.88
T1 O2	2.44	.53	2.63	1.17	1.43
AL2 O3	15.00	15.14	17.29	20.43	18.17
FE2 O3	13.85	13.70	16.98	12.33	11.94
FE O	-.01	-.01	-.01	-.01	-.01
MN O	.17	.14	.08	.02	.02
MG O	9.23	9.17	8.49	3.30	7.82
CA O	5.87	9.06	1.75	5.84	1.11
NA2 O	3.78	2.82	4.77	.36	4.33
K2 O	.89	.06	.30	3.84	.85
P2 O5	.29	.41	.38	.50	.45
S	.02	.10	.87	.04	.03
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	100.09	100.86	100.05	100.03

## TRACE ELEMENT CHEMISTRY (PPM)

BA	1953.00	146.00	1160.00	706.00	2928.00
CU	66.00	52.00	144.00	52.00	13.00
PB	6.00	10.00	20.00	10.00	25.00
ZN	94.00	97.00	82.00	68.00	78.00
CD	0.	0.	0.	0.	0.
AG	0.	0.	0.	0.	0.
CR	190.00	240.00	90.00	130.00	20.00
V	290.00	200.00	288.00	182.00	220.00
CO	46.00	62.00	64.00	57.00	38.00
NI	68.00	182.00	72.00	96.00	22.00
MB	3.00	4.00	4.00	4.00	3.00
RB	15.00	5.00	3.00	48.00	17.00
SR	214.00	197.00	74.00	39.00	45.00
ZR	160.00	195.00	222.00	442.00	365.00
Y	15.00	14.00	14.00	26.00	36.00

## GEOCHEMICAL DATA (PERCENT)

GROUP 1

SPECIMEN ID	1458	1505	1617	830
ROCK TYPE	MCV	MCV	MCV	MCV
SEQUENCE NO	1053	1054	1055	1056
SI O2	49.37	49.85	50.92	47.23
TI O2	1.15	1.25	2.66	1.56
AL2 O3	15.76	15.35	12.99	17.01
FE2 O3	12.67	15.13	12.99	15.21
FE O	-.01	-.01	-.01	-.01
MN O	.09	.13	.15	.10
MG O	5.29	6.53	6.18	8.03
CA O	9.48	7.40	9.07	4.67
NA2 O	5.40	3.54	4.23	4.01
K2 O	.50	.49	.52	1.32
P2 O5	.30	.33	.30	.86
S	.14	.07	.02	.06
L.O.I.	0.	0.	0.	0.
TOTAL	100.15	100.07	100.03	100.06

## TRACE ELEMENT CHEMISTRY (PPM)

BA	931.00	2627.00	600.00	515.00
CU	117.00	145.00	100.00	53.00
PB	9.00	8.00	10.00	4.00
ZN	90.00	144.00	110.00	75.00
CD	0.	0.	0.	0.
AG	0.	0.	0.	0.
CR	215.00	65.00	185.00	10.00
V	275.00	285.00	193.00	150.00
CO	54.00	52.00	52.00	53.00
NI	125.00	47.00	98.00	13.00
MB	4.00	4.00	4.00	3.00
RB	12.00	9.00	9.00	19.00
SR	282.00	264.00	333.00	506.00
ZR	156.00	175.00	188.00	241.00
Y	27.00	31.00	27.00	21.00

		GEOCHEMICAL DATA (PERCENT)				GROUP 2
SPECIMEN ID	4197	4198	4219	4474	4505	
ROCK TYPE	MCV	MCV	MCV	MCV	MCV	
SEQUENCE NO	2016	2017	2018	2020	2021	
SI O2	48.75	50.12	47.78	48.75	50.67	
TI O2	1.59	2.39	1.27	1.78	2.57	
AL2 O3	16.97	14.73	13.63	18.67	15.82	
FE2 O3	2.67	2.54	2.75	3.13	3.37	
FE O	7.30	9.34	8.72	8.63	10.15	
MN O	.15	.21	.16	.15	.12	
MG O	6.48	7.68	7.61	9.49	5.02	
CA O	10.28	8.09	13.21	3.45	7.27	
NA2 O	2.88	4.00	4.44	4.64	4.28	
K2 O	2.67	.52	.11	.49	.27	
P2 O5	.25	.38	.33	.63	.47	
S	-.01	-.01	-.01	-.01	-.01	
L.O.I.	0.	0.	0.	0.	0.	
TOTAL	99.99	100.00	100.01	100.01	100.01	
TRACE ELEMENT CHEMISTRY (PPM)						
BA	-.01	-.01	-.01	-.01	-.01	
CJ	-.01	-.01	-.01	-.01	-.01	
PB	-.01	-.01	-.01	-.01	-.01	
ZN	-.01	-.01	-.01	-.01	-.01	
CD	-.01	-.01	-.01	-.01	-.01	
AG	-.01	-.01	-.01	-.01	-.01	
CR	-.01	-.01	-.01	-.01	-.01	
V	-.01	-.01	-.01	-.01	-.01	
CU	-.01	-.01	-.01	-.01	-.01	
NI	-.01	-.01	-.01	-.01	-.01	
MB	-.01	-.01	-.01	-.01	-.01	
RB	-.01	-.01	-.01	-.01	-.01	
SR	-.01	-.01	-.01	-.01	-.01	
ZR	94.00	160.00	120.00	115.00	185.00	
Y	0.	0.	0.	0.	5.00	

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4506	4648	4663	4692	4955
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2022	2023	2024	2025	2026
SI O2	49.18	48.10	48.83	48.01	46.26
TI O2	3.48	1.55	2.78	2.73	1.86
AL2 O3	15.06	15.93	15.86	13.97	11.14
FE2 O3	1.84	1.76	5.15	3.27	2.76
FE O	10.24	9.05	9.45	9.11	9.95
MN O	.15	.16	.19	.15	.13
MG O	5.74	9.52	5.36	6.33	15.10
CA O	8.61	8.59	9.66	10.69	10.78
NA2 O	3.89	3.41	2.31	4.58	1.08
K2 O	1.33	1.66	0.	.71	.60
P2 O5	.47	.28	.41	.45	.35
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	99.99	100.01	100.00	100.00	100.01

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	190.00	135.00	160.00	175.00	145.00
Y	10.00	0.	6.00	0.	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	4957	5009	5329	5535	5549
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2027	2090	2091	2092	2093
SI O2	47.64	49.56	46.77	49.17	44.12
TI O2	3.87	2.95	4.20	4.04	.63
AL2 O3	16.93	15.82	15.13	14.70	10.64
FE2 O3	5.22	5.75	7.04	4.87	2.40
FE O	8.99	7.59	8.41	8.90	8.45
MN O	.16	.19	.18	.16	.21
MG O	5.33	5.90	5.78	5.80	24.20
CA O	6.06	10.02	6.73	7.76	8.45
NA2 O	4.70	1.69	4.10	3.11	.37
K2 O	.52	.11	1.05	.98	.16
P2 O5	.59	.43	.61	.52	.40
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	100.01	100.00	100.01	100.03

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	245.00	180.00	240.00	220.00	105.00
Y	17.00	0.	15.00	12.00	0.

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## GEOCHEMICAL DATA (PERCENT)

GROUP 2

SPECIMEN ID	5573	5623	5764	5794	6331
ROCK TYPE	MCV	MCV	MCV	MCV	MCV
SEQUENCE NO	2094	2095	2096	2097	2098
SI 02	43.77	47.61	51.97	46.51	49.03
TI 02	2.33	1.55	.97	3.61	2.76
AL2 O3	16.88	14.05	16.17	14.89	16.56
FE2 O3	2.15	4.13	3.67	2.98	2.33
FE 0	8.09	4.54	9.70	9.57	11.04
MN 0	.16	.12	.13	.09	.15
MG 0	9.20	7.85	7.22	5.50	12.12
CA 0	10.94	14.98	5.50	8.59	2.49
NA2 O	2.10	.52	4.10	1.09	2.92
K2 O	3.90	3.92	.16	6.53	.16
P2 O5	.49	.72	.41	.64	.44
S	-.01	-.01	-.01	-.01	-.01
L.O.I.	0.	0.	0.	0.	0.
TOTAL	100.01	99.99	100.00	100.00	100.00

## TRACE ELEMENT CHEMISTRY (PPM)

BA	-.01	-.01	-.01	-.01	-.01
CU	-.01	-.01	-.01	-.01	-.01
PB	-.01	-.01	-.01	-.01	-.01
ZN	-.01	-.01	-.01	-.01	-.01
CD	-.01	-.01	-.01	-.01	-.01
AG	-.01	-.01	-.01	-.01	-.01
CR	-.01	-.01	-.01	-.01	-.01
V	-.01	-.01	-.01	-.01	-.01
CO	-.01	-.01	-.01	-.01	-.01
NI	-.01	-.01	-.01	-.01	-.01
MB	-.01	-.01	-.01	-.01	-.01
RB	-.01	-.01	-.01	-.01	-.01
SR	-.01	-.01	-.01	-.01	-.01
ZR	175.00	180.00	175.00	250.00	180.00
Y	0.	6.00	0.	8.00	0.

## SIMPLE STATISTICS

## MENZIE CREEK VOLCANICS

File # 1

File # 3

Oxide	MEAN	STD DEV	MEAN	STD DEV
SiO <sub>2</sub>	46.675	2.005	49.298	1.804
TiO <sub>2</sub>	2.476	1.002	2.605	1.037
Al <sub>2</sub> O <sub>3</sub>	14.668	1.312	15.493	1.334
Fe <sub>2</sub> O <sub>3</sub>	13.643	1.379	14.411	1.404
MnO	0.139	0.046	0.146	0.049
MgO	6.396	1.353	6.759	1.444
CaO	6.785	2.651	7.181	2.833
Na <sub>2</sub> O	3.534	0.896	3.731	0.932
K <sub>2</sub> O	0.491	0.330	0.519	0.344
P <sub>2</sub> O <sub>5</sub>	0.407	0.092	0.430	0.096
LOI	5.249	1.991		

14 analyses

FeO (8 analyses)	8.533	0.713	8.993	0.756
S (6 analyses)	0.175	0.322	0.185	0.337

# UNIT MENZIE CREEK VOLCANICS — Summary of Analyses & Petrography

28 analyses total

Pearce - Cann — scattered analyses in fields C & D and towards Zr-rich corner of triangular diagram.

D - within plate basalts

C - calc-alkaline basalts

Alkalis vs  $\text{SiO}_2$  — scattered in subalkaline and alkaline fields.

Higher proportions in alkaline field (may be partly a result of later sericitic alteration of plagioclase.)

## Evaluation of analyses

830 — now listed as MCV — should be changed to 5C

3555 — now listed as MCV — should be changed to 5C

Diabasic texture (not meta-volcanic)

4474, 4648, 5549?

## Porphyritic

plag only

1135, 1458, 4955, 4957, 5623, (3838)

plag + pyroxene

1617, 4197, 4198, 4506, 4663, 4692, 5009, (2602),  
(4082)

pyroxene only

1129, (3957)

Non-porphyritic (no phenocrysts)

1912, 1481, 1505, 4505, 5329, 5535, 5794, 6331,

Clastic texture

1138, 5573?, 5764

Relic pyroxene

1129, (2602), (3957), (4036), (4082), 4197, 4198, 4506, 4648, 4663,  
4957, 5009,

## ACTINONITE/TREMOLITE-bearing

1129, 1617, 2602, 3838, 3957, 4219, 4648, 4692, 5549,  
5623

## Biotite-bearing

1129, 1458?, 1505, 4692, 5549,

## General Petrography

The whole rock chemistry shows some variation. Variation appears to be mainly in MgO content.

Whole rock chemistry definitely shows the effects of metamorphism & alteration variable. Ca related to carbonate content.

high K related to the development of sericite.

variable. Na probably related to albite development.

Ti also appears to be variable - could this be related to alterations of the oxide phase?

Most thin sections have a fine-grained, ~~ophitic~~ subophitic volcanic texture.

often has appearance of crenulation cleavage / pressure solution

In many cases a foliation is only weakly developed or absent.

Plagioclase enclaves  
pyroxene phenocrysts  
Commonly porphyritic - with phenocrysts being plagioclase or plagioclase + pyroxene.

Plagioclase has  
sericite or clinzoisite dust  
Only rarely are pyroxene phenocrysts present without plagioclase.

Plagioclase phenocrysts occur typically as aggregates of plagioclase grains rather than as a single crystal.

Plagioclase has mottled extinctions and irregular margins.

Matrix primary textures are feldspar microlites with anhedral pyroxene grains and opaque spherules.

Only rarely is primary pyroxene seen in the matrix.

More commonly the matrix contains chlorite, plagioclase, carbonate, epidote/clinozoisite, (actinolite/tremolite), (biotite)

Some thin sections are amygdaloidal. Amygdaloids commonly filled largely by carbonate. Also chlorite + quartz. Amygdaloids are both round and elongate/flattened.

Fractures are filled with carbonate + quartz ± chlorite.

Samples averaged for whole rock analysis

1129, 1135, 1458, 1481, 1505, 1617, 1912, 4198, 4663,  
4505, 4692, 4957, 5009, 5535, 5329

Samples rejected for whole rock average

4955 ( $\text{CO}_3^-$ ), 5549 (high MgO), 5573, 5623, 5794 (high  $\text{K}_2\text{O}$ ),  
1138 (clastic), 4197 (high  $\text{K}_2\text{O}$ ), 4219 (high CaO), 4474 (diabasic),  
4506 (high  $\text{K}_2\text{O}$ ), 4648 (high  $\text{K}_2\text{O}$ -possible feldspars), 5764 (clastic?),  
6331 (weird texture)

RESEARCH SAMPLE LOG

PROJECT: ~~172~~

STATION: 1129

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: *MCV - Vangorda area*

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS: *Whole rock + traces*

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

*Amygdaloidal chloritic phyllite  
(measured 51)*

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 1129  
 DDH: \_\_\_\_\_  
 UNIT: MCR

DESCRIBED BY: LCP  
 DATE: Jan 23 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

	EST.	POINT CT.
CHLORITE	25	
TREMOLITE	20	
CINOPYROXENE	5	
OPAQUES	10	
PLAGIOCLASE	40	
BIOTITE	TR	

Plag  $\perp$  a  
 14 13  
 187-201-214  
 21 11  
 178-199-200  
 14 14  
 231-245-259  
 16 6  
 94-110-116

Chlorite interference colors  
 dark blue to dark brown

Biotite pleochroism  
 clear  
 walnut brown

COMMENTS:

Large subhedral ferromagnesian phenocrysts in a medium-grained matrix of interlocking plagioclase microlites (laths) with minor chlorite

Ferromags are relic pyroxene surrounded by randomly oriented chlorite and/or tremolite. One pyroxene-chlorite aggregate has a minor amount of biotite

Plag forms interlocking randomly oriented laths. Irregular growth margins

Mottled extinctions. Only minor sericite

Opaques show partial alteration.

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1135

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV - Vangorda area

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS: Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

chloritic phyllite      Copper show - cpy, malachite + azurite in Qtz -  
vein network in chloritic phyllite      Qtz veins appear to || S<sub>2</sub>  
(unmeasured S<sub>1</sub>)

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 1135  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 23 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite interference colors  
 khaki brown  
 pale green in plane light*

*Plag ± a  
 7 10  
 348-355-005  
 12 16  
 50-66-82*

	EST.	POINT CT.
OPAQUES	10	
PLAGIOCLASE	50	
CARBONATE	15	
CHLORITE	25	

COMMENTS:

*Vague, poorly defined fthw looks like accumulation cluge. Forms as "solution" lines across chlorite orientation.*

*Slide consists of sparse plagioclase phenocrysts in a medium-grained matrix of plagioclase-chlorite-carbonate. Total sample is fairly extensively altered.*

*Plag. extinction is mottled. Margins are irregular - Abundant dust alteration - looks like chlorite.*

*Original rock looks to have been quite plag. rich.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1138

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: *MCV - Vangorda area*

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS: *Whole rock + traces*

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

*Chloritic phyllite w/ amygdaloides  
(measured S<sub>1</sub>)*

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 1138

DDH: \_\_\_\_\_

UNIT: MCV

DESCRIBED BY: LCP

DEPTH: \_\_\_\_\_

DATE: Jan 23 1980

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite inflections color  
blue.*

	EST.	POINT CT.
CARBONATE	30	
CHLORITE	15	
QUARTZ	40	
SERICITE	15	
OPAQUES	R	

COMMENTS: *S1 fltn present - in places looks like a crenulations cleve.  
looks like epivolcaniclastic with larger fragments of metavolcanics.  
Some textures look very much like amygdaloidal.  
Carbonate typically occurs as large splashes - often coarse grained.  
Much of rock looks to contain too much quartz to be a metavolcanic.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1458

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU - Faro area

THIN SECTION: ✓

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS: ✓ Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

*Amygdaloidal calcite-chlorite phyllite. Certain zones of large  
otcp so amygdaloidal that the rk contain very little matrix*

*(measured S<sub>1</sub>)*

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 145B  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 23 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite interference colors  
 dark brown with  
 slight purplish tint*

*Phenocrysts.*

*Plag ± a  
 13 14  
 111-98-84  
 13 14  
 365-292-278*

	EST.	POINT CT.
CARBONATE	15	
PLAGIOCLASE	40	
OPAQUES	5	
CHLORITE	40	
BIOTITE ?	Te	
(STIKRONMELANE ??)		

COMMENTS:

*Subhedral plag phenocrysts in a matrix of fine-grained opaques, chlorite, plag microlites. Phenocrysts are typically aggregates - clumps - of more than 1 plag crystal. Heavy alteration seen in plag. Twinning often looks mottled.*

*Contains two types of amygdules*

- 1 - carbonate - large crystals - vast majority of amygdules*
- 2 - chlorite + quartz - Quartz forms elongate crystals growing inward.*

*Also have carbonate alteration - splatky - in matrix*

*10% phenocrysts*

*Dark brown, pleochroic, fine-grained mineral in matrix associated with chlorite & opaques. Possibly stilpnomelane. It has one carbonate amygdule*

(OVER)

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1481

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU - Faro area

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS: Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Lt green amygdaloidal calcite chlorite phyllite

(measured Si)

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 1481

DESCRIBED BY: LCP

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

DATE: Jan 23 1980

UNIT: MCV

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite interference colors  
pale olive green*

	EST.	POINT CT.
CARBONATE	10	
OPAQUES	10	
CHLORITE	25	
QUARTZ	10	
PLAGIOCLASE	45	
MUSCOVITE ?	R	

COMMENTS:

*Fine-grained matrix of plagioclase-chlorite-opaques-muscovite(?)*

*Fractures filled with carbonate-quartz + chlorite. Some assemblage in coarse-grained  
form fills scattered amygdales. One amygdale contains abundant coarse, cubical opaques.*

*Poorly defined cleage visible*

*Musc. tentatively identified by  
high 1<sup>st</sup> order colors, elongate, clear, parallel extinctions, length slow.  
May be an amphibole instead  
poorly aligned || cleage*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1487

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV - Faro area

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Fairly massive med gr amphibolite contact w/ amygdal unit

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 1487  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 23 1980

*Missing from whole rock analysis file.*

HAND SAMPLE:

PURPOSE:

*Chlorite interference colors  
 deep blue to gray  
 Chlorite pale green in plane light*

*Plag La  
 11 16  
 331-320-304  
 12 17  
 328-316-299  
 17 11  
 187-204-215*

	EST.	POINT CT.
OPAQUES	10	
CHLORITE	50	
PLAGIOCLASE	30	
SERICITE / MUSCOVITE	20	
APATITE	T	
QUARTZ	R	

COMMENTS:

*Poorly defined S1 folia - Muscovite oriented || S1*

*Fine-grained matrix of plagioclase, chlorite, opaques, muscovite.*

*Extensive sericite alterations of plagioclase.*

*OPAQUES as rods and cuboidal cubes. - Large cuboidal cubes are probably the result of later alterations.*

*Plag. has very irregular margins, mottled extinction, abundant sericite*

*Qtz occurs as elongate crystals growing inward in <sup>scattered</sup> A-anggdulae. These tend to be round rather than flat.*

*A few slightly larger plagioclase phenocrysts are present.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1505

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU - Faro area

THIN SECTION:  \_\_\_\_\_

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Chlorite/calcite amygd. phyllite - light yellow/orange

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 1565  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 24 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite green in plane light  
 Interference colours  
 deep blue to gray  
 sometimes purplish tint*

*Plag La  
 13 20  
 190-177-157  
 8 12  
 93-85-73*

	EST.	POINT CT.
OPAQUES	5	
CARBONATE	15	
PLAGIOCLASE	40	
CHLORITE	40	
QUARTZ ??	?	
BIOTITE	R	

COMMENTS:

*Film (S1) poorly marked by opaque stripes (pressure solution sort of thing)*

*Fine-grained matrix of plagioclase-carbonate-chlorite-opaques.*

*Quartz suspected but not confirmed*

*Minor amt of fine-grained biotite occur locally with chlorite. Noted only in 1 specific part of slide.*

*Plag extensively altered - mottled with very irregular boundaries - also full of small inclusions.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1617

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV - Faro area

THIN SECTION:  \_\_\_\_\_

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Massive, dk. green "basaltic" pillow lavas in ACP unit.

Pillows have max. dimension of 3½ - 4 ft. and are not strongly deformed. No obvious planar orientation to pillows. Cannot say whether they are flattened in S<sub>1</sub> or S<sub>2</sub>. Most amygdules are filled w/ dark "chloritic" material. Flattening of pillows ⇒ tops to SW

Close observation ⇒ pillows fairly close to being transposed into S<sub>2</sub>  
S<sub>2</sub> defined by flattened, oriented amygdules

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 1617  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 24 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Amphibole pleochroism  
 clear  
 pale green length slow  
 inclined extinctions  
 007°  
 21°*

*Chlorite pale green  
 interference colors are  
 purplish*

*Plag ± a  
 16 14  
 284-300-314  
 7 7  
 40-33-26*

	EST.	POINT CT.
PLAGIOCLASE	25	
OPAQUES	5	
CHLORITE	15	
CARBONATE	5	
EPIDOTE / CLINOROISITE	20	
TREMOLITE / ACTINONITE	30	
QUARTZ ?	TR	

COMMENTS: *Phenocrysts at 20%*

*Scattered plagioclase and ferromagnesian phenocrysts in a fine grained volcanic matrix.  
 Clumps of plag phenocrysts.  
 Matrix consists of plagioclase-opaques-tremolite-chlorite-epidote/clinoroisite.*

*Ferromagnesian phenocrysts have all been totally altered. Considered phenos because some have regular, euhedral outlines. Some may be amygdules instead. Present mineralogy consists of chlorite-epidote/clinoroisite ± carbonate. These are coarse grained compared to matrix.*

*S1 poorly marked by detritalite orientations in the matrix*

*Quartz locally associated with phenocrysts/amygdules and along their features.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 1912

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU - Vanguarda area

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS: Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 1912  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 24 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite pale green in  
 plane, light  
 interference colors are  
 deep brown*

	EST.	POINT CT.
OPAQUES	7	
CARBONATE	3	
PLAGIOCLASE	50	
CHLORITE	40	

COMMENTS:

*Abundant irregular plagioclase microlites (microlaths) with lesser amounts of fine-grained opaques-chlorite-carbonate. Plag looks mottled (altered)-contains some sericite.*

*Carbonate also fills fractures.*

*Film (51) poorly marked by orientation of opaques & plagioclase.*

*A few scattered slightly larger plagioclase laths.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 2602

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU

105 K/12

TWOPETE MOUNTAIN

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

massive hard med green fine grained volcanics - good plag laths -  
rare amygdules - no measurable meaningful struct.

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 2602  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 24 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Deleted - total = 106.51*

*Pyroxene optically +*

*Chlorite pale green in plane light  
 Blue interference colors*

	EST.	POINT CT.
PLAGIOCLASE (primary)	10	
CLINO PYROXENE	20	
CHLORITE	40	
EPIDOTE / CLINOZOISITE	30	
SERICITE MUSCOVITE	10	
ACTINOLITE	Tr	
CARBONATE	Tr	

COMMENTS:

*≈ 10% phenocrysts*

*Scattered phenocrysts of plagioclase and clinopyroxene in a fine-grained crystalline groundmass. Plag has been totally altered to a mixture of chlorite-muscovite-clinzoisite/epidote. Often phenocrysts of plag consisted of an aggregate of several grains (i.e. clumps)*

*Pyroxene phenocrysts most commonly as single crystals. When associated with the feldspars they are partly to completely enclosed by plagioclase phenocrysts.*

*"Potential" scattered amygdules consist of chlorite, epidote/clinzoisite, carbonate*

*Groundmass presently consists of pyroxene, chlorite, epidote/clinzoisite. Chlorite has thin rod-needle shape - may have been amphibole originally - lo see minor (over)*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 3555

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV 5C      105 K/5      ROSE MOUNTAIN

mapped as Unit 5C

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

- Well foliated, very f.g. Black slight magnetic rx?
- 1 → 3 mm CO<sub>3</sub> "eyes" scatt throughout

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 3555  
 DDH: \_\_\_\_\_  
 UNIT: MCU  
           50

DESCRIBED BY: LCP  
 DATE: Jan 24 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis Deleted total = 103.75*

Hbl pleochroism  
 blue green  
 yellowish green  
 Biotite pleochroism  
 green-brownish tint  
 clear

	EST.	POINT CT.
BIOTITE	30	
HORNBLLENDE	20	
OPAQUES	5	
CARBONATE	10	
EPIDOTE / CLINOZOISITE	7	
QUARTZ	20	
PLAGIOCLASE	15	

COMMENTS:  
 Strong S1 fltn delineated by hbl, biotite, elongate carbonate lenses (pods). Hbl also crosscuts the fltn.  
 Assemblage is biotite-hornblende-opaques-gtz-plag ± carbonate  
 Epidote/clinozoisite only occurs in small amounts.  
 Can see a vague compositional zoning in terms of gtz content  
 Plag as irregular skeletal grains with abundant inclusions. Looks more like metamorphic plag.  
 Blue-green hbl occur as slightly larger, euhedral porphyroblasts.  
 Carbonate ± gtz elongate pods - portions have quite abundant gtz.

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 3838

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU      105 K/1      TENAS CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

ACP med green, massive, slumped, pillow lavas, chlor. mottled  
non-amygdaloidal. No structure - slumped.

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 3838  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 24 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Deleted -  
total = 105.67*

*Chlorite - pale green in plane light  
blue interference colors to  
1<sup>st</sup> order gray*

*Amphibole is clear*

	EST.	POINT CT.
CHLORITE	.30	
PLAGIOCLASE	<u>2</u>	
CARBONATE	5	
TREMOLITE / ACTINOLITE	20	
EPIDOTE / CLINOZOISITE	30	
QUARTZ	<u>2</u>	
SERICITIC MUSCOVITE	10	
OPAQUES	5	

COMMENTS:

*Scattered plagioclase phenocrysts. Phenos are heavily replaced by sericitic muscovite-clinzoisite ± carbonate. Can barely recognize former cubical shape and mineralogy.*

*Also scattered amygdaloids - these are generally flattened & elongate in S1. Presently consist dominantly of chlorite ± carbonate.*

*Fine-grained matrix consists of opaques, tremolite, clinzoisite, chlorite ± carbonate. Amphibole poorly oriented parallel S1 - also cuts across the fth. Only minor plagioclase remains in matrix.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 3957

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 L/9 MENZIE CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

massive metabasite - med grained - green on fresh surface - weath rusty -  
a few tufts - no dk spots not like ACP-KD.

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 3957  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: Whole rock analysis

*Deleted  
total = 104.37*

*Chlorite interference colors  
 dark blue to dark brown  
 to 1<sup>st</sup> order gray  
 Pyroxene is biotial +*

	EST.	POINT CT.
ORTHOPIXENE	25	
OPAQUES (altered)	—	
EPIDOTE / CLINOZOISITE	10	
TREMOLITE / ACTINOLITE	25	
CHLORITE	30	
CARBONATE	TR	
SPHENE	10	
PLAGIOCLASE	TR	

COMMENTS:

*Abundant pyroxene phenocrysts in a fine-grained matrix of chlorite - tremolite - sphene - clinzoisite. Pyroxenes have partial rims of tremolite (slight interstitial extinction). Classified as orthopyroxene because all are 1<sup>st</sup> order gray to yellow white colors.*

*Regular to irregular chlorite aggregates may be amygdules or may be replacing mafic phenocrysts*

*One clump of interstitial plagioclase noted in matrix.*

*Rock definitely more basic than the usual MCV  
 Carbonate in fractures*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4036

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU

105 L/9 MENZIE CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Massive, fabricless, metabasite or basalt flows, no breccia, tuffs, etc.

(measured Si)

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4036  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*deleted -  
total = 105.07*

*Chlorite pale green,  
Interference colors are blue to  
dark blue.*

*Plag ± a  
55-74-89 (in vein)*

	EST.	POINT CT.
OPAQUES (SPHENE)	10	
PLAGIOCLASE	35	
CHLORITE	25	
CLINOPYROXENE	30	
CARBONATE	Tr	
APATITE	Tr	

COMMENTS:

*Equidial to subhedral pyroxene in a matrix of randomly oriented  
 plagioclase laths. Plag too abundant to readily call it a subophitic texture. Opaques  
 show alterations to fine-grained aggregate (sphene?).  
 Plag heavily shot with very fine clinovisite dust. Also irregular marginal growth  
 Carbonate - gte ± plagioclase veins  
 Chlorite as irregular aggregate - replacing ferromagnesian mineral(s)?*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4082

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 L/9 MENTIE CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Massive basalt flows, c.f. UFG ridge i.e. ACP Sample only,  
absolutely no structure.

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4082  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*deleted -  
total = 105.31*

*Chlorite green in plane light  
 Gray to blue in X-nicals*

*Plag Lw  
 13  
 52-65-76  
 18 12  
 340-358-10*

*Pyroxene has slight brownish  
 tint in plane light*

	EST.	POINT CT.
CARBONATE	.7	
OPAQUES	10	
PLAGIOCLASE	25	
CLINOPYROXENE	30	
CHLORITE	30	
EPIDOTE / CLINOZOISITE	5	

COMMENTS:

*Scattered euhedral to subhedral plagioclase and pyroxene phenocrysts in a fine-grained matrix of pyroxene-chlorite-opaques-clinozoisite-plagioclase. Plag phenos tend to form clumps. Plag has slight clinozoisite dust, mottled extinction. No readily visible ftn.*

*Chlorite as irregular aggregates - amygdules??*

*Carbonate tends to occur as aggregates of slightly coarser grains.*

*Subophitic texture to groundmass*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4197

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU

105 L/15 DROMEDARY MTN

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Rusty weathering, massive, fabricless, mod. fractured lt. med gray to greenish gray fresh, non-calc., porphyritic andesite (sub-volc?) or diorite. Could this be South Fork?? or is it part of Menzies Ck. sequence. Unit becomes far less porphyritic to S along ridge crest

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4197  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

	EST.	POINT CT.
CLINOPYROXENE	30	
PLAGIOCLASE	30	
OPAQUES	10	
QUARTZ	$\bar{R}$	
CHLORITE	30	
CARBONATE	$\bar{R}$	

COMMENTS:

*SLIDE SLIGHTLY THICK - gtz up to 1<sup>st</sup> order red to blue.*

*Plagioclase and pyroxene phenocrysts in a fine-grained matrix. Phenos are euhedral - consist of single crystals*

*Matrix subophitic to ophitic - consists of fine-grained pyroxene, chlorite, opaques,*

*feldspar microlites*

*Some euhedral phenos completely replaced by chlorite - 3 types of chlorite*

*?? possibly amphibole ??* } *outer - greenish-brownish*  
*inner - clear with blue interference colors - with opaques*  
*contain small aggregates of bright green (may be piemontite?)*

*Plagioclase has extensive sericite alteration*

(OVER)

Plag phenocrysts partly enclose pyroxene.

Pyroxene phenocrysts enclose the chlorite-altered phenocrysts - suggesting that it might have been a different mineral. Plag never with pyroxene phenocrysts.

Quartz occurs only along veins and fractures.

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4198

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU

105 4/15

DROMEDARY MTN

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

As 4197 except med. gray green fresh & less oxy Dritic

Unit is a porphyritic andesite/diorite of uncertain affinity

Dep shows weak shearing or isolated "foliation bundles" this could be  
jt set w/ later shearing.

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4198  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Plag + a*  
*260-272-278*

	EST.	POINT CT.
OPAQUES	10	
PLAGIOCLASE	40	
CLINOPYROXENE	25	
CHLORITE	25	
SPHENE (OPAQUES?)	—	

COMMENTS:

*Similar to 4197 - only less altered. Both plagioclase and pyroxene phenocrysts less abundant & generally smaller. Subophitic texture.*

*Matrix consists of fine-grained pyroxene - sphene - chlorite - plagioclase microclites*

*Plag. typically has very fine - clinocrisite desert. - tends to be concentrated in center of phenocryst and along specific twins.*

*Large phenocrysts now altered to greenish chlorite aggregates*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4219

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 L/10 DETOUR LAKES

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

1+ green mod fol. amygd pillow lavas?

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4219  
 DDH: \_\_\_\_\_  
 UNIT: MLV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

	EST.	POINT CT.
CARBONATE	25	
CHLORITE	15	
TREMOLITE / ACTINOLITE	45	
OPAQUES	10	
QUARTZ?	5	

COMMENTS:

*Ellipsoidal or lenticular aggregates of carbonate ± chlorite in a fine-grained matrix. Matrix currently looks like tremolite-chlorite-opaques-quartz. Former microlite texture visible in matrix. Tremolite is randomly oriented. - forms radiating rosettes.*

*Rock extensively altered with abundant carbonate.  
 Carbonate also occurs along fractures.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4474

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV 105 K/7 BLIND CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Mcv?  
dark green, fine grained, non-mag., non-porph., non-calc meta basalt  
no fol'n obtainable

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 4474

DESCRIBED BY: LCP

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

DATE: Jan 29 1980

UNIT: MCU

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite pale green in plane light  
Dark brown in X-rays*

	EST.	POINT CT.
OPAQUES (SPHENE)	.5	
CHLORITE	20	
PLAGIOCLASE	75	
APATITE	R	

COMMENTS:

*Skeletal, euhedral opaques which are largely altered to sphene.  
Interlocking plagioclase grains - subhedral to anhedral - with  
interstitial chlorite. Plag has light to heavy sericite draping - chlorite also.*

*Does not have fine volcanic texture of typical MCU. Rather  
it looks more like anorthositic meta-igneous.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4505

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 L/10 DETOUR LAKES

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

ACP; interbanded well foliated lt. gray green basalts (meta-basites)  
& pervasively foliated, rusty heavily carbonated tuffs. S<sub>1</sub> only fabric element  
good S<sub>0</sub> || S<sub>1</sub>

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4565  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite has blue-grey  
interference colors.*

*Plag 1 a  
238-253-266  
17 13  
267-284-297*

	EST.	POINT CT.
OPAQUES	<i>. R</i>	
CHLORITE	<i>40</i>	
PLAGIOCLASE	<i>35</i>	
CARBONATE	<i>25</i>	

COMMENTS:

*Fine-grained volcanic texture - no phenocrysts - All quite fine-grained  
 Subophitic texture.  
 Primarily consists of plagioclas microlites - chlorite - opaques - carbonate.  
 Texture preserved - extensive carbonate in thin-section*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4506

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 4/10

DETOUR LAKES

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Mass. porphyritic, gray green andesites as seen @ 4197, 4198, 4199, 4200,  
4501, 4502 i.e. this andesite  $\phi$ ry is a unit in the Monzie Cr. Fm.

(measured 51)

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4506  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Plag ± a*  
*16 11*  
*13-25-38*  
*357-13-20*

*Chlorite interference colors*  
*deep blue to blue-green*  
*pale green in plane light*

	EST.	POINT CT.
<i>Chlorite</i>	<i>.20</i>	
<i>Plagioclase</i>	<i>35</i>	
<i>Clinopyroxene</i>	<i>30</i>	
<i>Opagues</i>	<i>15</i>	
<i>Epidote / Clinocrisite</i>	<i>TR</i>	
<i>Quartz</i>	<i>R</i>	

COMMENTS: *No ftr evident*      *10% phenocrysts*  
*Scattered plagioclase and pyroxene phenocrysts in a fine-grained matrix.*  
*Ophitic texture to matrix. Phenocrysts subhedral to euhedral*  
*Matrix consists of pyroxene-plagioclase microlites-chlorite-opagues*  
*Pyroxene anhedral*

*Plagioclase shows least alteration - sericite & clinocrisite*  
*Opagues are partly to completely altered*  
*Quartz fills veins & fractures*  
*Pyroxene as inclusions in the large plag. phenocrysts*

*Is chlorite possibly replacing olivine?*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 464B

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

165 K/G MT MyE

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Mass. metabasik, good relict igneous texture. Looks like it belongs in Vangorda Fm

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4648  
 DDH: \_\_\_\_\_  
 UNIT: MCU

DESCRIBED BY: KCP  
 DATE: Jan 29 1980

*Possible feeder for Menzie Creek.*

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite interference colors -  
 blue to brown*

	EST.	POINT CT.
OPAQUES	5	
CLINOPYROXENE	25	
TREMOLITE / ACTINOLITE	10	
CHLORITE	20	
PLAGIOCLASE	40	
SERICITE	5	
ZIRCON	R	
QUARTZ	R	
APATITE	R	

COMMENTS:

*Subhedral pyroxene in a matrix of med plagioclase laths.  
 Plag extensively altered to sericite.  
 Amphibole (tremolite) needles around pyroxene grains & scattered through matrix.  
 Tremolite randomly oriented  
 Opaques form euhedral, skeletal grains  
 Chlorite as regular equant to irregular aggregates. At least part of the  
 chlorite pseudomorphs phenocrysts.  
 Not a fine-grained meta-volcanic - more like meta diabase*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4663

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 K/II

BARWEAL LAKE

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

*Massive porphyritic flows or subvolc. intrusives of Menzie Ct. Completely massive, no fabric*  
*Downhill 15' (vert) sec foliated pillow lavas (measured S<sub>1</sub>)*

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4663  
 DDH: \_\_\_\_\_  
 UNIT: MCU

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite  
 pale green in plane light  
 blue in X-nicols*

	EST.	POINT CT.
CARBONATE	.20	
QUARTZ	R	
EPIDOTE / CLINOZOISITE	20	
OPAQUES	5	
CHLORITE	55	
PLAGIOCLASE	R	
PYROXENE	R	

COMMENTS:

*Fine-grained volcanic texture matrix. Matrix presently consists of chlorite-carbonate-clinzoisite-opaques (altered).*

*Former large plagioclase phenocrysts - Now totally altered to epidote/clinozoisite with reddish-brown dust. ~10% phenocrysts*

*Fractures contain carbonate + quartz*

*Minor pyroxene phenocrysts now partly altered to chlorite with relic pyroxene.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4692

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 K/7

BLIND CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Fantastic pillow lavas, basal? Menzic Ck? Plane of  
pillow flattening S<sub>1</sub>

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 4692  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite interference colors -  
 deep blue to gray to  
 deep brown*

*Plag L a  
 17 14  
 13-30-44  
 13 11  
 35-48-59  
 optically -*

	EST.	POINT CT.
CARBONATE	30	
PLAGIOCLASE	15	
OPAQUES	15	
CHLORITE	25	
BIOTITE ??	10	
TREMOLITE ??	5	

COMMENTS:

*Glomeruloporphritic metavolcanic. Phenocrysts of plagioclase aggregates.  
 Also equant, ferromagnesian phenocrysts (former pyroxene?) which presently are  
 fine-grained aggregate of brown mineral (biotite?) ± carbonate.  
 Irregular aggregates of chlorite and/or carbonate probably were  
 amygdules.  
 No fth visible.  
 Matrix presently consists of fine-grained carbonate-chlorite-opaques-  
 Can see unrounded needles in matrix (tremolite?) Former plag microlites totally altered.  
 Plag phenocrysts are quite fresh - not totally altered.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4955

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU

105 L/15

DROMEDARY MTW

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS: Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

greenish grey fine grained weakly foliated. highly amygd. meta volcs. -  
Menzie Ck. - look like massive flows - rusty weath.

(measured Si)

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 4955

DESCRIBED BY: LCP

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

DATE: Jan 29 1980

UNIT: MCV

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite very pale green.  
Interference colors blue-gray*

	EST.	POINT CT.
CARBONATE	55	
CHLORITE	45	
OPAQUES	T	
PLAGIOCLASE	T	

COMMENTS:

*Highly altered porphyritic metavolcanic*  
*Plag phenocrysts now carbonate + chlorite - chlorite unimining rounded carbonate cores*  
*Matrix presently consists of fine-grained chlorite-carbonate-opaques.*  
*Originally very porphyritic 30%*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 4957

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 L/15 DROMEDARY MTN

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS: Med. greenish grey Menzies Ck volcs. - field phenos up to ~ 5mm  
in vfg greyish ~~g~~ groundmass - rare amygd. No sign of pillows - unfoliated

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 4957

DESCRIBED BY: LCP

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

DATE: Jan 29 1980

UNIT: MCV

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite - pale green color  
greenish blue in X-nicals*

	EST.	POINT CT.
PLAGIOCLASE	.45	
CARBONATE	$\frac{1}{2}$	
CHAORITE	15	
OPAQUES (sphene)	15	
CLINOPYROXENE	25	
QUARTZ	$\frac{1}{2}$	

COMMENTS:

*Porphyritic meta-volcanic. Scattered plagioclase phenocrysts. Minor  
sericite dusting on plagioclase. Cores more altered than rims.  
Ophitic textured, fine-grained matrix. Presently consists of chlorite (carbonate-)  
garnet-pyroxene-plagioclase microlites.  
Veins consist of fibrous chlorite (serpentine?) growing  $\perp$  vein wall -  
with center area containing carbonate. Veins break and displace plagioclase  
phenocrysts.  
 $\approx 10\%$  phenocrysts.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5009

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

KD area

105 K/7

BLIND CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS: (KD area)

rubble of blocky gray green with variably amygd. metabasals - grey when fresh - scattered feld phenocrysts in altered groundmass.

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 5009  
 DDH: \_\_\_\_\_  
 UNIT: MCV

DESCRIBED BY: LCP  
 DATE: Jan 29 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite pleochroic pale green  
 X-nicols dark blue often  
 with purplish tint*

	EST.	POINT CT.
CLINOPYROXENE	• K	
EPIDOTE / CLINOZOISITE	45	
OPAQUES	15	
CHLORITE	30	
CARBONATE	10	
QUARTZ	K	
PLAGIOCLASE	K	

COMMENTS:

*Highly altered metavolcanic. Very minor amt of scattered phenocrysts — these only contains relict amts of primary minerals. Pyroxene phenos now mainly chlorite. Plag phenos consist of mixture of chlorite, clinzoisite, carbonate. Clinzoisite commonly contains reddish dust.*

*Also have rounded to subhedral aggregates of quartz-carbonate ± chlorite. these may be amygdules.*

*Matrix is fine-grained altered opaques (both rod and spherical) - chlorite - clinzoisite - carbonate. No primary mineralogy remains. Can still see primary microlite texture, however. No foliation evident*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5329

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 R/6 Mount MJE

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

vfg. grey non amygd. basalt. - a few veinlets along fractures but

little alteration

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 5329  
 DDH: \_\_\_\_\_  
 UNIT: MLV

DESCRIBED BY: LCP  
 DATE: Jan 30 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite pale green  
 Interference colors gray*

	EST.	POINT CT.
OPAQUES	15	
CHLORITE	40	
CARBONATE	20	
QUARTZ ?	25	
PLAGIOCLASE S		

COMMENTS:

*Non-porphyrific, fine-grained, altered metavolcanic.*

*Groundmass consists of intergrown chlorite-carbonate-spheroidal to subhedral opaques - also mineral with 1<sup>st</sup> order gray interference colors. - This gray mineral may be either quartz or plagioclase.*

*Fractures/veins filled by carbonate-chlorite-quartz - these are much coarser grained than material in matrix*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5535

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU 105 K/6 MOUNT MyE

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

*massive to flow brecciated vfg med green basalt flow - local columnar jointed areas. - (interior of flow?) ... Flow breccias can hardly be taken as breccias since frags and matrix are very similar. Unit uncertain (?) by well defined hand lithic breccias. probably of the avalanche type - very monotonous section*

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 5535

DESCRIBED BY: LCP

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

DATE: Jan 30 1980

UNIT: MCV

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite pale green in plane  
light*

*Dark gray to blue in  
X-nicols.*

	EST.	POINT CT.
CARBONATE	.15	
OPAQUES	5	
EPIDOTE / CLINOZOISITE	50	
CHAORITE	25	
QUARTZ	5	

COMMENTS:

*Fine-grained, slightly amygdaloidal, altered meta volcanic.*

*Groundmass consists of quartz-opaques-chlorite-clinzoisite-carbonate. A large amt of clinzoisite in this slide. Can still see primary microlite texture.*

*Filled vesicles consist of carbonate - coarser grained aggregate - with minor chlorite.*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5549

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 K/11 BARWELL LAKE

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

*first appearance of massive dk green fine grained metavolcanics that looks like Menzie Creek. non amygdaloidal not pillowed and unfoliated.*

*(measured S1)*

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 5549  
 DDH: \_\_\_\_\_  
 UNIT: MCU

DESCRIBED BY: LCP  
 DATE: Jan 30 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Amphibole has inclined  
 extinction  
 16°*

	EST.	POINT CT.
CHLORITE	20	
OPAQUES	R	
BIOTITE	10	
TREMOLITE	70	

COMMENTS: *SLIDE TOO THIN*

*Interlocking tremolite needles, with scattered opaques and minor biotite.*

*Criss-cross pattern to tremolite. Biotite does not appear oriented.*

*Poorly defined SI with abundant minerals growing across it.  
 Opaques are skeletal-arched.*

*Medium-grained*

*Not a metavolcanic texture - more like metamorphic*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5573

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV      105 L/15      DROMEDARY MTN

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

MCV - f.g. lt grey to greenish grey sparsely & finely amygdal.  
flow or possibly a fine clastic??  
Flow - a few large orange weath CO<sub>3</sub> amygd

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 5573  
 DDH: \_\_\_\_\_  
 UNIT: MCU

DESCRIBED BY: LCP  
 DATE: Jan 30 1980

DEPTH: \_\_\_\_\_

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

*Chlorite interference colors  
 1<sup>st</sup> order grey*

	EST.	POINT CT.
CARBONATE	25	
OPAQUES	10	
CHLORITE	30	
PLAGIOCLASE	35	

COMMENTS:

*Either medium grained porphyritic metavolcanic or an  
 epicrostic volcanic rock. In either case it is highly altered. Phenocrysts or  
 larger grains totally altered to carbonate and/or chlorite  
 Matrix consists of chlorite-carbonate-plagioclase  
 Opaques form cuboidal, skeletal grains*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5623

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 K/7

BLIND CREEK

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Black EG cherts structurally beneath a pkg. of possibly metasomatized &/or contact metamorphosed EG gray banded calc-silicate bearing cherts. This "altered" sequence in turn underlies the MCV pillow lavas. Numerous samples of EG rocks in "altered zone" between MCV pillow lavas & more normal EG blk cherts taken for petrology to document nature of alteration

(measured  $S_0$  and  $S_1$ )

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 5623  
 DDH: \_\_\_\_\_  
 UNIT: MCU

DESCRIBED BY: KCP  
 DATE: Jan 30 1980

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

	EST.	POINT CT.
OPAQUES	• 10	
CARBONATE	10	
PLAGIOCLASE	K	
TREMOLITE / ACTINOLITE	80	
QUARTZ	K	
EPIDOTE / CHLORITOIDITE?	??	

COMMENTS:

*Metamorphosed metavolcanic Crude S1 ftr visible - especially with hand lens looks somewhat like fracture cluge with opaque dust preferential along ftr.-lines.*

*Sugen of possible former plagioclase phenocrysts now are composed entirely of unoriented sericite.*

*Most of matrix consists of radiating tremolite aggregates with intergranular carbonate and chloritoidite (?)*

*Coarser grained than typical MCU - partly a result of this definitely being a metamorphic texture.*

Skeletal aggregates of opagues intergrown with other minerals.

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5764

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCV

105 4/14

SAFETY PIN BEND

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Chlor. mottled, v. wkly calc "ACP" of MCV w/ minor metabasite

(measured  $S_1$ )

THIN SECTION LOG

PROJECT: \_\_\_\_\_  
 STATION: 5764  
 DDH: \_\_\_\_\_  
 UNIT: MCU

DESCRIBED BY: LCP  
 DATE: Jan 30 1980

HAND SAMPLE:

PURPOSE: *Whole rock analysis*

Plag L a  
 7 5  
 348-355-000  
 8 14  
 115-123-137  
 9 9  
 172-181-190 optically +  
 13 11  
 223-236-247

*Chlorite pale green  
 X-nicols deep blue to brown*

	EST.	POINT CT.
PLAGIOCLASE	40	
OPAQUES	10	
CHLORITE	25	
CARBONATE	25	
ZIRCON	R	

COMMENTS:

*Well defined S1 fol. delineated by chlorite, grains augen;  
 opaque duct pressure solution trails. Also have S2: cumulation cluge cuncks  
 In one chlorite aggregate S1 looks like a cumulation cluge.  
 Texturally looks like epivolcaniclastic. Angular to subrounded  
 grains of plagioclase in a foliated chlorite-carbonate-opaque matrix.  
 Carbonate has 2 appearances - clear and mottled, fine-grained brown.  
 Have what looks to be a fracture veins - in actuality this marks line where the  
 brown variety of carbonate does not occur.  
 Plagioclase forms augen in fol. - light to moderate sinistral ducting  
 May be a tectonic clastic*

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 5794

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU

105 L/9

MENZIE CREEK

KLIPPE in EARN Group

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + traces

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Lt gray-green, non calc, mafic?? clastic rocks. Uncertain whether this unit is a clastic or has ign. texture.

(measured S<sub>1</sub>)

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 5794

DDH: \_\_\_\_\_

UNIT: MCU

DESCRIBED BY: LCP

DEPTH: \_\_\_\_\_

DATE: Jan 30 1980

HAND SAMPLE:

PURPOSE: Whole rock analysis

	EST.	POINT CT.
CARBONATE	.35	
OPAQUES	10	
PLAGIOCLASE	45	
QUARTZ	5	
CHLORITE	5	

COMMENTS: Highly altered

Amygdales medium-grained meta-volcanic

Matrix consists of carbonate-chlorite-opaques-plagioclase

No foliation visible.

Carbonate also fills rounded to irregular amygdules. These often have 1 or more round quartz aggregates associated with the amygdules. Concentric growth of carbonate normal to walls of the vesicles. May have chlorite associated with these.

Plagioclase has fairly heavy sericite draping  
Large carbonate vein at one end of slide - very coarse grained

RESEARCH SAMPLE LOG

PROJECT: \_\_\_\_\_

STATION: 6331

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

HAND SAMPLE: MCU?

105 G/13 WEASEL LAKE

THIN SECTION:

POLISHED SECTION: \_\_\_\_\_

POLISHED THIN SECTION: \_\_\_\_\_

ANALYSIS:  Whole rock + frags

PROBE: \_\_\_\_\_

XRD: \_\_\_\_\_

ISOTOPE: \_\_\_\_\_

FOSSIL: \_\_\_\_\_

STAINED: \_\_\_\_\_

OTHER: \_\_\_\_\_

COMMENTS:

Dull lt → med olive green, calcareous, wkly amygdaloidal "ACP" facies  
of MCU ... Unit commonly chlorite mottled. PS1 foliated.

THIN SECTION LOG

PROJECT: \_\_\_\_\_

STATION: 6331

DESCRIBED BY: LCP

DDH: \_\_\_\_\_

DEPTH: \_\_\_\_\_

DATE: Jan 30 1980

UNIT: MCT?

HAND SAMPLE:

PURPOSE: Whole rock analysis

	EST.	POINT CT.
CHLORITE	.45	
OPAQUES	5	
CARBONATE	10	
QUARTZ ?	40	

COMMENTS: Strong S1 folia.

Very fine-grained matrix consisting of disseminated chlorite-quartz-carbonate-opaques.

One large lens (enclaves) of coarse carbonate with opaques and quartz in minor amounts.

Extremely elongate chlorite lenses in matrix. Textures of chlorite within these lenses look like S2 crenulation cleage (rather than S1).

Looks more siliceous than other MCT units