

AFPC Rock Check Program

Sample No. 2009-09

	Method #	# of Anal.	Grand Median	Std Dev
Moisture				
Ground Sample AFPC 9-2	101	17	0.53	0.172
Other (describe)	102	9	0.49	0.090
Method Group 100		26	0.51	0.15
BPL or P₂O₅				
Gravimetric AFPC 9-5	201	2	35.97	0.101
ICP-induced coupled plasma	202	3	35.80	0.229
Photometric-AFPC 9-6	203	13	35.70	0.306
Automated -AOAC 978.01-15th	204	11	35.66	0.114
Other(describe)	205	3	35.72	0.007
Method Group 200		32	35.71	0.20
BPL or P₂O₅ (on Dry Basis)				
Gravimetric AFPC 9-5	211	1	35.88	0.000
ICP-induced coupled plasma	212	3	36.01	0.198
Photometric-AFPC 9-6	213	8	35.74	0.483
Automated -AOAC 978.01-15th	214	11	35.86	0.182
Other(describe)	215	3	35.91	0.034
Method Group 210		26	35.87	0.22
Fe₂O₃				
Atomic Absorption-AFPC 9-12,13	301	3	0.10	0.022
ICP-induced coupled plasma	302	25	0.14	0.007
Other(describe)	303	2	0.06	0.044
Method Group 300		30	0.14	0.01
Al₂O₃				
Atomic Absorption-AFPC 9-16,17	401	3	0.38	0.129
ICP-induced coupled plasma	402	25	0.32	0.018
Other(describe)	403			
Method Group 400		28	0.32	0.02
MgO				
Atomic Absorption-AFPC 9-18,19	501	2	0.14	0.007
ICP-induced coupled plasma	502	27	0.15	0.015
Other(describe)	503	2	0.18	0.006
Method Group 500		31	0.15	0.01
Acid Insoluble				
Insoluble-AFPC 9-8	601	20	3.43	0.162
Other(describe)	602	1	3.11	0.000
Method Group 600		21	3.43	0.17
CaO				
Gravimetric sulfate	701			
ICP-induced coupled plasma	702	16	52.11	0.787
Ceric Sulfate volumetric	703			
Permanganate	704	7	51.00	0.205
EDTA Volumetric	705	2	53.11	0.326
Other(describe)	706	6	51.63	0.256
Method Group 700		31	51.64	1.01
CaO (on Dry Basis)				
Gravimetric sulfate	711			
ICP-induced coupled plasma	712	13	52.42	0.403
Ceric Sulfate volumetric	713			
Permanganate	714	6	51.26	0.084
EDTA Volumetric	715	1	53.81	0.000
Other(describe)	716	6	51.95	0.218
Method Group 710		26	52.01	0.68

	Method #	# of Anal.	Grand Median	Std Dev
Fluorine, F				
Volumetric-AFPC 9-37	801			
Specific Ion Electrode	802	19	3.98	0.203
Other (describe)	803	2	4.08	0.026
Method Group 800		21	3.98	0.24
Arsenic, As				
Atomic Absorption	911			
ICP-induced coupled plasma	912	7	13.0	3.61
Other(describe)	913	1	14.5	0.00
Method Group 900		8	13.4	3.76
Cadmium, Cd				
Atomic Absorption	921	1	40	0.0
ICP-induced coupled plasma	922	6	31	0.8
Other(describe)	923	3	31	13.0
Method Group 910		10	31	1.5
Cobalt, Co				
Atomic Absorption	931			
ICP-induced coupled plasma	932	3	0	0.3
Other(describe)	933	3	1	3.7
Method Group 920		6	1	0.6
Mercury, Hg				
Atomic Absorption	941			
ICP-induced coupled plasma	942			
Other(describe)	943	1		0.00
Method Group 930		1	0.0	0.00
Molybdenum, Mo				
Atomic Absorption	951			
ICP-induced coupled plasma	952	5	2	0.7
Other(describe)	953	3	2	3.5
Method Group 940		8	2	1.0
Nickel, Ni				
Atomic Absorption	961	1	22	0.0
ICP-induced coupled plasma	962	5	8	0.7
Other(describe)	963	3	3	3.6
Method Group 950		9	8	1.5
Lead, Pb				
Atomic Absorption	971	1	22	0.0
ICP-induced coupled plasma	972	4	3	1.3
Other(describe)	973	2	1	1.0
Method Group 960		7	3	1.7
Selenium, Se				
Atomic Absorption	981			
ICP-induced coupled plasma	982	1	2	0.0
Other(describe)	983	2	1	0.6
Method Group 970		3	2	0.6
Zinc, Zn				
Atomic Absorption	991	2	72	1
ICP-induced coupled plasma	992	5	66	15
Other(describe)	993	3	71	34
Method Group 980		10	70	13

101 Ground Sample AFPC 9-2			
Lab	%	H ₂ O	
27	0.74	-1.223	
Std Dev	0.70	-1.000	
10	0.62	-0.524	
15	0.62	-0.524	
16	0.62	-0.495	
10	0.61	-0.466	
15	0.60	-0.408	
16	0.57	-0.233	
24	0.57	-0.204	
49	0.53	0.000	
49	0.53	0.000	
Median	0.53	0.000	
24	0.44	0.553	
30	0.41	0.699	
6	0.38	0.874	
Std Dev	0.36	1.000	
6	0.35	1.049	
237	0.34	1.136	
77	0.15	2.214	
77	0.03	2.913	

102 Other (describe)			
Lab	%	H ₂ O	
13	0.64	-1.675	
Std Dev	0.58	-1.000	
13	0.56	-0.782	
21	0.51	-0.223	
21	0.51	-0.223	
26	0.49	0.000	
Median	0.49	0.000	
69	0.48	0.095	
Std Dev	0.40	1.000	
21	0.39	1.117	
21	0.39	1.117	
69	0.00	5.472	

201 Gravimetric AFPC 9-5			
Lab	%	P2O5	
50	36.10	-1.340	
Std Dev	36.07	-1.000	
Median	35.97	0.000	
Std Dev	35.86	1.000	

77	35.83	1.340	
202 ICP-induced coupled plasma			
Lab	%	P2O5	
6	36.16	-1.591	
Std Dev	36.02	-1.000	
10	35.80	0.000	
Median	35.80	0.000	
Std Dev	35.57	1.000	
10	35.55	1.089	

203 Photometric-AFPC 9-6			
Lab	%	P2O5	
6	36.12	-1.373	
36	36.10	-1.307	
60	36.10	-1.307	
Std Dev	36.01	-1.000	
16	35.80	-0.327	
92	35.80	-0.327	
16	35.79	-0.278	
92	35.70	0.000	
Median	35.70	0.000	
30	35.63	0.229	
26	35.53	0.556	
Std Dev	35.39	1.000	
270	35.39	1.013	
69	35.33	1.226	
27	34.66	3.415	
69	0.00	116.678	

204 Automated -AOAC 978.01-15th			
Lab	%	P2O5	
15	35.89	-1.977	
15	35.89	-1.977	
Std Dev	35.77	-1.000	
13	35.72	-0.527	
21	35.71	-0.439	
21	35.71	-0.439	
13	35.66	0.000	
77	35.66	0.000	
Median	35.66	0.000	
24	35.60	0.571	
Std Dev	35.55	1.000	
24	35.53	1.142	

21	35.48	1.626	
21	35.48	1.626	
205 Other(describe)			
Lab	%	P2O5	
49	35.72	0.000	
49	35.72	0.000	
Median	35.72	0.000	
Std Dev	35.71	1.000	
237	35.70	2.680	

211 Gravimetric AFPC 9-5			
Lab	%	P2O5	dB
77	35.88	0.000	
Median	35.88	0.000	

212 ICP-induced coupled plasma			
Lab	%	P2O5	dB
6	36.30	-1.429	
Std Dev	36.21	-1.000	
10	36.01	0.000	
Median	36.01	0.000	
Std Dev	35.82	1.000	
10	35.77	1.251	

213 Photometric-AFPC 9-6			
Lab	%	P2O5	dB
6	36.25	-1.047	
Std Dev	36.22	-1.000	
16	36.02	-0.581	
16	35.99	-0.516	
30	35.78	-0.074	
Median	35.74	0.000	
26	35.70	0.074	
69	35.50	0.507	
Std Dev	35.26	1.000	
27	34.91	1.712	
69	0.00	73.941	

214 Automated -AOAC 978.01-15th			
Lab	%	P2O5	dB
15	36.11	-1.364	
15	36.10	-1.325	
Std Dev	36.04	-1.000	

13	35.95	-0.491	
21	35.89	-0.177	
21	35.89	-0.177	
13	35.86	0.000	
Median	35.86	0.000	
24	35.80	0.350	
24	35.69	0.966	
Std Dev	35.68	1.000	
77	35.67	1.046	
21	35.61	1.358	
21	35.61	1.358	

215 Other(describe)			
Lab	%	P2O5	dB
49	35.91	0.000	
49	35.91	0.000	
Median	35.91	0.000	
Std Dev	35.88	1.000	
237	35.82	2.680	

301 Atomic Absorption-AFPC 9-12,13			
Lab	%	Fe2O3	
27	0.11	-0.581	
60	0.10	0.000	
Median	0.10	0.000	
Std Dev	0.07	1.000	
30	0.05	2.099	

302 ICP-induced coupled plasma			
Lab	%	Fe2O3	
13	0.15	-1.340	
16	0.15	-1.340	
77	0.15	-1.340	
77	0.15	-1.340	
Std Dev	0.15	-1.000	
16	0.15	-0.670	
50	0.14	-0.335	
10	0.14	0.000	
15	0.14	0.000	
15	0.14	0.000	
49	0.14	0.000	
49	0.14	0.000	
92	0.14	0.000	
92	0.14	0.000	

270	0.14	0.000
Median	0.14	0.000
21	0.14	0.670
21	0.14	0.670
237	0.14	0.670
Std Dev	0.13	1.000
6	0.13	1.340
6	0.13	1.340
10	0.13	1.340
13	0.13	1.340
21	0.13	2.010
21	0.13	2.010
24	0.12	2.680
26	0.05	12.060

303 Other(describe)		
Lab	%	Fe2O3
69	0.12	-1.340
Std Dev	0.10	-1.000
Median	0.06	0.000
Std Dev	0.01	1.000
69	0.00	1.340

401 Atomic Absorption-AFPC 9-16,17		
Lab	%	Al2O3
30	0.65	-2.097
Std Dev	0.51	-1.000
36	0.38	0.000
Median	0.38	0.000
27	0.31	0.583

402 ICP-induced coupled plasma		
Lab	%	Al2O3
26	0.38	-3.282
15	0.37	-2.735
270	0.37	-2.735
15	0.36	-2.188
13	0.34	-1.094
77	0.34	-1.094
69	0.34	-1.067
Std Dev	0.34	-1.000
24	0.33	-0.547
49	0.33	-0.547
49	0.33	-0.547

77	0.33	-0.547
10	0.33	-0.273
16	0.32	0.000
16	0.32	0.000
21	0.32	0.000
21	0.32	0.000
21	0.32	0.000
Median	0.32	0.000
10	0.32	0.273
21	0.32	0.273
21	0.32	0.273
6	0.31	0.547
13	0.31	0.547
Std Dev	0.30	1.000
6	0.30	1.094
92	0.29	1.641
92	0.29	1.641
69	0.00	17.502

403 Other(describe)		
Lab	%	Al2O3
Median	0.00	0.000

501 Atomic Absorption-AFPC 9-18,19		
Lab	%	MgO
30	0.15	-1.340
Std Dev	0.15	-1.000
Median	0.14	0.000
Std Dev	0.13	1.000
60	0.13	1.340

502 ICP-induced coupled plasma		
Lab	%	MgO
92	0.24	-6.030
92	0.24	-6.030
13	0.23	-5.360
50	0.17	-1.072
Std Dev	0.16	-1.000
10	0.16	-0.670
13	0.16	-0.670
49	0.16	-0.670
49	0.16	-0.670
15	0.16	-0.335
16	0.16	-0.335
16	0.16	-0.335

6	0.15	0.000
6	0.15	0.000
10	0.15	0.000
77	0.15	0.000
237	0.15	0.000
Median	0.15	0.000
15	0.15	0.335
21	0.14	0.670
21	0.14	0.670
21	0.14	0.670
21	0.14	0.670
26	0.14	0.670
77	0.14	0.670
Std Dev	0.14	1.000
69	0.14	1.005
24	0.13	1.675
270	0.03	8.040
69	0.00	10.050

503 Other(describe)		
Lab	%	MgO
36	0.19	-1.340
Std Dev	0.19	-1.000
Median	0.18	0.000
Std Dev	0.18	1.000
27	0.18	1.340

601 Insoluble-AFPC 9-8		
Lab	%	Al
69	4.25	-5.083
26	3.79	-2.249
16	3.67	-1.479
16	3.60	-1.078
Std Dev	3.59	-1.000
21	3.58	-0.924
21	3.58	-0.924
10	3.54	-0.709
10	3.54	-0.678
30	3.44	-0.092
21	3.43	0.000
21	3.43	0.000
Median	3.43	0.000
6	3.39	0.216
24	3.38	0.277

6	3.36	0.400
24	3.36	0.400
13	3.35	0.462
13	3.34	0.524
15	3.31	0.739
15	3.29	0.863
Std Dev	3.26	1.000
69	0.00	21.101

602 Other(describe)		
Lab	%	Al
27	3.11	0.000
Median	3.11	0.000

701 Gravimetric sulfate		
Lab	%	CaO
Median	0.00	0.000

702 ICP-induced coupled plasma		
Lab	%	CaO
50	53.88	-2.248
Std Dev	52.90	-1.000
49	52.74	-0.800
49	52.74	-0.800
6	52.48	-0.470
6	52.43	-0.406
77	52.40	-0.368
77	52.40	-0.368
69	52.12	-0.006
Median	52.11	0.000
10	52.11	0.006
10	51.93	0.235
237	51.90	0.267
16	51.40	0.902
16	51.35	0.965
Std Dev	51.32	1.000
92	50.60	1.918
92	50.21	2.413
69	0.00	66.187

703 Ceric Sulfate volumetric		
Lab	%	CaO
Median	0.00	0.000

704 Permanganate			
Lab	%	CaO	
30	51.28		-1.364
Std Dev	51.21		-1.000
21	51.05		-0.244
21	51.05		-0.244
21	51.00		0.000
21	51.00		0.000
Median	51.00		0.000
Std Dev	50.79		1.000
60	50.55		2.193
27	48.47		12.352

705 EDTA Volumetric			
Lab	%	CaO	
26	53.55		-1.340
Std Dev	53.43		-1.000
Median	53.11		0.000
Std Dev	52.78		1.000
270	52.67		1.340

706 Other(describe)			
Lab	%	CaO	
24	52.13		-1.937
24	51.89		-1.017
Std Dev	51.89		-1.000
15	51.64		-0.039
Median	51.63		0.000
15	51.62		0.039
13	51.44		0.743
Std Dev	51.37		1.000
13	51.26		1.448

711 Gravimetric sulfate			
Lab	%	CaO	dB
Median	0.00		0.000

712 ICP-induced coupled plasma			
Lab	%	CaO	dB
49	53.02		-1.503
49	53.02		-1.503
Std Dev	52.82		-1.000
6	52.68		-0.657
6	52.61		-0.493

77	52.48		-0.156
10	52.43		-0.036
77	52.42		0.000
Median	52.42		0.000
69	52.37		0.121
10	52.24		0.427
237	52.07		0.847
Std Dev	52.01		1.000
16	51.72		1.732
16	51.64		1.915
69	0.00		130.141

713 Ceric Sulfate volumetric			
Lab	%	CaO	dB
Median	0.00		0.000

714 Permanganate			
Lab	%	CaO	dB
30	51.49		-2.816
Std Dev	51.34		-1.000
21	51.31		-0.670
21	51.31		-0.670
Median	51.26		0.000
21	51.20		0.670
21	51.20		0.670
Std Dev	51.17		1.000
27	48.83		29.063

715 EDTA Volumetric			
Lab	%	CaO	dB
26	53.81		0.000
Median	53.81		0.000

716 Other(describe)			
Lab	%	CaO	dB
24	52.42		-2.172
Std Dev	52.17		-1.000
24	52.12		-0.778
15	51.95		-0.022
Median	51.95		0.000
15	51.94		0.022
13	51.73		0.994
Std Dev	51.73		1.000
13	51.59		1.633

801 Volumetric-AFPC 9-37			
Lab	%	Fluorine, F	
Median	0.00		0.000

802 Specific Ion Electrode			
Lab	%	Fluorine, F	
15	4.18		-1.008
Std Dev	4.18		-1.000
15	4.17		-0.959
69	4.16		-0.885
21	4.13		-0.738
21	4.13		-0.738
237	4.00		-0.123
21	3.99		-0.074
21	3.99		-0.074
13	3.98		-0.025
24	3.98		0.000
Median	3.98		0.000
24	3.96		0.074
13	3.90		0.369
270	3.85		0.615
49	3.79		0.910
49	3.79		0.910
Std Dev	3.77		1.000
30	3.77		1.008
36	3.74		1.156
27	3.57		1.992
69	0.00		19.547

803 Other(describe)			
Lab	%	Fluorine, F	
77	4.11		-1.340
Std Dev	4.10		-1.000
Median	4.08		0.000
Std Dev	4.05		1.000
77	4.04		1.340

911 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Arsenic, As	
Median	0.0		0.000

912 ICP-induced coupled plasma			
Lab	ppm	Arsenic, As	

26	24.0		-3.045
Std Dev	16.6		-1.000
6	15.0		-0.554
24	13.9		-0.235
270	13.0		0.000
Median	13.0		0.000
77	9.6		0.941
69	9.6		0.950
Std Dev	9.4		1.000
69	0.0		3.599

913 Other(describe)			
Lab	ppm	Arsenic, As	
13	14.5		0.000
Median	14.5		0.000

921 Atomic Absorption-AFPC 9-12,13			
Lab	ppm	Cadmium, Cd	
27	40		0.000
Median	40		0.000

922 ICP-induced coupled plasma			
Lab	ppm	Cadmium, Cd	
26	33		-2.025
Std Dev	32		-1.000
77	32		-0.834
6	32		-0.357
Median	31		0.000
77	31		0.357
270	31		0.715
Std Dev	30		1.000
237	26		6.313

923 Other(describe)			
Lab	ppm	Cadmium, Cd	
13	35		-0.312
69	31		0.000
Median	31		0.000
Std Dev	18		1.000
69	0		2.368

931 Atomic Absorption-AFPC 9-16,17			
Lab	ppm	Cobalt, Co	
Median	0		0.000

932 ICP-induced coupled plasma			
Lab	ppm	Cobalt, Co	
77	<1	0.000	
77	1	-2.513	
Std Dev	1	-1.000	
237	0	0.000	
Median	0	0.000	
270	0	0.168	

933 Other(describe)			
Lab	ppm	Cobalt, Co	
69	<0.05	0.000	
27	10	-2.450	
Std Dev	5	-1.000	
13	1	0.000	
Median	1	0.000	
69	0	0.230	

941 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Mercury, Hg	
Median	0.0	0.000	

942 ICP-induced coupled plasma			
Lab	ppm	Mercury, Hg	
Median	0.0	0.000	

943 Other(describe)			
Lab	ppm	Mercury, Hg	
69	<0.10	0.000	
13	<0.07	0.000	
69	0.0	0.000	
Median		0.000	

951 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Iolybdenum, Mo	
Median	0	0.000	

952 ICP-induced coupled plasma			
Lab	ppm	Iolybdenum, Mo	
50	4	-2.760	
270	3	-1.340	
Std Dev	3	-1.000	
77	2	0.000	

77	2	0.000	
Median	2	0.000	
237	2	0.670	

953 Other(describe)			
Lab	ppm	Iolybdenum, Mo	
69	9	-2.022	
Std Dev	6	-1.000	
13	2	0.000	
Median	2	0.000	
69	0	0.658	

961 Atomic Absorption-AFPC 9-12,13			
Lab	ppm	Nickel, Ni	
27	22	0.000	
Median	22	0.000	

962 ICP-induced coupled plasma			
Lab	ppm	Nickel, Ni	
237	9	-1.340	
Std Dev	9	-1.000	
6	8	0.000	
270	8	0.000	
Median	8	0.000	
Std Dev	7	1.000	
77	7	1.340	
77	7	1.340	

963 Other(describe)			
Lab	ppm	Nickel, Ni	
13	10	-1.755	
Std Dev	7	-1.000	
69	3	0.000	
Median	3	0.000	
69	0	0.925	

971 Atomic Absorption-AFPC 9-16,17			
Lab	ppm	Lead, Pb	
27	22	0.000	
Median	22	0.000	

972 ICP-induced coupled plasma			
Lab	ppm	Lead, Pb	
77	ND	0.000	

77	ND	0.000	
24	4	-0.608	
270	4	-0.494	
Median	3	0.000	
237	3	0.494	
26		1.787	

973 Other(describe)			
Lab	ppm	Lead, Pb	
69	<0.5	0.000	
13	3	-1.340	
Std Dev	2	-1.000	
Median	1	0.000	
Std Dev	0	1.000	
69	0	1.340	

981 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Selenium, Se	
Median	0	0.000	

982 ICP-induced coupled plasma			
Lab	ppm	Selenium, Se	
77	ND	0.000	
270	2	0.000	
Median	2	0.000	

983 Other(describe)			
Lab	ppm	Selenium, Se	
69	<0.10	0.000	
13	2	-1.340	
Std Dev	1	-1.000	
Median	1	0.000	
Std Dev	0	1.000	
69	0	1.340	

991 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Zinc, Zn	
27	74	-1.340	
Std Dev	73	-1.000	
Median	72	0.000	
Std Dev	71	1.000	
60	70	1.340	

992 ICP-induced coupled plasma			
Lab	ppm	Zinc, Zn	
50	92	-1.685	
270	82	-1.013	
Std Dev	81	-1.000	
6	66	0.000	
Median	66	0.000	
77	61	0.327	
77	60	0.392	

993 Other(describe)			
Lab	ppm	Zinc, Zn	
13	92	-0.613	
69	71	0.000	
Median	71	0.000	
Std Dev	36	1.000	
69	0	2.067	

