

AFPC Rock Check Program

Sample No. 2009-02

	Method #	# of Anal.	Grand Median	Std Dev
Moisture				
Ground Sample AFPC 9-2	101	19	0.16	0.039
Other (describe)	102	7	0.22	0.151
Method Group 100		26	0.16	0.05
BPL or P₂O₅				
Gravimetric AFPC 9-5	201	3	29.44	0.187
ICP-induced coupled plasma	202	5	29.55	0.201
Photometric-AFPC 9-6	203	11	29.39	0.282
Automated -AOAC 978.01-15th	204	9	29.69	0.160
Other(describe)	205	6	29.55	0.142
Method Group 200		34	29.55	0.27
BPL or P₂O₅ (on Dry Basis)				
Gravimetric AFPC 9-5	211	2	29.63	0.178
ICP-induced coupled plasma	212	5	29.60	0.196
Photometric-AFPC 9-6	213	7	29.54	0.348
Automated -AOAC 978.01-15th	214	9	29.70	0.152
Other(describe)	215	3	29.60	0.720
Method Group 210		26	29.61	0.28
Fe₂O₃				
Atomic Absorption-AFPC 9-12,13	301	6	0.65	0.049
ICP-induced coupled plasma	302	24	0.72	0.044
Other(describe)	303	3	0.46	0.229
Method Group 300		33	0.69	0.06
Al₂O₃				
Atomic Absorption-AFPC 9-16,17	401	5	0.43	0.052
ICP-induced coupled plasma	402	25	0.44	0.026
Other(describe)	403			
Method Group 400		30	0.44	0.04
MgO				
Atomic Absorption-AFPC 9-18,19	501	5	0.61	0.019
ICP-induced coupled plasma	502	25	0.62	0.022
Other(describe)	503	2	0.60	0.007
Method Group 500		32	0.61	0.03
Acid Insoluble				
Insoluble-AFPC 9-8	601	19	10.89	0.188
Other(describe)	602	1	10.99	0.000
Method Group 600		20	10.89	0.19
CaO				
Gravimetric sulfate	701			
ICP-induced coupled plasma	702	16	47.03	0.703
Ceric Sulfate volumetric	703			
Permanganate	704	3	45.65	1.657
EDTA Volumetric	705	4	44.99	0.756
Other(describe)	706	7	47.55	0.403
Method Group 700		30	46.81	0.87
CaO (on Dry Basis)				
Gravimetric sulfate	711			
ICP-induced coupled plasma	712	8	46.71	0.447
Ceric Sulfate volumetric	713			
Permanganate	714	2	44.26	1.070
EDTA Volumetric	715	3	44.96	0.602
Other(describe)	716	7	47.63	0.370
Method Group 710		25	46.89	1.17

	Method #	# of Anal.	Grand Median	Std Dev
Fluorine, F				
Volumetric-AFPC 9-37	801			
Specific Ion Electrode	802	20	3.40	0.188
Other (describe)	803	3	3.45	0.164
Method Group 800		23	3.40	0.16
Arsenic, As				
Atomic Absorption	911	1	1.0	0.00
ICP-induced coupled plasma	912	7	18.6	2.58
Other(describe)	913	2	13.1	1.57
Method Group 900		10	16.3	5.40
Cadmium, Cd				
Atomic Absorption	921	2	18	9.9
ICP-induced coupled plasma	922	11	32	1.5
Other(describe)	923	3	30	12.9
Method Group 910		16	32	2.7
Cobalt, Co				
Atomic Absorption	931			
ICP-induced coupled plasma	932	11	1	0.5
Other(describe)	933	3	2	7.3
Method Group 920		14	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	1	8	0.0
ICP-induced coupled plasma	952	8	9	2.1
Other(describe)	953	4	10	3.1
Method Group 940		13	9	1.9
Nickel, Ni				
Atomic Absorption	961	2	29	7.3
ICP-induced coupled plasma	962	10	19	1.3
Other(describe)	963	3	15	8.4
Method Group 950		15	19	2.6
Lead, Pb				
Atomic Absorption	971	2	6	0.4
ICP-induced coupled plasma	972	4	4	1.6
Other(describe)	973	3	4	3.7
Method Group 960		9	5	1.9
Selenium, Se				
Atomic Absorption	981			
ICP-induced coupled plasma	982	2	5	0.3
Other(describe)	983	2	2	1.6
Method Group 970		4	4	1.1
Zinc, Zn				
Atomic Absorption	991	3	316	15
ICP-induced coupled plasma	992	11	307	20
Other(describe)	993	3	309	116
Method Group 980		17	309	21

101 Ground Sample AFPC 9-2			
Lab	%	H ₂ O	
30	0.86	-17.994	
49	0.21	-1.404	
24	0.20	-1.021	
Std Dev	0.19	-1.000	
10	0.18	-0.638	
16	0.17	-0.383	
51	0.17	-0.383	
24	0.17	-0.255	
10	0.16	0.000	
15	0.16	0.000	
16	0.16	0.000	
Median	0.16	0.000	
35	0.15	0.128	
6	0.13	0.638	
15	0.13	0.638	
75	0.12	0.893	
Std Dev	0.12	1.000	
75	0.12	1.021	
6	0.11	1.149	
27	0.10	1.404	
77	0.07	2.170	
77	0.05	2.680	

102 Other (describe)			
Lab	%	H ₂ O	
55	0.52	-1.985	
55	0.46	-1.588	
Std Dev	0.37	-1.000	
13	0.28	-0.430	
69	0.22	0.000	
Median	0.22	0.000	
13	0.18	0.232	
241	0.15	0.430	
Std Dev	0.06	1.000	
69	0.00	1.423	

201 Gravimetric AFPC 9-5			
Lab	%	P2O5	
77	29.85	-2.198	
Std Dev	29.63	-1.000	
50	29.44	0.000	
Median	29.44	0.000	

202 ICP-induced coupled plasma			
Lab	%	P2O5	
6	29.85	-1.489	
6	29.77	-1.092	
Std Dev	29.75	-1.000	
10	29.55	0.000	
Median	29.55	0.000	
10	29.50	0.248	
Std Dev	29.35	1.000	
55	27.98	7.792	

203 Photometric-AFPC 9-6			
Lab	%	P2O5	
60	30.45	-3.763	
35	29.91	-1.846	
Std Dev	29.67	-1.000	
69	29.67	-0.976	
16	29.53	-0.479	
16	29.49	-0.337	
78	29.39	0.000	
Median	29.39	0.000	
270	29.35	0.142	
78	29.31	0.302	
30	29.13	0.923	
Std Dev	29.11	1.000	
27	28.96	1.544	

204 Automated -AOAC 978.01-15th			
Lab	%	P2O5	
75	30.00	-1.932	
75	29.95	-1.620	
Std Dev	29.85	-1.000	
15	29.78	-0.530	
15	29.71	-0.125	
77	29.69	0.000	
Median	29.69	0.000	
13	29.61	0.499	
24	29.56	0.810	
Std Dev	29.53	1.000	
24	29.42	1.683	
13	29.36	2.057	

205 Other(describe)			
Lab	%	P2O5	
49	29.72	-1.234	
Std Dev	29.69	-1.000	
36	29.56	-0.106	
51	29.55	-0.035	
Median	29.55	0.000	
244	29.54	0.035	
Std Dev	29.40	1.000	
51	29.31	1.657	
55	27.71	12.942	

211 Gravimetric AFPC 9-5			
Lab	%	P2O5	dB
77	29.87	-1.340	
Std Dev	29.81	-1.000	
Median	29.63	0.000	
Std Dev	29.45	1.000	
241	29.39	1.340	

212 ICP-induced coupled plasma			
Lab	%	P2O5	dB
6	29.88	-1.425	
6	29.81	-1.047	
Std Dev	29.80	-1.000	
10	29.60	0.000	
Median	29.60	0.000	
10	29.55	0.293	
Std Dev	29.41	1.000	
55	28.11	7.620	

213 Photometric-AFPC 9-6			
Lab	%	P2O5	dB
35	29.95	-1.206	
Std Dev	29.88	-1.000	
69	29.73	-0.556	
16	29.57	-0.102	
16	29.54	0.000	
Median	29.54	0.000	
30	29.38	0.438	
Std Dev	29.19	1.000	
27	28.98	1.583	
69	0.00	84.832	

214 Automated -AOAC 978.01-15th			
Lab	%	P2O5	dB
75	30.04	-2.181	
75	29.98	-1.842	
Std Dev	29.86	-1.000	
15	29.82	-0.766	
15	29.75	-0.289	
77	29.70	0.000	
Median	29.70	0.000	
13	29.69	0.077	
24	29.62	0.574	
Std Dev	29.55	1.000	
24	29.47	1.556	
13	29.41	1.922	

215 Other(describe)			
Lab	%	P2O5	dB
49	29.78	-0.253	
51	29.60	0.000	
Median	29.60	0.000	
Std Dev	28.88	1.000	
55	27.85	2.427	

301 Atomic Absorption-AFPC 9-12,13			
Lab	%	Fe2O3	
30	1.10	-9.051	
Std Dev	0.70	-1.000	
27	0.68	-0.556	
55	0.67	-0.253	
Median	0.65	0.000	
241	0.64	0.253	
Std Dev	0.60	1.000	
60	0.60	1.062	
51	0.59	1.264	

302 ICP-induced coupled plasma			
Lab	%	Fe2O3	
35	0.85	-2.791	
77	0.82	-2.220	
77	0.82	-2.220	
Std Dev	0.77	-1.000	
49	0.74	-0.396	
78	0.74	-0.396	

78	0.74	-0.396
10	0.74	-0.282
16	0.74	-0.282
75	0.73	-0.192
10	0.73	-0.168
16	0.73	-0.168
75	0.73	-0.060
Median	0.72	0.000
13	0.72	0.060
13	0.72	0.060
50	0.69	0.663
6	0.69	0.745
6	0.69	0.745
51	0.68	0.973
Std Dev	0.68	1.000
15	0.67	1.201
15	0.67	1.315
55	0.67	1.315
24	0.66	1.429
24	0.66	1.429
270	0.66	1.429

303 Other(describe)		
Lab	%	Fe2O3
69	0.62	-0.675
36	0.46	0.000
Median	0.46	0.000
Std Dev	0.23	1.000
69	0.00	2.005

401 Atomic Absorption-AFPC 9-16,17		
Lab	%	Al2O3
30	1.14	-13.591
Std Dev	0.48	-1.000
241	0.45	-0.383
51	0.43	0.000
Median	0.43	0.000
55	0.38	0.957
Std Dev	0.38	1.000
27	0.37	1.244

402 ICP-induced coupled plasma		
Lab	%	Al2O3
78	0.55	-4.020

75	0.54	-3.780
75	0.54	-3.665
78	0.53	-3.446
77	0.49	-1.914
77	0.49	-1.914
Std Dev	0.47	-1.000
24	0.45	-0.383
24	0.45	-0.383
51	0.45	-0.383
69	0.45	-0.383
35	0.45	-0.191
13	0.44	0.000
270	0.44	0.000
Median	0.44	0.000
49	0.43	0.383
10	0.42	0.766
13	0.42	0.766
16	0.42	0.766
16	0.42	0.766
10	0.42	0.957
Std Dev	0.41	1.000
55	0.40	1.723
6	0.38	2.297
6	0.38	2.297
15	0.37	2.680
15	0.37	2.680
69	0.00	16.846

403 Other(describe)		
Lab	%	Al2O3
Median	0.00	0.000

501 Atomic Absorption-AFPC 9-18,19		
Lab	%	MgO
35	0.62	-0.643
51	0.61	-0.268
60	0.61	0.000
Median	0.61	0.000
Std Dev	0.59	1.000
55	0.59	1.072
30	0.41	10.452

502 ICP-induced coupled plasma		
Lab	%	MgO

10	0.65	-1.340
Std Dev	0.64	-1.000
75	0.64	-0.774
16	0.64	-0.670
75	0.63	-0.485
6	0.63	-0.447
6	0.63	-0.447
13	0.63	-0.447
16	0.63	-0.447
49	0.63	-0.447
78	0.63	-0.447
50	0.63	-0.281
10	0.63	-0.223
78	0.62	0.000
Median	0.62	0.000
77	0.61	0.447
270	0.61	0.447
15	0.61	0.670
15	0.60	0.893
51	0.60	0.893
77	0.60	0.893
Std Dev	0.60	1.000
13	0.59	1.340
24	0.58	1.787
24	0.58	1.787
69	0.58	1.787
55	0.57	2.233
69	0.00	27.693

503 Other(describe)		
Lab	%	MgO
27	0.61	-1.340
Std Dev	0.61	-1.000
Median	0.60	0.000
Std Dev	0.59	1.000
36	0.59	1.340

601 Insoluble-AFPC 9-8		
Lab	%	Al
30	13.06	-11.543
51	11.26	-1.990
6	11.10	-1.141
Std Dev	11.07	-1.000
6	11.00	-0.610

69	11.00	-0.610
35	10.94	-0.292
15	10.91	-0.133
15	10.90	-0.053
24	10.90	-0.053
16	10.89	0.000
Median	10.89	0.000
16	10.86	0.159
10	10.84	0.239
24	10.80	0.451
13	10.74	0.770
Std Dev	10.70	1.000
55	10.70	1.008
13	10.65	1.247
10	10.56	1.725
55	10.20	3.635
69	0.00	57.766

602 Other(describe)		
Lab	%	Al
27	10.99	0.000
Median	10.99	0.000

701 Gravimetric sulfate		
Lab	%	CaO
Median	0.00	0.000

702 ICP-induced coupled plasma		
Lab	%	CaO
75	49.48	-3.478
75	49.34	-3.279
50	48.17	-1.621
Std Dev	47.73	-1.000
77	47.50	-0.668
6	47.37	-0.483
77	47.30	-0.384
6	47.27	-0.341
49	47.24	-0.299
Median	47.03	0.000
10	46.82	0.299
10	46.80	0.334
78	46.53	0.711
16	46.46	0.810
16	46.46	0.810

Std Dev	46.33	1.000
78	46.31	1.031
69	45.92	1.578
69	0.00	66.865

703 Ceriic Sulfate volumetric			
Lab	%	CaO	
Median	0.00		0.000

704 Permanganate			
Lab	%	CaO	
60	46.90		-0.755
27	45.65		0.000
Median	45.65		0.000
Std Dev	43.99		1.000
30	42.46		1.925

705 EDTA Volumetric			
Lab	%	CaO	
270	46.42		-1.893
Std Dev	45.75		-1.000
55	45.23		-0.311
Median	44.99		0.000
55	44.76		0.311
Std Dev	44.23		1.000
35	43.78		1.601

706 Other(describe)			
Lab	%	CaO	
51	47.74		-0.471
15	47.64		-0.211
15	47.64		-0.211
24	47.55		0.000
Median	47.55		0.000
24	47.50		0.124
Std Dev	47.15		1.000
13	46.69		2.134
13	46.66		2.209

711 Gravimetric sulfate			
Lab	%	CaO	dB
Median	0.00		0.000

712 ICP-induced coupled plasma				
Lab	%	CaO		dB
6	47.42			-1.596
6	47.33			-1.393
Std Dev	47.16			-1.000
10	46.89			-0.411
10	46.88			-0.381
Median	46.71			0.000
16	46.54			0.381
16	46.53			0.397
Std Dev	46.26			1.000
69	46.02			1.545
69	0.00			104.567

713 Ceriic Sulfate volumetric				
Lab	%	CaO		dB
Median	0.00			0.000

714 Permanganate				
Lab	%	CaO		dB
27	45.70			-1.340
Std Dev	45.33			-1.000
Median	44.26			0.000
Std Dev	43.19			1.000
30	42.83			1.340

715 EDTA Volumetric				
Lab	%	CaO		dB
55	45.46			-0.830
55	44.96			0.000
Median	44.96			0.000
Std Dev	44.36			1.000
35	43.85			1.850

716 Other(describe)				
Lab	%	CaO		dB
51	47.82			-0.521
15	47.71			-0.217
15	47.70			-0.185
24	47.63			0.000
Median	47.63			0.000
24	47.59			0.097
Std Dev	47.26			1.000
13	46.82			2.181

13	46.74	2.389
801 Volumetric-AFPC 9-37		
Lab	%	Fluorine, F
Median	0.00	0.000

802 Specific Ion Electrode			
Lab	%		Fluorine, F
69	3.77		-1.990
13	3.66		-1.406
49	3.66		-1.406
35	3.63		-1.247
24	3.62		-1.168
24	3.60		-1.061
Std Dev	3.58		-1.000

51	3.46		-0.345
30	3.43		-0.186
75	3.43		-0.186
55	3.40		0.000
75	3.40		0.000
Median	3.40		0.000
27	3.37		0.133
15	3.37		0.159
6	3.36		0.186
270	3.35		0.239
6	3.34		0.292
13	3.34		0.292
15	3.34		0.292
Std Dev	3.21		1.000
55	3.18		1.168
69	0.00		18.017

803 Other(describe)			
Lab	%		Fluorine, F
77	3.53		-0.487
77	3.45		0.000
Median	3.45		0.000
Std Dev	3.29		1.000
36	3.09		2.193

911 Atomic Absorption-AFPC 9-18,19			
Lab	ppm		Arsenic, As
27	1.0		0.000
Median	1.0		0.000

912 ICP-induced coupled plasma			
Lab	ppm		Arsenic, As
55	20.5		-0.736
55	19.9		-0.504
69	19.5		-0.355
6	18.6		0.000
Median	18.6		0.000
78	17.0		0.620
Std Dev	16.0		1.000
78	15.5		1.201
69	0.0		7.209

913 Other(describe)			
Lab	ppm		Arsenic, As
13	15.2		-1.340
Std Dev	14.7		-1.000
Median	13.1		0.000
Std Dev	11.5		1.000
51	11.0		1.340

921 Atomic Absorption-AFPC 9-12,13			
Lab	ppm		Cadmium, Cd
51	31		-1.340
Std Dev	28		-1.000
Median	18		0.000
Std Dev	8		1.000
27	5		1.340

922 ICP-induced coupled plasma			
Lab	ppm		Cadmium, Cd
78	35		-1.709
75	34		-1.173
75	34		-1.173
Std Dev	34		-1.000
51	33		-0.503
55	33		-0.302
78	32		0.000
Median	32		0.000
55	32		0.121
6	32		0.168
77	31		0.838
Std Dev	31		1.000
270	29		2.111

77 29 2.178

923 Other(describe)			
Lab	ppm	Cadmium, Cd	
13	35		-0.375
69	30		0.000
Median	30		0.000
Std Dev	17		1.000
69	0		2.305

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

932 ICP-induced coupled plasma			
Lab	ppm	Cobalt, Co	
51	3		-3.510
50	2		-2.276
Std Dev	2		-1.000
6	2		-0.872
75	2		-0.319
55	1		-0.213
55	1		0.000
Median	1		0.000
75	1		0.744
77	1		0.744
77	1		0.744
78	1		0.744
78	1		0.744

933 Other(describe)			
Lab	ppm	Cobalt, Co	
69	<0.05		0.000
27	20		-2.422
Std Dev	9		-1.000
13	2		0.000
Median	2		0.000
69	0		0.258

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	
13	<0.07		0.000
69	<0.05		0.000
69	0.0		0.000
Median			0.000

951 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	lolybdenum, Mo	
51	8		0.000
Median	8		0.000

952 ICP-induced coupled plasma			
Lab	ppm	lolybdenum, Mo	
78	17		-3.681
Std Dev	11		-1.000
50	11		-0.850
78	10		-0.793
6	9		-0.130
Median	9		0.000
55	8		0.130
55	8		0.438
77	7		0.817
77	7		0.817

953 Other(describe)			
Lab	ppm	lolybdenum, Mo	
69	16		-1.934
Std Dev	13		-1.000
51	10		-0.034
Median	10		0.000
13	10		0.034
Std Dev	7		1.000
69	0		3.221

961 Atomic Absorption-AFPC 9-12,13			
Lab	ppm	Nickel, Ni	
27	39		-1.340
Std Dev	36		-1.000
Median	29		0.000

Std Dev	21		1.000
51	19		1.340

962 ICP-induced coupled plasma			
Lab	ppm	Nickel, Ni	
78	23		-2.606
Std Dev	20		-1.000
55	20		-0.856
78	20		-0.744
55	20		-0.521
6	19		0.000
51	19		0.000
Median	19		0.000
75	19		0.372
75	18		0.744
Std Dev	18		1.000
77	15		2.978
77	14		3.722

963 Other(describe)			
Lab	ppm	Nickel, Ni	
13	22		-0.848
69	15		0.000
Median	15		0.000
Std Dev	7		1.000
69	0		1.832

971 Atomic Absorption-AFPC 9-16,17			
Lab	ppm	Lead, Pb	
27	6		-1.340
Std Dev	6		-1.000
Median	6		0.000
Std Dev	5		1.000
51	5		1.340

972 ICP-induced coupled plasma			
Lab	ppm	Lead, Pb	
77	<1		0.000
77	<1		0.000
78	9		-3.061
Std Dev	6		-1.000
78	5		-0.320
Median	4		0.000
55	3		0.320

55 0.381

973 Other(describe)			
Lab	ppm	Lead, Pb	
69	10		-1.686
Std Dev	7		-1.000
13	4		0.000
Median	4		0.000
69	0		0.994

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

982 ICP-induced coupled plasma			
Lab	ppm	Selenium, Se	
55	5		-1.340
Std Dev	5		-1.000
Median	5		0.000
Std Dev	5		1.000
55	5		1.340

983 Other(describe)			
Lab	ppm	Selenium, Se	
69	<0.05		0.000
13	4		-1.340
Std Dev	4		-1.000
Median	2		0.000
Std Dev	1		1.000
69	0		1.340

991 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Zinc, Zn	
27	327		-0.737
60	316		0.000
Median	316		0.000
Std Dev	301		1.000
51	287		1.943

992 ICP-induced coupled plasma			
Lab	ppm	Zinc, Zn	
50	318		-0.587
78	318		-0.576
75	316		-0.450

55	314	-0.374
75	310	-0.172
55	307	0.000
Median	307	0.000
6	300	0.334
51	290	0.839
Std Dev	287	1.000
78	287	1.016
77	234	3.671
77	225	4.126

993 Other(describe)		
Lab	ppm	Zinc, Zn
69	312	-0.026
13	309	0.000
Median	309	0.000
Std Dev	193	1.000
69	0	2.654