

AFPC Rock Check Program

Sample No. 2009-05

	Method #	# of Anal.	Grand Median	Std Dev
Moisture				
Ground Sample AFPC 9-2	101	15	0.71	0.125
Other (describe)	102	14	0.70	0.151
Method Group 100		29	0.70	0.15
BPL or P₂O₅				
Gravimetric AFPC 9-5	201	3	28.98	0.052
ICP-induced coupled plasma	202	4	29.02	0.244
Photometric-AFPC 9-6	203	15	29.22	0.396
Automated -AOAC 978.01-15th	204	10	28.93	0.481
Other(describe)	205	5	29.27	0.179
Method Group 200		37	29.10	0.26
BPL or P₂O₅ (on Dry Basis)				
Gravimetric AFPC 9-5	211	3	29.18	0.056
ICP-induced coupled plasma	212	3	29.25	0.481
Photometric-AFPC 9-6	213	12	29.44	0.426
Automated -AOAC 978.01-15th	214	10	29.13	0.500
Other(describe)	215	1	29.62	0.000
Method Group 210		29	29.21	0.33
Fe₂O₃				
Atomic Absorption-AFPC 9-12,13	301	6	0.55	0.053
ICP-induced coupled plasma	302	24	0.53	0.039
Other(describe)	303	5	0.53	0.493
Method Group 300		35	0.53	0.04
Al₂O₃				
Atomic Absorption-AFPC 9-16,17	401	5	0.96	0.034
ICP-induced coupled plasma	402	28	0.77	0.139
Other(describe)	403			
Method Group 400		33	0.84	0.18
MgO				
Atomic Absorption-AFPC 9-18,19	501	6	0.42	0.024
ICP-induced coupled plasma	502	27	0.41	0.024
Other(describe)	503	2	0.42	0.022
Method Group 500		35	0.41	0.03
Acid Insoluble				
Insoluble-AFPC 9-8	601	24	12.63	0.453
Other(describe)	602	2	14.19	1.636
Method Group 600		26	12.63	0.54
CaO				
Gravimetric sulfate	701			
ICP-induced coupled plasma	702	13	42.95	0.440
Ceric Sulfate volumetric	703	1	44.65	0.000
Permanganate	704	5	42.75	0.250
EDTA Volumetric	705	6	43.39	0.191
Other(describe)	706	8	42.72	0.116
Method Group 700		33	42.95	0.43
CaO (on Dry Basis)				
Gravimetric sulfate	711			
ICP-induced coupled plasma	712	8	43.22	15.163
Ceric Sulfate volumetric	713			
Permanganate	714	4	43.24	0.250
EDTA Volumetric	715	6	43.71	0.202
Other(describe)	716	8	43.03	0.106
Method Group 710		29	43.25	0.47

	Method #	# of Anal.	Grand Median	Std Dev
Fluorine, F				
Volumetric-AFPC 9-37	801	1	3.39	0.000
Specific Ion Electrode	802	20	3.10	0.198
Other (describe)	803	4	3.03	0.065
Method Group 800		25	3.06	0.19
Arsenic, As				
Atomic Absorption	911			
ICP-induced coupled plasma	912	6	9.2	10.62
Other(describe)	913	2	6.3	1.71
Method Group 900		8	8.5	6.75
Cadmium, Cd				
Atomic Absorption	921	2	90	1.3
ICP-induced coupled plasma	922	5	91	3.4
Other(describe)	923	5	9	69.4
Method Group 910		12	90	23.1
Cobalt, Co				
Atomic Absorption	931			
ICP-induced coupled plasma	932	4	1	0.5
Other(describe)	933	5	2	1.9
Method Group 920		9	2	0.7
Mercury, Hg				
Atomic Absorption	941			
ICP-induced coupled plasma	942	1	0.3	0.00
Other(describe)	943	3		0.07
Method Group 930		4	0.1	0.16
Molybdenum, Mo				
Atomic Absorption	951			
ICP-induced coupled plasma	952	4	8	1.9
Other(describe)	953	5	10	13.3
Method Group 940		9	10	1.9
Nickel, Ni				
Atomic Absorption	961	1	128	0.0
ICP-induced coupled plasma	962	4	83	18.0
Other(describe)	963	5	21	61.2
Method Group 950		10	77	45.3
Lead, Pb				
Atomic Absorption	971	2	14	4.1
ICP-induced coupled plasma	972	4	7	3.4
Other(describe)	973	5	6	7.9
Method Group 960		11	8	3.9
Selenium, Se				
Atomic Absorption	981			
ICP-induced coupled plasma	982	1	23	0.0
Other(describe)	983	3		5.3
Method Group 970		4	7	12.2
Zinc, Zn				
Atomic Absorption	991	3	791	19
ICP-induced coupled plasma	992	3	605	8
Other(describe)	993	5	49	519
Method Group 980		11	626	343

101 Ground Sample AFPC 9-2		
Lab	%	H ₂ O
49	0.80	-0.720
266	0.80	-0.720
27	0.79	-0.640
10	0.76	-0.400
10	0.75	-0.280
24	0.74	-0.200
16	0.73	-0.160
16	0.71	0.000
Median	0.71	0.000
15	0.67	0.320
15	0.63	0.640
35	0.61	0.800
Std Dev	0.59	1.000
24	0.56	1.200
30	0.55	1.280
77	0.36	2.800
77	0.35	2.880

102 Other (describe)		
Lab	%	H ₂ O
69	1.16	-3.011
Std Dev	0.85	-1.000
9	0.79	-0.562
9	0.77	-0.463
13	0.76	-0.397
21	0.72	-0.132
21	0.72	-0.099
13	0.70	0.000
26	0.70	0.000
Median	0.70	0.000
69	0.65	0.331
33	0.63	0.463
Std Dev	0.55	1.000
6	0.52	1.191
241	0.32	2.515
69	0.00	4.632
69	0.00	4.632

201 Gravimetric AFPC 9-5		
Lab	%	P2O5
77	29.08	-1.914
Std Dev	29.03	-1.000

26	28.98	0.000
Median	28.98	0.000
241	28.94	0.766

202 ICP-induced coupled plasma		
Lab	%	P2O5
10	29.21	-0.747
10	29.03	-0.010
Median	29.02	0.000
6	29.02	0.010
Std Dev	28.78	1.000
266	27.91	4.552

203 Photometric-AFPC 9-6		
Lab	%	P2O5
69	32.59	-8.520
60	30.40	-2.996
69	29.96	-1.884
35	29.86	-1.631
Std Dev	29.61	-1.000
16	29.29	-0.190
9	29.27	-0.126
16	29.22	-0.013
9	29.22	0.000
Median	29.22	0.000
92	29.15	0.164
30	29.11	0.265
92	29.10	0.291
33	28.99	0.569
Std Dev	28.82	1.000
27	28.53	1.745
69	0.00	73.864
69	0.00	73.864

204 Automated -AOAC 978.01-15th		
Lab	%	P2O5
21	30.90	-4.103
15	29.75	-1.704
15	29.73	-1.672
Std Dev	29.41	-1.000
13	28.99	-0.135
21	28.94	-0.031
Median	28.93	0.000
6	28.91	0.031

13	28.90	0.052
24	28.90	0.052
77	28.89	0.073
24	28.85	0.166

205 Other(describe)		
Lab	%	P2O5
36	31.62	-13.149
Std Dev	29.44	-1.000
49	29.38	-0.642
51	29.27	0.000
Median	29.27	0.000
244	29.14	0.698
Std Dev	29.09	1.000
51	29.00	1.508

211 Gravimetric AFPC 9-5			
Lab	%	P2O5	dB
26	29.18	-0.038	
77	29.18	0.000	
Median	29.18	0.000	
Std Dev	29.13	1.000	
241	29.03	2.642	

212 ICP-induced coupled plasma			
Lab	%	P2O5	dB
10	29.42	-0.368	
10	29.25	0.000	
Median	29.25	0.000	
Std Dev	28.77	1.000	
266	28.14	2.312	

213 Photometric-AFPC 9-6			
Lab	%	P2O5	dB
69	32.97	-8.273	
69	30.16	-1.685	
35	30.04	-1.420	
Std Dev	29.86	-1.000	
16	29.51	-0.159	
9	29.49	-0.128	
9	29.45	-0.020	
Median	29.44	0.000	
16	29.43	0.020	
30	29.27	0.391	

33	29.17	0.618
Std Dev	29.01	1.000
27	28.75	1.607
69	0.00	69.025
69	0.00	69.025

214 Automated -AOAC 978.01-15th			
Lab	%	P2O5	dB
21	31.12	-3.985	
15	29.95	-1.629	
15	29.92	-1.574	
Std Dev	29.63	-1.000	
13	29.21	-0.162	
21	29.15	-0.034	
Median	29.13	0.000	
24	29.11	0.034	
13	29.10	0.055	
6	29.06	0.140	
24	29.01	0.247	
77	28.99	0.274	

215 Other(describe)			
Lab	%	P2O5	dB
49	29.62	0.000	
Median	29.62	0.000	

301 Atomic Absorption-AFPC 9-12,13		
Lab	%	Fe2O3
30	0.63	-1.505
Std Dev	0.60	-1.000
27	0.56	-0.188
33	0.55	0.000
241	0.55	0.000
Median	0.55	0.000
Std Dev	0.50	1.000
60	0.47	1.599
51	0.46	1.693

302 ICP-induced coupled plasma		
Lab	%	Fe2O3
21	15.10	#####
35	0.74	-5.488
266	0.61	-2.170
13	0.57	-1.149

77	0.57	-1.149
26	0.57	-1.021
Std Dev	0.56	-1.000
77	0.56	-0.893
6	0.54	-0.383
15	0.54	-0.383
15	0.54	-0.383
51	0.54	-0.255
13	0.53	-0.128
Median	0.53	0.000
9	0.52	0.128
49	0.52	0.128
9	0.52	0.255
10	0.51	0.383
10	0.51	0.383
92	0.51	0.383
16	0.51	0.510
24	0.51	0.510
16	0.50	0.638
24	0.50	0.638
92	0.49	0.893
Std Dev	0.49	1.000
21	0.46	1.787

303 Other(describe)		
Lab	%	Fe2O3
69	1.15	-1.258
Std Dev	1.02	-1.000
36	0.66	-0.273
69	0.53	0.000
Median	0.53	0.000
Std Dev	0.03	1.000
69	0.00	1.067
69	0.00	1.067

401 Atomic Absorption-AFPC 9-16,17		
Lab	%	Al2O3
33	1.16	-6.104
Std Dev	0.99	-1.000
51	0.97	-0.298
27	0.96	0.000
Median	0.96	0.000
Std Dev	0.92	1.000
30	0.92	1.042

241	0.79	4.913
402 ICP-induced coupled plasma		
Lab	%	Al2O3
266	1.66	-6.385
26	1.55	-5.558
77	1.51	-5.306
77	1.50	-5.234
51	1.08	-2.176
35	0.95	-1.277

Std Dev	0.91	-1.000
15	0.89	-0.809
15	0.89	-0.809
9	0.88	-0.737
69	0.86	-0.641
9	0.85	-0.522
6	0.84	-0.486
69	0.84	-0.486
21	0.79	-0.090
Median	0.77	0.000
92	0.76	0.090
92	0.75	0.162
24	0.74	0.270
21	0.73	0.306
24	0.73	0.306
16	0.71	0.486
16	0.71	0.486
49	0.68	0.666
10	0.64	0.953
Std Dev	0.63	1.000
10	0.63	1.025
13	0.61	1.169
13	0.56	1.529
69	0.00	5.558
69	0.00	5.558

403 Other(describe)			
Lab	%	Al2O3	
Median	0.00	0.000	

501 Atomic Absorption-AFPC 9-18,19			
Lab	%	MgO	
35	0.47	-2.268	
30	0.44	-1.031	

Std Dev	0.44	-1.000
33	0.42	-0.206
Median	0.42	0.000
241	0.41	0.206
51	0.40	0.618
Std Dev	0.39	1.000
60	0.37	1.855

502 ICP-induced coupled plasma			
Lab	%	MgO	
69	0.52	-4.453	
13	0.46	-2.062	
92	0.46	-2.062	
92	0.45	-1.649	
13	0.44	-1.237	
Std Dev	0.43	-1.000	

69	0.43	-0.866
9	0.43	-0.825
24	0.43	-0.618
6	0.42	-0.412
15	0.42	-0.412
15	0.42	-0.206
24	0.42	-0.206
51	0.42	-0.206
10	0.41	0.000
49	0.41	0.000
77	0.41	0.000
Median	0.41	0.000
9	0.41	0.206
16	0.40	0.412
16	0.40	0.412
266	0.40	0.412
10	0.39	0.825
21	0.39	0.825
Std Dev	0.39	1.000
77	0.38	1.237
26	0.31	4.123
21	0.23	7.586
69	0.00	16.905
69	0.00	16.905

503 Other(describe)			
Lab	%	MgO	
27	0.45	-1.340	

Std Dev	0.44	-1.000
Median	0.42	0.000
Std Dev	0.40	1.000
36	0.39	1.340

601 Insoluble-AFPC 9-8			
Lab	%	Al	
15	15.56	-6.446	
15	15.55	-6.424	
26	13.42	-1.737	
Std Dev	13.09	-1.000	
21	12.97	-0.744	
16	12.86	-0.502	
16	12.85	-0.480	
9	12.84	-0.458	
9	12.78	-0.314	
24	12.74	-0.226	
30	12.69	-0.127	
10	12.68	-0.105	
24	12.66	-0.050	
Median	12.63	0.000	
10	12.61	0.050	
51	12.61	0.050	
21	12.59	0.094	
13	12.51	0.270	
13	12.30	0.733	
33	12.29	0.755	

Std Dev	12.18	1.000
6	12.07	1.241
35	11.85	1.726
69	11.12	3.347
69	3.90	19.262
69	0.00	27.864
69	0.00	27.864

602 Other(describe)			
Lab	%	Al	
27	16.39	-1.340	
Std Dev	15.83	-1.000	
Median	14.19	0.000	
Std Dev	12.56	1.000	
266	12.00	1.340	

701 Gravimetric sulfate			
Lab	%	CaO	
Median	0.00	0.000	

702 ICP-induced coupled plasma			
Lab	%	CaO	
77	43.60	-1.488	
77	43.40	-1.033	
Std Dev	43.39	-1.000	
69	43.38	-0.988	
10	43.24	-0.670	
49	43.22	-0.625	
10	42.96	-0.034	
16	42.95	0.000	
Median	42.95	0.000	
16	42.87	0.182	
92	42.85	0.216	
92	42.65	0.670	
Std Dev	42.50	1.000	
69	30.52	28.219	
69	0.00	97.536	
69	0.00	97.536	

703 Ceric Sulfate volumetric			
Lab	%	CaO	
241	44.65	0.000	
Median	44.65	0.000	

704 Permanganate			
Lab	%	CaO	
21	43.10	-1.420	
21	43.08	-1.320	
Std Dev	43.00	-1.000	
27	42.75	0.000	
Median	42.75	0.000	
30	42.74	0.020	
Std Dev	42.50	1.000	
60	42.20	2.180	

705 EDTA Volumetric			
Lab	%	CaO	
35	43.98	-3.072	
266	43.60	-1.085	
Std Dev	43.58	-1.000	

9	43.41	-0.092	
Median	43.39	0.000	
26	43.38	0.092	
9	43.27	0.641	
Std Dev	43.20	1.000	
6	42.99	2.105	

706 Other(describe)			
Lab	%	CaO	
51	43.18	-4.020	
15	42.85	-1.167	
Std Dev	42.83	-1.000	
15	42.82	-0.865	
13	42.74	-0.216	
Median	42.72	0.000	
13	42.69	0.216	
24	42.67	0.389	
24	42.67	0.432	
Std Dev	42.60	1.000	
33	42.24	4.106	

711 Gravimetric sulfate			
Lab	%	CaO	dB
Median	0.00	0.000	

712 ICP-induced coupled plasma			
Lab	%	CaO	dB
69	43.89	-0.044	
10	43.56	-0.023	
10	43.29	-0.005	
16	43.25	-0.002	
Median	43.22	0.000	
16	43.18	0.002	
69	30.72	0.824	
Std Dev	28.05	1.000	
69	0.00	2.850	
69	0.00	2.850	

713 Ceric Sulfate volumetric			
Lab	%	CaO	dB
Median	0.00	0.000	

714 Permanganate			
Lab	%	CaO	dB

21	43.41	-0.696	
21	43.39	-0.604	
Median	43.24	0.000	
27	43.09	0.604	
Std Dev	42.99	1.000	
30	42.98	1.040	

715 EDTA Volumetric			
Lab	%	CaO	dB
35	44.25	-2.651	
266	43.95	-1.176	
Std Dev	43.92	-1.000	
9	43.75	-0.163	
Median	43.71	0.000	
26	43.68	0.163	
9	43.61	0.502	
Std Dev	43.51	1.000	
6	43.21	2.468	

716 Other(describe)			
Lab	%	CaO	dB
51	43.18	-1.419	
Std Dev	43.14	-1.000	
15	43.12	-0.870	
15	43.10	-0.702	
13	43.07	-0.359	
Median	43.03	0.000	
13	42.99	0.359	
24	42.99	0.406	
Std Dev	42.92	1.000	
24	42.91	1.165	
33	42.51	4.903	

801 Volumetric-AFPC 9-37			
Lab	%	Fluorine, F	
33	3.39	0.000	
Median	3.39	0.000	

802 Specific Ion Electrode			
Lab	%	Fluorine, F	
69	4.28	-5.954	
30	3.57	-2.389	
35	3.42	-1.631	
Std Dev	3.30	-1.000	

21	3.27	-0.847	
21	3.24	-0.721	
69	3.22	-0.619	
15	3.15	-0.265	
49	3.14	-0.215	
15	3.14	-0.190	
51	3.14	-0.190	
Median	3.10	0.000	
9	3.06	0.190	
13	3.05	0.240	
9	3.04	0.291	
266	2.99	0.544	
24	2.96	0.695	
24	2.96	0.695	
13	2.94	0.796	
Std Dev	2.90	1.000	
27	2.58	2.642	
69	0.00	15.663	
69	0.00	15.663	

803 Other(describe)			
Lab	%	Fluorine, F	
6	3.08	-0.842	
36	3.05	-0.383	
Median	3.03	0.000	
77	3.00	0.383	
Std Dev	2.96	1.000	
77	2.88	2.221	

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	
69	25.8	-1.562	
Std Dev	19.8	-1.000	
69	18.5	-0.876	
266	9.9	-0.066	
Median	9.2	0.000	
26	8.5	0.066	
69	0.0	0.867	
69	0.0	0.867	

913 Other(describe)			
Lab	ppm	Arsenic, As	
13	8.6	-1.340	
Std Dev	8.0	-1.000	
Median	6.3	0.000	
Std Dev	4.6	1.000	
51	4.0	1.340	

921 Atomic Absorption-AFPC 9-12,13			
Lab	ppm	Cadmium, Cd	
51	92	-1.340	
Std Dev	92	-1.000	
Median	90	0.000	
Std Dev	89	1.000	
27	89	1.340	

922 ICP-induced coupled plasma			
Lab	ppm	Cadmium, Cd	
51	99	-2.233	
Std Dev	94	-1.000	
26	94	-0.744	
77	91	0.000	
Median	91	0.000	
77	89	0.596	
Std Dev	88	1.000	
266	80	3.365	

923 Other(describe)			
Lab	ppm	Cadmium, Cd	
13	97	-1.267	
69	93	-1.204	
Std Dev	79	-1.000	
69	9	0.000	
Median	9	0.000	
69	0	0.136	
69	0	0.136	

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

932 ICP-induced coupled plasma			
Lab	ppm	Cobalt, Co	
266	2	-1.608	

Std Dev	2	-1.000	
51	2	-0.536	
Median	1	0.000	
77	1	0.536	
77	1	0.536	

933 Other(describe)			
Lab	ppm	Cobalt, Co	
69	<0.05	0.000	
27	10	-4.079	
Std Dev	4	-1.000	
69	3	-0.327	
13	2	0.000	
Median	2	0.000	
Std Dev	0	1.000	
69	0	1.013	
69	0	1.013	

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	
266	0.3	0.000	
Median	0.3	0.000	

943 Other(describe)			
Lab	ppm	Mercury, Hg	
69	<0.05	0.000	
13	0.2	-2.680	
Std Dev	0.1	-1.000	
69	0.0	0.000	
69	0.0	0.000	
Median	0.0	0.000	

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

952 ICP-induced coupled plasma			
Lab	ppm	Molybdenum, Mo	
266	10	-0.707	
51	10	-0.665	

Median	8	0.000	
77	7	0.665	
77	7	0.665	

953 Other(describe)			
Lab	ppm	Molybdenum, Mo	
69	19	-0.671	
69	18	-0.624	
13	10	0.000	
Median	10	0.000	
69	0	0.716	
69	0	0.716	

961 Atomic Absorption-AFPC 9-12,13			
Lab	ppm	Nickel, Ni	
27	128	0.000	
Median	128	0.000	

962 ICP-induced coupled plasma			
Lab	ppm	Nickel, Ni	
266	96	-0.726	
51	95	-0.654	
Median	83	0.000	
77	71	0.654	
77	70	0.710	

963 Other(describe)			
Lab	ppm	Nickel, Ni	
13	92	-1.160	
69	82	-1.001	
Std Dev	82	-1.000	
69	21	0.000	
Median	21	0.000	
69	0	0.339	
69	0	0.339	

971 Atomic Absorption-AFPC 9-16,17			
Lab	ppm	Lead, Pb	
27	19	-1.340	
Std Dev	18	-1.000	
Median	14	0.000	
Std Dev	9	1.000	
51	8	1.340	

972 ICP-induced coupled plasma			
Lab	ppm	Lead, Pb	
266	10	-0.749	
26	10	-0.659	
Median	7	0.000	
77	5	0.659	
77	5	0.659	

973 Other(describe)			
Lab	ppm	Lead, Pb	
69	26	-2.579	
Std Dev	13	-1.000	
69	11	-0.640	
13	6	0.000	
Median	6	0.000	
69	0	0.700	
69	0	0.700	

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

982 ICP-induced coupled plasma			
Lab	ppm	Selenium, Se	
266	23	0.000	
Median	23	0.000	

983 Other(describe)			
Lab	ppm	Selenium, Se	
69	<0.1	0.000	
13	14	-2.680	
Std Dev	5	-1.000	
69	0	0.000	
69	0	0.000	
Median	0	0.000	

991 Atomic Absorption-AFPC 9-18,19			
Lab	ppm	Zinc, Zn	
27	835	-2.293	
Std Dev	810	-1.000	
51	791	0.000	
Median	791	0.000	
60	783	0.387	

992 ICP-induced coupled plasma		
Lab	ppm	Zinc, Zn
77	626	-2.680
Std Dev	613	-1.000
77	605	0.000
266	605	0.000
Median	605	0.000

993 Other(describe)		
Lab	ppm	Zinc, Zn
13	801	-1.448
69	696	-1.246
Std Dev	568	-1.000
69	49	0.000
Median	49	0.000
69	0	0.094
69	0	0.094