



Analyte PT For All Labs  
 Sample # 240511  
 Mg thiosulfate

**Magruder Fertilizer Proficiency Testing Program**  
 Regular PT Scheme  
 Statistical Summary

# Analytes: 29  
 # Labs Reporting: 58  
 Issue Date : 06/30/2024

Analyte Code	Analyte Sample # 240511	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Analyte Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Analyte IA Ratio	Average Range (R-bar)	Horwitz %RSD
001	Ammoniacal N (%)	1		0.0044									
005	Urea N (%)	1		0.0069									
010	Total N (%)	4	4	0.0593	0.0531	0.0593	0.4900	0.0531	0.0332	89.55%	0.25	0.0153	6.12%
020	Total P2O5 (%)	3	2	0.0346	0.0567	0.0019		0.0024	0.0022	130.11%		0.0015	10.29%
041	Direct Available P2O5 (%)	1		0.0100									
050	Soluble K2O (%)	4	3	0.0319	0.0454	0.0093	0.4100	0.0015	0.0011	16.65%	0.01	0.0013	8.09%
101	Acid Soluble Ca (%)	3	3	0.1328	0.0333	0.1328	0.2066	0.0333	0.0241	25.11%	0.38	0.0006	5.42%
121	Acid Soluble Mg (4%)	47	46	4.154	0.3268	4.115	0.4058	0.2765	0.0510	6.72%	1.59	0.0933	3.23%
131	Water Soluble Mg (%)	12	12	4.168	0.2196	4.142		0.1924	0.0694	4.65%		0.0625	3.23%
143	Elemental S (%)	4	4	10.35	0.1346	10.35		0.1346	0.0841	1.30%		0.0736	2.81%
145	Sulfate S, HCl soluble (%)	5	5	10.25	0.2740	10.25		0.2740	0.1532	2.67%		0.1425	2.82%
146	Total S in Liquid (10%)	5	5	10.28	0.2447	10.28	0.7139	0.2447	0.1368	2.38%	0.80	0.0446	2.82%
148	Total S (10%)	34	32	10.56	2.029	10.19	0.7095	0.5897	0.1303	5.79%	1.94	0.2359	2.82%
149	S - HNO3 soluble (%)	5	5	9.449	1.163	9.449		1.163	0.6502	12.31%		0.1765	2.85%
151	Acid Soluble As (ppm)	11	3	1.461	2.086	1.430		2.422	1.748	169.40%		0.2162	15.16%
165	Acid Soluble B (%)	5	4	0.0030	0.0040	0.0012	0.0032	0.0007	0.0004	56.12%	0.51	0.0007	10.95%
181	Acid Soluble Cd (ppm)	9	4	0.8980	0.9131	0.9998		1.222	0.7637	122.23%		2.010	16.00%
191	Acid Soluble Cr (ppm)	8	4	1.098	1.360	1.597		1.817	1.136	113.76%		0.6126	14.91%
202	Acid Soluble Co (ppm)	9	3	3.264	8.660	9.297	3.7890	14.76	10.65	158.73%	9.07	2.907	11.44%
221	Acid Soluble Cu (%)	13	4	0.0012	0.0027	0.0003	0.0050	0.0001	0.0001	40.82%	0.06	0.0001	13.56%
241	Acid Soluble Fe (%)	4	3	0.0069	0.0121	0.0087	0.0059	0.0142	0.0102	163.72%	5.63	0.0053	8.18%
251	Acid Soluble Pb (ppm)	10	2	1.616	1.767	0.9214		1.006	0.8889	109.16%		0.0293	16.20%
261	Acid Soluble Mn (%)	5	3	0.0045	0.0056	0.0039	0.0054	0.0065	0.0047	168.71%	2.81	0.0001	9.23%
281	Acid Soluble Hg (ppm)	6	1	0.5618	0.8578	0.0039		0.0065	0.0081	168.71%		0.0000	22.00%
289	Acid Soluble Mo (ppm)	9	3	0.5014	0.8959	1.094	1.3283	1.424	1.028	130.18%	2.50	0.1790	15.78%
291	Acid Soluble Ni (ppm)	8	4	5.744	13.42	10.58		18.89	11.80	178.51%		2.965	11.22%
301	Acid Soluble Se (ppm)	10	5	1.718	3.098	0.8012		1.432	0.8008	178.79%		0.1266	16.54%
311	Sodium (%)	4	4	0.0221	0.0157	0.0221	0.0072	0.0157	0.0098	71.16%	5.08	0.0060	7.10%
321	Acid Soluble Zn (%)	11	2	0.0012	0.0030	0.0004	0.0050	0.0001	0.0001	35.36%	0.07	0.0002	12.98%

Analyte Code	Analyte Sample # 240511	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Analyte Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Analyte IA Ratio	Average Range (R-bar)	Horwitz %RSD
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The Analyte IA Ratio =  $2.33 * \text{Robust SD} / \text{IA at the Analyte Assigned Value}$ . IA ratios of 1 and less indicate participant data dispersion is as good or less than the IA. Red indicates the IA ratio is significantly greater than 1, Orange indicates marginally greater than 1, Green indicates IA ratio is not significantly greater than 1 and Grey indicates < 6 labs reporting. The Horwitz %RSD is calculated using the Thompson Modification, Analyst,2000,125,385-386.



Analyte PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

# Analytes: 29

Sample # 240511

Regular PT Scheme

# Labs Reporting: 58

Mg thiosulfate

Lab Values

Issue Date : 06/30/2024

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
001	Ammoniacal N (%)	0524	0.0044	0.0000				1		001.99	0
005	Urea N (%)	0524	0.0069	0.0000				1		005.99	0
010	Total N (%)	0422	0.0200	0.0000	0.0593	0.0531	0.0153	4	-0.74	010.60	0
010	Total N (%)	0524	0.0220	0.0100	0.0593	0.0531	0.0153	4	-0.70	010.99	0
010	Total N (%)	0354	0.0615	0.0050	0.0593	0.0531	0.0153	4	0.04	010.60	0
010	Total N (%)	0588	0.1335	0.0310	0.0593	0.0531	0.0153	4	1.40	010.60	0
020	Total P2O5 (%)	0524	0.0002	0.0001				2		020.50	0
020	Total P2O5 (%)	0422	0.0036	0.0028				2		020.50	0
020	Total P2O5 (%)	0588	< 0.1					2		020.50	5
041	Direct Available P2O5 (%)	0354	< 0.01					0		041.21	5
050	Soluble K2O (%)	0524	0.0076	0.0006	0.0093	0.0015	0.0013	3	-1.07	050.99	0
050	Soluble K2O (%)	0354	0.0095	0.0010	0.0093	0.0015	0.0013	3	0.16	050.52	0
050	Soluble K2O (%)	0422	0.0107	0.0023	0.0093	0.0015	0.0013	3	0.91	050.50	0
050	Soluble K2O (%)	0588	< 0.1		0.0093	0.0015	0.0013	3		050.99	5
101	Acid Soluble Ca (%)	0422	0.1058	0.0001	0.1328	0.0333	0.0006	3	-0.81	101.30	0
101	Acid Soluble Ca (%)	0035	0.1225	0.0010	0.1328	0.0333	0.0006	3	-0.31	101.30	0
101	Acid Soluble Ca (%)	0354	0.1700	0.0000	0.1328	0.0333	0.0006	3	1.12	101.30	0
121	Acid Soluble Mg (4%)	0055	3.698†	0.1850	4.115	0.2765	0.0933	46	-1.51	121.33	0
121	Acid Soluble Mg (4%)	0220	3.700†	0.1400	4.115	0.2765	0.0933	46	-1.50	121.32	0
121	Acid Soluble Mg (4%)	0368	3.703†	0.0747	4.115	0.2765	0.0933	46	-1.49	121.99	0
121	Acid Soluble Mg (4%)	0485	3.795	0.0700	4.115	0.2765	0.0933	46	-1.16	121.00	0
121	Acid Soluble Mg (4%)	0553	3.835	0.0100	4.115	0.2765	0.0933	46	-1.01	121.00	0
121	Acid Soluble Mg (4%)	0095	3.855	0.2500	4.115	0.2765	0.0933	46	-0.94	121.32	0
121	Acid Soluble Mg (4%)	0136	3.885	0.0300	4.115	0.2765	0.0933	46	-0.83	121.33	0
121	Acid Soluble Mg (4%)	0451	3.889	0.2580	4.115	0.2765	0.0933	46	-0.82	121.30	0
121	Acid Soluble Mg (4%)	0433	3.905	0.0900	4.115	0.2765	0.0933	46	-0.76	121.30	0
121	Acid Soluble Mg (4%)	0389	3.925	0.0030	4.115	0.2765	0.0933	46	-0.69	121.99	0
121	Acid Soluble Mg (4%)	0073	3.930	0.1000	4.115	0.2765	0.0933	46	-0.67	121.32	0
121	Acid Soluble Mg (4%)	0042	3.930	0.4800	4.115	0.2765	0.0933	46	-0.67	121.99	0
121	Acid Soluble Mg (4%)	0377	3.940	0.2600	4.115	0.2765	0.0933	46	-0.63	121.30	0
121	Acid Soluble Mg (4%)	0177	3.945	0.1386	4.115	0.2765	0.0933	46	-0.61	121.33	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
121	Acid Soluble Mg (4%)	0049	3.950	0.2200	4.115	0.2765	0.0933	46	-0.60	121.30	0
121	Acid Soluble Mg (4%)	0324	3.955	0.0900	4.115	0.2765	0.0933	46	-0.58	121.30	0
121	Acid Soluble Mg (4%)	0040	3.975	0.0300	4.115	0.2765	0.0933	46	-0.51	121.33	0
121	Acid Soluble Mg (4%)	0231	3.980	0.0000	4.115	0.2765	0.0933	46	-0.49	121.30	0
121	Acid Soluble Mg (4%)	0405	3.980	0.0600	4.115	0.2765	0.0933	46	-0.49	121.32	0
121	Acid Soluble Mg (4%)	0423	4.033	0.0210	4.115	0.2765	0.0933	46	-0.30	121.32	0
121	Acid Soluble Mg (4%)	0354	4.060	0.0400	4.115	0.2765	0.0933	46	-0.20	121.30	0
121	Acid Soluble Mg (4%)	0023	4.062	0.0170	4.115	0.2765	0.0933	46	-0.19	121.99	0
121	Acid Soluble Mg (4%)	0255	4.070	0.0380	4.115	0.2765	0.0933	46	-0.16	121.30	0
121	Acid Soluble Mg (4%)	0561	4.120	0.0000	4.115	0.2765	0.0933	46	0.02	121.33	0
121	Acid Soluble Mg (4%)	0562	4.125	0.0500	4.115	0.2765	0.0933	46	0.04	121.99	0
121	Acid Soluble Mg (4%)	0600	4.125	0.0500	4.115	0.2765	0.0933	46	0.04	121.99	0
121	Acid Soluble Mg (4%)	0494	4.129	0.0756	4.115	0.2765	0.0933	46	0.05	121.33	0
121	Acid Soluble Mg (4%)	0498	4.150	0.1000	4.115	0.2765	0.0933	46	0.13	121.03	0
121	Acid Soluble Mg (4%)	0291	4.155	0.0100	4.115	0.2765	0.0933	46	0.14	121.30	0
121	Acid Soluble Mg (4%)	0029	4.202	0.2810	4.115	0.2765	0.0933	46	0.31	121.00	0
121	Acid Soluble Mg (4%)	0169	4.235	0.0300	4.115	0.2765	0.0933	46	0.43	121.33	0
121	Acid Soluble Mg (4%)	0234	4.245	0.2500	4.115	0.2765	0.0933	46	0.47	121.30	0
121	Acid Soluble Mg (4%)	0527	4.257	0.0076	4.115	0.2765	0.0933	46	0.51	121.33	0
121	Acid Soluble Mg (4%)	0422	4.259	0.0120	4.115	0.2765	0.0933	46	0.52	121.30	0
121	Acid Soluble Mg (4%)	0521	4.267	0.0000	4.115	0.2765	0.0933	46	0.55	121.33	0
121	Acid Soluble Mg (4%)	0102	4.300	0.0600	4.115	0.2765	0.0933	46	0.67	121.33	0
121	Acid Soluble Mg (4%)	0260	4.300	0.1000	4.115	0.2765	0.0933	46	0.67	121.33	0
121	Acid Soluble Mg (4%)	0035	4.380	0.0200	4.115	0.2765	0.0933	46	0.96	121.30	0
121	Acid Soluble Mg (4%)	0523	4.406	0.0190	4.115	0.2765	0.0933	46	1.05	121.99	0
121	Acid Soluble Mg (4%)	0534	4.485	0.0300	4.115	0.2765	0.0933	46	1.34	121.00	0
121	Acid Soluble Mg (4%)	0524	4.504	0.0521	4.115	0.2765	0.0933	46	1.41	121.99	0
121	Acid Soluble Mg (4%)	0452	4.655‡	0.0100	4.115	0.2765	0.0933	46	1.95	121.33	0
121	Acid Soluble Mg (4%)	0513	4.890‡	0.0000	4.115	0.2765	0.0933	46	2.80	121.30	0
121	Acid Soluble Mg (4%)	0515	4.975‡	0.4710	4.115	0.2765	0.0933	46	3.11	121.33	0
121	Acid Soluble Mg (4%)	0472	4.980‡	0.0400	4.115	0.2765	0.0933	46	3.13	121.33	0
121	Acid Soluble Mg (4%)	0515	5.003‡	0.3920	4.115	0.2765	0.0933	46	3.21	121.99	0
121	Acid Soluble Mg (4%)	0106	4.099	0.6384	4.115	0.2765	0.0933	46	-0.06	121.33	1
131	Water Soluble Mg (%)	0485	3.910	0.1200	4.142	0.1924	0.0625	12	-1.21	131.00	0
131	Water Soluble Mg (%)	0510	3.953	0.0433	4.142	0.1924	0.0625	12	-0.98	131.70	0
131	Water Soluble Mg (%)	0029	3.964	0.0640	4.142	0.1924	0.0625	12	-0.93	131.00	0
131	Water Soluble Mg (%)	0405	4.055	0.0300	4.142	0.1924	0.0625	12	-0.45	131.30	0
131	Water Soluble Mg (%)	0562	4.090	0.0600	4.142	0.1924	0.0625	12	-0.27	131.99	0
131	Water Soluble Mg (%)	0600	4.090	0.0600	4.142	0.1924	0.0625	12	-0.27	131.99	0
131	Water Soluble Mg (%)	0605	4.160	0.0200	4.142	0.1924	0.0625	12	0.09	131.30	0
131	Water Soluble Mg (%)	0394	4.175	0.0465	4.142	0.1924	0.0625	12	0.17	131.30	0
131	Water Soluble Mg (%)	0444	4.215	0.1300	4.142	0.1924	0.0625	12	0.38	131.30	0
131	Water Soluble Mg (%)	0619	4.235	0.0300	4.142	0.1924	0.0625	12	0.48	131.30	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
131	Water Soluble Mg (%)	0452	4.565	0.0100	4.142	0.1924	0.0625	12	2.20	131.30	0
131	Water Soluble Mg (%)	0518	4.600	0.2000	4.142	0.1924	0.0625	12	2.38	131.70	0
143	Elemental S (%)	0291	10.20	0.0100	10.35	0.1346	0.0736	4	-1.11	143.99	0
143	Elemental S (%)	0368	10.29	0.0544	10.35	0.1346	0.0736	4	-0.41	143.99	0
143	Elemental S (%)	0255	10.39	0.1100	10.35	0.1346	0.0736	4	0.30	143.99	0
143	Elemental S (%)	0389	10.51	0.1200	10.35	0.1346	0.0736	4	1.23	143.99	0
145	Sulfate S, HCl soluble (%)	0444	9.880	0.1400	10.25	0.2740	0.1425	5	-1.33	145.99	0
145	Sulfate S, HCl soluble (%)	0537	10.03	0.1800	10.25	0.2740	0.1425	5	-0.78	145.00	0
145	Sulfate S, HCl soluble (%)	0485	10.40	0.0000	10.25	0.2740	0.1425	5	0.57	145.00	0
145	Sulfate S, HCl soluble (%)	0619	10.40	0.2000	10.25	0.2740	0.1425	5	0.57	145.99	0
145	Sulfate S, HCl soluble (%)	0561	10.52	0.0500	10.25	0.2740	0.1425	5	0.99	145.00	0
146	Total S in Liquid (10%)	0102	10.11	0.0200	10.28	0.2447	0.0446	5	-0.69	146.00	0
146	Total S in Liquid (10%)	0177	10.13	0.0575	10.28	0.2447	0.0446	5	-0.61	146.00	0
146	Total S in Liquid (10%)	0023	10.17	0.0410	10.28	0.2447	0.0446	5	-0.43	146.99	0
146	Total S in Liquid (10%)	0537	10.28	0.0600	10.28	0.2447	0.0446	5	0.01	146.00	0
146	Total S in Liquid (10%)	0324	10.70	0.0000	10.28	0.2447	0.0446	5	1.72	146.00	0
148	Total S (10%)	0433	8.815†	0.3100	10.19	0.5897	0.2359	32	-2.33	148.99	0
148	Total S (10%)	0157	8.905†	0.6100	10.19	0.5897	0.2359	32	-2.18	148.00	0
148	Total S (10%)	0157	9.025†	0.3700	10.19	0.5897	0.2359	32	-1.98	148.01	0
148	Total S (10%)	0049	9.450†	0.0200	10.19	0.5897	0.2359	32	-1.26	148.00	0
148	Total S (10%)	0451	9.550	0.0800	10.19	0.5897	0.2359	32	-1.09	148.00	0
148	Total S (10%)	0095	9.610	0.2400	10.19	0.5897	0.2359	32	-0.98	148.01	0
148	Total S (10%)	0605	9.800	0.0400	10.19	0.5897	0.2359	32	-0.66	148.99	0
148	Total S (10%)	0472	9.820	0.0600	10.19	0.5897	0.2359	32	-0.63	148.07	0
148	Total S (10%)	0029	9.897	0.1110	10.19	0.5897	0.2359	32	-0.50	148.00	0
148	Total S (10%)	0136	9.915	0.1900	10.19	0.5897	0.2359	32	-0.47	148.00	0
148	Total S (10%)	0106	9.975	0.1700	10.19	0.5897	0.2359	32	-0.37	148.07	0
148	Total S (10%)	0523	10.04	0.2940	10.19	0.5897	0.2359	32	-0.26	148.99	0
148	Total S (10%)	0521	10.05	0.0000	10.19	0.5897	0.2359	32	-0.24	148.07	0
148	Total S (10%)	0177	10.06	0.1062	10.19	0.5897	0.2359	32	-0.22	148.07	0
148	Total S (10%)	0377	10.07	0.6400	10.19	0.5897	0.2359	32	-0.20	148.99	0
148	Total S (10%)	0498	10.11	0.1600	10.19	0.5897	0.2359	32	-0.14	148.01	0
148	Total S (10%)	0028	10.16	0.2800	10.19	0.5897	0.2359	32	-0.05	148.01	0
148	Total S (10%)	0040	10.20	0.0000	10.19	0.5897	0.2359	32	0.02	148.07	0
148	Total S (10%)	0073	10.27	0.6000	10.19	0.5897	0.2359	32	0.13	148.01	0
148	Total S (10%)	0494	10.42	0.3812	10.19	0.5897	0.2359	32	0.40	148.07	0
148	Total S (10%)	0562	10.45	0.2000	10.19	0.5897	0.2359	32	0.44	148.99	0
148	Total S (10%)	0600	10.45	0.2000	10.19	0.5897	0.2359	32	0.44	148.99	0
148	Total S (10%)	0534	10.52	0.4100	10.19	0.5897	0.2359	32	0.55	148.01	0
148	Total S (10%)	0354	10.55	0.1000	10.19	0.5897	0.2359	32	0.61	148.99	0
148	Total S (10%)	0220	10.63	0.0400	10.19	0.5897	0.2359	32	0.75	148.01	0
148	Total S (10%)	0169	10.68	0.0600	10.19	0.5897	0.2359	32	0.83	148.07	0
148	Total S (10%)	0452	10.72	0.2500	10.19	0.5897	0.2359	32	0.89	148.99	0



Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
148	Total S (10%)	0035	10.80	1.000	10.19	0.5897	0.2359	32	1.03	148.99	0
148	Total S (10%)	0260	10.85	0.3100	10.19	0.5897	0.2359	32	1.11	148.07	0
148	Total S (10%)	0422	11.00‡	0.0000	10.19	0.5897	0.2359	32	1.37	148.99	0
148	Total S (10%)	0527	11.19‡	0.3946	10.19	0.5897	0.2359	32	1.70	148.07	0
148	Total S (10%)	0513	11.45‡	0.0100	10.19	0.5897	0.2359	32	2.13	148.07	0
148	Total S (10%)	0515	12.47‡	1.740	10.19	0.5897	0.2359	32	3.87	148.07	1
148	Total S (10%)	0619	21.30‡	0.0000	10.19	0.5897	0.2359	32	18.84	148.07	2
149	S - HNO3 soluble (%)	0524	7.456	0.1576	9.449	1.163	0.1765	5	-1.71	149.04	0
149	S - HNO3 soluble (%)	0231	9.475	0.0100	9.449	1.163	0.1765	5	0.02	149.04	0
149	S - HNO3 soluble (%)	0423	9.866	0.0150	9.449	1.163	0.1765	5	0.36	149.04	0
149	S - HNO3 soluble (%)	0518	10.05	0.5000	9.449	1.163	0.1765	5	0.52	149.99	0
149	S - HNO3 soluble (%)	0619	10.40	0.2000	9.449	1.163	0.1765	5	0.82	149.99	0
151	Acid Soluble As (ppm)	0524	0.0014	0.0006	1.430	2.422	0.2162	3	-0.48	151.30	0
151	Acid Soluble As (ppm)	0086	0.0616	0.0400	1.430	2.422	0.2162	3	-0.46	151.32	0
151	Acid Soluble As (ppm)	0515	4.227	0.6080	1.430	2.422	0.2162	3	0.94	151.33	0
151	Acid Soluble As (ppm)	0255	0.0000	0.0000	1.430	2.422	0.2162	3		151.30	4
151	Acid Soluble As (ppm)	0515	< 0.186		1.430	2.422	0.2162	3		151.34	5
151	Acid Soluble As (ppm)	0368	< 0.4		1.430	2.422	0.2162	3		151.34	5
151	Acid Soluble As (ppm)	0220	< 0.5		1.430	2.422	0.2162	3		151.32	5
151	Acid Soluble As (ppm)	0220	< 0.5		1.430	2.422	0.2162	3		151.99	5
151	Acid Soluble As (ppm)	0136	< 1		1.430	2.422	0.2162	3		151.33	5
151	Acid Soluble As (ppm)	0405	< 3		1.430	2.422	0.2162	3		151.32	5
151	Acid Soluble As (ppm)	0605	< 6.2		1.430	2.422	0.2162	3		151.30	5
165	Acid Soluble B (%)	0422	0.0006	0.0000	0.0012	0.0007	0.0007	4	-0.92	165.30	0
165	Acid Soluble B (%)	0524	0.0007	0.0000	0.0012	0.0007	0.0007	4	-0.77	165.99	0
165	Acid Soluble B (%)	0515	0.0017	0.0007	0.0012	0.0007	0.0007	4	0.59	165.99	0
165	Acid Soluble B (%)	0423	0.0020	0.0000	0.0012	0.0007	0.0007	4	1.10	165.99	0
165	Acid Soluble B (%)	0354	< 0.01		0.0012	0.0007	0.0007	4		165.30	5
181	Acid Soluble Cd (ppm)	0220	0.0400	0.0000	0.9998	1.222	2.010	4	-0.67	181.32	0
181	Acid Soluble Cd (ppm)	0220	0.0400	0.0000	0.9998	1.222	2.010	4	-0.67	181.99	0
181	Acid Soluble Cd (ppm)	0515	1.329	0.0180	0.9998	1.222	2.010	4	0.23	181.33	0
181	Acid Soluble Cd (ppm)	0255	2.590	4.002	0.9998	1.222	2.010	4	1.10	181.30	0
181	Acid Soluble Cd (ppm)	0368	< 0.1		0.9998	1.222	2.010	4		181.34	5
181	Acid Soluble Cd (ppm)	0515	< 0.133		0.9998	1.222	2.010	4		181.34	5
181	Acid Soluble Cd (ppm)	0405	< 1		0.9998	1.222	2.010	4		181.32	5
181	Acid Soluble Cd (ppm)	0136	< 1		0.9998	1.222	2.010	4		181.33	5
181	Acid Soluble Cd (ppm)	0605	< 1.85		0.9998	1.222	2.010	4		181.30	5
191	Acid Soluble Cr (ppm)	0524	0.0168	0.0019	1.597	1.817	0.6126	4	-0.74	191.30	0
191	Acid Soluble Cr (ppm)	0220	0.1000	0.0000	1.597	1.817	0.6126	4	-0.70	191.32	0
191	Acid Soluble Cr (ppm)	0515	2.673	0.2360	1.597	1.817	0.6126	4	0.50	191.33	0
191	Acid Soluble Cr (ppm)	0368	3.600	1.600	1.597	1.817	0.6126	4	0.93	191.34	0
191	Acid Soluble Cr (ppm)	0136	< 0.05		1.597	1.817	0.6126	4		191.33	5
191	Acid Soluble Cr (ppm)	0515	< 0.141		1.597	1.817	0.6126	4		191.34	5

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
191	Acid Soluble Cr (ppm)	0405	< 1		1.597	1.817	0.6126	4		191.32	5
191	Acid Soluble Cr (ppm)	0605	< 1.2		1.597	1.817	0.6126	4		191.30	5
202	Acid Soluble Co (ppm)	0524	0.1465	0.0009	9.297	14.76	2.907	3	-0.50	202.30	0
202	Acid Soluble Co (ppm)	0515	1.424	0.0010	9.297	14.76	2.907	3	-0.43	202.33	0
202	Acid Soluble Co (ppm)	0255	26.32	8.720	9.297	14.76	2.907	3	0.94	202.99	0
202	Acid Soluble Co (ppm)	0136	< 0.05		9.297	14.76	2.907	3		202.33	5
202	Acid Soluble Co (ppm)	0220	< 0.1		9.297	14.76	2.907	3		202.32	5
202	Acid Soluble Co (ppm)	0368	< 0.1		9.297	14.76	2.907	3		202.34	5
202	Acid Soluble Co (ppm)	0220	< 0.1		9.297	14.76	2.907	3		202.99	5
202	Acid Soluble Co (ppm)	0515	< 0.139		9.297	14.76	2.907	3		202.34	5
202	Acid Soluble Co (ppm)	0405	< 1		9.297	14.76	2.907	3		202.32	5
221	Acid Soluble Cu (%)	0515	0.0002	0.0001	0.0003	0.0001	0.0001	4	-1.22	221.99	0
221	Acid Soluble Cu (%)	0368	0.0003	0.0001	0.0003	0.0001	0.0001	4	-0.41	221.99	0
221	Acid Soluble Cu (%)	0035	0.0004	0.0002	0.0003	0.0001	0.0001	4	0.82	221.30	0
221	Acid Soluble Cu (%)	0515	0.0004	0.0000	0.0003	0.0001	0.0001	4	0.82	221.33	0
221	Acid Soluble Cu (%)	0422	0.0000	0.0000	0.0003	0.0001	0.0001	4		221.30	4
221	Acid Soluble Cu (%)	0106	0.0000	0.0000	0.0003	0.0001	0.0001	4		221.33	4
221	Acid Soluble Cu (%)	0472	0.0000	0.0000	0.0003	0.0001	0.0001	4		221.33	4
221	Acid Soluble Cu (%)	0255	0.0005	0.0010	0.0003	0.0001	0.0001	4		221.30	4
221	Acid Soluble Cu (%)	0405	< 0.0002		0.0003	0.0001	0.0001	4		221.32	5
221	Acid Soluble Cu (%)	0136	< 0.0002		0.0003	0.0001	0.0001	4		221.33	5
221	Acid Soluble Cu (%)	0498	< 0.002		0.0003	0.0001	0.0001	4		221.03	5
221	Acid Soluble Cu (%)	0637	< 0.002		0.0003	0.0001	0.0001	4		221.99	5
221	Acid Soluble Cu (%)	0354	< 0.01		0.0003	0.0001	0.0001	4		221.30	5
241	Acid Soluble Fe (%)	0422	0.0002	0.0000	0.0087	0.0142	0.0053	3	-0.60	241.30	0
241	Acid Soluble Fe (%)	0035	0.0008	0.0005	0.0087	0.0142	0.0053	3	-0.56	241.30	0
241	Acid Soluble Fe (%)	0354	0.0250	0.0100	0.0087	0.0142	0.0053	3	1.15	241.30	0
241	Acid Soluble Fe (%)	0515	< 0.0017		0.0087	0.0142	0.0053	3		241.33	5
251	Acid Soluble Pb (ppm)	0524	0.2102	0.0096				2		251.30	0
251	Acid Soluble Pb (ppm)	0515	1.633	0.0490				2		251.33	0
251	Acid Soluble Pb (ppm)	0255	0.0000	0.0000				2		251.30	4
251	Acid Soluble Pb (ppm)	0515	< 0.216					2		251.34	5
251	Acid Soluble Pb (ppm)	0220	< 0.7					2		251.32	5
251	Acid Soluble Pb (ppm)	0368	< 0.7					2		251.34	5
251	Acid Soluble Pb (ppm)	0220	< 0.7					2		251.99	5
251	Acid Soluble Pb (ppm)	0136	< 3					2		251.33	5
251	Acid Soluble Pb (ppm)	0405	< 4					2		251.32	5
251	Acid Soluble Pb (ppm)	0605	< 5					2		251.30	5
261	Acid Soluble Mn (%)	0422	0.0001	0.0000	0.0039	0.0065	0.0001	3	-0.58	261.30	0
261	Acid Soluble Mn (%)	0368	0.0001	0.0000	0.0039	0.0065	0.0001	3	-0.58	261.99	0
261	Acid Soluble Mn (%)	0515	0.0114	0.0001	0.0039	0.0065	0.0001	3	1.15	261.35	0
261	Acid Soluble Mn (%)	0515	< 0.0011		0.0039	0.0065	0.0001	3		261.99	5
261	Acid Soluble Mn (%)	0354	< 0.01		0.0039	0.0065	0.0001	3		261.30	5

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
281	Acid Soluble Hg (ppm)	0035	0.0100	0.0040				1		281.99	0
281	Acid Soluble Hg (ppm)	0086	0.0005	0.0010				1		281.99	4
281	Acid Soluble Hg (ppm)	0220	< 0.01					1		281.99	5
281	Acid Soluble Hg (ppm)	0515	< 0.1					1		281.30	5
281	Acid Soluble Hg (ppm)	0605	< 1.25					1		281.30	5
281	Acid Soluble Hg (ppm)	0405	< 2					1		281.30	5
289	Acid Soluble Mo (ppm)	0220	0.1500	0.1000	1.094	1.424	0.1790	3	-0.54	289.32	0
289	Acid Soluble Mo (ppm)	0368	0.4000	0.4000	1.094	1.424	0.1790	3	-0.40	289.34	0
289	Acid Soluble Mo (ppm)	0515	2.733	0.0370	1.094	1.424	0.1790	3	0.93	289.33	0
289	Acid Soluble Mo (ppm)	0255	0.0000	0.0000	1.094	1.424	0.1790	3		289.30	4
289	Acid Soluble Mo (ppm)	0106	0.0000	0.0000	1.094	1.424	0.1790	3		289.33	4
289	Acid Soluble Mo (ppm)	0637	< 0.002		1.094	1.424	0.1790	3		289.30	5
289	Acid Soluble Mo (ppm)	0136	< 0.05		1.094	1.424	0.1790	3		289.33	5
289	Acid Soluble Mo (ppm)	0515	< 0.178		1.094	1.424	0.1790	3		289.34	5
289	Acid Soluble Mo (ppm)	0405	< 1		1.094	1.424	0.1790	3		289.32	5
291	Acid Soluble Ni (ppm)	0524	0.0321	0.0209	10.58	18.89	2.965	4	-0.47	291.30	0
291	Acid Soluble Ni (ppm)	0515	1.603	0.1680	10.58	18.89	2.965	4	-0.40	291.33	0
291	Acid Soluble Ni (ppm)	0368	1.800	0.4000	10.58	18.89	2.965	4	-0.39	291.34	0
291	Acid Soluble Ni (ppm)	0255	38.89	11.27	10.58	18.89	2.965	4	1.27	291.99	0
291	Acid Soluble Ni (ppm)	0136	< 0.05		10.58	18.89	2.965	4		291.33	5
291	Acid Soluble Ni (ppm)	0515	< 0.18		10.58	18.89	2.965	4		291.34	5
291	Acid Soluble Ni (ppm)	0405	< 1		10.58	18.89	2.965	4		291.32	5
291	Acid Soluble Ni (ppm)	0605	< 2.4		10.58	18.89	2.965	4		291.30	5
301	Acid Soluble Se (ppm)	0524	0.0191	0.0096	0.8012	1.432	0.1266	5	-0.48	301.30	0
301	Acid Soluble Se (ppm)	0086	0.0349	0.0068	0.8012	1.432	0.1266	5	-0.47	301.32	0
301	Acid Soluble Se (ppm)	0220	0.3000	0.0000	0.8012	1.432	0.1266	5	-0.31	301.32	0
301	Acid Soluble Se (ppm)	0220	0.3000	0.2000	0.8012	1.432	0.1266	5	-0.31	301.99	0
301	Acid Soluble Se (ppm)	0515	3.352	0.2900	0.8012	1.432	0.1266	5	1.55	301.33	0
301	Acid Soluble Se (ppm)	0255	0.0000	0.0000	0.8012	1.432	0.1266	5		301.99	4
301	Acid Soluble Se (ppm)	0515	< 0.226		0.8012	1.432	0.1266	5		301.34	5
301	Acid Soluble Se (ppm)	0368	< 1.3		0.8012	1.432	0.1266	5		301.34	5
301	Acid Soluble Se (ppm)	0605	< 1.65		0.8012	1.432	0.1266	5		301.30	5
301	Acid Soluble Se (ppm)	0405	< 10		0.8012	1.432	0.1266	5		301.32	5
311	Sodium (%)	0422	0.0104	0.0000	0.0221	0.0157	0.0060	4	-0.74	311.32	0
311	Sodium (%)	0423	0.0135	0.0010	0.0221	0.0157	0.0060	4	-0.55	311.33	0
311	Sodium (%)	0035	0.0195	0.0070	0.0221	0.0157	0.0060	4	-0.17	311.33	0
311	Sodium (%)	0354	0.0450	0.0100	0.0221	0.0157	0.0060	4	1.46	311.99	0
321	Acid Soluble Zn (%)	0515	0.0003	0.0000				2		321.33	0
321	Acid Soluble Zn (%)	0035	0.0005	0.0002				2		321.30	0
321	Acid Soluble Zn (%)	0255	0.0000	0.0000				2		321.30	4
321	Acid Soluble Zn (%)	0422	0.0000	0.0000				2		321.30	4
321	Acid Soluble Zn (%)	0106	0.0000	0.0000				2		321.33	4
321	Acid Soluble Zn (%)	0472	0.0000	0.0000				2		321.33	4



Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
321	Acid Soluble Zn (%)	0368	0.0001	0.0001				2		321.99	4
321	Acid Soluble Zn (%)	0405	< 0.0003					2		321.32	5
321	Acid Soluble Zn (%)	0136	< 0.0003					2		321.33	5
321	Acid Soluble Zn (%)	0637	< 0.002					2		321.99	5
321	Acid Soluble Zn (%)	0354	< 0.01					2		321.30	5

**Interpreting Z Scores and Flags:**

Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). Flags indicate data usage: 0 = Used, 1 = rejected for duplicates too far apart, 2 = rejected as extreme outlier, 3 = removed from stats, 4 = rejected due to 0s submitted and 5 = LOD. A 9 flag indicates a data problem - scores not calculated.

**Notes:**

\*Robust statistics not used if < 6 labs used in calculations, in this case Values and Z Scores are grayed out and should be interpreted with extreme caution. Identical duplicates not included in calculation of Rob R-bar. Your offset values are higher (‡) or lower (†) than the Robust Analyte value ± Investigational Allowance. Analyte codes in light green indicate a guaranteed analyte. Individual lab values may be below detection limits but are reported solely for the purpose of this Proficiency Testing program.