



Magruder Fertilizer Proficiency Testing

ANALYTE Summary Statistics

251215 (Potash)



Issue Date: 1/31/2026

Code	Analyte (Guarantees in green)	¹ Trueness (Lab Value)					² Thompson Horwitz %RSD		³ Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD		² IA ratio	Robust Mean	n used
001	Ammoniacal N (%)	3.164	2		4.407				0.16	1
005	Urea N (%)	30.53	2		42.83				0.386	2
010	Total N (%)	0.039	5	0.0165	0.0295	75.6	6.52			
020	Total P2O5 (%)	0.0204	4	0.0093	0.0148	72.6	7.18		0.0108	3
041	Direct Available P2O5 (%)	8.048	2		11.37				0.0655	2
050	Soluble K2O (60%)	60.57	74	0.1521	1.047	1.73	1.28	1.37	0.5737	70
060	Water (Free) (%)	0.2207	9	0.0757	0.1816	82.3	5.02		0.0195	5
101	Acid Soluble Ca (%)	0.0794	2		0.0009					
121	Acid Soluble Mg (%)	0.0571	6	0.0035	0.0068	11.9	6.15		0.0065	5
148	Total S (%)	0.0277	3	0.0046	0.0064	23.2	6.86		0.0073	3
149	S - HNO3 soluble (%)	0.0256	1						0.0009	1
151	Acid Soluble As (ppm)	0.0952	2		0.0599				0.02425	2
165	Acid Soluble B (%)	0.0001	1							

Code	Analyte (Guarantees in green)	¹ Trueness (Lab Value)					² Thompson Horwitz %RSD	² IA ratio	³ Precision (range)	
		Robust Mean	n used	Robust Uncert.	Robust StDev	Robust %RSD			Robust Mean	n used
181	Acid Soluble Cd (ppm)	0.1152	4	0.0714	0.1142	99.1	22		0.0353	3
190	Water Soluble Cl (%)	46.78	14	0.4947	1.481	3.17	1.46		0.1932	14
191	Acid Soluble Cr (ppm)	0.546	7	0.1409	0.2982	54.6	17.5		0.0651	5
202	Acid Soluble Co (ppm)	0.1992	2		0.1326				0.0103	2
221	Acid Soluble Cu (%)	0.0013	2		0.001				0.0001	1
241	Acid Soluble Fe (%)	0.0126	4	0.0011	0.0018	14.1	7.73		0.0008	3
251	Acid Soluble Pb (ppm)	0.2934	6	0.0707	0.1385	47.2	19.2		0.0228	6
261	Acid Soluble Mn (%)	0.0001	1							
289	Acid Soluble Mo (ppm)	1.263	3	1.452	2.012	159	15.4			
291	Acid Soluble Ni (ppm)	0.2545	6	0.017	0.0334	13.1	19.7		0.0226	6
301	Acid Soluble Se (ppm)	0.1879	2		0.0871				0.03985	2
311	Sodium (%)	1.115	15	0.0331	0.1025	9.19	3.93		0.0696	12
321	Acid Soluble Zn (%)	0.0017	6	0.001	0.0019	113	10.4		0.0004	5

1. Parameters evaluating Trueness of Lab Value: Trueness measures how close a Lab Value is to the mean. Parameters are shown for number of observations used (n used). Analyte All Tests report identifies data not used. Robust statistics was employed to determine mean and standard deviation (StDev) if number of observations used (n used) >=6 (blue background). Classical statistics was employed if number of observations used (n used) < 6 (no color background). %RSD is the relative standard deviation with respect to the mean (StDev/Mean x 100). Uncertainty (Uncert.) is a measure of where the true population mean lies.

2. Thompson-Horwitz %RSD and IA ratio: These values are benchmarks that can be used to evaluate the variability of a set of data in the round. Thompson-Horwitz %RSD is a standard benchmark on variability from proficiency testing programs. IA ratio is variability of the data set divided by variability expected from AAPFCO investigational allowance. IA ratios greater than 1 indicate population variability is greater than that expected from the IA.

3. Parameters evaluating Precision of Lab Range: Lab's precision is estimated by the difference in 2 results reported by the lab (range). Mean of ranges are shown for number of observations used (n used). Analyte All Tests report identifies data not used. Robust statistics was employed to determine mean if number of observations used (n used) >=6 (green background). Classical statistics was employed if number of observations used (n used) <6 (no color background).

Appendix

Content Description of Analyte Summary Statistics Report

Data collected from all the labs provides an estimate of trueness and precision for determination of an analyte regardless of method on the Analyte Summary Statistics report. Determination of summary statistics followed protocols in ISO 13528:2015(E) (Statistical methods for use in proficiency testing by interlaboratory comparison). Robust statistics was used to determine statistical parameters for sets with 6 or more observations. Classical statistics was used for sets with 3, 4, or 5 observations. Robust statistics has an advantage of removing undesired influence of outlying data on the mean and standard deviation without removing data from the statistical analysis.

For trueness, the mean and standard deviation (StDev) are presented for the number of observations used in a set of data. The uncertainty (Uncert.) is a measure of where the “real” value for the concentration lies around the mean with a 68% certainty ($\text{Mean} \pm \text{Uncert.}$). The larger the number of observations, the smaller the uncertainty. The relative standard deviation (%RSD) is a percentage of the standard deviation divided by the mean. The Thompson-Horwitz %RSD is a standard benchmark on inter-laboratory variability (Thompson, DOI: 10.1039/b000282h) that can be used to compare variability with Thompson-Horwitz expectation. The IA ratio is a measure of how disperse the data is in a set of data compared to dispersion expected by the AAPFCO investigational allowance (IA). The ratio is data dispersion in the data set divided by IA calculated data dispersion. Values greater than 1 indicate data dispersion was greater than IA dispersion.

Precision in the data populations is estimated by the range of duplicate results reported. The robust or classical mean is presented along with the number of observations used. Any duplicate results that are exactly the same are removed in the determination of the mean range to remove undue influence of entries from labs reporting one result twice.



Magruder Fertilizer Proficiency Testing

ANALYTE All Tests Report

251215 (Potash)



Issue Date: 1/31/2026

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
Ammoniacal N (%)											
001.99	Ammoniacal N (%)	Other	0524	0.048	0.048	0.048					7
001.99	Ammoniacal N (%)	Other	0423	6.36	6.2	6.28					
Urea N (%)											
005.99	Urea N (%)	Other	0524	0.24	0.242	0.241					
005.99	Urea N (%)	Other	0638	60.43	61.2	60.82					
Total N (%)											
010.12	Total N (%)	Salicylic	0568	0.0082	0.0082	0.0082	-1.05	0.039	0.0295	5	7
010.60	Total N (%)	Combustion	0422	0.01	0.01	0.01	-0.98	0.039	0.0295	5	7
010.60	Total N (%)	Combustion	0588	0.057	0.039	0.048	0.30	0.039	0.0295	5	
010.99	Total N (%)	Other	0524	0.0443	0.0598	0.052	0.44	0.039	0.0295	5	
010.60	Total N (%)	Combustion	0354	0.077	0.077	0.077	1.29	0.039	0.0295	5	7
010.60	Total N (%)	Combustion	0423	15.93	15.96	15.94	>100	0.039	0.0295	5	2

								³ Robust Stats			
Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	Mean Value	StDev	n used	⁴ Flag
		Total P2O5 (%)									
020.50	Total P2O5 (%)	ICP	0527	<0.01	<0.01	<0.01		0.0204	0.0148	4	6
020.50	Total P2O5 (%)	ICP	0524	0.0025	0.0029	0.0027	-1.20	0.0204	0.0148	4	
020.50	Total P2O5 (%)	ICP	0422	0.013	0.015	0.014	-0.43	0.0204	0.0148	4	
020.50	Total P2O5 (%)	ICP	0472	0.03	0.03	0.03	0.65	0.0204	0.0148	4	7
020.50	Total P2O5 (%)	ICP	0588	0.02	0.05	0.035	0.98	0.0204	0.0148	4	
020.50	Total P2O5 (%)	ICP	0523	59.487	59.41	59.45	>100	0.0204	0.0148	4	2
		Direct Available P2O5 (%)									
041.21	Direct Available P2O5 (%)	Spectrophotometric, Citrate-EDTA	0568	0	0	0					5
041.21	Direct Available P2O5 (%)	Spectrophotometric, Citrate-EDTA	0354	0.011	0.01	0.0105					
041.51	Direct Available P2O5 (%)	ICP, Citrate-EDTA Ext.	0423	16.02	16.15	16.08					
041.51	Direct Available P2O5 (%)	ICP, Citrate-EDTA Ext.	0027	58.99	59.93	59.46					1
		Soluble K2O (60 %)									
050.99	Soluble K2O (%)	Other	0515	45.82	54.63	50.22 †	-9.88	60.57	1.047	74	1
050.32	Soluble K2O (%)	AA (Citrate-EDTA)	0472	46.65	54.66	50.66 †	-9.47	60.57	1.047	74	1
050.99	Soluble K2O (%)	Other	0389	54.6	54.3	54.45 †	-5.85	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0543	55.817	55.982	55.9 †	-4.46	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0524	55.7397	58.2079	56.97 †	-3.44	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0588	56.83	58.12	57.48 †	-2.96	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0042	56	59.2	57.6 †	-2.84	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0624	58.77	58.6	58.68 †	-1.80	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0371	59.05	59.17	59.11	-1.40	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0324	60.4	58	59.2	-1.31	60.57	1.047	74	

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			⁴ Flag
								Mean Value	StDev	n used	
050.99	Soluble K2O (%)	Other	0255	59.574	59.08	59.33	-1.19	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0377	60.09	58.57	59.33	-1.19	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0233	58.11	61.08	59.6	-0.93	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0647	60.23	59.02	59.62	-0.90	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0073	60.15	59.12	59.64	-0.90	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0292	59.86	59.62	59.74	-0.80	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0072	59.7	59.9	59.8	-0.74	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0513	59.79	59.82	59.8	-0.73	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0521	59.8729	59.8729	59.87	-0.67	60.57	1.047	74	7
050.99	Soluble K2O (%)	Other	0556	59.85	59.95	59.9	-0.64	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0614	59.85	60.01	59.93	-0.61	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0106	59.48	60.42	59.95	-0.59	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0553	60.08	59.92	60	-0.55	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0169	60.08	60.1	60.09	-0.46	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0559	60.13	60.12	60.12	-0.43	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0551	60.12	60.15	60.14	-0.42	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0653	60.14	60.15	60.14	-0.41	60.57	1.047	74	
050.51	Soluble K2O (%)	ICP (Citrate)	0452	60.12	60.23	60.18	-0.38	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0055	59.23	61.16	60.2	-0.36	60.57	1.047	74	
050.32	Soluble K2O (%)	AA (Citrate-EDTA)	0185	60.22	60.19	60.2	-0.35	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0612	57.69	62.8	60.24	-0.31	60.57	1.047	74	
050.60	Soluble K2O (%)	Flame Photometric (Oxalate)	0169	60.3	60.25	60.28	-0.28	60.57	1.047	74	
050.51	Soluble K2O (%)	ICP (Citrate)	0568	60.3	60.3	60.3	-0.26	60.57	1.047	74	7
050.99	Soluble K2O (%)	Other	0600	60.2	60.4	60.3	-0.26	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0584	60.47	60.24	60.36	-0.21	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0518	60.43	60.29	60.36	-0.20	60.57	1.047	74	

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			⁴ Flag
								Mean Value	StDev	n used	
050.00	Soluble K2O (%)	STPB Oxalate	0049	60.51	60.35	60.43	-0.14	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0136	61.1	60	60.55	-0.02	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0615	60.3	60.8	60.55	-0.02	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0356	60.31	60.86	60.58	0.01	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0102	60.41	60.87	60.64	0.06	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0023	60.3	60.984	60.64	0.07	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0354	60.7	60.7	60.7	0.12	60.57	1.047	74	7
050.00	Soluble K2O (%)	STPB Oxalate	0405	60.72	60.7	60.71	0.13	60.57	1.047	74	
050.62	Soluble K2O (%)	Flame Photometric (Citrate-EDTA)	0517	60.8	60.85	60.82	0.24	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0055	60.88	60.86	60.87	0.28	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0177	60.7575	60.9854	60.87	0.29	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0494	60.22	61.53	60.88	0.29	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0538	61.1	60.8	60.95	0.36	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0539	61.02	60.9	60.96	0.37	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0220	60.97	60.99	60.98	0.39	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0481	60.29	61.69	60.99	0.40	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0231	61.01	61.01	61.01	0.42	60.57	1.047	74	7
050.60	Soluble K2O (%)	Flame Photometric (Oxalate)	0602	60.83	61.22	61.02	0.43	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0602	60.83	61.22	61.02	0.43	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0602	60.83	61.22	61.02	0.43	60.57	1.047	74	
050.30	Soluble K2O (%)	AA (Oxalate)	0309	61.02	61.15	61.08	0.49	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0043	61.51	60.69	61.1	0.50	60.57	1.047	74	
050.61	Soluble K2O (%)	Flame Photometric (Citrate)	0035	61.1	61.2	61.15	0.55	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0234	61.31	61	61.16	0.56	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0494	60.35	62.01	61.18	0.58	60.57	1.047	74	
050.00	Soluble K2O (%)	STPB Oxalate	0561	61.26	61.25	61.26	0.65	60.57	1.047	74	

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			⁴ Flag
								Mean Value	StDev	n used	
050.99	Soluble K2O (%)	Other	0451	61.34	61.57	61.46	0.84	60.57	1.047	74	
050.51	Soluble K2O (%)	ICP (Citrate)	0368	61.1827	61.7663	61.47	0.86	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0025	59.2	63.9	61.55	0.93	60.57	1.047	74	
050.51	Soluble K2O (%)	ICP (Citrate)	0291	61.84	61.83	61.84	1.21	60.57	1.047	74	
050.62	Soluble K2O (%)	Flame Photometric (Citrate-EDTA)	0095	61.17	62.6	61.88	1.25	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0394	62.03	62.393	62.21	1.57	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0527	61.9877	62.5478	62.27	1.62	60.57	1.047	74	
050.52	Soluble K2O (%)	ICP (Citrate-EDTA)	0485	62.3	62.7	62.5 ‡	1.84	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0433	62.26	63.14	62.7 ‡	2.03	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0605	62.51	63.41	62.96 ‡	2.28	60.57	1.047	74	
050.62	Soluble K2O (%)	Flame Photometric (Citrate-EDTA)	0029	64	62.18	63.09 ‡	2.40	60.57	1.047	74	
050.50	Soluble K2O (%)	ICP (Oxalate)	0422	63.62	62.813	63.22 ‡	2.53	60.57	1.047	74	
050.99	Soluble K2O (%)	Other	0307	62.5	65	63.75 ‡	3.04	60.57	1.047	74	
050.30	Soluble K2O (%)	AA (Oxalate)	0040	64	64.5	64.25 ‡	3.51	60.57	1.047	74	

Water (Free) (%)

060.99	Water (Free) (%)	Other	0481	<0.1	<0.1	<0.1		0.2207	0.1816	9	6
060.99	Water (Free) (%)	Other	0136	0.0245	0.026	0.0252	-1.08	0.2207	0.1816	9	
060.99	Water (Free) (%)	Other	0405	0.088	0.088	0.088	-0.73	0.2207	0.1816	9	7
060.30	Water (Free) (%)	AFPC No. 2B (105°C oven for 2	0220	0.1	0.1	0.1	-0.66	0.2207	0.1816	9	7
060.30	Water (Free) (%)	AFPC No. 2B (105°C oven for 2	0394	0.101	0.104	0.1025	-0.65	0.2207	0.1816	9	
060.20	Water (Free) (%)	Karl Fischer	0513	0.164	0.167	0.1655	-0.30	0.2207	0.1816	9	
060.99	Water (Free) (%)	Other	0561	0.27	0.27	0.27	0.27	0.2207	0.1816	9	7
060.20	Water (Free) (%)	Karl Fischer	0371	0.35	0.35	0.35	0.71	0.2207	0.1816	9	7
060.00	Water (Free) (%)	Vacuum Oven	0539	0.41	0.45	0.43	1.15	0.2207	0.1816	9	
060.00	Water (Free) (%)	Vacuum Oven	0538	0.43	0.48	0.455	1.29	0.2207	0.1816	9	

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
Acid Soluble Ca (%)											
101.33	Acid Soluble Ca (%)	ICP, 2017.02	0527	<0.01	<0.01	<0.01					6
101.30	Acid Soluble Ca (%)	ICP, test portion inorganic 965.09	0568	0.0787	0.0787	0.0787					7
101.33	Acid Soluble Ca (%)	ICP, 2017.02	0472	0.08	0.08	0.08					7
101.30	Acid Soluble Ca (%)	ICP, test portion inorganic 965.09	0354	0.14	0.15	0.145					1
Acid Soluble Mg (%)											
121.33	Acid Soluble Mg (%)	ICP, 2017.02	0527	0.0518	0.0485	0.0502	-1.02	0.0571	0.0068	6	
121.99	Acid Soluble Mg (%)	Other	0524	0.0487	0.0539	0.0513	-0.85	0.0571	0.0068	6	
121.33	Acid Soluble Mg (%)	ICP, 2017.02	0472	0.05	0.06	0.055	-0.31	0.0571	0.0068	6	
121.30	Acid Soluble Mg (%)	ICP, test portion inorganic 965.09	0568	0.0588	0.0588	0.0588	0.25	0.0571	0.0068	6	7
121.33	Acid Soluble Mg (%)	ICP, 2017.02	0494	0.0644	0.0602	0.0623	0.77	0.0571	0.0068	6	
121.30	Acid Soluble Mg (%)	ICP, test portion inorganic 965.09	0354	0.06	0.07	0.065	1.17	0.0571	0.0068	6	
Total S (%)											
148.07	Total S (%)	ICP, test portion as in 2017.02	0527	<0.1	<0.1	<0.1		0.0277	0.0064	3	6
148.99	Total S (%)	Other	0422	0.022	0.024	0.023	-0.73	0.0277	0.0064	3	
148.07	Total S (%)	ICP, test portion as in 2017.02	0472	0.03	0.02	0.025	-0.41	0.0277	0.0064	3	
148.99	Total S (%)	Other	0354	0.03	0.04	0.035	1.14	0.0277	0.0064	3	
S - HNO3 soluble (%)											
149.04	S - HNO3 soluble (%)	ICP	0524	0.0251	0.026	0.0256					
Acid Soluble As (ppm)											
151.33	Acid Soluble As (ppm)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001					6

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			⁴ Flag
								Mean Value	StDev	n used	
151.33	Acid Soluble As (ppm)	ICP, 2017.02	0515	<0.25	<0.25	<0.25					6
151.34	Acid Soluble As (ppm)	ICP, EPA 3050B/6010C	0368	<0.3	<0.3	<0.3					6
151.34	Acid Soluble As (ppm)	ICP, EPA 3050B/6010C	0515	<0.406	<0.406	<0.406					6
151.99	Acid Soluble As (ppm)	Other	0481	<0.5	<0.5	<0.5					6
151.32	Acid Soluble As (ppm)	ICP, 2006.03	0220	<0.5	<0.5	<0.5					6
151.99	Acid Soluble As (ppm)	Other	0220	<0.5	<0.5	<0.5					6
151.33	Acid Soluble As (ppm)	ICP, 2017.02	0136	<1	<1	<1					6
151.33	Acid Soluble As (ppm)	ICP, 2017.02	0027	<10	<10	<10					6
151.33	Acid Soluble As (ppm)	ICP, 2017.02	0117	<10	<10	<10					6
151.32	Acid Soluble As (ppm)	ICP, 2006.03	0405	<3	<3	<3					6
151.30	Acid Soluble As (ppm)	ICP	0605	<6.25	<6.25	<6.25					6
151.30	Acid Soluble As (ppm)	ICP	0255	0	0	0					5
151.30	Acid Soluble As (ppm)	ICP	0524	0.0401	0.0656	0.0528					
151.30	Acid Soluble As (ppm)	ICP	0523	0.126	0.149	0.1375					
151.32	Acid Soluble As (ppm)	ICP, 2006.03	0485	2.31	1.65	1.98					1

Acid Soluble B (%)

165.30	Acid Soluble B (%)	ICP, test portion in 982.01	0354	<0.01	<0.01	<0.01					6
165.99	Acid Soluble B (%)	Other	0527	<0.01	<0.01	<0.01					6
165.99	Acid Soluble B (%)	Other	0524	0.0001	0.0001	0.0001					7

Acid Soluble Cd (ppm)

181.33	Acid Soluble Cd (ppm)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001	0.1152	0.1142	4	6
181.99	Acid Soluble Cd (ppm)	Other	0220	<0.1	<0.1	<0.1	0.1152	0.1142	4	6
181.32	Acid Soluble Cd (ppm)	ICP, 2006.03	0220	<0.1	<0.1	<0.1	0.1152	0.1142	4	6
181.30	Acid Soluble Cd (ppm)	ICP	0394	<0.1	<0.1	<0.1	0.1152	0.1142	4	6

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
181.33	Acid Soluble Cd (ppm)	ICP, 2017.02	0515	<0.19	<0.19	<0.19		0.1152	0.1142	4	6
181.32	Acid Soluble Cd (ppm)	ICP, 2006.03	0485	<0.2	<0.2	<0.2		0.1152	0.1142	4	6
181.30	Acid Soluble Cd (ppm)	ICP	0605	<0.25	<0.25	<0.25		0.1152	0.1142	4	6
181.34	Acid Soluble Cd (ppm)	ICP, EPA 3050B/6010C	0515	<0.333	<0.333	<0.333		0.1152	0.1142	4	6
181.99	Acid Soluble Cd (ppm)	Other	0481	<0.5	<0.5	<0.5		0.1152	0.1142	4	6
181.33	Acid Soluble Cd (ppm)	ICP, 2017.02	0136	<1	<1	<1		0.1152	0.1142	4	6
181.32	Acid Soluble Cd (ppm)	ICP, 2006.03	0405	<1	<1	<1		0.1152	0.1142	4	6
181.33	Acid Soluble Cd (ppm)	ICP, 2017.02	0027	<10	<10	<10		0.1152	0.1142	4	6
181.33	Acid Soluble Cd (ppm)	ICP, 2017.02	0086	<5	<5	<5		0.1152	0.1142	4	6
181.33	Acid Soluble Cd (ppm)	ICP, 2017.02	0117	<5	<5	<5		0.1152	0.1142	4	6
181.30	Acid Soluble Cd (ppm)	ICP	0524	0.018	0.0198	0.0189	-0.84	0.1152	0.1142	4	
181.30	Acid Soluble Cd (ppm)	ICP	0523	0.024	0.02	0.022	-0.82	0.1152	0.1142	4	
181.99	Acid Soluble Cd (ppm)	Other	0371	0.17	0.17	0.17	0.48	0.1152	0.1142	4	7
181.34	Acid Soluble Cd (ppm)	ICP, EPA 3050B/6010C	0368	0.3	0.2	0.25	1.18	0.1152	0.1142	4	
181.30	Acid Soluble Cd (ppm)	ICP	0255	0.854	0.649	0.7515	5.57	0.1152	0.1142	4	1

Water Soluble Cl (%)

190.00	Water Soluble Cl (%)	Titrimetric	0553	44.75	44.5	44.62	-1.46	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0538	45.4	45.1	45.25	-1.04	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0539	45.36	45.2	45.28	-1.01	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0220	45.23	45.37	45.3	-1.00	46.78	1.481	14	
190.99	Water Soluble Cl (%)	Other	0136	44.7	46.9	45.8	-0.66	46.78	1.481	14	1
190.99	Water Soluble Cl (%)	Other	0029	46.62	46.24	46.43	-0.24	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0029	46.32	46.74	46.53	-0.17	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0513	46.64	46.54	46.59	-0.13	46.78	1.481	14	
190.99	Water Soluble Cl (%)	Other	0481	46.96	46.7	46.83	0.03	46.78	1.481	14	

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			⁴ Flag
								Mean Value	StDev	n used	
190.00	Water Soluble Cl (%)	Titrimetric	0405	47.54	47.56	47.55	0.52	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0394	47.8	47.76	47.78	0.67	46.78	1.481	14	
190.99	Water Soluble Cl (%)	Other	0524	47.7925	47.878	47.84	0.71	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0561	47.97	47.96	47.96	0.80	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0231	47.89	48.09	47.99	0.82	46.78	1.481	14	
190.00	Water Soluble Cl (%)	Titrimetric	0605	50.59	50.25	50.42	2.46	46.78	1.481	14	

Acid Soluble Cr (ppm)

191.33	Acid Soluble Cr (ppm)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001		0.546	0.2982	7	6
191.33	Acid Soluble Cr (ppm)	ICP, 2017.02	0515	0.749	<0.22	<0.22		0.546	0.2982	7	6
191.32	Acid Soluble Cr (ppm)	ICP, 2006.03	0405	<1	<1	<1		0.546	0.2982	7	6
191.33	Acid Soluble Cr (ppm)	ICP, 2017.02	0027	<10	<10	<10		0.546	0.2982	7	6
191.33	Acid Soluble Cr (ppm)	ICP, 2017.02	0086	<10	<10	<10		0.546	0.2982	7	6
191.30	Acid Soluble Cr (ppm)	ICP	0394	<2	<2	<2		0.546	0.2982	7	6
191.33	Acid Soluble Cr (ppm)	ICP, 2017.02	0136	<2.5	<2.5	<2.5		0.546	0.2982	7	6
191.99	Acid Soluble Cr (ppm)	Other	0481	<20	<20	<20		0.546	0.2982	7	6
191.33	Acid Soluble Cr (ppm)	ICP, 2017.02	0117	<5	<5	<5		0.546	0.2982	7	6
191.30	Acid Soluble Cr (ppm)	ICP	0524	0.2778	0.3045	0.2912	-0.85	0.546	0.2982	7	
191.30	Acid Soluble Cr (ppm)	ICP	0389	0.31	0.3	0.305	-0.81	0.546	0.2982	7	
191.32	Acid Soluble Cr (ppm)	ICP, 2006.03	0220	0.4	0.43	0.415	-0.44	0.546	0.2982	7	
191.99	Acid Soluble Cr (ppm)	Other	0220	0.43	0.43	0.43	-0.39	0.546	0.2982	7	7
191.34	Acid Soluble Cr (ppm)	ICP, EPA 3050B/6010C	0368	0.6	0.6	0.6	0.18	0.546	0.2982	7	7
191.30	Acid Soluble Cr (ppm)	ICP	0523	0.822	0.753	0.7875	0.81	0.546	0.2982	7	
191.30	Acid Soluble Cr (ppm)	ICP	0605	1.88	1.69	1.785	4.15	0.546	0.2982	7	
191.34	Acid Soluble Cr (ppm)	ICP, EPA 3050B/6010C	0515	10.9	4.95	7.925	24.74	0.546	0.2982	7	1

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			⁴ Flag
								Mean Value	StDev	n used	
Acid Soluble Co (ppm)											
202.33	Acid Soluble Co (ppm)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001					6
202.32	Acid Soluble Co (ppm)	ICP, 2006.03	0485	<0.1	<0.1	<0.1					6
202.99	Acid Soluble Co (ppm)	Other	0220	<0.1	<0.1	<0.1					6
202.32	Acid Soluble Co (ppm)	ICP, 2006.03	0220	<0.1	<0.1	<0.1					6
202.34	Acid Soluble Co (ppm)	ICP, EPA 3050B/6010C	0368	<0.1	<0.1	<0.1					6
202.33	Acid Soluble Co (ppm)	ICP, 2017.02	0515	<0.26	<0.26	<0.26					6
202.34	Acid Soluble Co (ppm)	ICP, EPA 3050B/6010C	0515	<0.324	<0.324	<0.324					6
202.32	Acid Soluble Co (ppm)	ICP, 2006.03	0405	<1	<1	<1					6
202.30	Acid Soluble Co (ppm)	ICP	0605	<1.25	<1.25	<1.25					6
202.33	Acid Soluble Co (ppm)	ICP, 2017.02	0027	<10	<10	<10					6
202.33	Acid Soluble Co (ppm)	ICP, 2017.02	0086	<10	<10	<10					6
202.33	Acid Soluble Co (ppm)	ICP, 2017.02	0136	<2.5	<2.5	<2.5					6
202.99	Acid Soluble Co (ppm)	Other	0481	<20	<20	<20					6
202.33	Acid Soluble Co (ppm)	ICP, 2017.02	0117	<5	<5	<5					6
202.30	Acid Soluble Co (ppm)	ICP	0523	0.105	0.106	0.1055					
202.30	Acid Soluble Co (ppm)	ICP	0524	0.2832	0.3028	0.293					
202.99	Acid Soluble Co (ppm)	Other	0255	1.934	2.805	2.37					1
Acid Soluble Cu (%)											
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001					6
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0136	<0.0002	<0.0002	<0.0002					6
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0394	<0.0002	<0.0002	<0.0002					6
221.32	Acid Soluble Cu (%)	ICP, test portion 2006.03A-C	0405	<0.0002	<0.0002	<0.0002					6
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0515	<0.0003	<0.0003	<0.0003					6

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
221.99	Acid Soluble Cu (%)	Other	0515	<0.0003	<0.0003	<0.0003					6
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0027	<0.001	<0.001	<0.001					6
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0117	<0.0025	<0.0025	<0.0025					6
221.30	Acid Soluble Cu (%)	ICP, test portion inorganic 965.09	0354	<0.01	<0.01	<0.01					6
221.99	Acid Soluble Cu (%)	Other	0481	<0.01	<0.01	<0.01					6
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0086	<10	<10	<10					6
221.30	Acid Soluble Cu (%)	ICP, test portion inorganic 965.09	0255	0	0	0					5
221.33	Acid Soluble Cu (%)	ICP, 2017.02	0106	0	0	0					5
221.99	Acid Soluble Cu (%)	Other	0368	0.0005	0.0006	0.0006					
221.99	Acid Soluble Cu (%)	Other	0523	0.002	0.002	0.002					7

Acid Soluble Fe (%)

241.33	Acid Soluble Fe (%)	ICP, 2017.02	0472	0.01	0.01	0.01	-1.44	0.0126	0.0018	4	7
241.99	Acid Soluble Fe (%)	Other	0524	0.0126	0.0129	0.0128	0.11	0.0126	0.0018	4	
241.33	Acid Soluble Fe (%)	ICP, 2017.02	0494	0.0128	0.0145	0.0136	0.61	0.0126	0.0018	4	
241.33	Acid Soluble Fe (%)	ICP, 2017.02	0527	0.0137	0.014	0.0138	0.73	0.0126	0.0018	4	
241.30	Acid Soluble Fe (%)	ICP, test portion inorganic 965.09	0354	0.01	0.03	0.02	4.19	0.0126	0.0018	4	1

Acid Soluble Pb (ppm)

251.33	Acid Soluble Pb (ppm)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001		0.2934	0.1385	6	6
251.33	Acid Soluble Pb (ppm)	ICP, 2017.02	0515	<0.21	<0.21	<0.21		0.2934	0.1385	6	6
251.34	Acid Soluble Pb (ppm)	ICP, EPA 3050B/6010C	0515	<0.496	<0.496	<0.496		0.2934	0.1385	6	6
251.33	Acid Soluble Pb (ppm)	ICP, 2017.02	0086	<1	<1	<1		0.2934	0.1385	6	6
251.99	Acid Soluble Pb (ppm)	Other	0481	<1	<1	<1		0.2934	0.1385	6	6
251.30	Acid Soluble Pb (ppm)	ICP	0394	<1	<1	<1		0.2934	0.1385	6	6
251.33	Acid Soluble Pb (ppm)	ICP, 2017.02	0027	<10	<10	<10		0.2934	0.1385	6	6

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
251.33	Acid Soluble Pb (ppm)	ICP, 2017.02	0136	<3	<3	<3		0.2934	0.1385	6	6
251.32	Acid Soluble Pb (ppm)	ICP, 2006.03	0405	<4	<4	<4		0.2934	0.1385	6	6
251.33	Acid Soluble Pb (ppm)	ICP, 2017.02	0117	<5	<5	<5		0.2934	0.1385	6	6
251.30	Acid Soluble Pb (ppm)	ICP	0605	<6.25	<6.25	<6.25		0.2934	0.1385	6	6
251.30	Acid Soluble Pb (ppm)	ICP	0255	0	0	0		0.2934	0.1385	6	5
251.30	Acid Soluble Pb (ppm)	ICP	0523	0.141	0.146	0.1435	-1.08	0.2934	0.1385	6	
251.99	Acid Soluble Pb (ppm)	Other	0371	0.18	0.16	0.17	-0.89	0.2934	0.1385	6	
251.30	Acid Soluble Pb (ppm)	ICP	0524	0.2371	0.2589	0.248	-0.33	0.2934	0.1385	6	
251.99	Acid Soluble Pb (ppm)	Other	0220	0.38	0.37	0.375	0.59	0.2934	0.1385	6	
251.32	Acid Soluble Pb (ppm)	ICP, 2006.03	0220	0.38	0.44	0.41	0.84	0.2934	0.1385	6	
251.32	Acid Soluble Pb (ppm)	ICP, 2006.03	0485	0.399	0.429	0.414	0.87	0.2934	0.1385	6	
251.34	Acid Soluble Pb (ppm)	ICP, EPA 3050B/6010C	0368	3.8	3.7	3.75	24.96	0.2934	0.1385	6	1

Acid Soluble Mn (%)

261.35	Acid Soluble Mn (%)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001					6
261.30	Acid Soluble Mn (%)	ICP, test portion 972.02a	0354	<0.01	<0.01	<0.01					6
261.99	Acid Soluble Mn (%)	Other	0524	0.0001	0.0001	0.0001					7

Acid Soluble Hg (ppm)

281.30	Acid Soluble Hg (ppm)	ICP	0527	<0.001	<0.001	<0.001					6
281.99	Acid Soluble Hg (ppm)	Other	0220	<0.01	<0.01	<0.01					6
281.30	Acid Soluble Hg (ppm)	ICP	0515	<0.01	<0.01	<0.01					6
281.30	Acid Soluble Hg (ppm)	ICP	0371	<0.05	<0.05	<0.05					6
281.00	Acid Soluble Hg (ppm)	AA	0481	<0.5	<0.5	<0.5					6
281.30	Acid Soluble Hg (ppm)	ICP	0605	<1.25	<1.25	<1.25					6
281.30	Acid Soluble Hg (ppm)	ICP	0405	<2	<2	<2					6

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
281.99	Acid Soluble Hg (ppm)	Other	0025	0	0	0					5
Acid Soluble Mo (ppm)											
289.32	Acid Soluble Mo (ppm)	ICP, 2006.03	0220	<0.1	<0.1	<0.1		1.263	2.012	3	6
289.34	Acid Soluble Mo (ppm)	ICP, EPA 3050B/6010C	0368	0	<0.1	<0.1		1.263	2.012	3	6
289.99	Acid Soluble Mo (ppm)	Other	0220	<0.1	<0.1	<0.1		1.263	2.012	3	6
289.32	Acid Soluble Mo (ppm)	ICP, 2006.03	0485	0.441	<0.2	<0.2		1.263	2.012	3	6
289.33	Acid Soluble Mo (ppm)	ICP, 2017.02	0515	<0.23	<0.23	<0.23		1.263	2.012	3	6
289.34	Acid Soluble Mo (ppm)	ICP, EPA 3050B/6010C	0515	<0.255	<0.255	<0.255		1.263	2.012	3	6
289.32	Acid Soluble Mo (ppm)	ICP, 2006.03	0405	<1	<1	<1		1.263	2.012	3	6
289.33	Acid Soluble Mo (ppm)	ICP, 2017.02	0027	<10	<10	<10		1.263	2.012	3	6
289.33	Acid Soluble Mo (ppm)	ICP, 2017.02	0136	<2.5	<2.5	<2.5		1.263	2.012	3	6
289.33	Acid Soluble Mo (ppm)	ICP, 2017.02	0086	<5	<5	<5		1.263	2.012	3	6
289.99	Acid Soluble Mo (ppm)	Other	0481	<50	<50	<50		1.263	2.012	3	6
289.30	Acid Soluble Mo (ppm)	ICP	0255	0	0	0		1.263	2.012	3	5
289.33	Acid Soluble Mo (ppm)	ICP, 2017.02	0106	0	0	0		1.263	2.012	3	5
289.30	Acid Soluble Mo (ppm)	ICP	0523	0.01	0.01	0.01	-0.62	1.263	2.012	3	7
289.30	Acid Soluble Mo (ppm)	ICP	0524	0.1667	0.2233	0.195	-0.53	1.263	2.012	3	
289.33	Acid Soluble Mo (ppm)	ICP, 2017.02	0527	3.5172	3.6502	3.584	1.15	1.263	2.012	3	
289.33	Acid Soluble Mo (ppm)	ICP, 2017.02	0117	6.677	2.623	4.65	1.68	1.263	2.012	3	1
Acid Soluble Ni (ppm)											
291.33	Acid Soluble Ni (ppm)	ICP, 2017.02	0527	<0.0001	<0.0001	<0.0001		0.2545	0.0334	6	6
291.34	Acid Soluble Ni (ppm)	ICP, EPA 3050B/6010C	0368	<0.2	<0.2	<0.2		0.2545	0.0334	6	6
291.33	Acid Soluble Ni (ppm)	ICP, 2017.02	0515	<0.26	<0.26	<0.26		0.2545	0.0334	6	6
291.34	Acid Soluble Ni (ppm)	ICP, EPA 3050B/6010C	0515	<0.483	<0.483	<0.483		0.2545	0.0334	6	6

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
291.32	Acid Soluble Ni (ppm)	ICP, 2006.03	0405	<1	<1	<1		0.2545	0.0334	6	6
291.30	Acid Soluble Ni (ppm)	ICP	0605	<1.25	<1.25	<1.25		0.2545	0.0334	6	6
291.33	Acid Soluble Ni (ppm)	ICP, 2017.02	0086	<10	<10	<10		0.2545	0.0334	6	6
291.33	Acid Soluble Ni (ppm)	ICP, 2017.02	0027	<10	<10	<10		0.2545	0.0334	6	6
291.30	Acid Soluble Ni (ppm)	ICP	0394	<2	<2	<2		0.2545	0.0334	6	6
291.33	Acid Soluble Ni (ppm)	ICP, 2017.02	0136	<2.5	<2.5	<2.5		0.2545	0.0334	6	6
291.99	Acid Soluble Ni (ppm)	Other	0481	<20	<20	<20		0.2545	0.0334	6	6
291.33	Acid Soluble Ni (ppm)	ICP, 2017.02	0117	<5	<5	<5		0.2545	0.0334	6	6
291.32	Acid Soluble Ni (ppm)	ICP, 2006.03	0485	0.214	0.173	0.1935	-1.83	0.2545	0.0334	6	
291.30	Acid Soluble Ni (ppm)	ICP	0389	0.23	0.24	0.235	-0.58	0.2545	0.0334	6	
291.30	Acid Soluble Ni (ppm)	ICP	0524	0.2601	0.2668	0.2634	0.27	0.2545	0.0334	6	
291.99	Acid Soluble Ni (ppm)	Other	0220	0.28	0.25	0.265	0.32	0.2545	0.0334	6	
291.30	Acid Soluble Ni (ppm)	ICP	0523	0.265	0.293	0.279	0.73	0.2545	0.0334	6	
291.32	Acid Soluble Ni (ppm)	ICP, 2006.03	0220	0.27	0.29	0.28	0.76	0.2545	0.0334	6	
291.99	Acid Soluble Ni (ppm)	Other	0255	3.367	2.826	3.096	85.20	0.2545	0.0334	6	1

Acid Soluble Se (ppm)

301.33	Acid Soluble Se (ppm)	ICP, 2017.02	0527	<0.01	<0.01	<0.01					6
301.99	Acid Soluble Se (ppm)	Other	0485	<0.02	<0.02	<0.02					6
301.33	Acid Soluble Se (ppm)	ICP, 2017.02	0515	<0.27	<0.27	<0.27					6
301.99	Acid Soluble Se (ppm)	Other	0220	<0.3	<0.3	<0.3					6
301.32	Acid Soluble Se (ppm)	ICP, 2006.03	0220	<0.3	<0.3	<0.3					6
301.99	Acid Soluble Se (ppm)	Other	0481	<0.5	<0.5	<0.5					6
301.34	Acid Soluble Se (ppm)	ICP, EPA 3050B/6010C	0515	<0.554	<0.554	<0.554					6
301.34	Acid Soluble Se (ppm)	ICP, EPA 3050B/6010C	0368	<1	<1.1	<1.1					6
301.32	Acid Soluble Se (ppm)	ICP, 2006.03	0405	<10	<10	<10					6

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			⁴ Flag
								Mean Value	StDev	n used	
301.33	Acid Soluble Se (ppm)	ICP, 2017.02	0027	<10	<10	<10					6
301.33	Acid Soluble Se (ppm)	ICP, 2017.02	0117	<5	<5	<5					6
301.30	Acid Soluble Se (ppm)	ICP	0605	<6.25	<6.25	<6.25					6
301.99	Acid Soluble Se (ppm)	Other	0255	0	0	0					5
301.30	Acid Soluble Se (ppm)	ICP	0524	0.105	0.1477	0.1264					
301.30	Acid Soluble Se (ppm)	ICP	0523	0.231	0.268	0.2495					

Sodium (%)

311.99	Sodium (%)	Other	0255	0.942	0.99	0.966	-1.45	1.115	0.1025	15	
311.99	Sodium (%)	Other	0035	1.01	1.01	1.01	-1.02	1.115	0.1025	15	7
311.30	Sodium (%)	Flame Photometric	0513	1.05	1.05	1.05	-0.63	1.115	0.1025	15	7
311.33	Sodium (%)	ICP, test portion as in 2017.02	0494	1.0682	1.0517	1.06	-0.54	1.115	0.1025	15	
311.99	Sodium (%)	Other	0481	1.09	1.08	1.085	-0.29	1.115	0.1025	15	
311.33	Sodium (%)	ICP, test portion as in 2017.02	0043	1.075	1.106	1.09	-0.24	1.115	0.1025	15	
311.99	Sodium (%)	Other	0605	1.09	1.1	1.095	-0.19	1.115	0.1025	15	
311.99	Sodium (%)	Other	0354	1.07	1.13	1.1	-0.14	1.115	0.1025	15	
311.33	Sodium (%)	ICP, test portion as in 2017.02	0136	1.1	1.1	1.1	-0.14	1.115	0.1025	15	7
311.32	Sodium (%)	ICP, 2006.03 test portion	0220	1.07	1.13	1.1	-0.14	1.115	0.1025	15	
311.33	Sodium (%)	ICP, test portion as in 2017.02	0527	1.071	1.1768	1.124	0.09	1.115	0.1025	15	
311.30	Sodium (%)	Flame Photometric	0405	1.143	1.13	1.136	0.21	1.115	0.1025	15	
311.99	Sodium (%)	Other	0485	1.45	1.14	1.295	1.76	1.115	0.1025	15	
311.30	Sodium (%)	Flame Photometric	0538	2.1	1.9	2	8.64	1.115	0.1025	15	
311.30	Sodium (%)	Flame Photometric	0539	2.08	1.95	2.015	8.78	1.115	0.1025	15	
311.33	Sodium (%)	ICP, test portion as in 2017.02	0394	1.0004	9686	4844	>100	1.115	0.1025	15	3

Code	Analyte	Method	Lab Code	Result1	Result2	¹ Lab Value	² Z score	³ Robust Stats			
								Mean Value	StDev	n used	⁴ Flag
Acid Soluble Zn (%)											
321.33	Acid Soluble Zn (%)	ICP, 2017.02	0515	<0.0002	<0.0002	<0.0002		0.0017	0.0019	6	6
321.33	Acid Soluble Zn (%)	ICP, 2017.02	0394	<0.0002	<0.0002	<0.0002		0.0017	0.0019	6	6
321.32	Acid Soluble Zn (%)	ICP, test portion 2006.03A-C	0405	<0.0003	<0.0003	<0.0003		0.0017	0.0019	6	6
321.33	Acid Soluble Zn (%)	ICP, 2017.02	0136	<0.0003	<0.0003	<0.0003		0.0017	0.0019	6	6
321.99	Acid Soluble Zn (%)	Other	0515	<0.0004	<0.0004	<0.0004		0.0017	0.0019	6	6
321.33	Acid Soluble Zn (%)	ICP, 2017.02	0027	<0.001	<0.001	<0.001		0.0017	0.0019	6	6
321.33	Acid Soluble Zn (%)	ICP, 2017.02	0527	<0.001	<0.001	<0.001		0.0017	0.0019	6	6
321.33	Acid Soluble Zn (%)	ICP, 2017.02	0117	<0.0025	<0.0025	<0.0025		0.0017	0.0019	6	6
321.99	Acid Soluble Zn (%)	Other	0481	<0.01	<0.01	<0.01		0.0017	0.0019	6	6
321.30	Acid Soluble Zn (%)	ICP, test portion inorganic 965.09	0354	<0.01	<0.01	<0.01		0.0017	0.0019	6	6
321.33	Acid Soluble Zn (%)	ICP, 2017.02	0106	0	0	0		0.0017	0.0019	6	5
321.32	Acid Soluble Zn (%)	ICP, test portion 2006.03A-C	0485	0.0003	0.0002	0.0002	-0.76	0.0017	0.0019	6	
321.99	Acid Soluble Zn (%)	Other	0368	0.0002	0.0004	0.0003	-0.73	0.0017	0.0019	6	
321.00	Acid Soluble Zn (%)	AA, inorganic 965.09	0485	0.0003	0.0009	0.0006	-0.58	0.0017	0.0019	6	
321.30	Acid Soluble Zn (%)	ICP, test portion inorganic 965.09	0255	0.002	0.002	0.002	0.15	0.0017	0.0019	6	7
321.99	Acid Soluble Zn (%)	Other	0523	0.002	0.003	0.0025	0.41	0.0017	0.0019	6	
321.32	Acid Soluble Zn (%)	ICP, test portion 2006.03A-C	0220	0.0085	0.0087	0.0086	3.59	0.0017	0.0019	6	
321.99	Acid Soluble Zn (%)	Other	0389	0.478	0.438	0.458	>100	0.0017	0.0019	6	3

1. Lab Value: Lab Value is the average of 2 reported lab result. † or ‡ beside Lab Value denotes the value exceeds the investigational allowance (IA) around the analyte mean. † denotes value is less than IA and ‡ denotes value is greater than IA. This is noted for guaranteed analytes with number of observations used (n used) >= 6. Method code and analyte name are shown in green for guaranteed analytes along with guaranteed concentration.

2. Z score: Red = Z value >3 or <-3 (action required), Orange = Z value between 2 and 3 or -2 and -3 (warning), Green = Z value between -2 and 2 (pass). Z values are shown for data sets with number of observation used (n used) >= 3 for Lab Values that are not an analytical limit or 0. Color ratings shown for number of observations used (n used) >=6. Z values were calculated as (Lab Value - Mean Value)/(standard deviation).

3. Statistical parameters: Robust statistics was employed to determine mean and standard deviation (StDev) if number of observations used (n used) >=6 (blue background). Classical statistics was employed if number of observations used (n used) = 3, 4, or 5 (pink background). Flags identify data not used to calculate mean and standard deviation.

4. Flag: Flag number identifies why data was not used to determine statistical parameters. 1 = data rejected for dups too far apart, 2 = rejected as extreme outlier, 3 = rejected for both dups too far apart and extreme outlier, 4 = removed after manual inspection, 5 = rejected due to zero(s) submitted, 6 = rejected due to analytical limit submitted (eg "<0.1"), 7 = Lab's range rejected for determining mean range on Report Cards due to identical values reported for two results.

Appendix

Content Description of Analyte All Tests Report

The All Tests reports have results listed for every lab grouped by Analyte with data in each group sorted by lab value. The reports are helpful to see where your lab result fell within the whole set of data for the Analyte by identifying your results by your lab code. Data on the right side of the report shows the mean, standard deviation, and number of observations (obs) used in the analysis of each group. An observation was a lab value for a test which was the average of reported duplicate results. Determination of mean and standard deviation followed protocols in ISO 13528:2015(E) (Statistical methods for use in proficiency testing by interlaboratory comparison) where robust statistics was used to determine the mean and standard deviation for 6 or more observations. Robust statistics has an advantage of removing undesired influence of outlying data on the mean and standard deviation without removing data from the statistical analysis. Robust statistics is only appropriate for use on data sets with 6 or more observations. For data sets with 3, 4, or 5 observations, classical calculation of mean and standard deviation was performed. Z scores for data sets with a small number of observations are given less importance as indicated by no color coding of Z score with less than 6 observations. No Z scores were determined for 1 or 2 observations.

Before determining mean and standard deviation for a set of data, data was removed from statistical analysis for various reasons. Mandel statistical analysis was used to identify and remove extreme outliers and lab values from duplicate results that were too far apart (ISO 5725-2:1994, Accuracy (trueness and precision) of measurement methods and results – Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.). Any individual result report of zero or less than a limit resulted in lab value removed from analysis. The lab values removed from analysis are denoted with numerical flags on the far right-hand side of the report. Z scores are reported for data removed due to extreme outlier or duplicates too far apart even though data was not used in the determination of mean and standard deviation. However, Z scores are not reported for results reported as 0 or less than a limit. Also, any submission of just one lab result is removed for consideration in statistical analysis and presentation on reports.

The American Association of Plant Food Control Officials (AAPFCO) recommends limits around a nutrient guarantee that should initiate an investigation if observed nutrient concentration falls outside of the limits. These limits are referred to as Investigational Allowances (IAs). Lab Values that fall outside of the IA limits around the analyte mean are denoted with † (below limit) or ‡ (above limit). These same symbols are also used to denote Lab Values beyond IA limits on Laboratory Report Cards.