Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 042
Method: 01-LONG LIST.mth
Acq Time: 13:05:27 Wed 19-Aug-20
Sample Name: 16695.01s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	35609.376	0.034050	mg/L		3
Be	9	13.333	0.000044	mg/L		3
B	11	68305.223	0.410660	mg/L		3
Al	27	67161.214	0.131760	mg/L		3
Ti	47	120.001	0.007720	mg/L		3
V	51	745.020	0.001850	mg/L		3
Cr	52	576.678	0.000885	mg/L		3
Mn	55	316223.434	1.207123	mg/L		3
Fe	57	74579.245	6.987622	mg/L		3
Co	59	1791.779	0.001783	mg/L		3
Ni	60	791.689	0.002781	mg/L		3
Cu	65	458.341	0.001081	mg/L		3
Zn	66	230.002	0.002232	mg/L		3
As	75	286.670	0.005625	mg/L		3
Sr	88	109728.212	0.283390	mg/L		3
Mo	95	1100.361	0.002981	mg/L		3
Ag	107	155.001	0.000039	mg/L		3
Cd	111	83.334	0.000022	mg/L		3
Sn	118	546.677	-0.000171	mg/L		3
Sb	121	168.334	0.000085	mg/L		3
Ba	137	28618.648	0.152255	mg/L		3
Tl	205	65.000	0.000012	mg/L		3
Pb	208	1035.347	0.000165	mg/L		3
Se	78	1121.490	0.000707	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 044
Method: 01-LONG LIST.mth
Acq Time: 13:08:48 Wed 19-Aug-20
Sample Name: 16695.02s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	51671.769	0.056930	mg/L		3
Be	9	6.667	0.000008	mg/L		3
B	11	859832.962	5.198889	mg/L		3
Al	27	105152.723	0.207764	mg/L		3
Ti	47	118.334	0.007536	mg/L		3
V	51	305.003	0.000668	mg/L		3
Cr	52	381.672	0.000481	mg/L		3
Mn	55	532061.456	2.021362	mg/L		3
Fe	56	331670.257	0.783880	mg/L		3
Co	59	4470.701	0.004498	mg/L		3
Ni	60	7588.682	0.027967	mg/L		3
Cu	65	581.679	0.001418	mg/L		3
Zn	66	1246.721	0.015424	mg/L		3
As	75	90.000	0.000884	mg/L		3
Sr	88	148996.406	0.382983	mg/L		3
Mo	95	3402.370	0.010626	mg/L		3
Ag	107	138.334	0.000024	mg/L		3
Cd	111	91.667	0.000077	mg/L		3
Sn	118	541.677	-0.000200	mg/L		3
Sb	121	148.334	0.000028	mg/L		3
Ba	137	8530.881	0.044843	mg/L		3
Tl	205	148.334	0.000035	mg/L		3
Pb	208	1690.377	0.000329	mg/L		3
Se	78	1084.829	-0.000125	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 046
Method: 01-LONG LIST.mth
Acq Time: 13:15:02 Wed 19-Aug-20
Sample Name: 16695.03s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	18311.730	0.008452	mg/L		3
Be	9	0.000	-0.000024	mg/L		3
B	11	10465.499	0.059377	mg/L		3
Al	27	3438.749	0.004664	mg/L		3
Ti	47	46.667	0.000734	mg/L		3
V	51	73.334	0.000046	mg/L		3
Cr	52	180.001	0.000060	mg/L		3
Mn	55	15778.710	0.058520	mg/L		3
Fe	56	639429.701	1.488945	mg/L		3
Co	59	315.004	0.000268	mg/L		3
Ni	60	336.671	0.001056	mg/L		3
Cu	65	126.667	0.000143	mg/L		3
Zn	66	171.668	0.001419	mg/L		3
As	75	395.005	0.008023	mg/L		3
Sr	88	56837.885	0.143184	mg/L		3
Mo	95	1390.203	0.003842	mg/L		3
Ag	107	131.667	0.000017	mg/L		3
Cd	111	68.334	-0.000093	mg/L		3
Sn	118	555.012	-0.000190	mg/L		3
Sb	121	131.667	-0.000025	mg/L		3
Ba	137	32014.170	0.166348	mg/L		3
Tl	205	61.667	0.000011	mg/L		3
Pb	208	373.667	0.000007	mg/L		3
Se	78	1185.692	0.001163	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 050
Method: 01-LONG LIST.mth
Acq Time: 13:21:52 Wed 19-Aug-20
Sample Name: CCV2-0.1
Sample Type: Sample
Matrix: Liquid
Comments: IV-std made 08/19/20
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	377343.349	0.097928	mg/L		3
Be	9	108968.369	0.100326	mg/L		3
B	11	89479.695	0.101841	mg/L		3
Al	27	263787.729	0.098917	mg/L		3
Ti	47	5922.895	0.099752	mg/L		3
V	51	206110.833	0.099676	mg/L		3
Cr	52	270496.666	0.100664	mg/L		3
Mn	55	148481.148	0.102249	mg/L		3
Fe	56	242150.114	0.103328	mg/L		3
Co	59	521220.302	0.096079	mg/L		3
Ni	60	151355.998	0.101758	mg/L		3
Cu	65	193667.418	0.097855	mg/L		3
Zn	66	44123.039	0.103788	mg/L		3
As	75	22656.290	0.098316	mg/L		3
Sr	88	221553.242	0.103289	mg/L		3
Mo	95	170944.829	0.103000	mg/L		3
Ag	107	650800.668	0.099152	mg/L		3
Cd	111	83082.691	0.103927	mg/L		3
Sn	118	165375.607	0.100168	mg/L		3
Sb	121	196265.743	0.097709	mg/L		3
Ba	137	104722.792	0.100850	mg/L		3
Tl	205	1937871.741	0.104619	mg/L		3
Pb	208	2012116.949	0.096120	mg/L		3
Se	78	30873.823	0.104141	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 051
Method: 01-LONG LIST.mth
Acq Time: 13:29:41 Wed 19-Aug-20
Sample Name: Rinse
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	12050.092	-0.000008	mg/L		3
Be	9	46.667	0.000039	mg/L		3
B	11	571.678	0.000399	mg/L		3
Al	27	1013.369	0.000010	mg/L		3
Ti	47	33.333	-0.000129	mg/L		3
V	51	98.334	0.000020	mg/L		3
Cr	52	196.668	0.000015	mg/L		3
Mn	55	178.334	0.000067	mg/L		3
Fe	56	3635.464	0.000196	mg/L		3
Co	59	176.668	0.000024	mg/L		3
Ni	60	73.334	0.000017	mg/L		3
Cu	65	111.667	0.000017	mg/L		3
Zn	66	61.667	-0.000005	mg/L		3
As	75	55.000	-0.000010	mg/L		3
Sr	88	190.001	0.000046	mg/L		3
Mo	95	1220.919	0.000617	mg/L		3
Ag	107	351.671	0.000037	mg/L		3
Cd	111	113.334	0.000035	mg/L		3
Sn	118	1901.794	0.000784	mg/L		3
Sb	121	918.363	0.000393	mg/L		3
Ba	137	120.001	0.000025	mg/L		3
Tl	205	463.341	0.000025	mg/L		3
Pb	208	908.677	0.000028	mg/L		3
Se	78	1130.585	-0.000171	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 052
Method: 01-LONG LIST.mth
Acq Time: 13:31:11 Wed 19-Aug-20
Sample Name: CCB2
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	11858.257	-0.000006	mg/L		3
Be	9	53.333	0.000046	mg/L		3
B	11	540.010	0.000371	mg/L		3
Al	27	933.364	-0.000014	mg/L		3
Ti	47	63.333	0.000402	mg/L		3
V	51	105.000	0.000023	mg/L		3
Cr	52	175.001	0.000007	mg/L		3
Mn	55	113.334	0.000022	mg/L		3
Fe	56	3628.795	0.000207	mg/L		3
Co	59	118.334	0.000013	mg/L		3
Ni	60	66.667	0.000013	mg/L		3
Cu	65	126.667	0.000026	mg/L		3
Zn	66	70.000	0.000017	mg/L		3
As	75	43.333	-0.000060	mg/L		3
Sr	88	185.001	0.000044	mg/L		3
Mo	95	1073.692	0.000531	mg/L		3
Ag	107	283.336	0.000026	mg/L		3
Cd	111	100.000	0.000018	mg/L		3
Sn	118	1646.763	0.000634	mg/L		3
Sb	121	820.024	0.000347	mg/L		3
Ba	137	76.667	-0.000017	mg/L		3
Tl	205	421.673	0.000023	mg/L		3
Pb	208	732.005	0.000020	mg/L		3
Se	78	1113.004	-0.000240	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 053
Method: 01-LONG LIST.mth
Acq Time: 13:34:20 Wed 19-Aug-20
Sample Name: 16695.07s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	12088.452	-0.000374	mg/L		3
Be	9	36.667	0.000144	mg/L		3
B	11	671.682	0.002472	mg/L		3
Al	27	2415.205	0.002624	mg/L		3
Ti	47	36.667	-0.000309	mg/L		3
V	51	68.334	0.000026	mg/L		3
Cr	52	225.002	0.000134	mg/L		3
Mn	55	173.334	0.000326	mg/L		3
Fe	56	3513.766	0.000821	mg/L		3
Co	59	93.334	0.000043	mg/L		3
Ni	60	51.667	0.000012	mg/L		3
Cu	65	136.667	0.000157	mg/L		3
Zn	66	125.001	0.000766	mg/L		3
As	75	45.000	-0.000254	mg/L		3
Sr	88	211.668	0.000287	mg/L		3
Mo	95	721.820	0.001569	mg/L		3
Ag	107	263.336	0.000117	mg/L		3
Cd	111	83.334	-0.000012	mg/L		3
Sn	118	1265.056	0.001989	mg/L		3
Sb	121	666.682	0.001348	mg/L		3
Ba	137	198.335	0.000525	mg/L		3
Tl	205	308.337	0.000078	mg/L		3
Pb	208	707.005	0.000085	mg/L		3
Se	78	1142.761	-0.000712	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 055
Method: 01-LONG LIST.mth
Acq Time: 13:37:26 Wed 19-Aug-20
Sample Name: 16695.04s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	70915.801	0.085087	mg/L		3
Be	9	45.000	0.000198	mg/L		3
B	11	737453.445	4.489940	mg/L		3
Al	27	1087441.736	2.182040	mg/L		3
Ti	47	810.023	0.075170	mg/L		3
V	51	2573.566	0.006982	mg/L		3
Cr	52	2330.190	0.004671	mg/L		3
Mn	55	63976.312	0.252417	mg/L		3
Fe	56	1906670.786	4.721309	mg/L		3
Co	59	3228.699	0.003365	mg/L		3
Ni	60	4477.369	0.017097	mg/L		3
Cu	65	2376.865	0.006686	mg/L		3
Zn	66	1340.063	0.017319	mg/L		3
As	75	153.334	0.002558	mg/L		3
Sr	88	307019.355	0.820699	mg/L		3
Mo	95	19707.774	0.067470	mg/L		3
Ag	107	338.337	0.000204	mg/L		3
Cd	111	98.334	0.000153	mg/L		3
Sn	118	1166.714	0.002051	mg/L		3
Sb	121	631.681	0.001424	mg/L		3
Ba	137	10237.000	0.056064	mg/L		3
Tl	205	815.023	0.000222	mg/L		3
Pb	208	14335.943	0.003462	mg/L		3
Se	78	1115.576	0.000540	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 057
Method: 01-LONG LIST.mth
Acq Time: 13:44:08 Wed 19-Aug-20
Sample Name: 16695.05s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	44308.688	0.044223	mg/L		3
Be	9	13.333	0.000039	mg/L		3
B	11	148845.982	0.864896	mg/L		3
Al	27	4178.945	0.006140	mg/L		3
Ti	47	33.333	-0.000396	mg/L		3
V	51	203.335	0.000399	mg/L		3
Cr	52	206.668	0.000123	mg/L		3
Mn	55	410140.986	1.561397	mg/L		3
Fe	56	7163.467	0.010024	mg/L		3
Co	59	635.014	0.000600	mg/L		3
Ni	60	2155.163	0.007852	mg/L		3
Cu	65	521.676	0.001255	mg/L		3
Zn	66	378.338	0.004154	mg/L		3
As	75	61.667	0.000194	mg/L		3
Sr	88	471476.692	1.214723	mg/L		3
Mo	95	9130.661	0.029754	mg/L		3
Ag	107	253.336	0.000122	mg/L		3
Cd	111	101.667	0.000148	mg/L		3
Sn	118	778.355	0.000599	mg/L		3
Sb	121	385.005	0.000679	mg/L		3
Ba	137	10130.260	0.053443	mg/L		3
Tl	205	248.336	0.000063	mg/L		3
Pb	208	873.675	0.000128	mg/L		3
Se	78	1121.896	0.000333	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 059
Method: 01-LONG LIST.mth
Acq Time: 13:51:54 Wed 19-Aug-20
Sample Name: 16695.06s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	18326.779	0.009094	mg/L		3
Be	9	6.667	0.000008	mg/L		3
B	11	9908.450	0.057515	mg/L		3
Al	27	3193.694	0.004369	mg/L		3
Ti	47	23.333	-0.001400	mg/L		3
V	51	75.000	0.000051	mg/L		3
Cr	52	220.002	0.000141	mg/L		3
Mn	55	15455.024	0.057300	mg/L		3
Fe	56	637190.114	1.483399	mg/L		3
Co	59	250.002	0.000203	mg/L		3
Ni	60	310.003	0.000960	mg/L		3
Cu	65	100.000	0.000070	mg/L		3
Zn	66	176.668	0.001482	mg/L		3
As	75	368.338	0.007387	mg/L		3
Sr	88	57242.850	0.144126	mg/L		3
Mo	95	1609.268	0.004554	mg/L		3
Ag	107	160.001	0.000040	mg/L		3
Cd	111	73.334	-0.000058	mg/L		3
Sn	118	651.682	0.000127	mg/L		3
Sb	121	331.671	0.000514	mg/L		3
Ba	137	32217.981	0.167344	mg/L		3
Tl	205	108.334	0.000024	mg/L		3
Pb	208	427.001	0.000018	mg/L		3
Se	78	1029.258	-0.001682	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 073
Method: 01-LONG LIST.mth
Acq Time: 14:14:51 Wed 19-Aug-20
Sample Name: 16695.06 MS-0.05
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	201121.732	0.264950	mg/L		3
Be	9	52984.897	0.254421	mg/L		3
B	11	53063.683	0.314308	mg/L		3
Al	27	130966.734	0.255106	mg/L		3
Ti	47	3018.652	0.275193	mg/L		3
V	51	101598.571	0.267237	mg/L		3
Cr	52	131892.718	0.266879	mg/L		3
Mn	55	89559.884	0.335624	mg/L		3
Fe	56	734377.983	1.721783	mg/L		3
Co	59	257557.812	0.258336	mg/L		3
Ni	60	70771.576	0.258887	mg/L		3
Cu	65	92678.006	0.254803	mg/L		3
Zn	66	21314.223	0.272474	mg/L		3
As	75	11636.405	0.274303	mg/L		3
Sr	88	160928.341	0.408351	mg/L		3
Mo	95	78859.147	0.258235	mg/L		3
Ag	107	296568.905	0.245885	mg/L		3
Cd	111	39885.612	0.271227	mg/L		3
Sn	118	76715.508	0.251961	mg/L		3
Sb	121	76435.641	0.206881	mg/L		3
Ba	137	81840.433	0.428622	mg/L		3
Tl	205	926511.066	0.257149	mg/L		3
Pb	208	940311.481	0.230907	mg/L		3
Se	78	14986.494	0.262116	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 074
Method: 01-LONG LIST.mth
Acq Time: 14:16:22 Wed 19-Aug-20
Sample Name: 16695.06 MSD-0.05
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	200337.268	0.271488	mg/L		3
Be	9	53888.186	0.266012	mg/L		3
B	11	50888.886	0.309818	mg/L		3
Al	27	129811.345	0.259792	mg/L		3
Ti	47	3098.670	0.285541	mg/L		3
V	51	100700.542	0.267616	mg/L		3
Cr	52	128565.943	0.262868	mg/L		3
Mn	55	88127.664	0.333700	mg/L		3
Fe	56	737963.510	1.748280	mg/L		3
Co	59	253027.179	0.256435	mg/L		3
Ni	60	69654.451	0.257458	mg/L		3
Cu	65	91195.222	0.253368	mg/L		3
Zn	66	21579.623	0.278777	mg/L		3
As	75	11427.906	0.272169	mg/L		3
Sr	88	161030.898	0.412829	mg/L		3
Mo	95	84360.980	0.279175	mg/L		3
Ag	107	301020.185	0.252190	mg/L		3
Cd	111	39065.033	0.268414	mg/L		3
Sn	118	78964.330	0.262178	mg/L		3
Sb	121	77849.888	0.212900	mg/L		3
Ba	137	80315.180	0.425007	mg/L		3
Tl	205	944000.519	0.265350	mg/L		3
Pb	208	932469.638	0.231876	mg/L		3
Se	78	15692.058	0.272198	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 075
Method: 01-LONG LIST.mth
Acq Time: 14:18:26 Wed 19-Aug-20
Sample Name: CCV3-0.1
Sample Type: Sample
Matrix: Liquid
Comments: IV-std made 08/19/20
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	381552.495	0.099494	mg/L		3
Be	9	105770.907	0.097773	mg/L		3
B	11	86851.966	0.099184	mg/L		3
Al	27	260076.851	0.097821	mg/L		3
Ti	47	5996.259	0.102325	mg/L		3
V	51	206446.341	0.101028	mg/L		3
Cr	52	268822.800	0.101247	mg/L		3
Mn	55	149816.498	0.104480	mg/L		3
Fe	56	240968.978	0.104110	mg/L		3
Co	59	536454.873	0.100125	mg/L		3
Ni	60	150072.888	0.102181	mg/L		3
Cu	65	196114.003	0.100336	mg/L		3
Zn	66	43517.877	0.103616	mg/L		3
As	75	22744.762	0.099978	mg/L		3
Sr	88	213988.453	0.101025	mg/L		3
Mo	95	168982.569	0.103069	mg/L		3
Ag	107	651581.374	0.100529	mg/L		3
Cd	111	82510.935	0.104488	mg/L		3
Sn	118	162772.586	0.099845	mg/L		3
Sb	121	195699.786	0.098634	mg/L		3
Ba	137	100360.058	0.097805	mg/L		3
Tl	205	1876011.097	0.099017	mg/L		3
Pb	208	2006391.448	0.093613	mg/L		3
Se	78	30361.490	0.102684	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 076
Method: 01-LONG LIST.mth
Acq Time: 14:26:21 Wed 19-Aug-20
Sample Name: Rinse
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	11784.867	-0.000194	mg/L		3
Be	9	33.333	0.000025	mg/L		3
B	11	416.673	0.000201	mg/L		3
Al	27	775.021	-0.000092	mg/L		3
Ti	47	35.000	-0.000095	mg/L		3
V	51	83.334	0.000013	mg/L		3
Cr	52	166.668	0.000004	mg/L		3
Mn	55	120.001	0.000027	mg/L		3
Fe	56	3278.710	0.000055	mg/L		3
Co	59	168.334	0.000023	mg/L		3
Ni	60	86.667	0.000027	mg/L		3
Cu	65	128.334	0.000027	mg/L		3
Zn	66	86.667	0.000059	mg/L		3
As	75	65.000	0.000039	mg/L		3
Sr	88	166.668	0.000035	mg/L		3
Mo	95	1151.666	0.000582	mg/L		3
Ag	107	355.004	0.000038	mg/L		3
Cd	111	130.001	0.000058	mg/L		3
Sn	118	1828.451	0.000751	mg/L		3
Sb	121	875.027	0.000376	mg/L		3
Ba	137	116.667	0.000023	mg/L		3
Tl	205	530.010	0.000029	mg/L		3
Pb	208	858.675	0.000026	mg/L		3
Se	78	1152.762	0.000024	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 077
Method: 01-LONG LIST.mth
Acq Time: 14:27:52 Wed 19-Aug-20
Sample Name: CCB3
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-1
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	11633.069	-0.000101	mg/L		3
Be	9	36.667	0.000030	mg/L		3
B	11	426.673	0.000232	mg/L		3
Al	27	805.023	-0.000068	mg/L		3
Ti	47	28.333	-0.000203	mg/L		3
V	51	105.000	0.000024	mg/L		3
Cr	52	216.668	0.000025	mg/L		3
Mn	55	123.334	0.000031	mg/L		3
Fe	56	3168.686	0.000028	mg/L		3
Co	59	141.667	0.000018	mg/L		3
Ni	60	65.000	0.000012	mg/L		3
Cu	65	106.667	0.000016	mg/L		3
Zn	66	98.334	0.000090	mg/L		3
As	75	73.334	0.000082	mg/L		3
Sr	88	133.334	0.000020	mg/L		3
Mo	95	1033.872	0.000519	mg/L		3
Ag	107	281.669	0.000027	mg/L		3
Cd	111	95.000	0.000014	mg/L		3
Sn	118	1525.083	0.000575	mg/L		3
Sb	121	841.692	0.000366	mg/L		3
Ba	137	81.667	-0.000011	mg/L		3
Tl	205	416.673	0.000022	mg/L		3
Pb	208	758.673	0.000021	mg/L		3
Se	78	1120.077	-0.000188	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 078
Method: 01-LONG LIST.mth
Acq Time: 14:30:12 Wed 19-Aug-20
Sample Name: 081920_2 LCS-0.05
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-2
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Al	27	132188.798	0.048567	mg/L		3
Ti	47	3130.343	0.052448	mg/L		3
V	51	99955.193	0.048332	mg/L		3
Mn	55	75363.338	0.051927	mg/L		3
Fe	56	123940.540	0.052246	mg/L		3
Cu	65	99117.711	0.050115	mg/L		3
Zn	66	21885.084	0.051435	mg/L		3
Sr	88	109755.038	0.051193	mg/L		3
Ba	137	50059.233	0.048172	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 079
Method: 01-LONG LIST.mth
Acq Time: 14:36:18 Wed 19-Aug-20
Sample Name: Rinse
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-2
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Li	7	11544.676	-0.000156	mg/L		3
Be	9	23.333	0.000017	mg/L		3
B	11	353.338	0.000142	mg/L		3
Al	27	748.353	-0.000093	mg/L		3
Ti	47	35.000	-0.000085	mg/L		3
V	51	75.000	0.000009	mg/L		3
Cr	52	155.001	0.000001	mg/L		3
Mn	55	110.000	0.000022	mg/L		3
Fe	56	2978.644	-0.000050	mg/L		3
Co	59	121.667	0.000015	mg/L		3
Ni	60	63.333	0.000011	mg/L		3
Cu	65	95.000	0.000011	mg/L		3
Zn	66	66.667	0.000012	mg/L		3
As	75	68.334	0.000058	mg/L		3
Sr	88	143.334	0.000026	mg/L		3
Mo	95	1036.109	0.000524	mg/L		3
Ag	107	288.336	0.000028	mg/L		3
Cd	111	110.000	0.000036	mg/L		3
Sn	118	1606.758	0.000631	mg/L		3
Sb	121	506.676	0.000191	mg/L		3
Ba	137	81.667	-0.000010	mg/L		3
Tl	205	378.338	0.000020	mg/L		3
Pb	208	775.340	0.000021	mg/L		3
Se	78	1087.502	-0.000282	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 080
Method: 01-LONG LIST.mth
Acq Time: 14:37:48 Wed 19-Aug-20
Sample Name: 081920_2 LRB
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-2
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Al	27	1928.464	0.000357	mg/L		3
Ti	47	36.667	-0.000057	mg/L		3
V	51	63.333	0.000003	mg/L		3
Mn	55	125.001	0.000032	mg/L		3
Fe	56	3117.007	0.000007	mg/L		3
Cu	65	108.334	0.000017	mg/L		3
Zn	66	126.667	0.000161	mg/L		3
Sr	88	200.001	0.000053	mg/L		3
Ba	137	86.667	-0.000005	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 091
Method: 01-LONG LIST.mth
Acq Time: 15:17:49 Wed 19-Aug-20
Sample Name: CCV4-0.1
Sample Type: Sample
Matrix: Liquid
Comments: IV-std made 08/19/20
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-2
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Al	27	246150.798	0.100127	mg/L		3
Ti	47	5922.895	0.106518	mg/L		3
V	51	199672.572	0.102989	mg/L		3
Mn	55	142325.480	0.104598	mg/L		3
Fe	56	228875.860	0.104211	mg/L		3
Cu	65	188711.741	0.101755	mg/L		3
Zn	66	41786.051	0.104888	mg/L		3
Sr	88	211321.779	0.105151	mg/L		3
Ba	137	96436.197	0.099038	mg/L		3

Data Set: MT4-20-0819A
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 093
Method: 01-LONG LIST.mth
Acq Time: 15:30:05 Wed 19-Aug-20
Sample Name: CCB4
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819A.cal
Cal Type: External Calibration
Last Calib: MTD-081920-2
Bkg File:
Int Correct:
Blank File: Blank.007

Element	Mass		Concentration	Units	RSD %	Rep
Al	27	668.349	-0.000099	mg/L		3
Ti	47	31.667	-0.000109	mg/L		3
V	51	116.667	0.000034	mg/L		3
Mn	55	125.001	0.000037	mg/L		3
Fe	56	3240.368	0.000148	mg/L		3
Cu	65	1680.099	0.000907	mg/L		3
Zn	66	343.338	0.000749	mg/L		3
Sr	88	213.335	0.000066	mg/L		3
Ba	137	130.001	0.000046	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 001
Method: 01-MINERALS.mth
Acq Time: 16:09:08 Wed 19-Aug-20
Sample Name: Blank
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	14802.222	0	mg/L		3
Mg	24	6590.000	0	mg/L		3
K	39	268954.444	0	mg/L		3
Ca	44	7297.778	0	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 002
Method: 01-MINERALS.mth
Acq Time: 16:09:51 Wed 19-Aug-20
Sample Name: Std-0.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	14884.444	-0.000020	mg/L		3
Mg	24	6557.778	-0.000080	mg/L		3
K	39	268707.778	-0.002192	mg/L		3
Ca	44	7411.111	0.001115	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 003
Method: 01-MINERALS.mth
Acq Time: 16:10:34 Wed 19-Aug-20
Sample Name: Std-0.20
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	394821.111	0.194840	mg/L		3
Mg	24	237491.111	0.193342	mg/L		3
K	39	541193.333	0.188271	mg/L		3
Ca	44	15787.778	0.216797	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 004
Method: 01-MINERALS.mth
Acq Time: 16:11:17 Wed 19-Aug-20
Sample Name: Std-0.50
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	941514.444	0.480944	mg/L		3
Mg	24	575721.111	0.482200	mg/L		3
K	39	960594.444	0.495106	mg/L		3
Ca	44	25152.222	0.469291	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 005
Method: 01-MINERALS.mth
Acq Time: 16:12:00 Wed 19-Aug-20
Sample Name: Std-1.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	1841988.889	0.955711	mg/L		3
Mg	24	1177678.889	0.999406	mg/L		3
K	39	1625416.667	0.983341	mg/L		3
Ca	44	44152.222	0.982364	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 006
Method: 01-MINERALS.mth
Acq Time: 16:12:43 Wed 19-Aug-20
Sample Name: Std-2.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	3700607.778	1.946811	mg/L		3
Mg	24	2240352.222	1.923955	mg/L		3
K	39	2964880.000	1.980607	mg/L		3
Ca	44	81551.111	2.004132	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 007
Method: 01-MINERALS.mth
Acq Time: 16:13:26 Wed 19-Aug-20
Sample Name: Std-5.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	9708108.889	5.032245	mg/L		3
Mg	24	5945384.444	5.032583	mg/L		3
K	39	7208971.111	5.012047	mg/L		3
Ca	44	196137.778	5.004273	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 008
Method: 01-MINERALS.mth
Acq Time: 16:14:09 Wed 19-Aug-20
Sample Name: ICV-2.0
Sample Type: Sample
Matrix: Liquid
Comments: Spex-std made 08/19/
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	3782345.556	1.974697	mg/L		3
Mg	24	2335302.222	1.991811	mg/L		3
K	39	3053921.111	2.029475	mg/L		3
Ca	44	80887.778	1.970390	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 009
Method: 01-MINERALS.mth
Acq Time: 16:15:02 Wed 19-Aug-20
Sample Name: CCV-2.0
Sample Type: Sample
Matrix: Liquid
Comments: IV-std made 08/19/20
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	3760445.556	1.929133	mg/L		3
Mg	24	2303420.000	1.929841	mg/L		3
K	39	2967694.444	1.929414	mg/L		3
Ca	44	81432.222	1.947032	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 010
Method: 01-MINERALS.mth
Acq Time: 16:16:01 Wed 19-Aug-20
Sample Name: ICB
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	24827.778	0.005486	mg/L		3
Mg	24	12461.111	0.005230	mg/L		3
K	39	269732.222	0.002275	mg/L		3
Ca	44	7374.444	0.003850	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 011
Method: 01-MINERALS.mth
Acq Time: 16:16:44 Wed 19-Aug-20
Sample Name: CCB
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	17394.444	0.001468	mg/L		3
Mg	24	7546.667	0.000892	mg/L		3
K	39	267460.000	0.000040	mg/L		3
Ca	44	7077.778	-0.004807	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 012
Method: 01-MINERALS.mth
Acq Time: 16:17:33 Wed 19-Aug-20
Sample Name: BS-0.05
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	111625.556	0.050337	mg/L		3
Mg	24	61946.667	0.046970	mg/L		3
K	39	334922.222	0.044041	mg/L		3
Ca	44	8907.778	0.039292	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 013
Method: 01-MINERALS.mth
Acq Time: 16:18:18 Wed 19-Aug-20
Sample Name: BS-0.1
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	216364.444	0.103230	mg/L		3
Mg	24	127680.000	0.101217	mg/L		3
K	39	409095.556	0.093046	mg/L		3
Ca	44	10783.333	0.084442	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 014
Method: 01-MINERALS.mth
Acq Time: 16:20:03 Wed 19-Aug-20
Sample Name: 081920_1 LCS-1.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	1851971.111	0.950283	mg/L		3
Mg	24	1138238.889	0.955805	mg/L		3
K	39	1649831.111	0.988735	mg/L		3
Ca	44	44397.778	0.976746	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 015
Method: 01-MINERALS.mth
Acq Time: 16:21:01 Wed 19-Aug-20
Sample Name: 081920_2 LRB
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	17903.333	0.001758	mg/L		3
Mg	24	7832.222	0.001155	mg/L		3
K	39	267521.111	0.000426	mg/L		3
Ca	44	6995.556	-0.006774	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 026
Method: 01-MINERALS.mth
Acq Time: 16:42:12 Wed 19-Aug-20
Sample Name: CCV2-2.0
Sample Type: Sample
Matrix: Liquid
Comments: IV-std made 08/19/20
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	3805674.444	1.959857	mg/L		3
Mg	24	2342795.556	1.971056	mg/L		3
K	39	3025302.222	1.980152	mg/L		3
Ca	44	81342.222	1.953258	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 027
Method: 01-MINERALS.mth
Acq Time: 16:42:58 Wed 19-Aug-20
Sample Name: CCB2
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	37528.889	0.012181	mg/L		3
Mg	24	16558.889	0.008724	mg/L		3
K	39	277058.889	0.005892	mg/L		3
Ca	44	7010.000	-0.007937	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 028
Method: 01-MINERALS.mth
Acq Time: 16:43:58 Wed 19-Aug-20
Sample Name: 16695.07s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	24106.667	0.022485	mg/L		3
Mg	24	8678.889	0.007727	mg/L		3
K	39	267112.222	-0.042729	mg/L		3
Ca	44	9424.444	0.243113	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 030
Method: 01-MINERALS.mth
Acq Time: 16:45:41 Wed 19-Aug-20
Sample Name: 16695.01s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	17062208.889	44.719525	mg/L		3
Mg	24	10261497.778	43.849372	mg/L		3
K	39	709602.222	1.593576	mg/L		3
Ca	44	1215951.111	161.779672	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 032
Method: 01-MINERALS.mth
Acq Time: 16:47:57 Wed 19-Aug-20
Sample Name: 16695.06s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	9827771.111	26.230909	mg/L		3
Mg	24	8787531.111	38.304203	mg/L		3
K	39	634485.556	1.365458	mg/L		3
Ca	44	791594.444	107.183286	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 034
Method: 01-MINERALS.mth
Acq Time: 16:50:22 Wed 19-Aug-20
Sample Name: 16695.02s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	23359270.000	61.690233	mg/L		3
Mg	24	15690910.000	67.653349	mg/L		3
K	39	544432.222	1.007535	mg/L		3
Ca	44	2025595.556	272.270717	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 036
Method: 01-MINERALS.mth
Acq Time: 16:52:39 Wed 19-Aug-20
Sample Name: 16695.03s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	10066836.667	27.113757	mg/L		3
Mg	24	8979383.333	39.506833	mg/L		3
K	39	652203.333	1.455304	mg/L		3
Ca	44	817580.000	111.706542	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 038
Method: 01-MINERALS.mth
Acq Time: 16:54:55 Wed 19-Aug-20
Sample Name: 16695.02 dil
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 50

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	2447815.556	63.344518	mg/L		3
Mg	24	1579847.778	66.902740	mg/L		3
K	39	318312.222	1.560520	mg/L		3
Ca	44	207823.333	266.651132	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 040
Method: 01-MINERALS.mth
Acq Time: 16:56:33 Wed 19-Aug-20
Sample Name: 16695.04s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	29946588.889	78.053076	mg/L		3
Mg	24	15916087.778	67.702303	mg/L		3
K	39	1764714.444	5.406258	mg/L		3
Ca	44	2009961.111	266.909237	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 042
Method: 01-MINERALS.mth
Acq Time: 16:58:48 Wed 19-Aug-20
Sample Name: 16695.05s
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	18429127.778	47.749706	mg/L		3
Mg	24	8065147.778	34.093805	mg/L		3
K	39	2014395.556	6.280398	mg/L		3
Ca	44	1295755.556	170.906278	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 044
Method: 01-MINERALS.mth
Acq Time: 17:00:36 Wed 19-Aug-20
Sample Name: 16695.06 MS-2.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	13415193.333	35.521179	mg/L		3
Mg	24	10889816.667	47.106713	mg/L		3
K	39	3413141.111	11.606728	mg/L		3
Ca	44	885953.333	119.135371	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 045
Method: 01-MINERALS.mth
Acq Time: 17:01:19 Wed 19-Aug-20
Sample Name: 16695.06 MSD-2.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 5

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	13689394.444	36.550674	mg/L		3
Mg	24	10985086.667	47.863477	mg/L		3
K	39	3427812.222	11.759010	mg/L		3
Ca	44	881706.667	119.436280	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 047
Method: 01-MINERALS.mth
Acq Time: 17:03:03 Wed 19-Aug-20
Sample Name: CCV3-2.0
Sample Type: Sample
Matrix: Liquid
Comments: IV-std made 08/19/20
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	3853935.556	1.948622	mg/L		3
Mg	24	2372631.111	1.962819	mg/L		3
K	39	2991024.444	1.917967	mg/L		3
Ca	44	82925.556	1.956542	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 048
Method: 01-MINERALS.mth
Acq Time: 17:03:48 Wed 19-Aug-20
Sample Name: CCB3
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-1
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	37835.556	0.012008	mg/L		3
Mg	24	17702.222	0.009468	mg/L		3
K	39	269317.778	-0.002649	mg/L		3
Ca	44	7290.000	-0.003047	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 049
Method: 01-MINERALS.mth
Acq Time: 17:05:11 Wed 19-Aug-20
Sample Name: 081920_2 LCS-1.0
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-2
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	1944207.778	0.993367	mg/L		3
Mg	24	1155540.000	0.965568	mg/L		3
K	39	1661200.000	0.992733	mg/L		3
Ca	44	44557.778	0.974799	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 050
Method: 01-MINERALS.mth
Acq Time: 17:06:01 Wed 19-Aug-20
Sample Name: 081920_2 LRB
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-2
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	35006.667	0.010531	mg/L		3
Mg	24	14035.556	0.006305	mg/L		3
K	39	271017.778	-0.000580	mg/L		3
Ca	44	7166.667	-0.005661	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 059
Method: 01-MINERALS.mth
Acq Time: 17:17:49 Wed 19-Aug-20
Sample Name: CCV4-2.0
Sample Type: Sample
Matrix: Liquid
Comments: IV-std made 08/19/20
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-2
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	3786732.222	1.979634	mg/L		3
Mg	24	2237841.111	1.910342	mg/L		3
K	39	2986438.889	1.984373	mg/L		3
Ca	44	80278.889	1.957353	mg/L		3

Data Set: MT4-20-0819B
Run Date: 08/19/20

Metals Quantitation Summary Report

Analyst: CCM
Instrument: PE NEXION

Sequence #: 060
Method: 01-MINERALS.mth
Acq Time: 17:18:34 Wed 19-Aug-20
Sample Name: CCB4
Sample Type: Sample
Matrix: Liquid
Comments:
Dilution: 1

Operator:
Acq Mode: Data Acquisition
Cal Title: 20-0819B.cal
Cal Type: External Calibration
Last Calib: mtd-081920-2
Bkg File:
Int Correct:
Blank File: Blank.034

Element	Mass		Concentration	Units	RSD %	Rep
Na	23	35653.333	0.010917	mg/L		3
Mg	24	15633.333	0.007753	mg/L		3
K	39	277630.000	0.003540	mg/L		3
Ca	44	6988.889	-0.011117	mg/L		3

Metals Digestion 3015A \ 3050B

DATE 8-19-20 PREP BATCH MTD-081920-1

TIME START 10:30 TIME FINISH 11:00 ANALYST CCM

Pipet Calibration:

Pipet #	Test #	Pipet Volume Setting mL	Wt. of water from pipet, g	Criteria	Pipet #	Test #	Pipet Volume Setting mL	Wt. of water from pipet, g	Criteria
2	1	1.0	1.001	Bias: Mean ± 2% of nominal value Precision: RSD ≤1% of nominal value	3	1	0.5	0.501	Bias: Mean ± 2% of nominal value Precision: RSD ≤1% of nominal value
	2		1.002			2	1	0.501	
	3	1	1.002			3		0.500	

SAMPLE#	BTL ID	SAMPLE AMOUNT GRAMS (g)	FINAL VOLUME (ml)	REMARKS	% TOTAL SOLIDS	DILUTION FACTOR
LCS-081920-1	----	50	50		—	1
LRB-081920-1	----	50	50		—	1
16402.01		10				5
.02						
.02 MS						
.02 MSD						
16513.02						
16531.01				TOT		
.01				DIS		
16561.01						
16653.01		25				2
16663.01		10				5
.02						
.03						
.04						
.05						
16689.01						
16695.01						
.02						
.03						
.04						
.05						
.06						
.06 MS						
.06 MSD						
.07						

NOTES: *1) Spike values (unless otherwise stated):*
LCS = 0.05 ppm = 50 mls / 0.50 mls of 5ppm Spiking Solution
Samples: Water = 0.05 ppm = 50 mls / 0.50 mls of 5ppm Spiking Solution
Soil = 0.10 ppm = 50 mls / 1.0 mls of 5ppm Spiking Solution
Spiking Solution - Date Prepared: 8-19-20

2) Spike values for minerals (Ca-Mg-K-Na)
LCS = 1.0 ppm = 50 mls / 0.50 mls HM Stock Solution
Samples (Water or Soil) = 2.0 ppm = 50 mls / 1.0 mls HM Stock Solution
High Purity Stock Solution (HM)- Lot # 1927522-500

3) HNO_3 Lot # 248841

4) Centrifuge Tube Lot # 191210-060

5) Balance ID: M1

Reviewed by [signature] *On* 8/19/20

Form 0: Sequence Log

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Filename	*Run Time*	*Sample ID*	*Matrix*	*QC Type*
001	8/26/2020 12:05:16 PM	Calibration Blank	Liquid	
002	8/26/2020 12:07:07 PM	Standard #1	Liquid	
003	8/26/2020 12:08:59 PM	Standard #2	Liquid	
004	8/26/2020 12:10:51 PM	Standard #3	Liquid	
005	8/26/2020 12:12:42 PM	Standard #4	Liquid	
006	8/26/2020 12:14:34 PM	Standard #5	Liquid	
007	8/26/2020 12:16:25 PM	Standard #6	Liquid	
008	8/26/2020 12:19:44 PM	Standard #7	Liquid	
009	8/26/2020 12:22:59 PM	Standard #8	Liquid	
010	8/26/2020 12:26:35 PM	ICV-5.0 ppb	Liquid	ICV
011	8/26/2020 12:29:24 PM	ICB	Liquid	ICB
012	8/26/2020 12:31:15 PM	CCV1-2.0 ppb	Liquid	CCV
013	8/26/2020 12:33:07 PM	CCB1	Liquid	CCB
014	8/26/2020 12:34:59 PM	BS-0.10	Liquid	BS
015	8/26/2020 12:36:49 PM	082620_1 LCS-2.0	Liquid	
016	8/26/2020 12:38:40 PM	082620_1 LCS-2.0	Liquid	
017	8/26/2020 12:42:25 PM	082620_1 LCS-2.0	Liquid	LCS
018	8/26/2020 12:44:16 PM	082620_1 LRB	Liquid	LRB
019	8/26/2020 12:46:02 PM	16695.01s	Liquid	S
020	8/26/2020 12:47:49 PM	16695.02s	Liquid	S
021	8/26/2020 12:49:36 PM	16695.03s	Liquid	S
022	8/26/2020 12:51:24 PM	16695.04s	Liquid	S
023	8/26/2020 12:53:13 PM	16695.05s	Liquid	S
024	8/26/2020 12:55:02 PM	16695.06s	Liquid	S
025	8/26/2020 12:56:49 PM	16712.01s	Liquid	S
026	8/26/2020 12:58:37 PM	16712.02s	Liquid	S
027	8/26/2020 1:00:25 PM	16712.03s	Liquid	S
028	8/26/2020 1:02:13 PM	16897.01s	Liquid	S
029	8/26/2020 1:05:55 PM	16897.01 MS-2.0	Liquid	MS
030	8/26/2020 1:07:43 PM	16897.01 MSD	Liquid	MSD
031	8/26/2020 1:09:34 PM	CCV2-2.0 ppb	Liquid	CCV
032	8/26/2020 1:11:26 PM	CCB2	Liquid	CCB
033	8/26/2020 1:13:15 PM	16712.04s	Liquid	S
034	8/26/2020 1:15:04 PM	16712.05s	Liquid	S
035	8/26/2020 1:16:51 PM	16735.01s	Liquid	S
036	8/26/2020 1:18:38 PM	16767.01s	Liquid	S
037	8/26/2020 1:20:26 PM	16768.01s	Liquid	S
038	8/26/2020 1:22:14 PM	16768.02s	Liquid	S
039	8/26/2020 1:24:02 PM	16768.03s	Liquid	S
040	8/26/2020 1:25:51 PM	16738.04s	Liquid	S
041	8/26/2020 1:27:40 PM	16738.05s	Liquid	S
042	8/26/2020 1:29:29 PM	16695.07s	Liquid	S
043	8/26/2020 1:31:16 PM	16695.07 MS-2.0	Liquid	MS
044	8/26/2020 1:33:03 PM	16695.07 MSD	Liquid	MSD
045	8/26/2020 1:34:54 PM	CCV3-2.0 ppb	Liquid	CCV
046	8/26/2020 1:36:46 PM	CCB3	Liquid	CCB
047	8/26/2020 1:38:37 PM	082620_2 LCS-2.0	Liquid	
048	8/26/2020 1:40:27 PM	082620_2 LRB	Liquid	
049	8/26/2020 1:42:15 PM	16866.01s	Liquid	
050	8/26/2020 1:44:04 PM	16867.01s	Liquid	
051	8/26/2020 1:45:52 PM	16868.01s	Liquid	
052	8/26/2020 1:47:42 PM	16796.06s	Liquid	
053	8/26/2020 1:51:08 PM	16738.06s	Liquid	
054	8/26/2020 1:52:56 PM	16738.05s	Liquid	
055	8/26/2020 1:54:44 PM	16738.05 MS-2.0	Liquid	
056	8/26/2020 1:56:32 PM	16738.05 MSD	Liquid	

Form 0: Sequence Log

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Filename	*Run Time*	*Sample ID*	*Matrix*	*QC Type*
057	8/26/2020 1:58:24 PM	CCV4-2.0 ppb	Liquid	
058	8/26/2020 2:00:15 PM	CCV4-2.0 ppb	Liquid	
059	8/26/2020 2:02:07 PM	CCB4	Liquid	

Form 1: Metals Analysis Data Sheet

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Lab Sample ID: S16695.01
Sample Tag: MW-1 L008009-01
Date Collected: 08/18/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7439-97-6	Mercury	Not detected	0.0002	0.000016	mg/L	1	08/26/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Lab Sample ID: S16695.02
Sample Tag: MW-2 L008009-02
Date Collected: 08/18/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7439-97-6	Mercury	Not detected	0.0002	0.000016	mg/L	1	08/26/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Lab Sample ID: S16695.03
Sample Tag: MW-4 L008009-03
Date Collected: 08/18/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7439-97-6	Mercury	Not detected	0.0002	0.000016	mg/L	1	08/26/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Lab Sample ID: S16695.04
Sample Tag: MW-5 L008009-04
Date Collected: 08/18/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7439-97-6	Mercury	Not detected	0.0002	0.000016	mg/L	1	08/26/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Lab Sample ID: S16695.05
Sample Tag: MW-6 L008009-05
Date Collected: 08/18/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7439-97-6	Mercury	Not detected	0.0002	0.000016	mg/L	1	08/26/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Lab Sample ID: S16695.06
Sample Tag: MW-4 Duplicate L008009-06
Date Collected: 08/18/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7439-97-6	Mercury	Not detected	0.0002	0.000016	mg/L	1	08/26/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Lab Sample ID: S16695.07
Sample Tag: Field Blank L008009-07
Date Collected: 08/18/2020
Matrix: Water

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7439-97-6	Mercury	Not detected	0.0002	0.000016	mg/L	1	08/26/2020	

Form 1: Metals Analysis Data Sheet - Flag Description Key

Data Set ID: HG2-HG3-20-0826A
Analysis Date: 08/26/20
Instrument ID: HG QuickTrace
Analyst: JRH

Note/Qualifier Key	
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
m	Duplicate injection precision not met
n	Spiked sample recovery outside control limits
s	Reported value determined by the MSA
u	Analyte not detected above reporting limit
A	TIC is a suspected aldol-condensation product
B	Compound also found in associated method blank
C	Analyte presence confirmed by GC/MS
D	Identified in an analysis at a secondary dilution factor
E	Concentration exceeds calibration range
J	Estimated value less than reporting limit, but greater than MDL
N	Presumptive evidence of TIC
P	Pesticide/Aroclor 2-column RPD exceeds limit
U	Analyte not detected above reporting limit
!	Result is outside of stated limit criteria
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
K	Elevated reporting limit due to low total solids
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
Q	Reported result represents most abundant aroclor
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
V	Accurate value not available due to presence of multiple aroclors
W	Surrogate result not applicable due to sample dilution
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
Z	Estimated result due to matrix interference
a	ASTM prep method F963-11
d	Duplicate analysis not within control limits
f	Filtered and preserved in lab
i	Incremental sampling
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one
r	This analyte is being reported as the best result from multiple
v	VOCs analyzed outside of holding time based on the measurement of
x	Preserved from bulk sample
c	Filtered in lab

Form 2A: Initial and Continuing Calibration Verification

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Sample Name	*QC Type*	*Dilute*	*Element*	*Sample Conc*	*Actual Conc*	*%Rec*	*LCL/UCL*	*Units*	*Matrix*
010 ICV-5.0 ppb	ICV	1.0	Hg	5.230	5.0	105	90/110	ug/L	Liquid
012 CCV1-2.0 ppb	CCV	1.0	Hg	2.017	2.0	101	90/110	ug/L	Liquid
031 CCV2-2.0 ppb	CCV	1.0	Hg	1.962	2.0	98	90/110	ug/L	Liquid
045 CCV3-2.0 ppb	CCV	1.0	Hg	1.927	2.0	96	90/110	ug/L	Liquid

Form 3: Blanks

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Sample Name	*QC Type*	*Dilute*	*Element*	*Sample Conc*	*Raw Conc*	*Units*	*Matrix*
011 ICB	ICB	1.0	Hg	<0.05	-0.0150	ug/L	Liquid
013 CCB1	CCB	1.0	Hg	<0.05	-0.0169	ug/L	Liquid
018 082620_1 LRB	LRB	1.0	Hg	<0.05	-0.0227	ug/L	Liquid
032 CCB2	CCB	1.0	Hg	<0.05	-0.0149	ug/L	Liquid
046 CCB3	CCB	1.0	Hg	<0.05	-0.0165	ug/L	Liquid

Form 5A: Matrix Spike Sample Recovery

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Spike Name	Sample Name	Dilute	Element	Spike Conc	Sample Conc	Spike Amount	%Rec	LCL/UCL	Units	Matrix
014 BS-0.10		1.0	Hg	0.093	ND	0.10	93	70/130	ug/L	Liquid
029 16897.01 MS-2.0	**028 16897.01s**	1.0	Hg	2.050	<0.2	2.0	103	80/120	ug/L	Liquid
043 16695.07 MS-2.0	**042 16695.07s**	1.0	Hg	2.125	<0.2	2.0	106	80/120	ug/L	Liquid

Form 5B: Matrix Spike Duplicate Evaluation

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Duplicate Name	*Sample Name*	*Dilute*	*Element*	*Dup Conc*	*Samp Conc*	*%RPD*	*LCL/UCL*	*Units*	*Matrix*
030 16897.01 MSD	**029 16897.01 MS-2.0**	1.0	Hg	2.039	2.050	1	0/20	ug/L	Liquid
044 16695.07 MSD	**043 16695.07 MS-2.0**	1.0	Hg	2.080	2.125	2	0/20	ug/L	Liquid

Form 7: Laboratory Control Sample

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Sample Name	Dilute	Element	Sample Conc	Actual Conc	%Rec	LCL/UCL	Units	Matrix
017 082620_1 LCS-2.0	1.0	Hg	2.100	2.0	105	85/115	ug/L	Liquid

Form 13: Analysis Run Log

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Filename	*Run Time*	*Matrix*	*Analytes*
001 Calibration Blank	8/26/2020 12:05:16 PM	Liquid	Hg
002 Standard #1	8/26/2020 12:07:07 PM	Liquid	Hg
003 Standard #2	8/26/2020 12:08:59 PM	Liquid	Hg
004 Standard #3	8/26/2020 12:10:51 PM	Liquid	Hg
005 Standard #4	8/26/2020 12:12:42 PM	Liquid	Hg
006 Standard #5	8/26/2020 12:14:34 PM	Liquid	Hg
007 Standard #6	8/26/2020 12:16:25 PM	Liquid	Hg
008 Standard #7	8/26/2020 12:19:44 PM	Liquid	Hg
009 Standard #8	8/26/2020 12:22:59 PM	Liquid	Hg
010 ICV-5.0 ppb	8/26/2020 12:26:35 PM	Liquid	Hg
011 ICB	8/26/2020 12:29:24 PM	Liquid	Hg
012 CCV1-2.0 ppb	8/26/2020 12:31:15 PM	Liquid	Hg
013 CCB1	8/26/2020 12:33:07 PM	Liquid	Hg
014 BS-0.10	8/26/2020 12:34:59 PM	Liquid	Hg
015 082620_1 LCS-2.0	8/26/2020 12:36:49 PM	Liquid	Hg
016 082620_1 LCS-2.0	8/26/2020 12:38:40 PM	Liquid	Hg
017 082620_1 LCS-2.0	8/26/2020 12:42:25 PM	Liquid	Hg
018 082620_1 LRB	8/26/2020 12:44:16 PM	Liquid	Hg
019 16695.01s	8/26/2020 12:46:02 PM	Liquid	Hg
020 16695.02s	8/26/2020 12:47:49 PM	Liquid	Hg
021 16695.03s	8/26/2020 12:49:36 PM	Liquid	Hg
022 16695.04s	8/26/2020 12:51:24 PM	Liquid	Hg
023 16695.05s	8/26/2020 12:53:13 PM	Liquid	Hg
024 16695.06s	8/26/2020 12:55:02 PM	Liquid	Hg
025 16712.01s	8/26/2020 12:56:49 PM	Liquid	Hg
026 16712.02s	8/26/2020 12:58:37 PM	Liquid	Hg
027 16712.03s	8/26/2020 1:00:25 PM	Liquid	Hg
028 16897.01s	8/26/2020 1:02:13 PM	Liquid	Hg
029 16897.01 MS-2.0	8/26/2020 1:05:55 PM	Liquid	Hg
030 16897.01 MSD	8/26/2020 1:07:43 PM	Liquid	Hg
031 CCV2-2.0 ppb	8/26/2020 1:09:34 PM	Liquid	Hg
032 CCB2	8/26/2020 1:11:26 PM	Liquid	Hg
033 16712.04s	8/26/2020 1:13:15 PM	Liquid	Hg
034 16712.05s	8/26/2020 1:15:04 PM	Liquid	Hg
035 16735.01s	8/26/2020 1:16:51 PM	Liquid	Hg
036 16767.01s	8/26/2020 1:18:38 PM	Liquid	Hg
037 16768.01s	8/26/2020 1:20:26 PM	Liquid	Hg
038 16768.02s	8/26/2020 1:22:14 PM	Liquid	Hg
039 16768.03s	8/26/2020 1:24:02 PM	Liquid	Hg
040 16738.04s	8/26/2020 1:25:51 PM	Liquid	Hg
041 16738.05s	8/26/2020 1:27:40 PM	Liquid	Hg
042 16695.07s	8/26/2020 1:29:29 PM	Liquid	Hg
043 16695.07 MS-2.0	8/26/2020 1:31:16 PM	Liquid	Hg
044 16695.07 MSD	8/26/2020 1:33:03 PM	Liquid	Hg
045 CCV3-2.0 ppb	8/26/2020 1:34:54 PM	Liquid	Hg
046 CCB3	8/26/2020 1:36:46 PM	Liquid	Hg
047 082620_2 LCS-2.0	8/26/2020 1:38:37 PM	Liquid	Hg
048 082620_2 LRB	8/26/2020 1:40:27 PM	Liquid	Hg
049 16866.01s	8/26/2020 1:42:15 PM	Liquid	Hg
050 16867.01s	8/26/2020 1:44:04 PM	Liquid	Hg
051 16868.01s	8/26/2020 1:45:52 PM	Liquid	Hg
052 16796.06s	8/26/2020 1:47:42 PM	Liquid	Hg
053 16738.06s	8/26/2020 1:51:08 PM	Liquid	Hg
054 16738.05s	8/26/2020 1:52:56 PM	Liquid	Hg
055 16738.05 MS-2.0	8/26/2020 1:54:44 PM	Liquid	Hg
056 16738.05 MSD	8/26/2020 1:56:32 PM	Liquid	Hg

Form 13: Analysis Run Log

Data Set ID: HG2-HG3-20-0826A
Instrument ID: HG QuickTrace
Analysis Date: 08/26/20
Analyst: JRH

Filename	*Run Time*	*Matrix*	*Analytes*
057 CCV4-2.0 ppb	8/26/2020 1:58:24 PM	Liquid	Hg
058 CCV4-2.0 ppb	8/26/2020 2:00:15 PM	Liquid	Hg
059 CCB4	8/26/2020 2:02:07 PM	Liquid	Hg

Data Set: HG2-HG3-20-0826A
Run Date: 08/26/20

Mercury Summary Report

Analyst: JRH
Instrument: HG QuickTrace

Element	Seq #	Acquisition Time	Sample Name	Peak	Concentration	Units	Matrix	Dilution	Sample Wt.	Sample Vol.
Hg	001	8/26/2020 12:05:16 PM	Calibration Blank	145.0000	0.0000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	002	8/26/2020 12:07:07 PM	Standard #1	1498.0000	0.1000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	003	8/26/2020 12:08:59 PM	Standard #2	2721.0000	0.2000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	004	8/26/2020 12:10:51 PM	Standard #3	6685.0000	0.5000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	005	8/26/2020 12:12:42 PM	Standard #4	13290.0000	1.0000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	006	8/26/2020 12:14:34 PM	Standard #5	25840.0000	2.0000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	007	8/26/2020 12:16:25 PM	Standard #6	76640.0000	6.0000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	008	8/26/2020 12:19:44 PM	Standard #7	101300.0000	8.0000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	009	8/26/2020 12:22:59 PM	Standard #8	127600.0000	10.0000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	010	8/26/2020 12:26:35 PM	ICV-5.0 ppb	66710.0000	5.2300	ug/L	Liquid	1.0	1.0000	1.0000
Hg	011	8/26/2020 12:29:24 PM	ICB	112.1000	-0.0150	ug/L	Liquid	1.0	1.0000	1.0000
Hg	012	8/26/2020 12:31:15 PM	CCV1-2.0 ppb	25910.0000	2.0170	ug/L	Liquid	1.0	1.0000	1.0000
Hg	013	8/26/2020 12:33:07 PM	CCB1	87.8000	-0.0169	ug/L	Liquid	1.0	1.0000	1.0000
Hg	014	8/26/2020 12:34:59 PM	BS-0.10	1481.0000	0.0928	ug/L	Liquid	1.0	1.0000	1.0000
Hg	015	8/26/2020 12:36:49 PM	082620_1 LCS-2.0	2356.0000	0.1618	ug/L	Liquid	1.0	1.0000	1.0000
Hg	016	8/26/2020 12:38:40 PM	082620_1 LCS-2.0	2369.0000	0.1627	ug/L	Liquid	1.0	1.0000	1.0000
Hg	017	8/26/2020 12:42:25 PM	082620_1 LCS-2.0	26970.0000	2.1000	ug/L	Liquid	1.0	1.0000	1.0000
Hg	018	8/26/2020 12:44:16 PM	082620_1 LRB	14.2700	-0.0227	ug/L	Liquid	1.0	1.0000	1.0000
Hg	019	8/26/2020 12:46:02 PM	16695.01s	104.3000	-0.0156	ug/L	Liquid	1.0	1.0000	1.0000
Hg	020	8/26/2020 12:47:49 PM	16695.02s	155.9000	-0.0115	ug/L	Liquid	1.0	1.0000	1.0000
Hg	021	8/26/2020 12:49:36 PM	16695.03s	184.0000	-0.0093	ug/L	Liquid	1.0	1.0000	1.0000
Hg	022	8/26/2020 12:51:24 PM	16695.04s	308.3000	0.0005	ug/L	Liquid	1.0	1.0000	1.0000
Hg	023	8/26/2020 12:53:13 PM	16695.05s	134.5000	-0.0132	ug/L	Liquid	1.0	1.0000	1.0000
Hg	024	8/26/2020 12:55:02 PM	16695.06s	93.5400	-0.0165	ug/L	Liquid	1.0	1.0000	1.0000
Hg	031	8/26/2020 1:09:34 PM	CCV2-2.0 ppb	25220.0000	1.9620	ug/L	Liquid	1.0	1.0000	1.0000
Hg	032	8/26/2020 1:11:26 PM	CCB2	113.3000	-0.0149	ug/L	Liquid	1.0	1.0000	1.0000
Hg	042	8/26/2020 1:29:29 PM	16695.07s	82.3100	-0.0173	ug/L	Liquid	1.0	1.0000	1.0000
Hg	043	8/26/2020 1:31:16 PM	16695.07 MS-2.0	27280.0000	2.1250	ug/L	Liquid	1.0	1.0000	1.0000
Hg	044	8/26/2020 1:33:03 PM	16695.07 MSD	26710.0000	2.0800	ug/L	Liquid	1.0	1.0000	1.0000
Hg	045	8/26/2020 1:34:54 PM	CCV3-2.0 ppb	24770.0000	1.9270	ug/L	Liquid	1.0	1.0000	1.0000
Hg	046	8/26/2020 1:36:46 PM	CCB3	93.0000	-0.0165	ug/L	Liquid	1.0	1.0000	1.0000

Mercury Digestion
Method # 245.1, 7471B, 7470A (OHIO VAP)

TIME START: 940
TIME FINISH: 1140
PREP BATCH: HGD-082620-1
BALANCE ID: M4

Beginning block #1 95 °C End block #1 95 °C ID # HB1SS 05
Beginning block #2 ____ °C End block #2 ____ °C ID # ____
Beginning block #3 ____ °C End block #3 ____ °C ID # ____

DATE 8/26/20
ANALYST [illegible]
REVIEWED BY CCM
REVIEW DATE 8-27-20

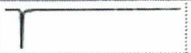
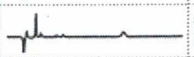
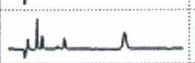
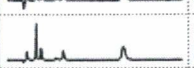
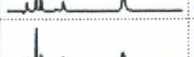
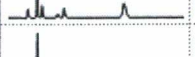
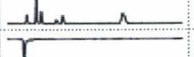
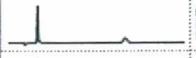
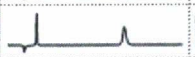
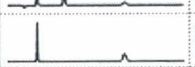
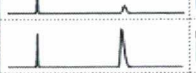
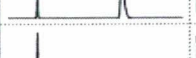
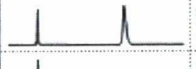
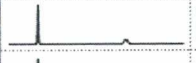
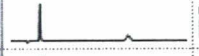
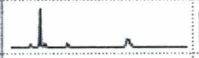
SAMPLE#	BTL ID	SAMPLE AMOUNT GRAMS (g)	%TOT. SOLIDS	DRY SAMPLE WT.	DILUTION FACTOR	FINAL VOLUME	REMARKS
LCS 082620-1	------	25	--------	----------	1	25g	
LRB 082620-1	------		--------	----------		25g	
16695.01							
02							
03							
04							
05							
06							
07							
07 MS							
07 MSD							
16712.01							
02							
03							
04							
05							
16735.01							
16767.01							
16768.01							
02							
03							
04							
05							
16897.01							
01 MS							
01 MSD							

NOTES: 1) Spike values (unless otherwise stated):
2.0 ppb for LCS: 0.50 ml of HPS solution, 2.0 ppb for liquid samples: 0.50 ml of HPS solution & 0.002 ppm for solid samples: 0.50 ml of HPS solution (Date Prepared 8/19/20 Exp 9/2/20)
Centrifuge Tube Lot # 191210-060
HNO_3 Lot # 248841
H_2SO_4 Lot # 231834

Pipet Calibration:

Test #	Pipet Volume Setting mL	Wt. of water from pipet, g	Notes
1	0.500	0.503	
2		0.502	
3		0.504	

ICS-1100 A Dionex CC / Meth 300.0 **082020**

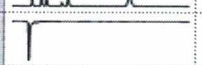
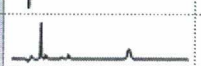
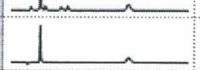
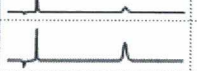
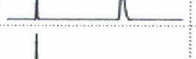
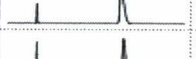
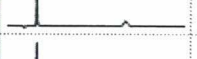
#	ECD_1	Name	Type	Level	Positio	Instrument Method	Processing Method	Status	Inject Time	Weight
1		water blank	Unknown		1	Norm Method	Anion	Finished	7/7/2020 9:56:15 AM -...	1.0000
2		1131Cal1	Calibration Standard	01	2	Norm Method	Anion	Finished	7/7/2020 10:08:32 AM...	1.0000
3		1131Cal2	Calibration Standard	02	3	Norm Method	Anion	Finished	7/7/2020 10:21:21 AM...	1.0000
4		1131Cal3	Calibration Standard	03	4	Norm Method	Anion	Finished	7/7/2020 10:34:09 AM...	1.0000
5		1131Cal4	Calibration Standard	04	5	Norm Method	Anion	Finished	7/7/2020 10:46:58 AM...	1.0000
6		1131Cal5	Calibration Standard	05	6	Norm Method	Anion	Finished	7/7/2020 10:59:49 AM...	1.0000
7		Blank	Unknown		1	Norm Method	Anion	Finished	8/20/2020 8:48:24 AM...	1.0000
8		BSpike 11738BS1	Check Standard		2	Norm Method	Anion	Finished	8/20/2020 9:00:41 AM...	1.0000
9		LCS 11738LCS1	Check Standard		3	Norm Method	Anion	Finished	8/20/2020 9:13:29 AM...	1.0000
10		16750.01	Unknown		4	Norm Method	Anion	Finished	8/20/2020 9:26:18 AM...	1.0000
11		16750.02	Unknown		5	Norm Method	Anion	Finished	8/20/2020 9:39:06 AM...	1.0000
12		16750.03	Unknown		6	Norm Method	Anion	Finished	8/20/2020 9:51:58 AM...	1.0000
13		16750.04	Unknown		7	Norm Method	Anion	Finished	8/20/2020 10:04:47 A...	1.0000
14		16695.01	Unknown		8	Norm Method	Anion	Finished	8/20/2020 10:17:36 A...	1.0000
15		16695.02	Unknown		9	Norm Method	Anion	Finished	8/20/2020 10:30:24 A...	1.0000
16		16695.03	Unknown		10	Norm Method	Anion	Finished	8/20/2020 10:43:13 A...	1.0000
17		16695.04	Unknown		11	Norm Method	Anion	Finished	8/20/2020 10:56:01 A...	1.0000
18		16695.05	Unknown		12	Norm Method	Anion	Finished	8/20/2020 11:08:50 A...	1.0000
19		16695.06	Unknown		13	Norm Method	Anion	Finished	8/20/2020 11:21:38 A...	1.0000
20		16750.01 dup	Unknown		14	Norm Method	Anion	Finished	8/20/2020 11:34:27 A...	1.0000
21		16750.01 MS 13060...	Unknown		15	Norm Method	Anion	Finished	8/20/2020 11:47:15 A...	1.0000
22		16750.01 MSD 1306...	Unknown		16	Norm Method	Anion	Finished	8/20/2020 12:00:04 P...	1.0000
23		BSpike 11738BS1	Check Standard		17	Norm Method	Anion	Finished	8/20/2020 12:12:52 P...	1.0000
24		16695.07	Unknown		18	Norm Method	Anion	Finished	8/20/2020 12:25:41 P...	1.0000

FL200820-WL-A CL200820-WL-A NTRA200820-WL-A

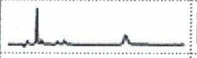
CAL IS# ICSA070720CAL

NTNI200820-WL-A

082020

#	ECD_1	Dilution	IntStd	Replicate ID	Comment	Spike Grou
1		1.0000	1.0000		Jeff Phifer	
2		1.0000	1.0000		Jeff Phifer	
3		1.0000	1.0000		Jeff Phifer	
4		1.0000	1.0000		Jeff Phifer	
5		1.0000	1.0000		Jeff Phifer	
6		1.0000	1.0000		Jeff Phifer	
7		1.0000	1.0000		Jeff Phifer	
8		1.0000	1.0000		Jeff Phifer	
9		1.0000	1.0000		Jeff Phifer	
10		5.0000	1.0000		Jeff Phifer	
11		5.0000	1.0000		Jeff Phifer	
12		5.0000	1.0000		Jeff Phifer	
13		5.0000	1.0000		Jeff Phifer	
14		5.0000	1.0000		Jeff Phifer	
15		5.0000	1.0000		Jeff Phifer	
16		5.0000	1.0000		Jeff Phifer	
17		5.0000	1.0000		Jeff Phifer	
18		5.0000	1.0000		Jeff Phifer	
19		5.0000	1.0000		Jeff Phifer	
20		5.0000	1.0000		Jeff Phifer	
21		1.0000	1.0000		Jeff Phifer	
22		1.0000	1.0000		Jeff Phifer	
23		1.0000	1.0000		Jeff Phifer	
24		2.5000	1.0000		Jeff Phifer	

082020

#	ECD_1	Name	Type	Level	Positio	Instrument Method	Processing Method	Status	Inject Time	Weight
25		16750.04 dup	Unknown		19	Norm Method	Anion	Finished	8/20/2020 12:38:30 P...	1.0000
26		BSpike 11738BS1	Check Standard		20	Norm Method	Anion	Finished	8/20/2020 12:51:18 P...	1.0000
27	Loading...	Blank	Unknown		21	Norm Method	Anion	Finished	8/20/2020 1:04:07 PM...	1.0000
	Click here to add a new injection									

082020

#	ECD_1	Dilution	IntStd	Replicate ID	Comment	Spike Grou
25		5.0000	1.0000		Jeff Phifer	
26		1.0000	1.0000		Jeff Phifer	
27	Loading...	1.0000	1.0000		Jeff Phifer	
	Click here to add a new injection					

Norm Method	03/08/11 13:39	Jeff Phifer	**Method 300.0**	
Stage	Time	Command	Value	Comment
	min			
Instrument Setup				
	initial			
		Sampler.HomeNeedle		
		Sampler.ResetVials	1, 50	
		Pump_ECD.Pressure.UpperLimit	4500 [psi]	
		Sampler.DelayVolume	125 [µl]	
		Pump_ECD.%A.Equate	"Carb - BiCarb"	
		Pump_ECD.Pressure.LowerLimit	100 [psi]	
		Pump_ECD.CellTemperature.Nominal	35.0 [°C]	
		Pump_ECD.Data_Collection_Rate	5.0 [Hz]	
		Pump_ECD.Suppressor_Type	ASRS_4mm	
		Pump_ECD.Suppressor_Carbonate	1.8 [mM]	
		Pump_ECD.Suppressor_Bicarbonate	1.7 [mM]	
		Pump_ECD.Suppressor_Hydroxide	0.0 [mM]	
		Pump_ECD.Suppressor_Tetraborate	0.0 [mM]	
		Pump_ECD.Suppressor_OtherEluent	0.0 [mN]	
		Pump_ECD.Suppressor_RecommendedCurrent	27 [mA]	
		Pump_ECD.Suppressor_Current	27 [mA]	
		Sampler.FlushFactor	10	
		Sampler.DeliverSpeed	4.0 [ml/min]	
		Pump_ECD.Flow	2.00	
		Sampler.LoadPosition		
		Sampler.DeliverSample	Full	
		Sampler.EndSamplePrep		
Inject				
	0.000			
		Wait	Sampler.CycleTimeState, Hold,	
		Sampler.Inject		
Start Run				
	0.000			
		Pump_ECD.Channel_Pressure.AcqOn		
		Pump_ECD.Autozero		
		Pump_ECD.ECD_1.AcqOn		
		Pump_ECD.ECD_Total.AcqOn		
Run			Duration = 10.000 [min]	
	0.000			
	0.500			
		Sampler.BeginOverlap		
Stop Run				
	10.000			
		Pump_ECD.Channel_Pressure.AcqOff		
		Pump_ECD.ECD_1.AcqOff		
		Pump_ECD.ECD_Total.AcqOff		
End				

8.20.20

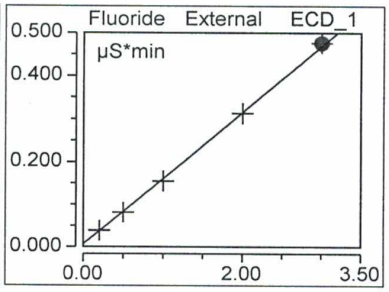
Calibration Batch Report
CAL ID# ICSA070720CAL

Sequence:	082020	*Injection Volu.*	2,500.00
Instrument Method:	Norm Method	*Operator:*	Jeff Phifer
Inj. Date / Time:	07-Jul-2020 / 10:59	*Column:*	AS4A-SC 038777

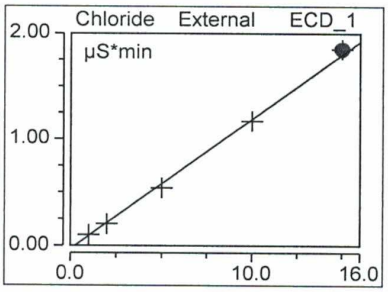
Calibration Summary

Peak Name	Eval.Type	Cal.Type	Window Width min	Offset (C0)	Slope (C1)	Curve (C2)	Corr.Coeff.
Fluoride	Area	Lin, WithOffset, 1/A	0.01	0.006	0.154	0.000	0.9996
Chloride	Area	Lin, WithOffset, 1/A	0.02	-0.031	0.122	0.000	0.9988
Nitrite	Area	Lin, WithOffset, 1/A	0.03	-0.003	0.227	0.000	0.9996
Bromide	Area	Lin, WithOffset, 1/A	0.05	-0.001	0.044	0.000	0.9998
Nitrate	Area	Lin, WithOffset, 1/A	0.07	-0.001	0.263	0.000	0.9996
Sulfate	Area	Lin, WithOffset, 1/A	0.33	-0.002	0.080	0.000	0.9996
		AVERAGE:		-0.0052	0.1482	0.0000	0.9995

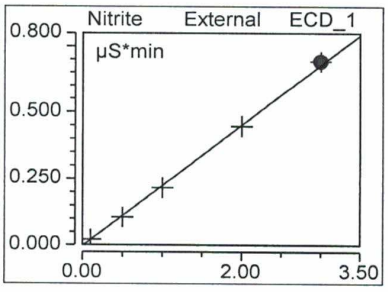
Injection Name / **Fluoride**	Ret.Time min Fluoride	Area µS*min Fluoride	Height µS Fluoride	Amount Fluoride
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	1.114	0.0387	0.521	0.210
1131Cal2	1.114	0.0816	1.223	0.488
1131Cal3	1.114	0.1551	2.427	0.966
1131Cal4	1.114	0.3125	5.047	1.987
1131Cal5	1.114	0.4761	7.811	3.049
Average	1.114			
Rel. Std. Dev.	0.013 %			



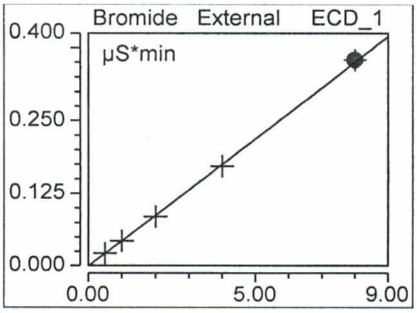
Injection Name / **Chloride**	Ret.Time min Chloride	Area µS*min Chloride	Height µS Chloride	Amount Chloride
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	1.637	0.1013	1.651	1.089
1131Cal2	1.638	0.2015	3.302	1.912
1131Cal3	1.641	0.5404	9.060	4.694
1131Cal4	1.644	1.1707	19.722	9.867
1131Cal5	1.647	1.8494	30.847	15.438
Average	1.641			
Rel. Std. Dev.	0.262 %			



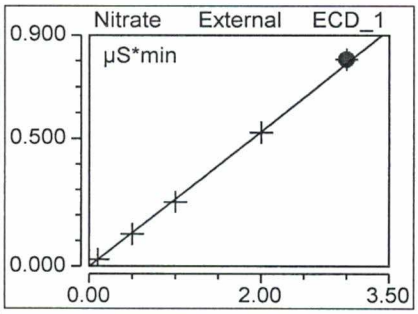
Injection Name / **Nitrite**	Ret.Time min Nitrite	Area µS*min Nitrite	Height µS Nitrite	Amount Nitrite
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	1.927	0.0213	0.296	0.106
1131Cal2	1.924	0.1057	1.494	0.479
1131Cal3	1.924	0.2162	3.083	0.966
1131Cal4	1.924	0.4469	6.494	1.984
1131Cal5	1.924	0.6920	10.161	3.065
Average	1.925			
Rel. Std. Dev.	0.075 %			



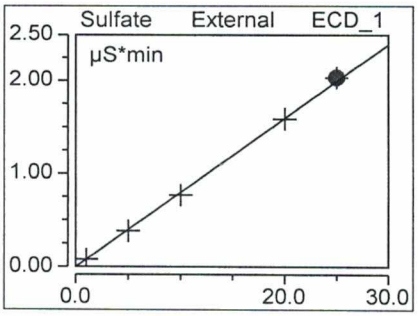
Injection Name **Bromide**	Ret.Time min Bromide	Area µS*min Bromide	Height µS Bromide	Amount Bromide
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	2.827	0.0217	0.250	0.511
1131Cal2	2.821	0.0433	0.489	1.003
1131Cal3	2.818	0.0852	0.977	1.960
1131Cal4	2.807	0.1717	1.992	3.934
1131Cal5	2.801	0.3540	4.145	8.093
Average	2.815			
Rel. Std. Dev.	0.380 %			



Injection Name **Nitrate**	Ret.Time min Nitrate	Area µS*min Nitrate	Height µS Nitrate	Amount Nitrate
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	3.191	0.0271	0.268	0.106
1131Cal2	3.181	0.1260	1.252	0.482
1131Cal3	3.168	0.2515	2.511	0.959
1131Cal4	3.151	0.5229	5.181	1.990
1131Cal5	3.134	0.8054	7.979	3.063
Average	3.165			
Rel. Std. Dev.	0.721 %			



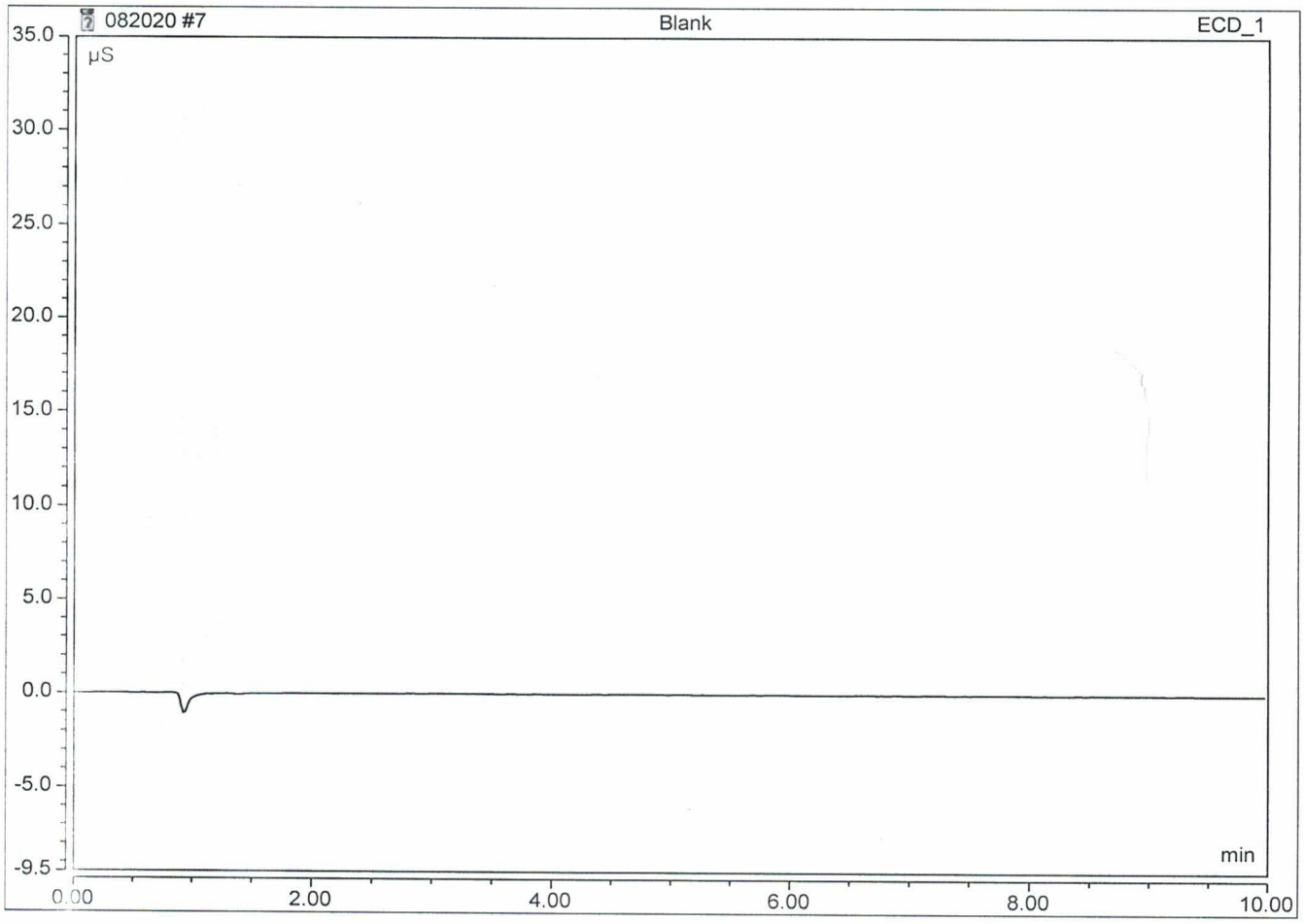
Injection Name **Sulfate**	Ret.Time min Sulfate	Area µS*min Sulfate	Height µS Sulfate	Amount Sulfate
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	6.617	0.0815	0.364	1.050
1131Cal2	6.608	0.3828	1.734	4.832
1131Cal3	6.594	0.7678	3.517	9.664
1131Cal4	6.571	1.5858	7.313	19.933
1131Cal5	6.557	2.0310	9.317	25.521
Average	6.589			
Rel. Std. Dev.	0.380 %			



Peak Integration Report

Sample Name:	**Blank**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 08:48**	*Operator:*	**Jeff Phifer**

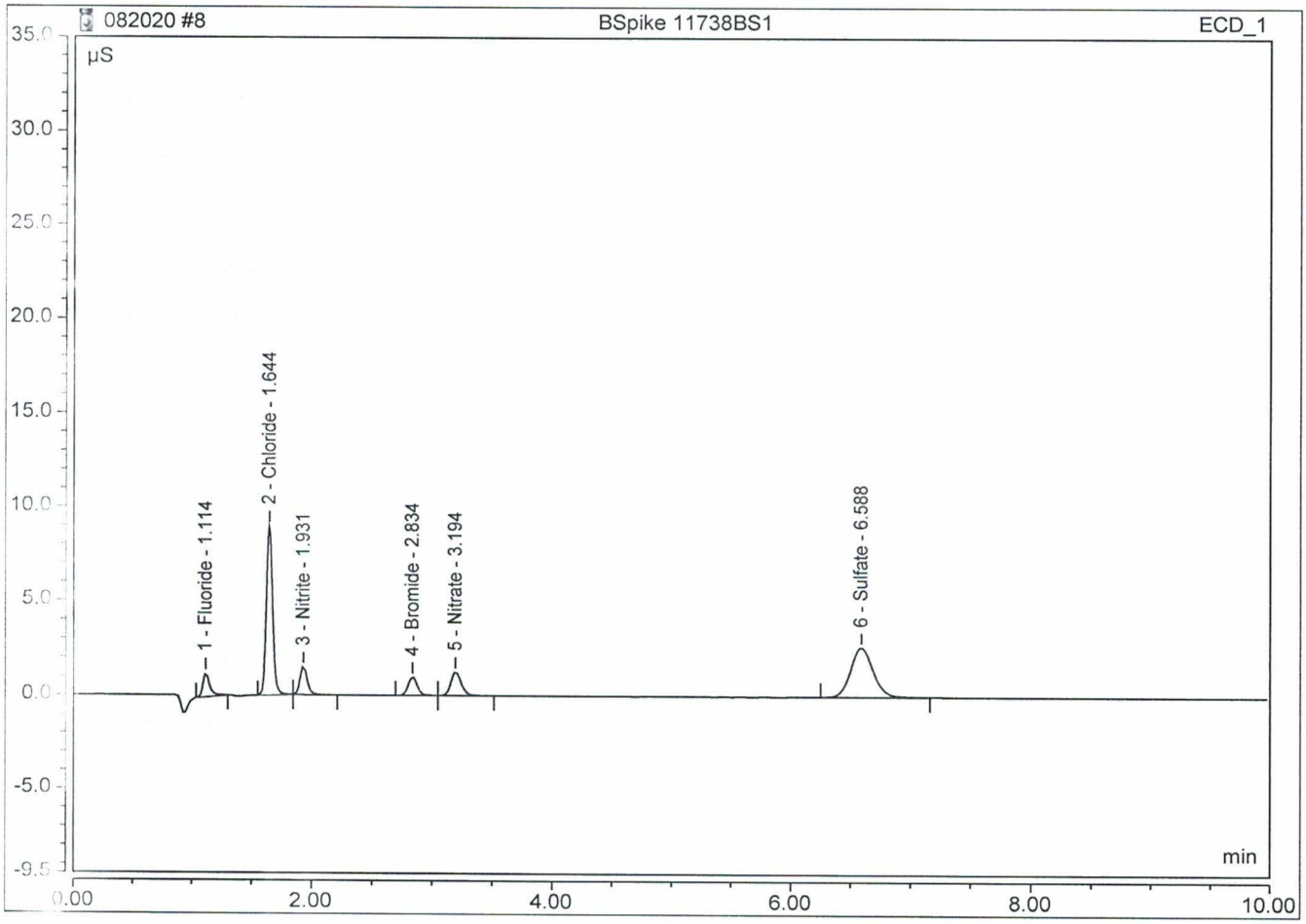
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
TOTAL:				0.00	0.00	0.00



Peak Integration Report

Sample Name:	**BSpike 11738BS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 09:00**	*Operator:*	**Jeff Phifer**

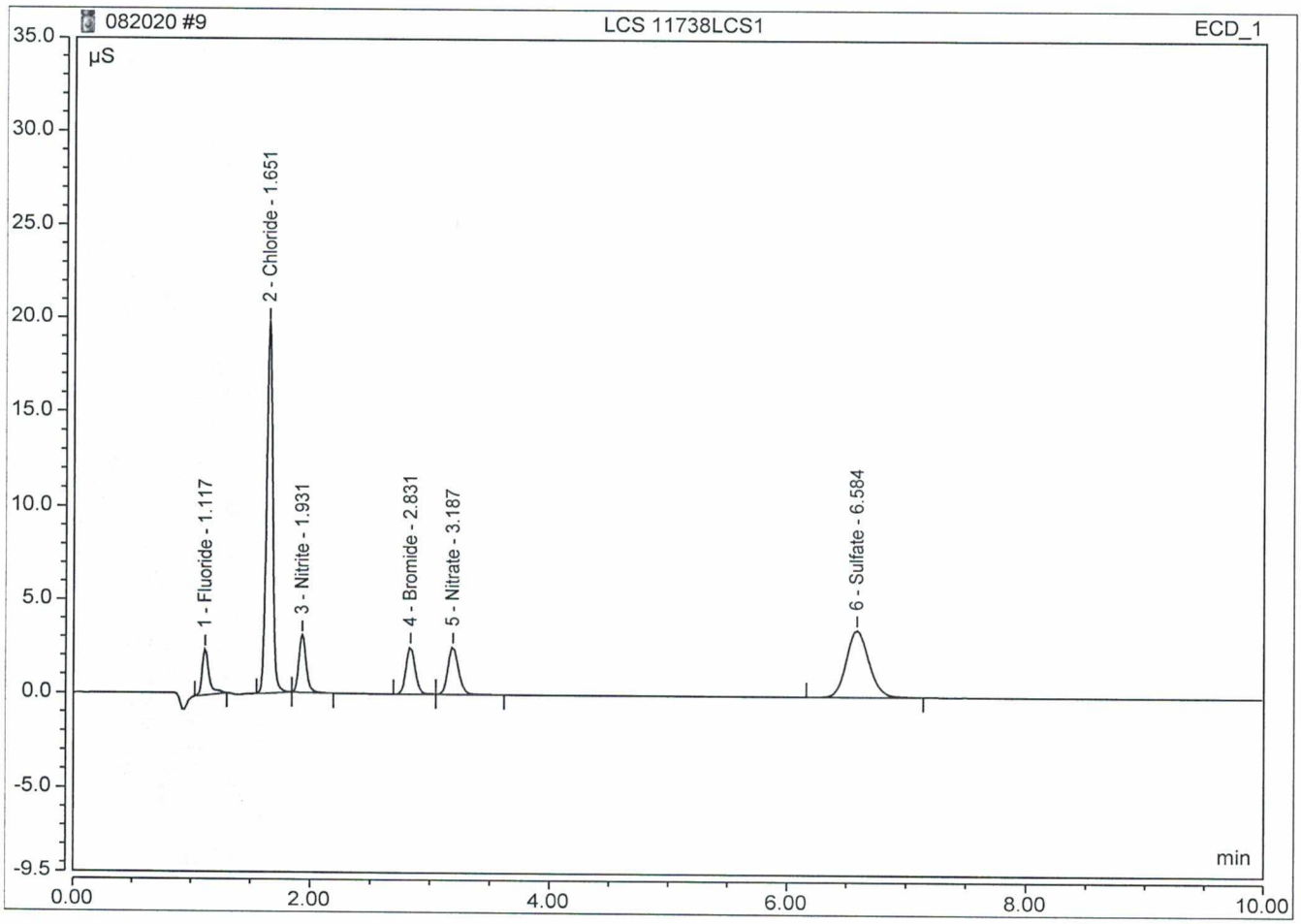
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L		
1	1.11	Fluoride	BMB	0.085	1.267	0.5	0.5095	102%
2	1.64	Chloride	BMB	0.545	8.988	5	4.7317	94%
3	1.93	Nitrite	BMB	0.106	1.484	0.5	0.4796	96%
4	2.83	Bromide	BMB	0.088	0.986		2.0143	
5	3.19	Nitrate	BMB	0.127	1.260	0.5	0.4870	98%
6	6.59	Sulfate	BMB	0.571	2.619	7.5	7.1979	96%
TOTAL:				1.52	16.60		15.42	



Peak Integration Report

Sample Name:	**LCS 11738LCS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 09:13**	*Operator:*	**Jeff Phifer**

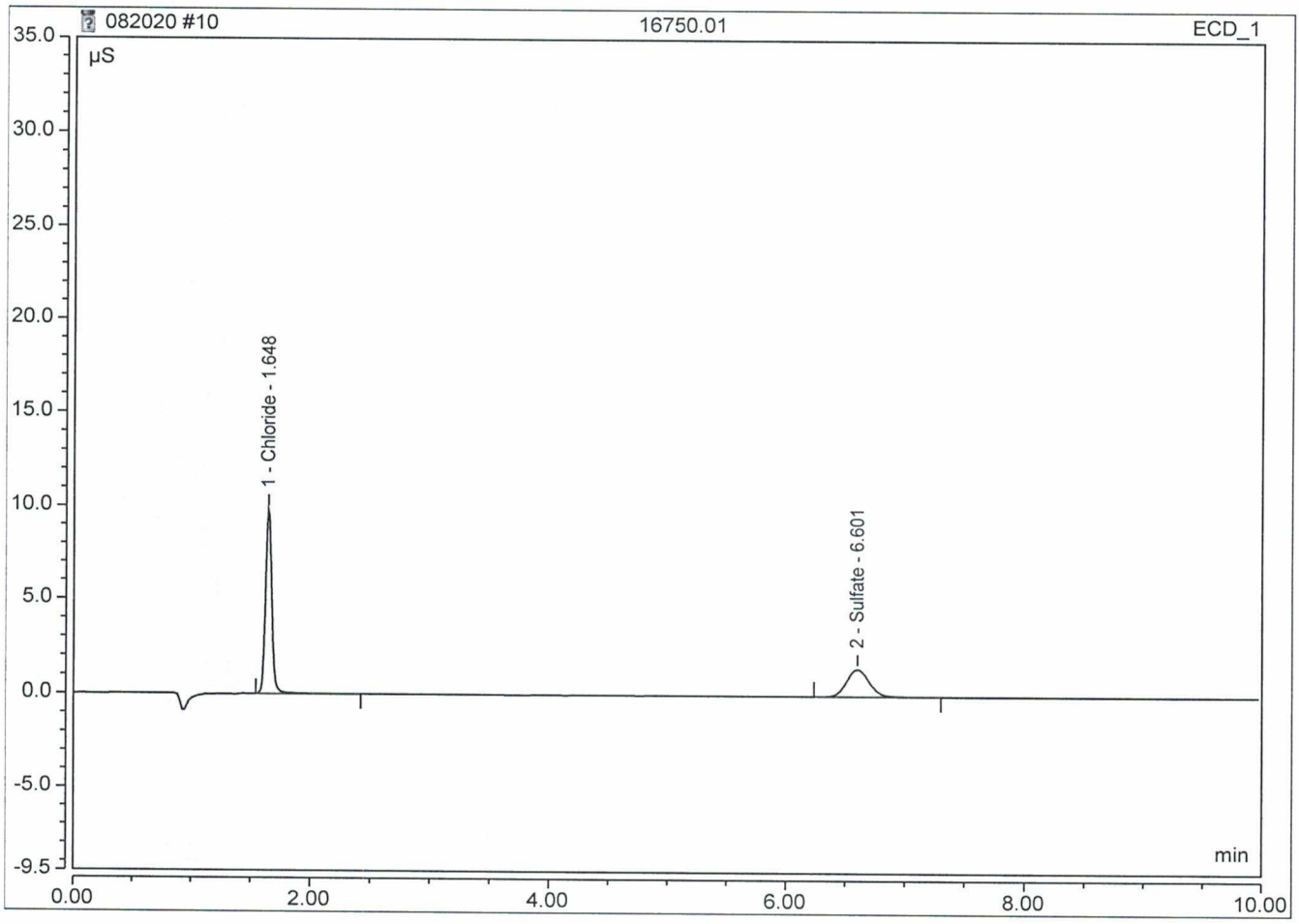
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L	
1	1.12	Fluoride	BMB	0.160	2.416	1 0.9956	100%
2	1.65	Chloride	BMB	1.184	19.736	10 9.9757	100%
3	1.93	Nitrite	BMB	0.215	3.058	1 0.9610	96%
4	2.83	Bromide	BMB	0.220	2.495	5.0262	
5	3.19	Nitrate	BMB	0.254	2.509	1 0.9694	97%
6	6.58	Sulfate	BMB	0.773	3.548	10 9.7279	97%
TOTAL:				2.81	33.76	27.66	



Peak Integration Report

Sample Name:	**16750.01**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 09:26**	*Operator:*	**Jeff Phifer**

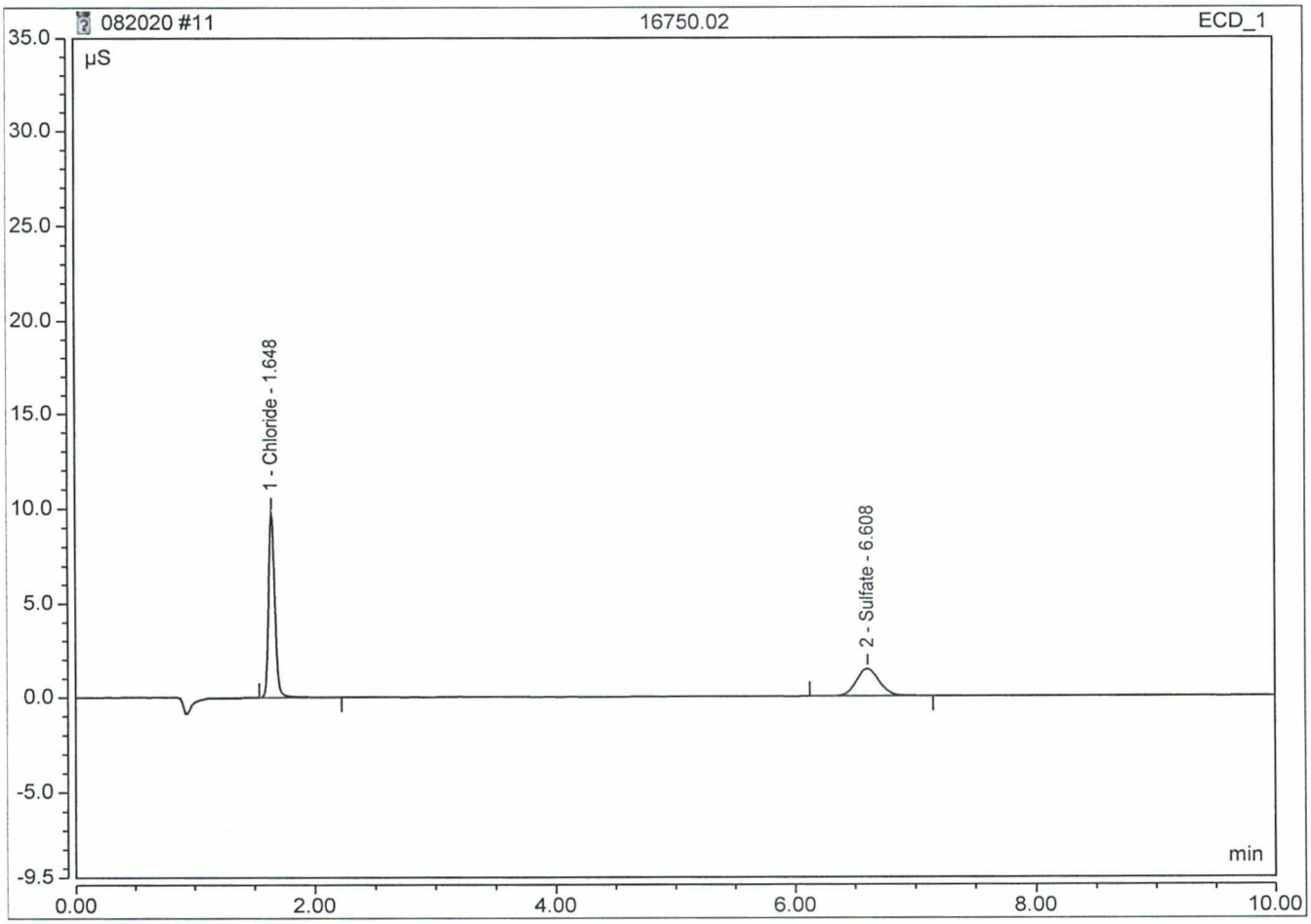
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.65	Chloride	BMB	0.606	9.867	26.1621
2	6.60	Sulfate	BMB	0.319	1.444	20.1389
TOTAL:				0.92	11.31	46.30



Peak Integration Report

Sample Name:	**16750.02**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 09:39**	*Operator:*	**Jeff Phifer**

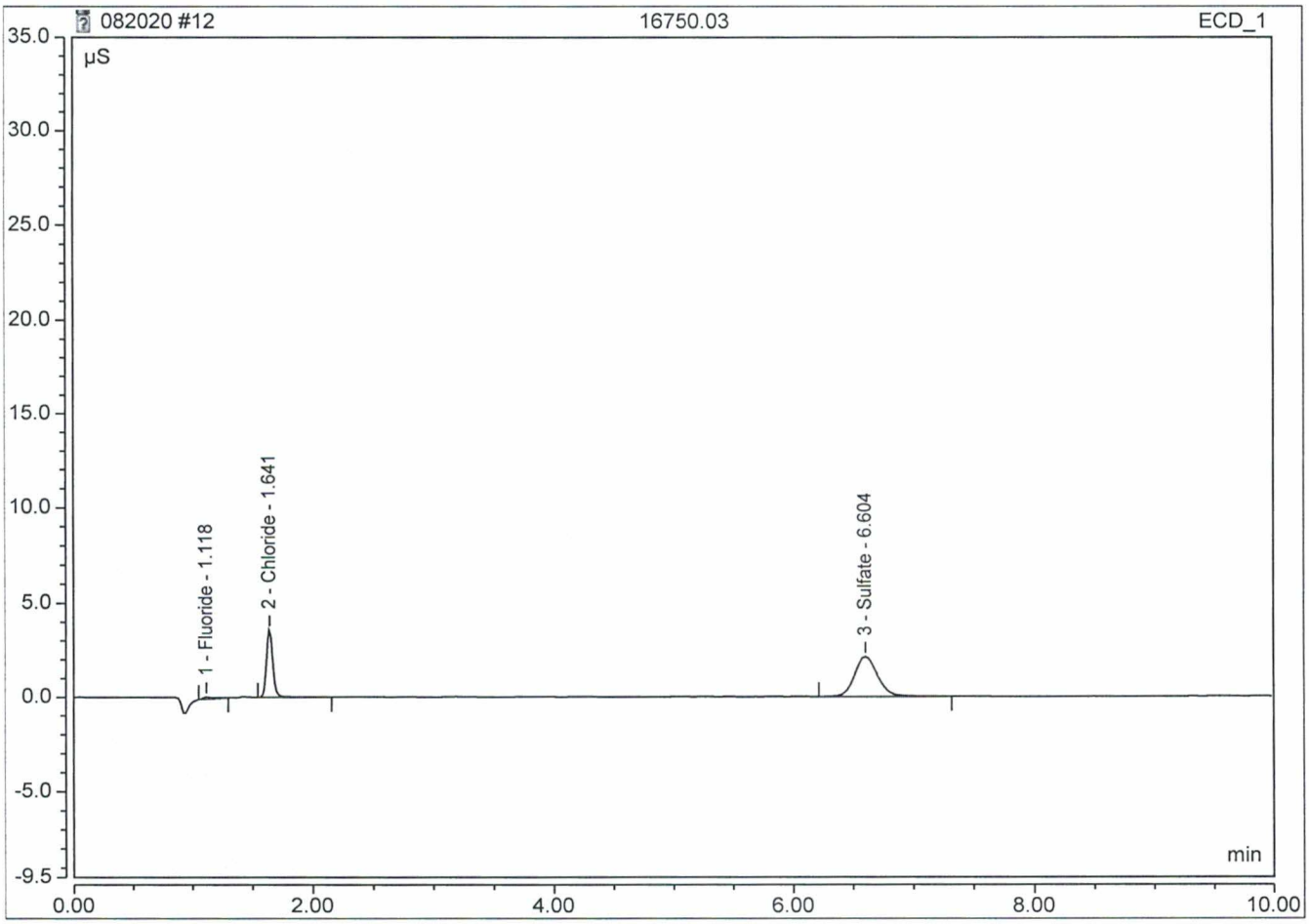
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.65	**Chloride**	BMB	0.600	9.810	25.9152
2	6.61	**Sulfate**	BMB	0.320	1.458	20.2473
TOTAL:				0.92	11.27	46.16



Peak Integration Report

Sample Name:	**16750.03**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 09:51**	*Operator:*	**Jeff Phifer**

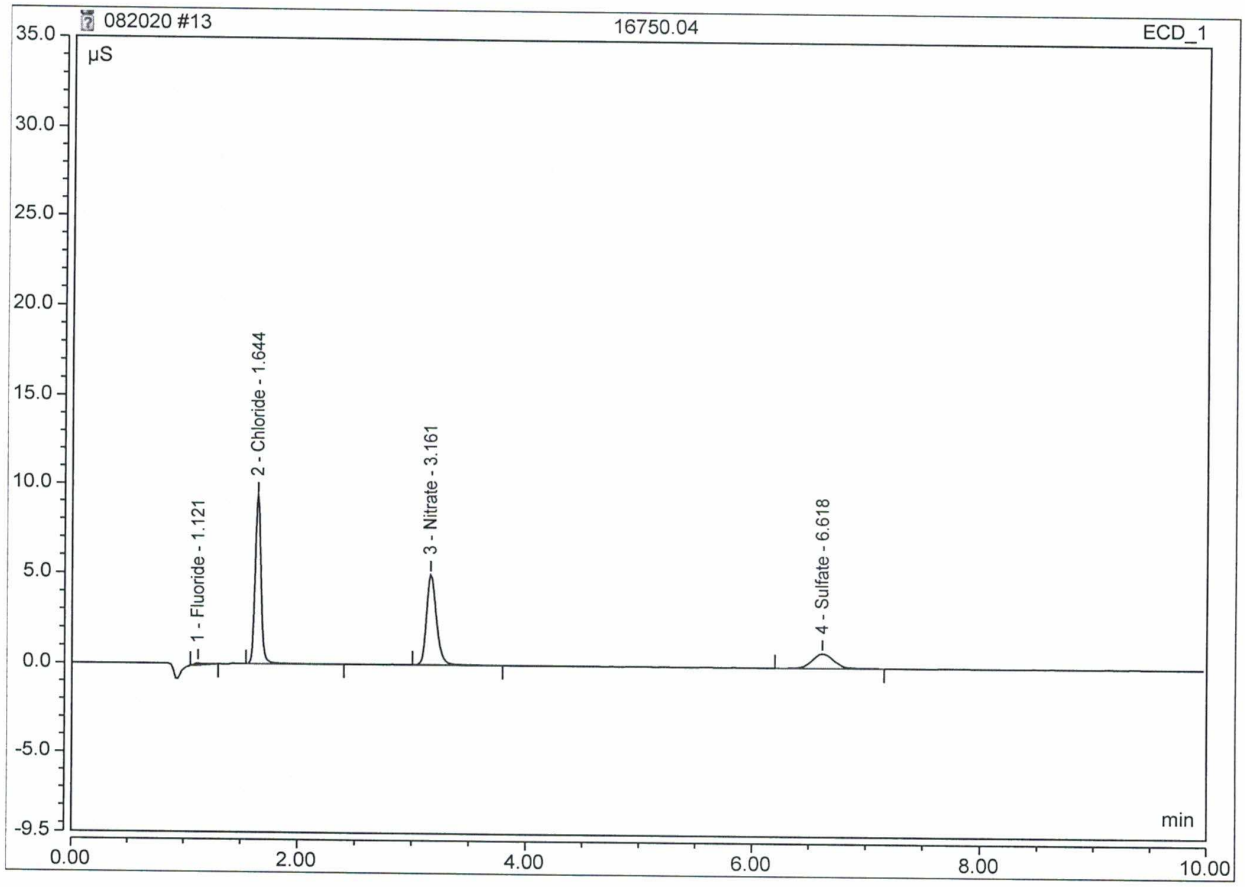
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.12	**Fluoride**	BMB	0.011	0.118	0.1610
2	1.64	**Chloride**	BMB	0.222	3.588	10.4025
3	6.60	**Sulfate**	BMB	0.470	2.136	29.6048
TOTAL:				0.70	5.84	40.17



Peak Integration Report

Sample Name:	**16750.04**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 10:04**	*Operator:*	**Jeff Phifer**

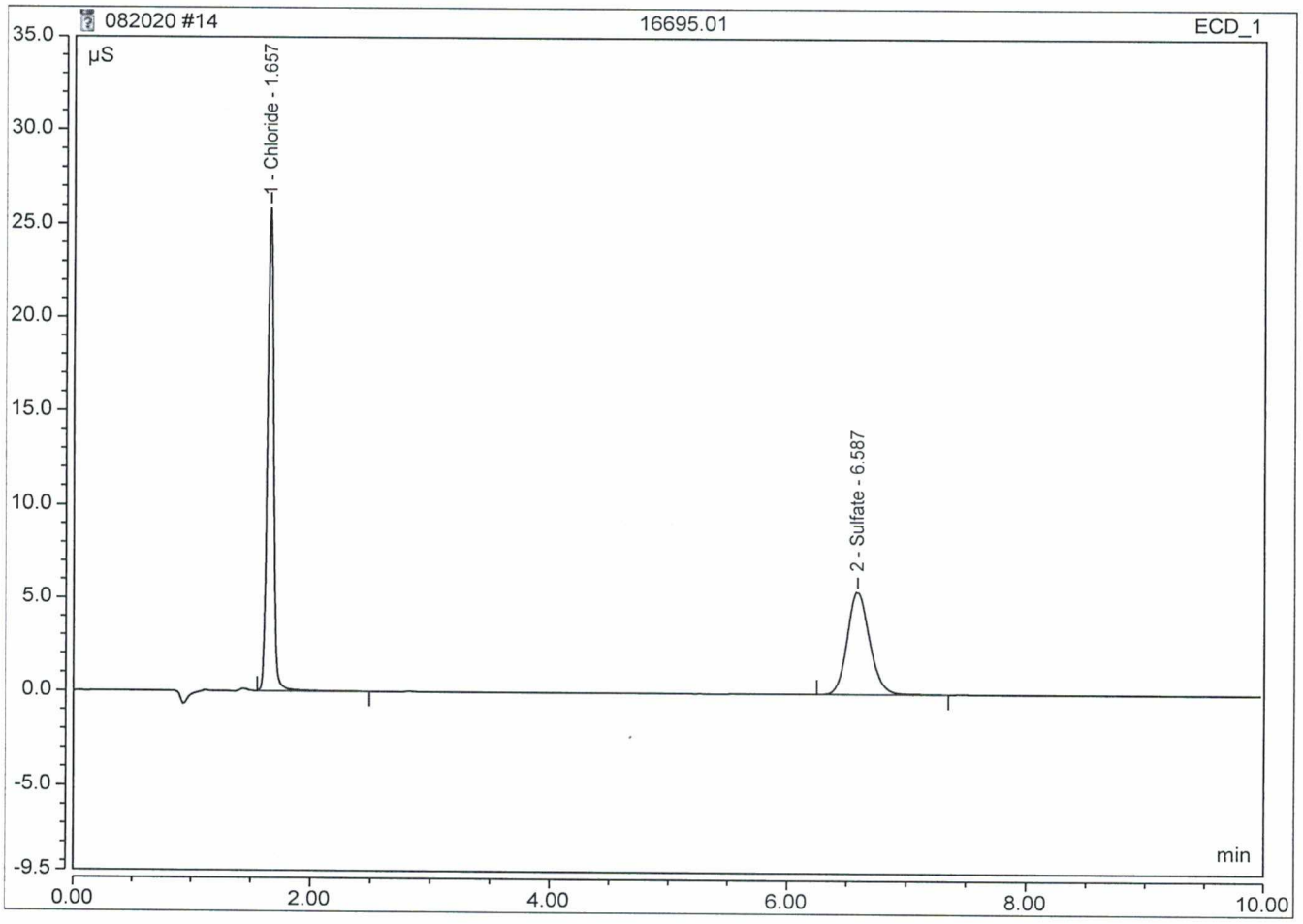
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.12	Fluoride	BMB	0.010	0.106	0.1197
2	1.64	Chloride	BMB	0.571	9.342	24.7031
3	3.16	Nitrate	BMB	0.510	5.004	9.7030
4	6.62	Sulfate	BMB	0.180	0.814	11.4405
TOTAL:				1.27	15.27	45.97



Peak Integration Report

Sample Name:	**16695.01**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 10:17**	*Operator:*	**Jeff Phifer**

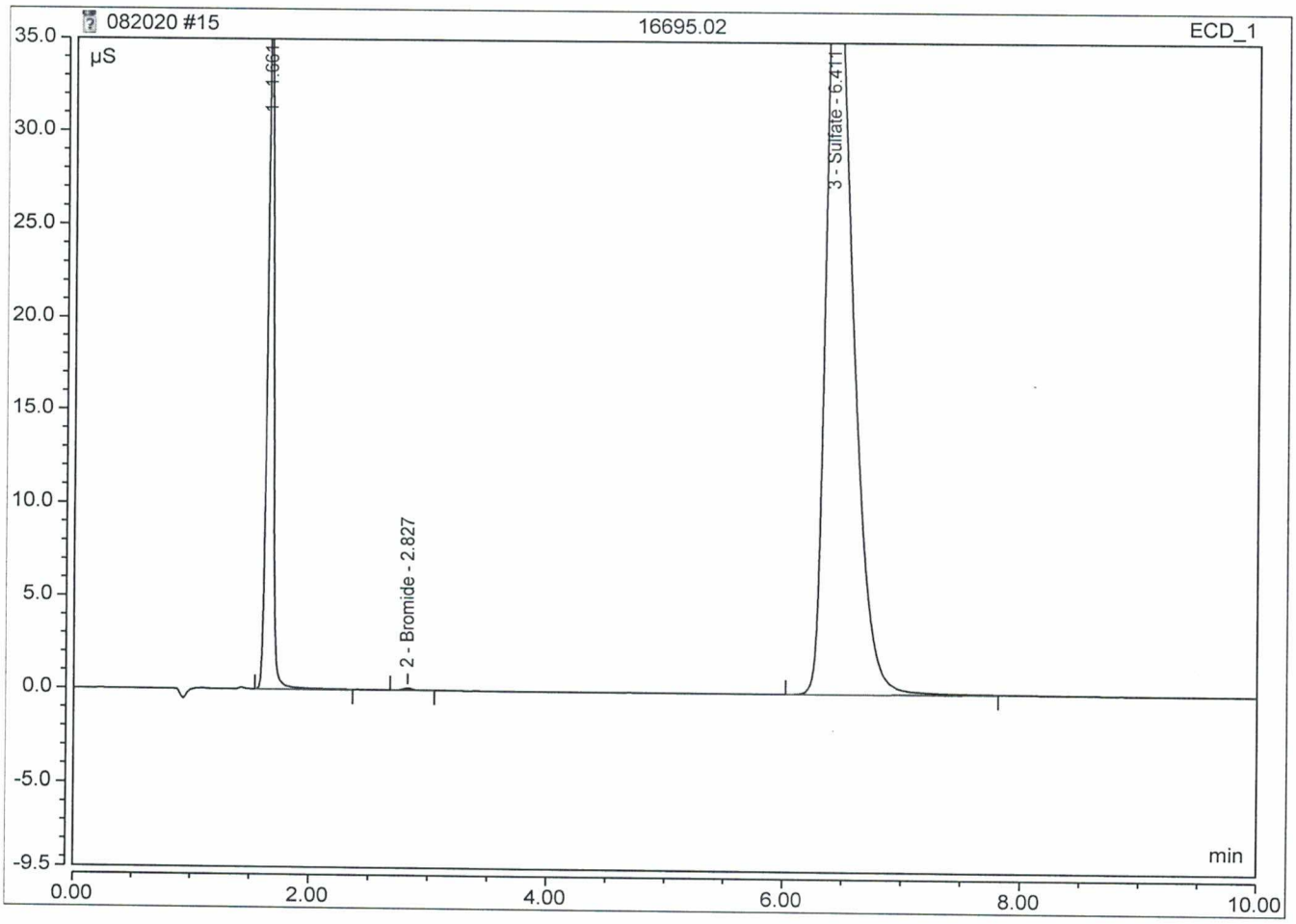
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.66	Chloride	BMB	1.559	25.897	65.2650
2	6.59	Sulfate	BMB	1.195	5.498	75.1540
TOTAL:				2.75	31.40	140.42



Peak Integration Report

Sample Name:	**16695.02**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 10:30**	*Operator:*	**Jeff Phifer**

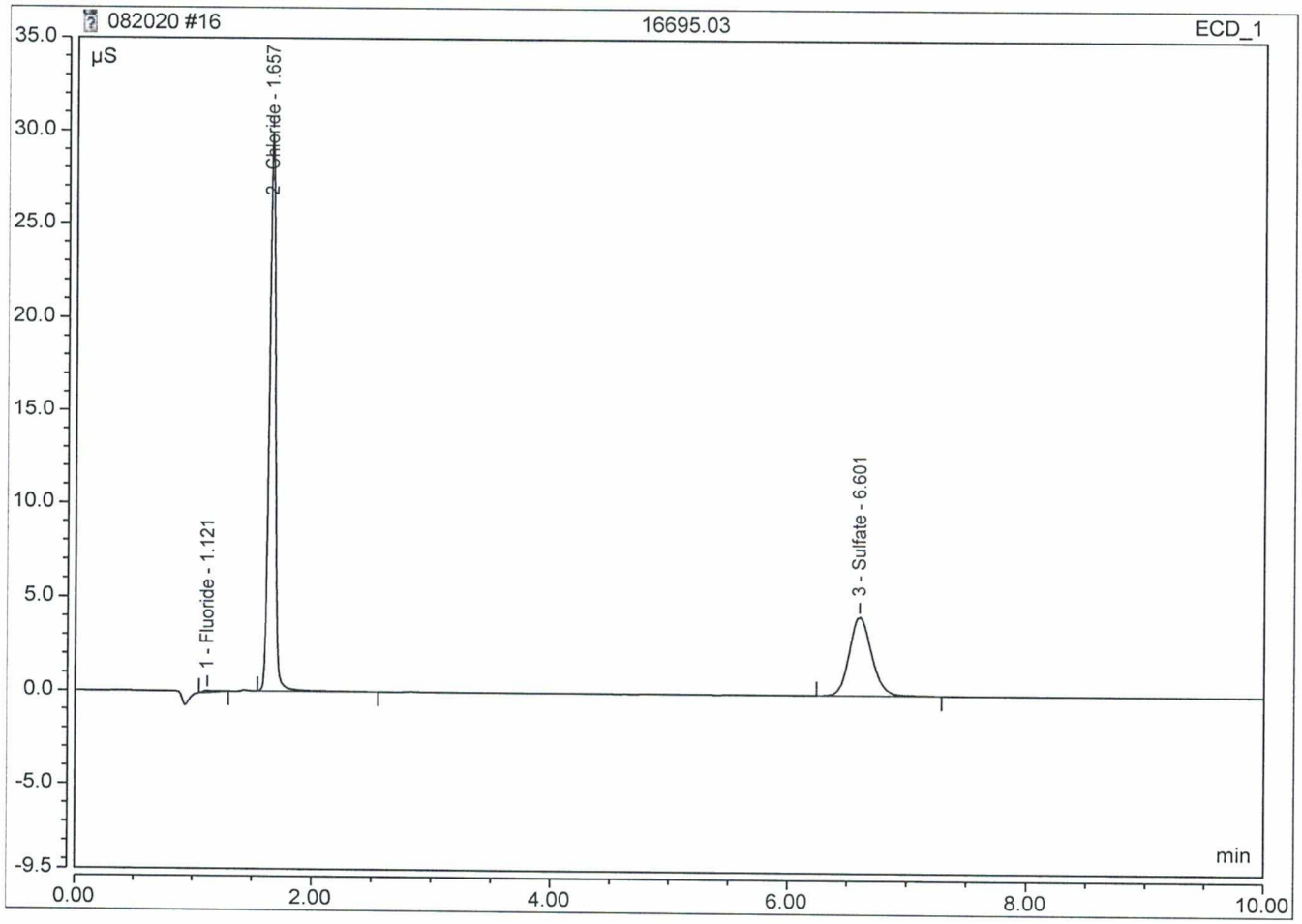
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
2	2.83	**Bromide**	BMB	0.010	0.115	1.2592
3	6.41	**Sulfate**	BMB	10.845	43.446	680.8320
TOTAL:				10.86	43.56	682.09



Peak Integration Report

Sample Name:	**16695.03**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 10:43**	*Operator:*	**Jeff Phifer**

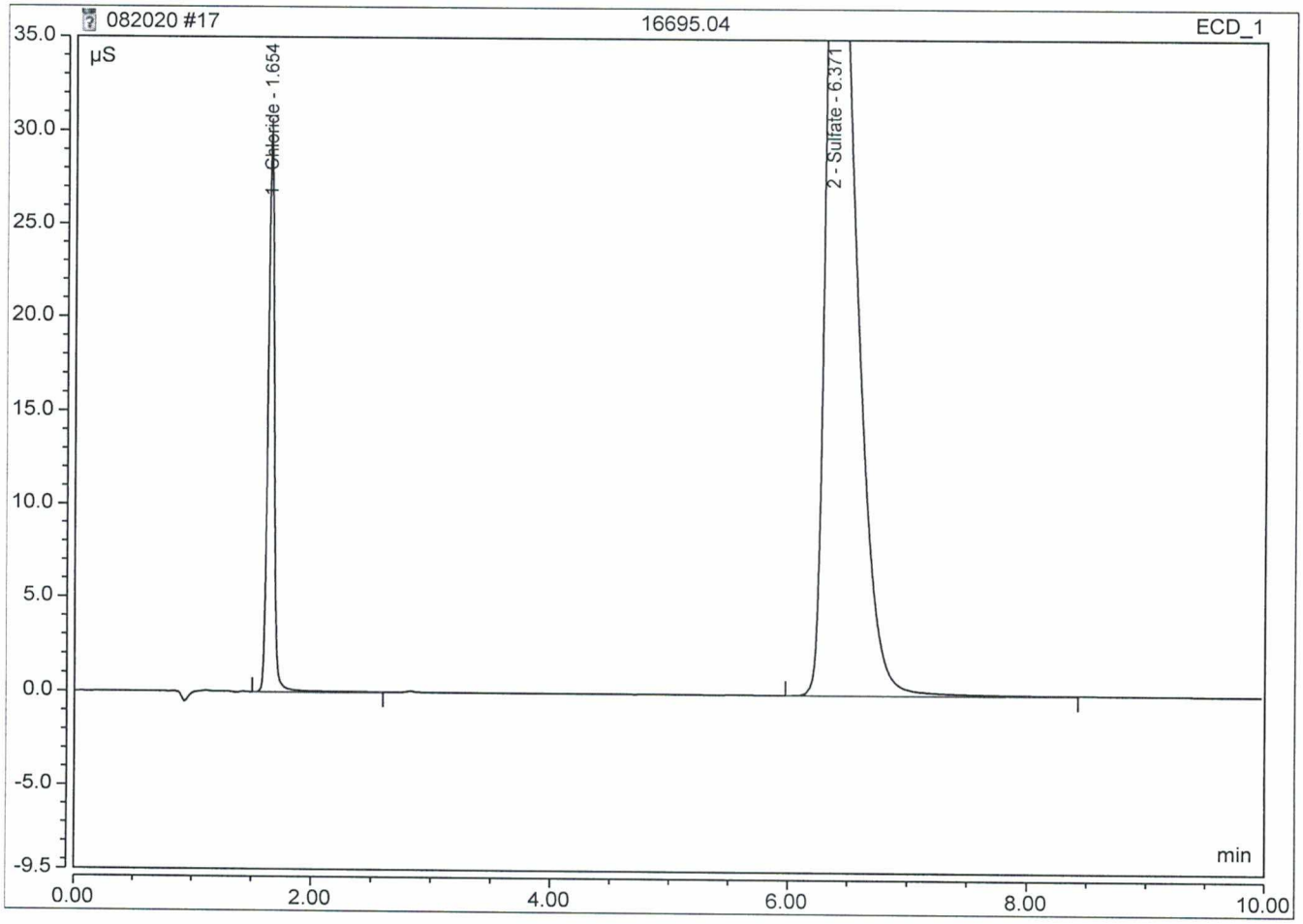
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.12	Fluoride	BMB	0.011	0.110	0.1407
2	1.66	Chloride	BMB	1.832	30.001	76.4939
3	6.60	Sulfate	BMB	0.914	4.193	57.5018
TOTAL:				2.76	34.30	134.14



Peak Integration Report

Sample Name:	**16695.04**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 10:56**	*Operator:*	**Jeff Phifer**

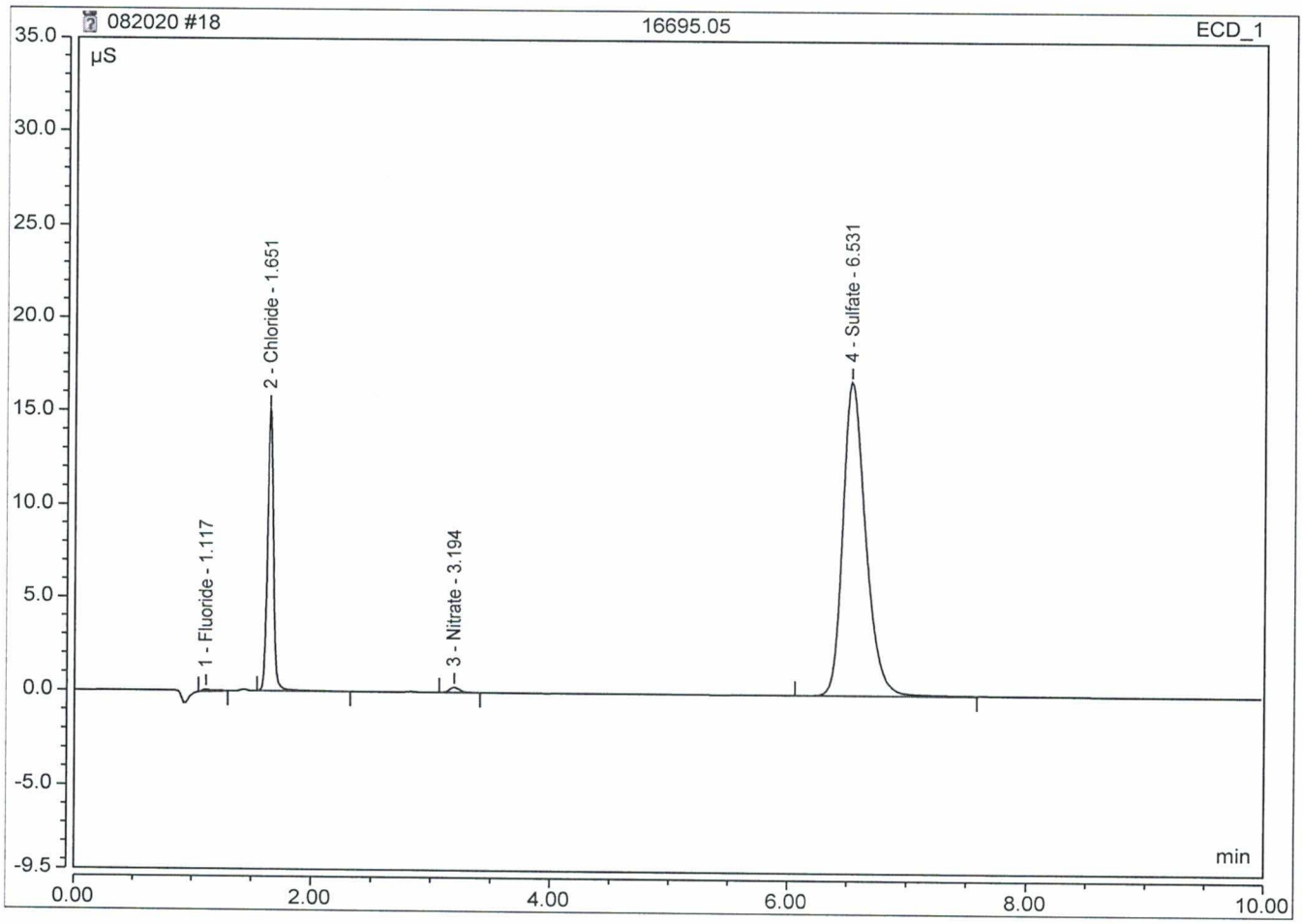
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.65	**Chloride**	BMB	1.858	29.927	77.5627
2	6.37	**Sulfate**	BMB	14.189	53.792	890.7205
TOTAL:				16.05	83.72	968.28



Peak Integration Report

Sample Name:	**16695.05**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 11:08**	*Operator:*	**Jeff Phifer**

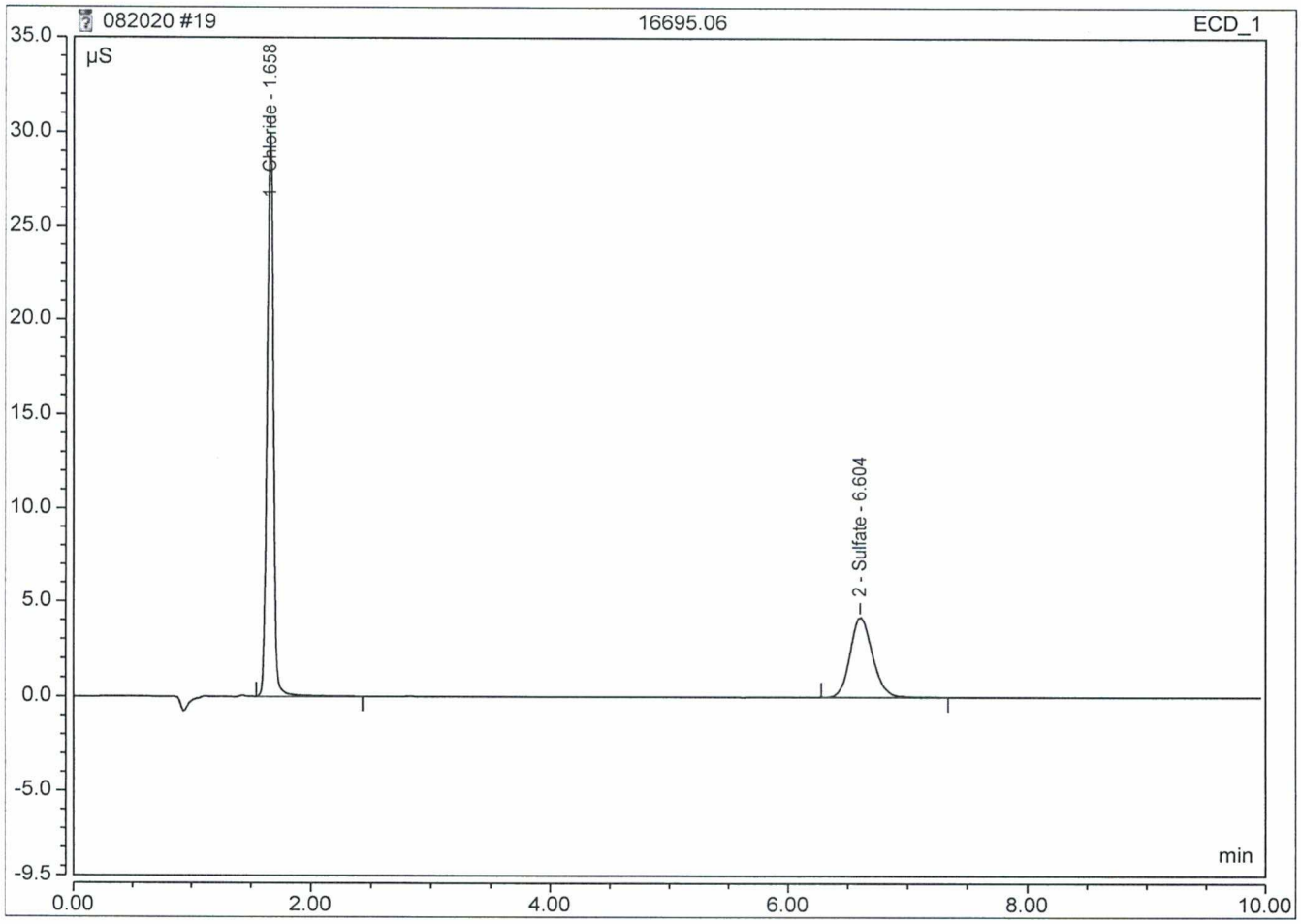
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.12	Fluoride	BMB	0.010	0.121	0.1325
2	1.65	Chloride	BMB	0.910	15.058	38.6365
3	3.19	Nitrate	BMB	0.027	0.267	0.5236
4	6.53	Sulfate	BMB	3.717	16.747	233.4505
TOTAL:				4.66	32.19	272.74



Peak Integration Report

Sample Name:	**16695.06**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 11:21**	*Operator:*	**Jeff Phifer**

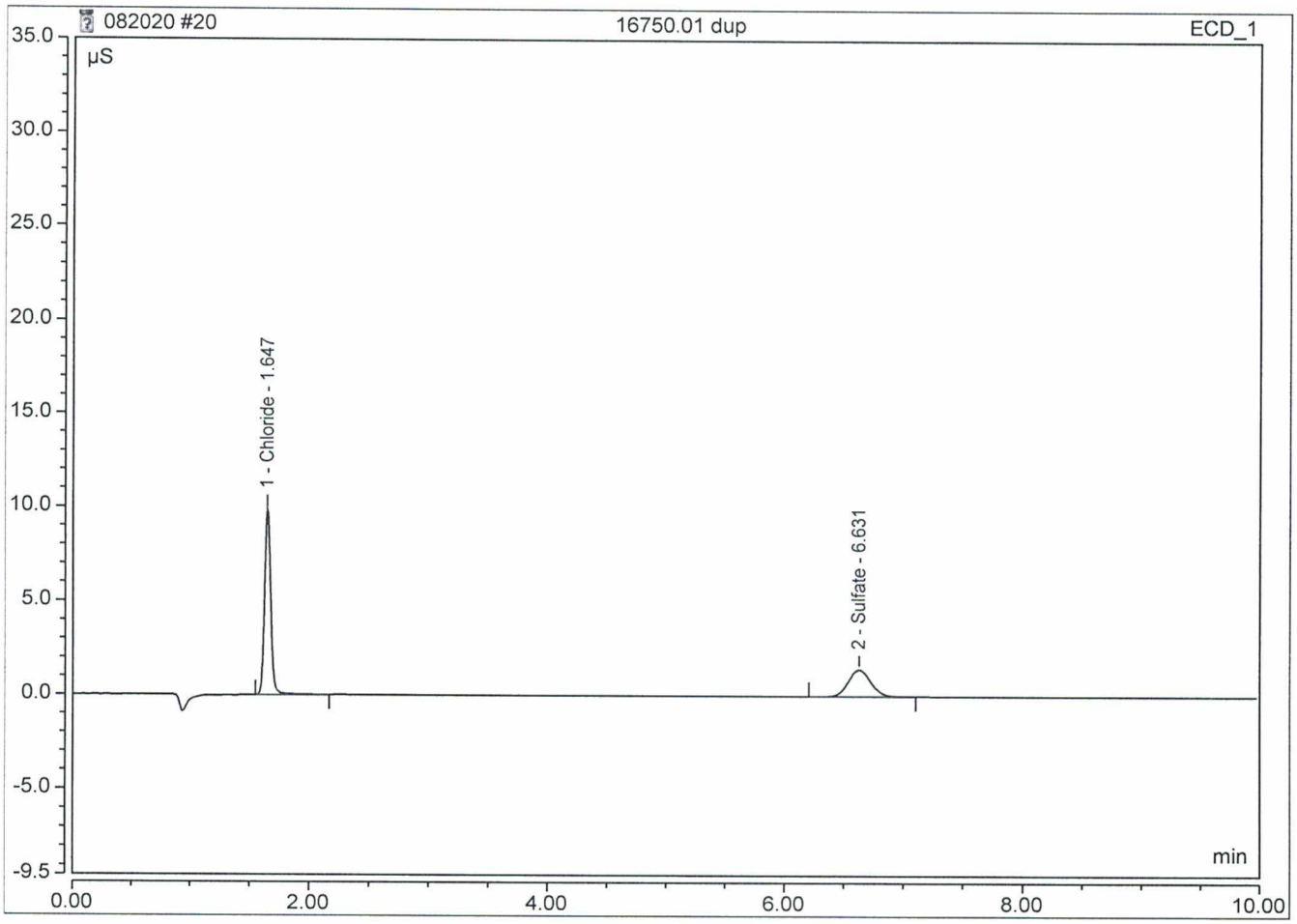
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.66	Chloride	BMB	1.834	30.034	76.5504
2	6.60	Sulfate	BMB	0.919	4.201	57.8319
TOTAL:				2.75	34.24	134.38



Peak Integration Report

Sample Name:	**16750.01 dup**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 11:34**	*Operator:*	**Jeff Phifer**

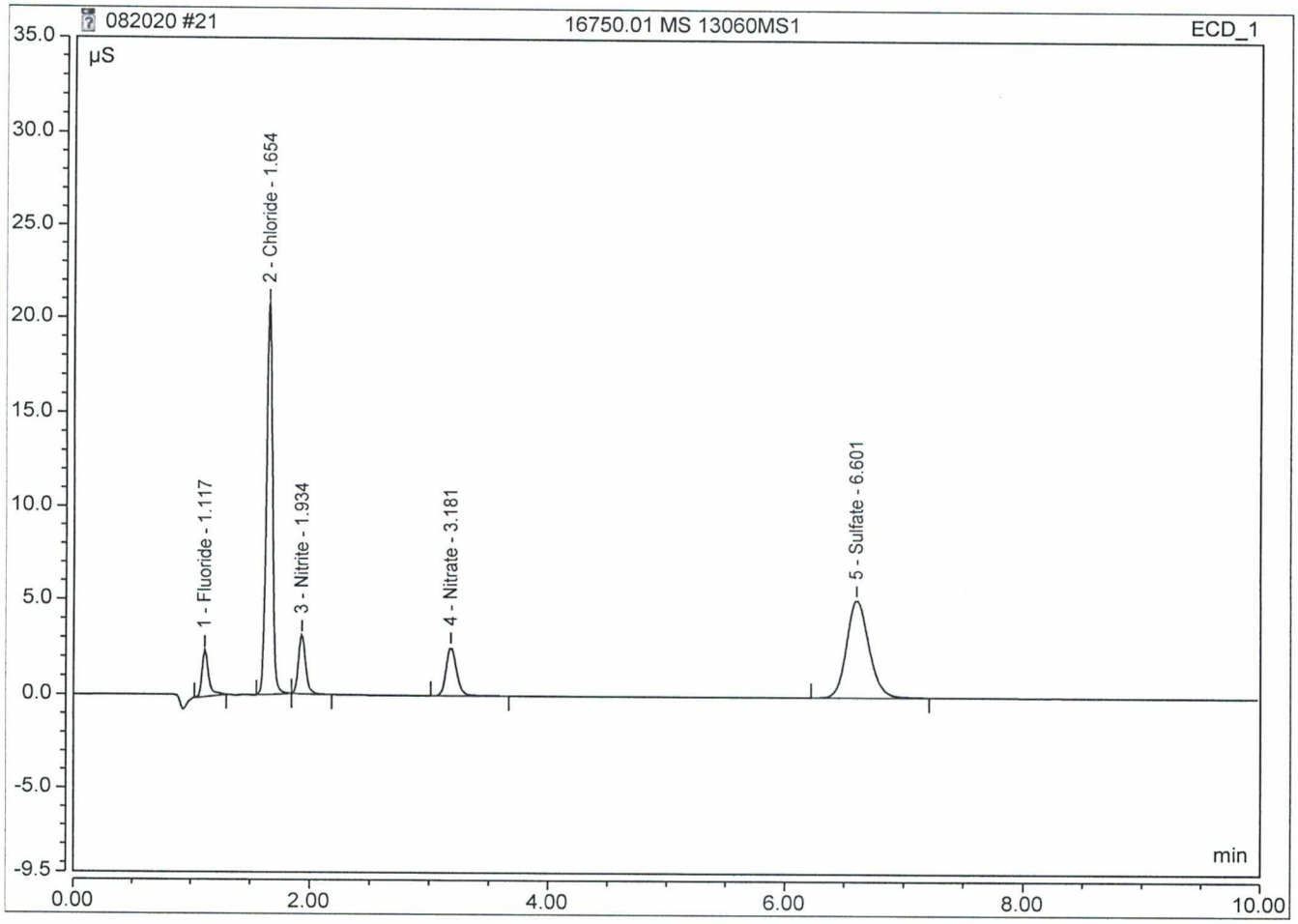
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.65	Chloride	BMB	0.601	9.849	25.9463
2	6.63	Sulfate	BMB	0.313	1.433	19.7868
TOTAL:				0.91	11.28	45.73



Peak Integration Report

Sample Name:	**16750.01 MS 13060MS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 11:47**	*Operator:*	**Jeff Phifer**

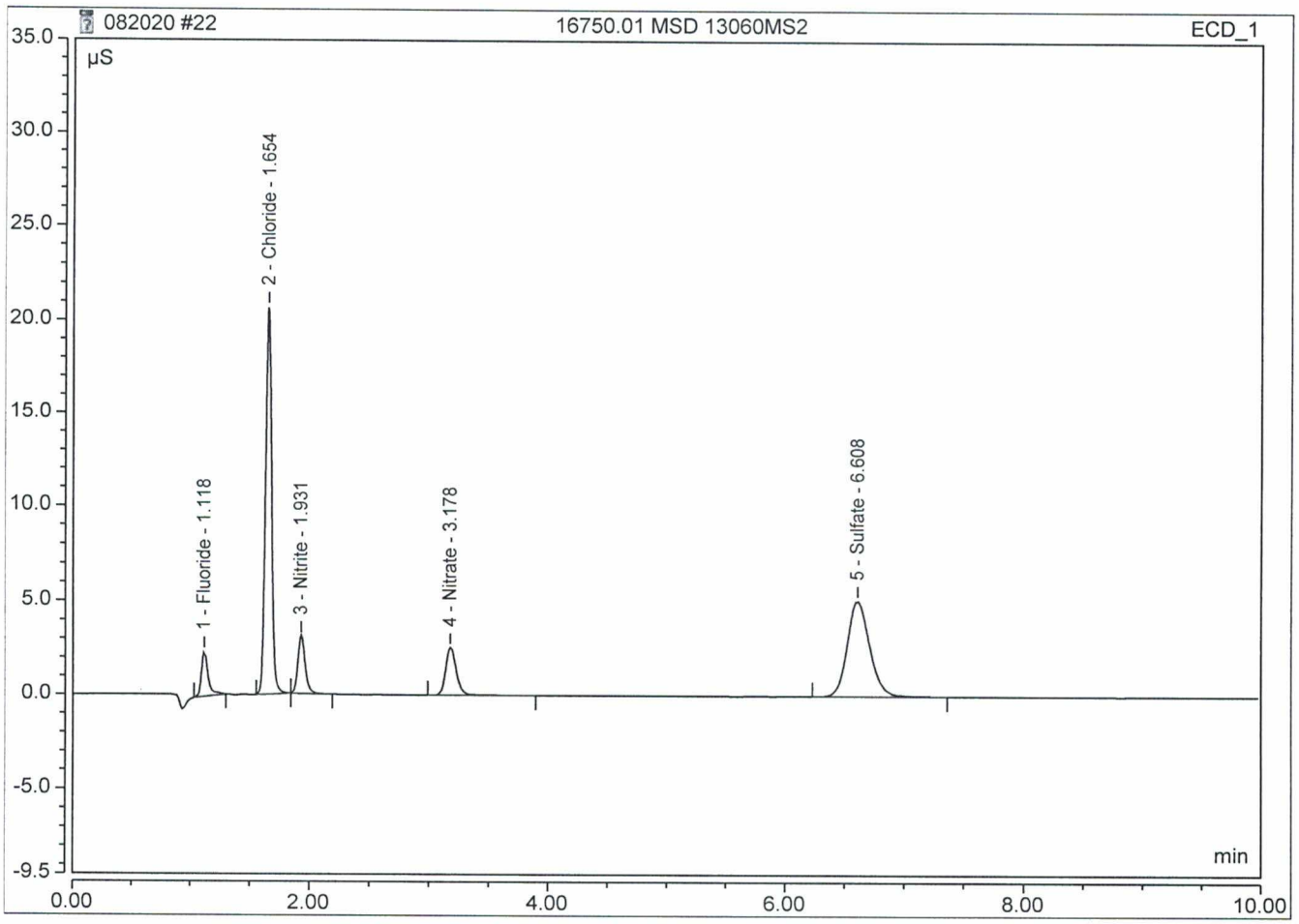
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L	
1	1.12	Fluoride	BMB	0.156	2.418	0.9693	97%
2	1.65	Chloride	BMB	1.241	20.746	10.4441	104%
3	1.93	Nitrite	BMB	0.215	3.081	0.9611	96%
4	3.18	Nitrate	BMB	0.260	2.557	0.9923	99%
5	6.60	Sulfate	BMB	1.112	5.110	13.9908	100%
TOTAL:				2.98	33.91	27.36	



Peak Integration Report

Sample Name:	**16750.01 MSD 13060MS2**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 12:00**	*Operator:*	**Jeff Phifer**

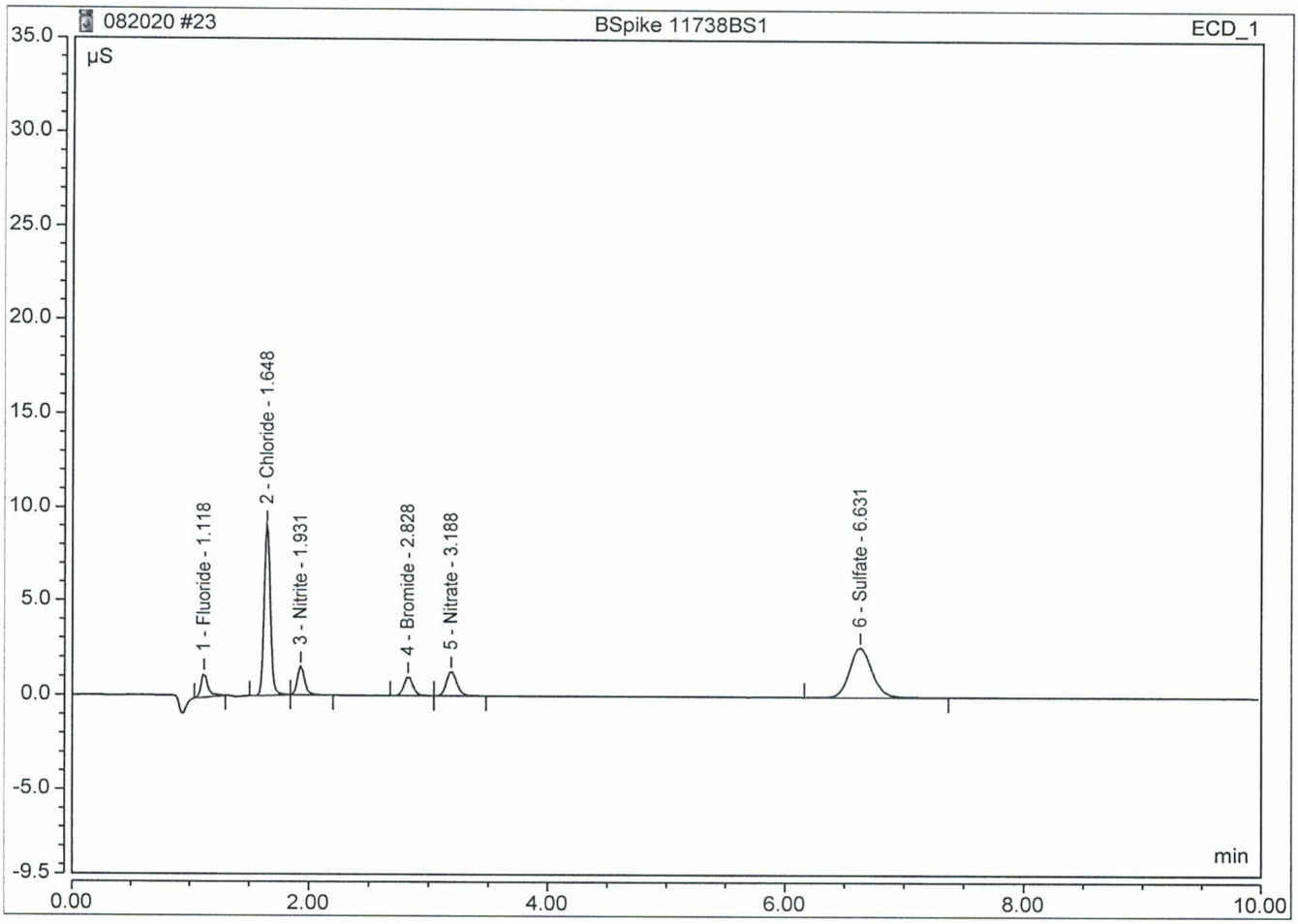
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L	
1	1.12	Fluoride	BMB	0.155	2.406	0.9658	96%
2	1.65	Chloride	BMB	1.237	20.706	10.4139	104%
3	1.93	Nitrite	BMB	0.216	3.086	0.9632	96%
4	3.18	Nitrate	BMB	0.265	2.562	1.0108	101%
5	6.61	Sulfate	BMB	1.118	5.122	14.0640	101%
TOTAL:				2.99	33.88	27.42	



Peak Integration Report

Sample Name:	**BSpike 11738BS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 12:12**	*Operator:*	**Jeff Phifer**

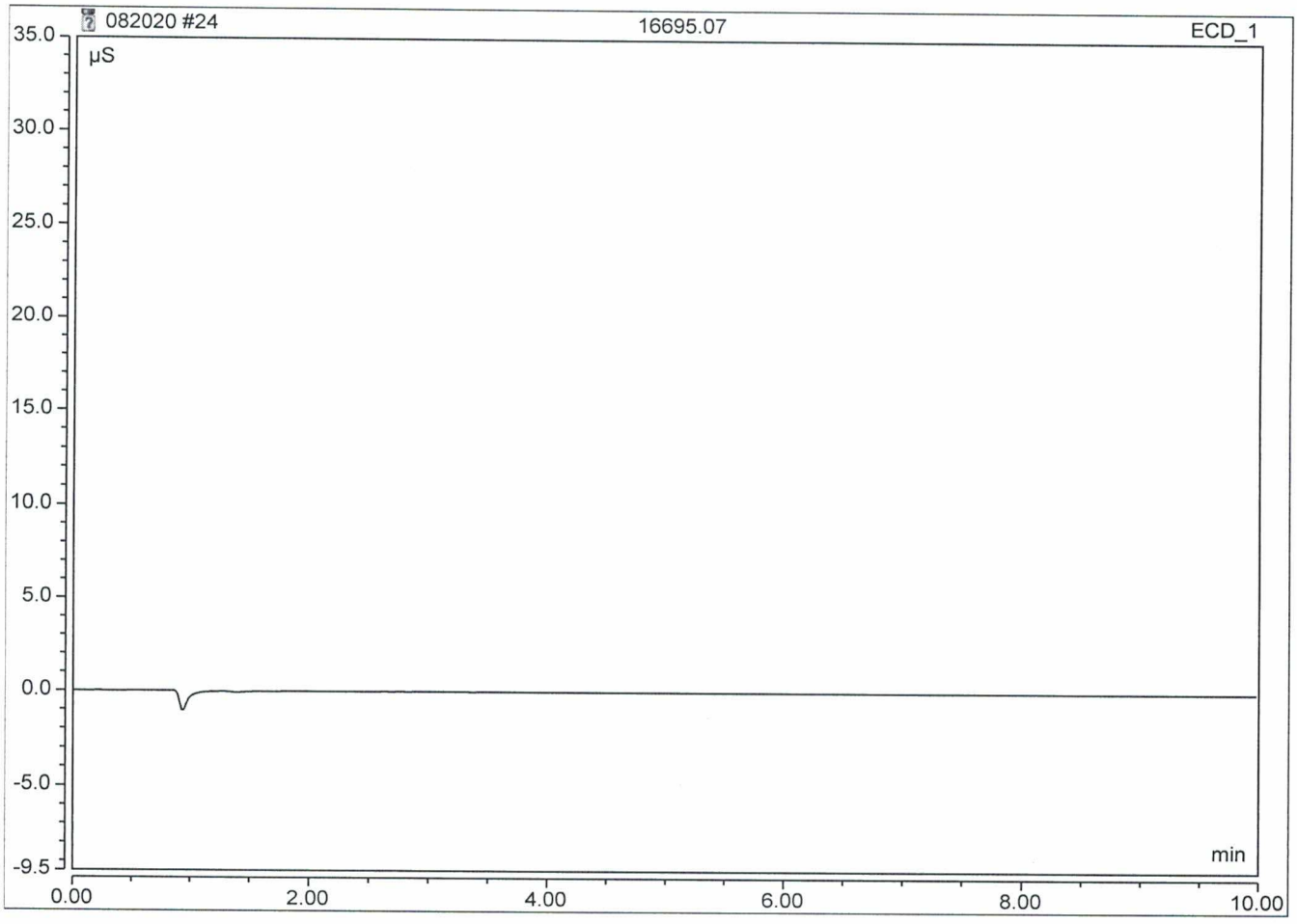
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L		
1	1.12	Fluoride	BMB	0.083	1.242	0.5	0.4986	100 %
2	1.65	Chloride	BMB	0.550	9.067	5	4.7699	96 %
3	1.93	Nitrite	BMB	0.106	1.489	0.5	0.4805	96 %
4	2.83	Bromide	BMB	0.089	0.994		2.0389	
5	3.19	Nitrate	BMB	0.130	1.287	0.5	0.4957	100 %
6	6.63	Sulfate	BMB	0.574	2.605	7.5	7.2382	96 %
TOTAL:				1.53	16.68		15.52	



Peak Integration Report

Sample Name:	**16695.07**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**2.5000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 12:25**	*Operator:*	**Jeff Phifer**

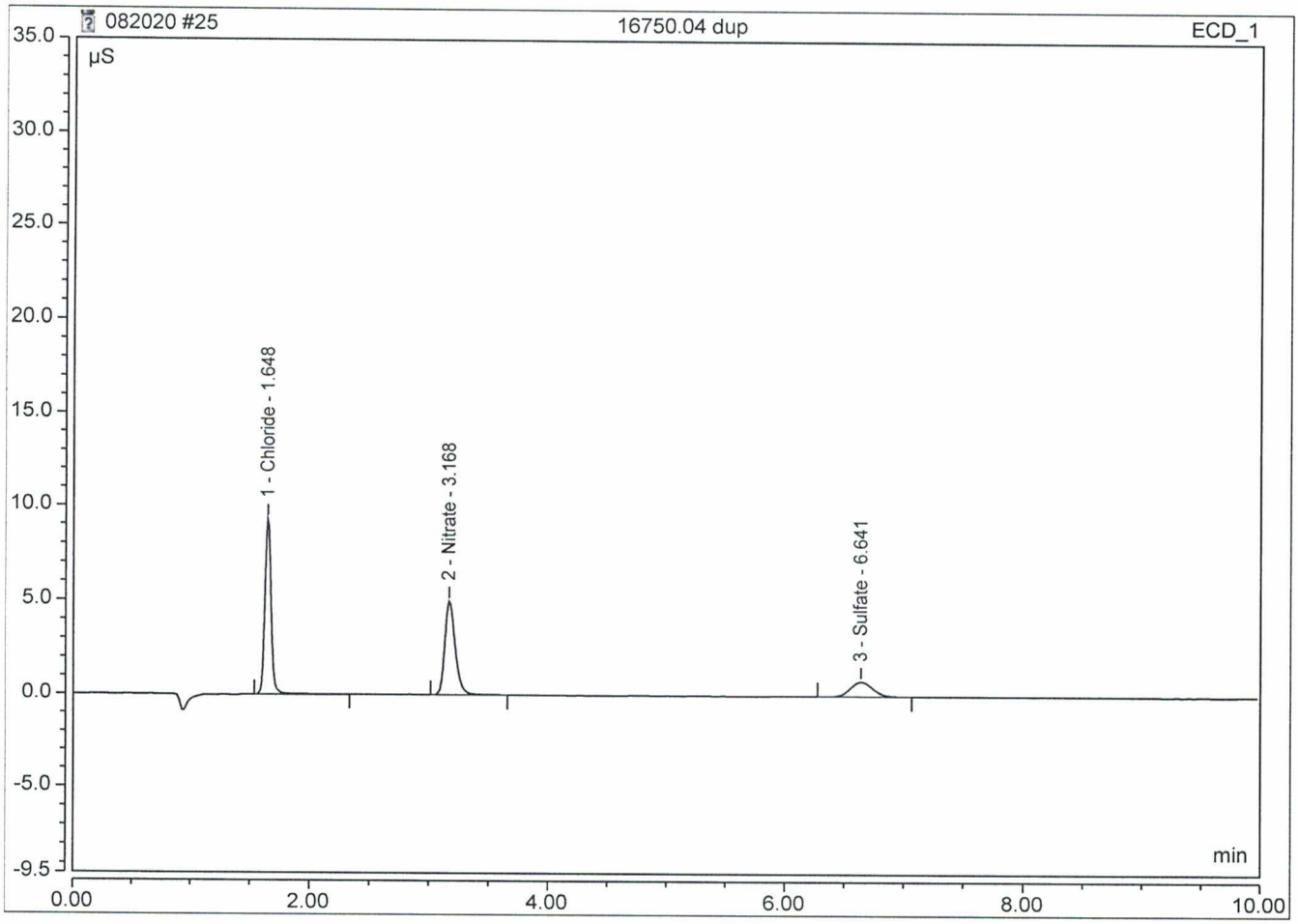
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
TOTAL:				0.00	0.00	0.00



Peak Integration Report

Sample Name:	**16750.04 dup**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**5.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 12:38**	*Operator:*	**Jeff Phifer**

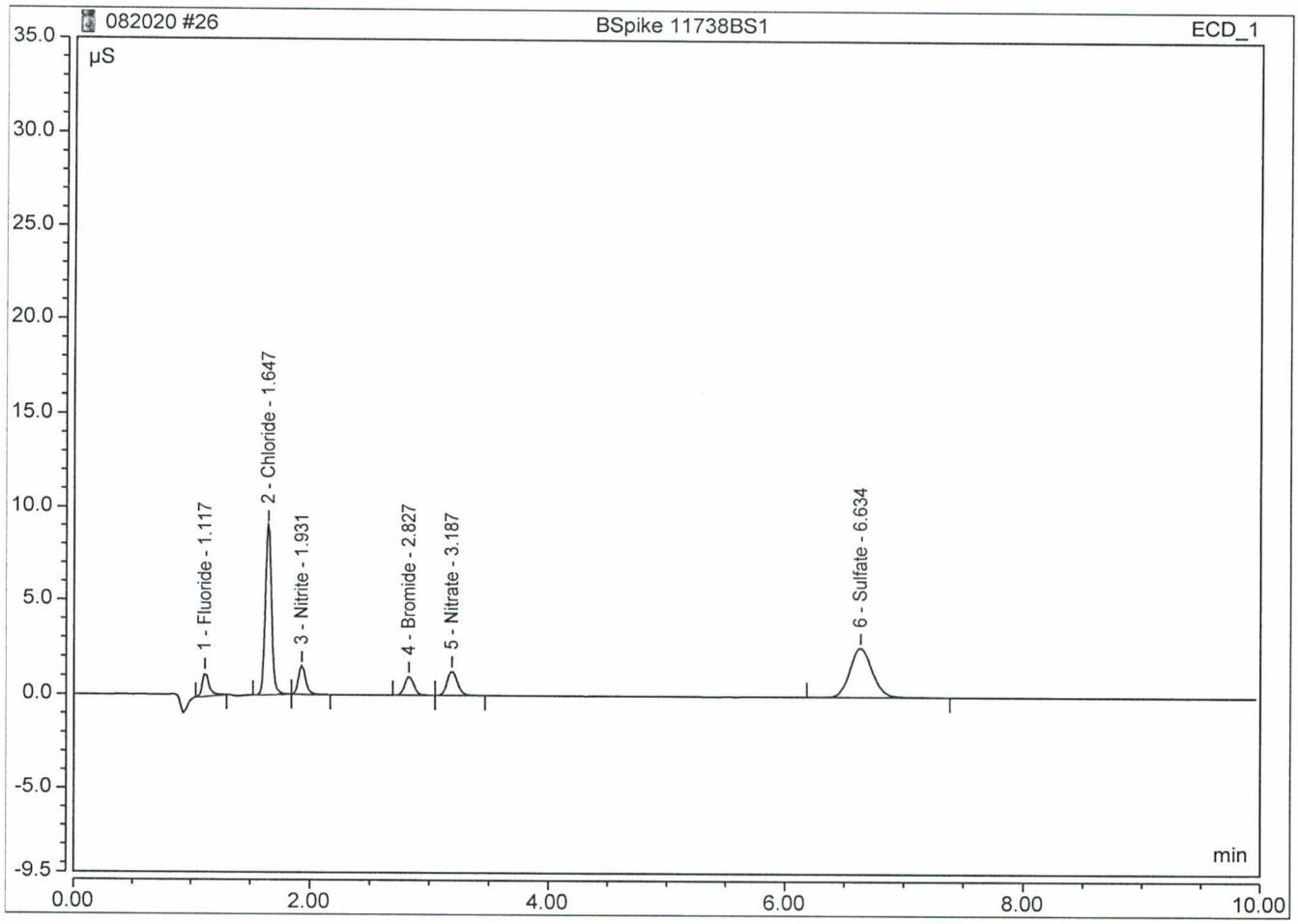
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.65	Chloride	BMB	0.573	9.319	24.8188
2	3.17	Nitrate	BMB	0.507	4.971	9.6446
3	6.64	Sulfate	BMB	0.179	0.806	11.3427
TOTAL:				1.26	15.10	45.81



Peak Integration Report

Sample Name:	**BSpike 11738BS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 12:51**	*Operator:*	**Jeff Phifer**

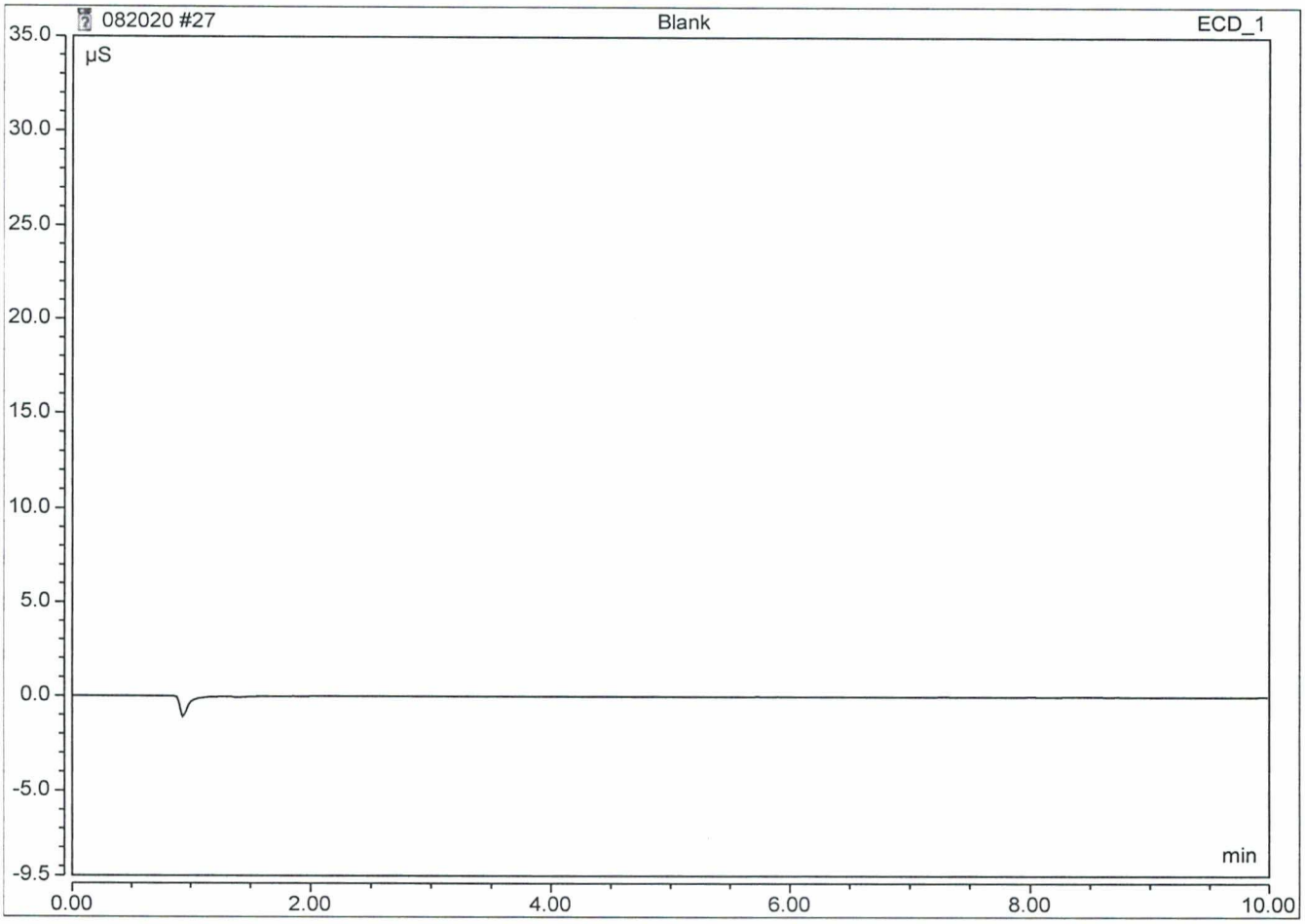
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L		
1	1.12	Fluoride	BMB	0.083	1.246	0.5	0.4961	100 %
2	1.65	Chloride	BMB	0.549	9.071	5	4.7673	96 %
3	1.93	Nitrite	BMB	0.106	1.490	0.5	0.4807	96 %
4	2.83	Bromide	BMB	0.087	0.991		2.0060	
5	3.19	Nitrate	BMB	0.130	1.292	0.5	0.4964	100 %
6	6.63	Sulfate	BMB	0.572	2.600	7.5	7.2076	96 %
TOTAL:				1.53	16.69		15.45	



Peak Integration Report

Sample Name:	**Blank**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**20-Aug-2020 / 13:04**	*Operator:*	**Jeff Phifer**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
TOTAL:				0.00	0.00	0.00



ICS-1100 A Dionex IC/Meth 300.0 **070720** new CAL

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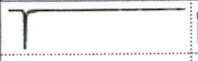
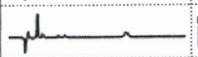
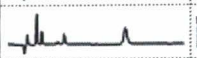
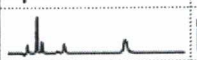
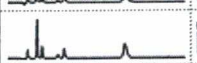
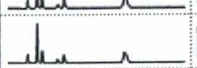
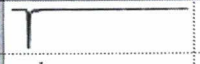
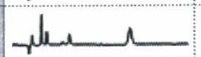
1		water blank	Unknown		1	Norm Method	Anion	Finished	7/7/2020 9:56:15 AM -...	1.0000
2		1131Cal1	Calibration Standard	01	2	Norm Method	Anion	Finished	7/7/2020 10:08:32 AM...	1.0000
3		1131Cal2	Calibration Standard	02	3	Norm Method	Anion	Finished	7/7/2020 10:21:21 AM...	1.0000
4		1131Cal3	Calibration Standard	03	4	Norm Method	Anion	Finished	7/7/2020 10:34:09 AM...	1.0000
5		1131Cal4	Calibration Standard	04	5	Norm Method	Anion	Finished	7/7/2020 10:46:58 AM...	1.0000
6		1131Cal5	Calibration Standard	05	6	Norm Method	Anion	Finished	7/7/2020 10:59:49 AM...	1.0000
		Click here to add a new injection								

CAL INJ# ICSA070720CAL

070720

#	ECD_1	Dilution	IntStd	Replicate ID	Comment	Spike Grou
1		1.0000	1.0000		Jeff Phifer	
2		1.0000	1.0000		Jeff Phifer	
3		1.0000	1.0000		Jeff Phifer	
4		1.0000	1.0000		Jeff Phifer	
5		1.0000	1.0000		Jeff Phifer	
6		1.0000	1.0000		Jeff Phifer	
	Click here to add a new injection					

Norm Method	03/08/11 13:39	Jeff Phifer	**Method 300.0**	
Stage	Time	Command	Value	Comment
	min			
Instrument Setup				
	initial			
		Sampler.HomeNeedle		
		Sampler.ResetVials	1, 50	
		Pump_ECD.Pressure.UpperLimit	4500 [psi]	
		Sampler.DelayVolume	125 [µl]	
		Pump_ECD.%A.Equate	"Carb - BiCarb"	
		Pump_ECD.Pressure.LowerLimit	100 [psi]	
		Pump_ECD.CellTemperature.Nominal	35.0 [°C]	
		Pump_ECD.Data_Collection_Rate	5.0 [Hz]	
		Pump_ECD.Suppressor_Type	ASRS_4mm	
		Pump_ECD.Suppressor_Carbonate	1.8 [mM]	
		Pump_ECD.Suppressor_Bicarbonate	1.7 [mM]	
		Pump_ECD.Suppressor_Hydroxide	0.0 [mM]	
		Pump_ECD.Suppressor_Tetraborate	0.0 [mM]	
		Pump_ECD.Suppressor_OtherEluent	0.0 [mN]	
		Pump_ECD.Suppressor_RecommendedCurrent	27 [mA]	
		Pump_ECD.Suppressor_Current	27 [mA]	
		Sampler.FlushFactor	10	
		Sampler.DeliverSpeed	4.0 [ml/min]	
		Pump_ECD.Flow	2.00	
		Sampler.LoadPosition		
		Sampler.DeliverSample	Full	
		Sampler.EndSamplePrep		
Inject				
	0.000			
		Wait	Sampler.CycleTimeState, Hold,	
		Sampler.Inject		
Start Run				
	0.000			
		Pump_ECD.Channel_Pressure.AcqOn		
		Pump_ECD.Autozero		
		Pump_ECD.ECD_1.AcqOn		
		Pump_ECD.ECD_Total.AcqOn		
Run			Duration = 10.000 [min]	
	0.000			
	0.500			
		Sampler.BeginOverlap		
Stop Run				
	10.000			
		Pump_ECD.Channel_Pressure.AcqOff		
		Pump_ECD.ECD_1.AcqOff		
		Pump_ECD.ECD_Total.AcqOff		
End				

7.7.20

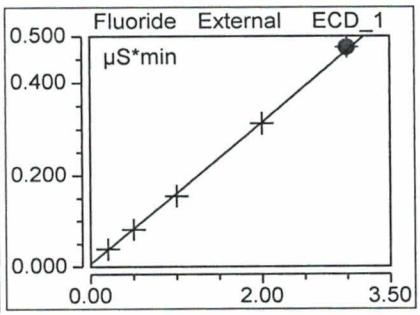
Calibration Batch Report
CAL ID# ICSA070720CAL

Sequence:	070720	*Injection Volu.*	2,500.00
Instrument Method:	Norm Method	*Operator:*	Jeff Phifer
Inj. Date / Time:	07-Jul-2020 / 10:59	*Column:*	AS4A-SC 038777

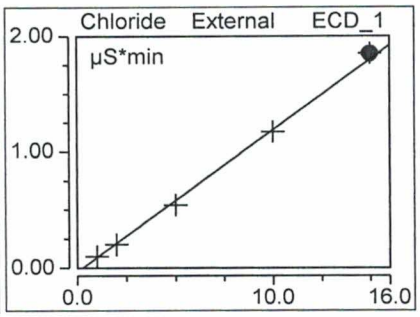
Calibration Summary

Peak Name	Eval.Type	Cal.Type	Window Width min	Offset (C0)	Slope (C1)	Curve (C2)	Corr.Coeff.
Fluoride	Area	Lin, WithOffset, 1/A	0.01	0.006	0.154	0.000	0.9996
Chloride	Area	Lin, WithOffset, 1/A	0.02	-0.031	0.122	0.000	0.9988
Nitrite	Area	Lin, WithOffset, 1/A	0.03	-0.003	0.227	0.000	0.9996
Bromide	Area	Lin, WithOffset, 1/A	0.05	-0.001	0.044	0.000	0.9998
Nitrate	Area	Lin, WithOffset, 1/A	0.07	-0.001	0.263	0.000	0.9996
Sulfate	Area	Lin, WithOffset, 1/A	0.33	-0.002	0.080	0.000	0.9996
		AVERAGE:		-0.0052	0.1482	0.0000	0.9995

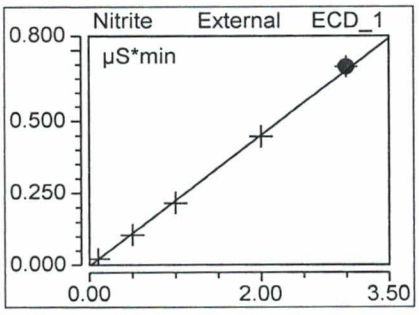
Injection Name	Ret.Time min	Area µS*min	Height µS	Amount
Fluoride	Fluoride	Fluoride	Fluoride	Fluoride
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	1.114	0.0387	0.521	0.210
1131Cal2	1.114	0.0816	1.223	0.488
1131Cal3	1.114	0.1551	2.427	0.966
1131Cal4	1.114	0.3125	5.047	1.987
1131Cal5	1.114	0.4761	7.811	3.049
Average	1.114			
Rel. Std. Dev.	0.013 %			



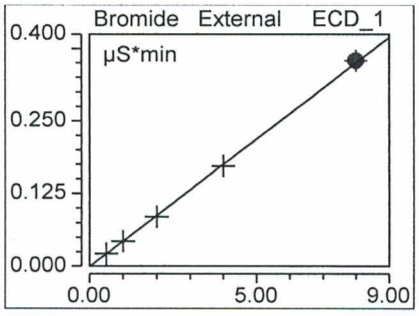
Injection Name	Ret.Time min	Area µS*min	Height µS	Amount
Chloride	Chloride	Chloride	Chloride	Chloride
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	1.637	0.1013	1.651	1.089
1131Cal2	1.638	0.2015	3.302	1.912
1131Cal3	1.641	0.5404	9.060	4.694
1131Cal4	1.644	1.1707	19.722	9.867
1131Cal5	1.647	1.8494	30.847	15.438
Average	1.641			
Rel. Std. Dev.	0.262 %			



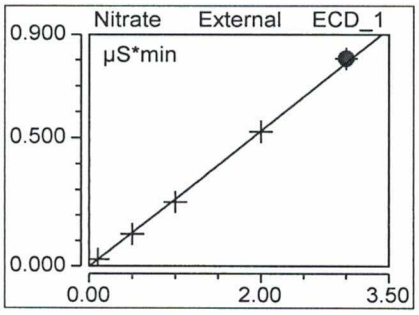
Injection Name	Ret.Time min	Area µS*min	Height µS	Amount
Nitrite	Nitrite	Nitrite	Nitrite	Nitrite
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	1.927	0.0213	0.296	0.106
1131Cal2	1.924	0.1057	1.494	0.479
1131Cal3	1.924	0.2162	3.083	0.966
1131Cal4	1.924	0.4469	6.494	1.984
1131Cal5	1.924	0.6920	10.161	3.065
Average	1.925			
Rel. Std. Dev.	0.075 %			



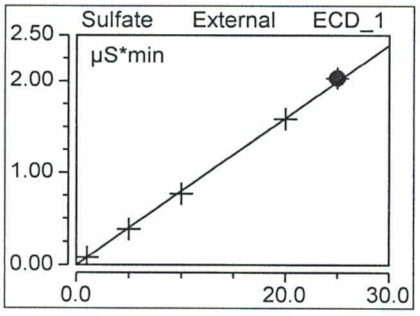
Injection Name **Bromide**	Ret.Time min Bromide	Area µS*min Bromide	Height µS Bromide	Amount Bromide
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	2.827	0.0217	0.250	0.511
1131Cal2	2.821	0.0433	0.489	1.003
1131Cal3	2.818	0.0852	0.977	1.960
1131Cal4	2.807	0.1717	1.992	3.934
1131Cal5	2.801	0.3540	4.145	8.093
Average	2.815			
Rel. Std. Dev.	0.380 %			



Injection Name **Nitrate**	Ret.Time min Nitrate	Area µS*min Nitrate	Height µS Nitrate	Amount Nitrate
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	3.191	0.0271	0.268	0.106
1131Cal2	3.181	0.1260	1.252	0.482
1131Cal3	3.168	0.2515	2.511	0.959
1131Cal4	3.151	0.5229	5.181	1.990
1131Cal5	3.134	0.8054	7.979	3.063
Average	3.165			
Rel. Std. Dev.	0.721 %			



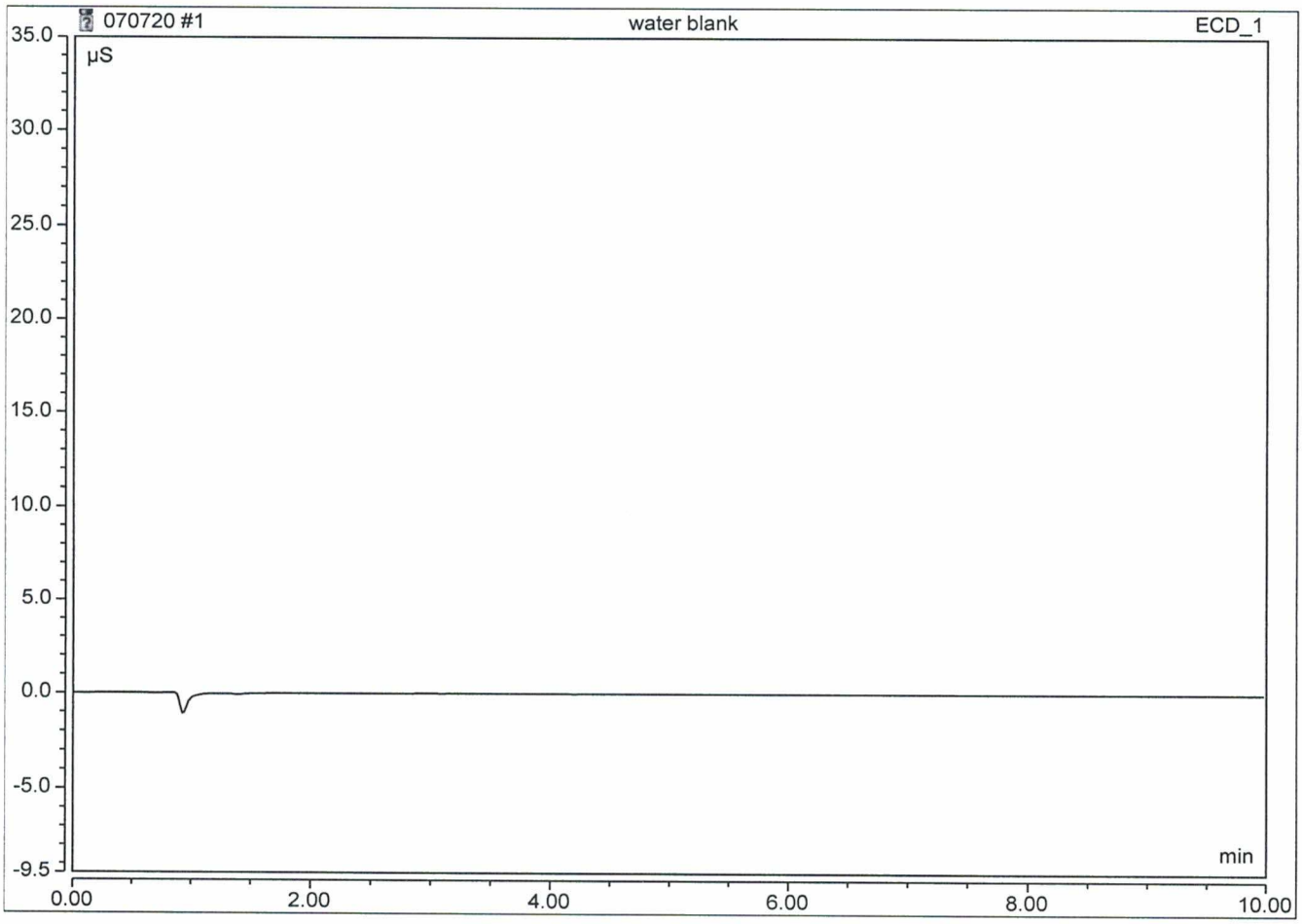
Injection Name **Sulfate**	Ret.Time min Sulfate	Area µS*min Sulfate	Height µS Sulfate	Amount Sulfate
	ECD_1	ECD_1	ECD_1	ECD_1
1131Cal1	6.617	0.0815	0.364	1.050
1131Cal2	6.608	0.3828	1.734	4.832
1131Cal3	6.594	0.7678	3.517	9.664
1131Cal4	6.571	1.5858	7.313	19.933
1131Cal5	6.557	2.0310	9.317	25.521
Average	6.589			
Rel. Std. Dev.	0.380 %			



Peak Integration Report

Sample Name:	**water blank**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 09:56**	*Operator:*	**Jeff Phifer**

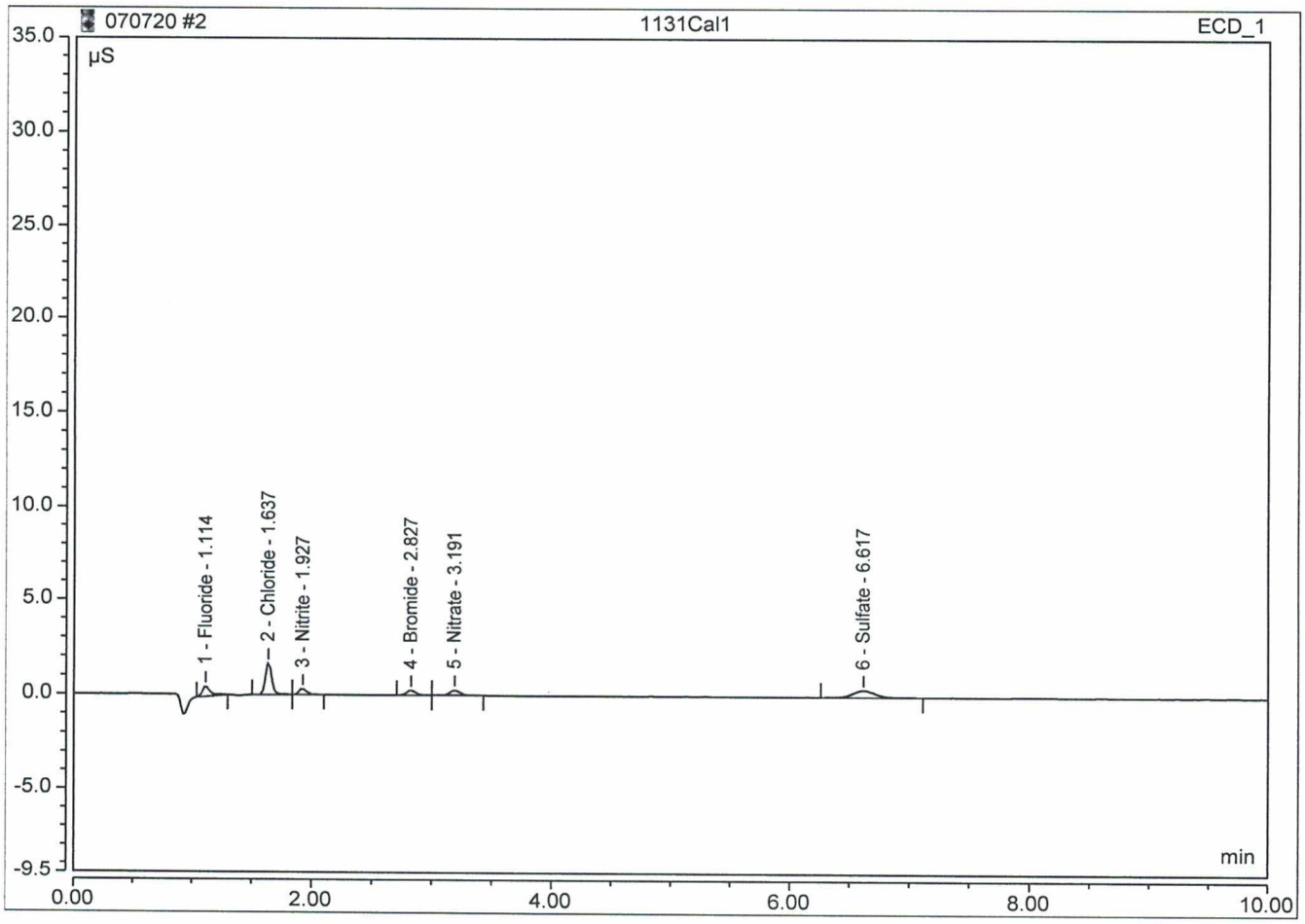
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
TOTAL:				0.00	0.00	0.00



Peak Integration Report

Sample Name:	**1131Cal1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:08**	*Operator:*	**Jeff Phifer**

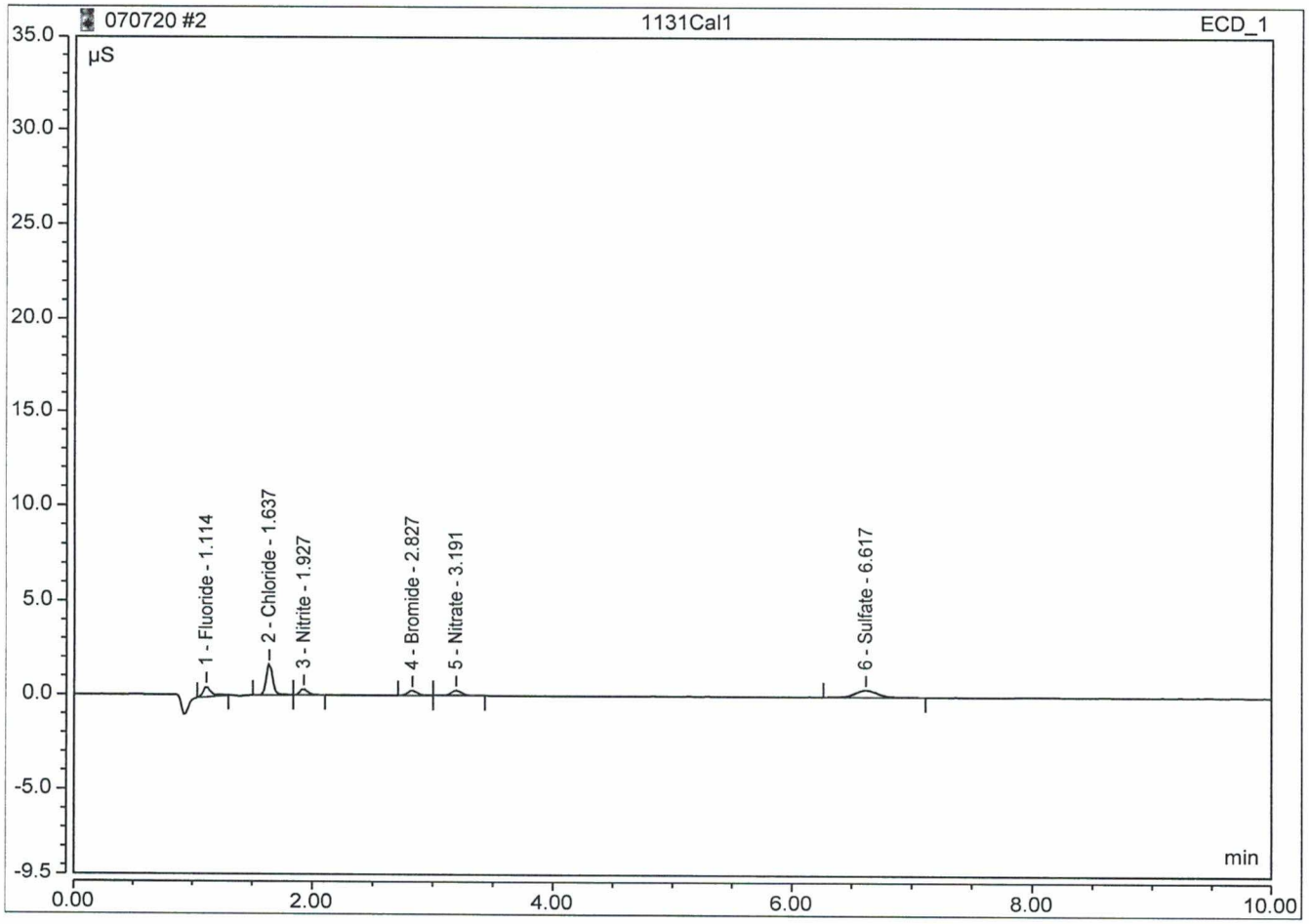
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L	
1	1.11	Fluoride	BMB	0.039	0.521	0.2	0.2096
2	1.64	Chloride	BMB	0.101	1.651	1	1.0894
3	1.93	Nitrite	BMB	0.021	0.296	0.1	0.1063
4	2.83	Bromide	BMB	0.022	0.250	0.5	0.5113
5	3.19	Nitrate	BMB	0.027	0.268	0.1	0.1061
6	6.62	Sulfate	BMB	0.082	0.364	1	1.0497
TOTAL:				0.29	3.35		3.07



Peak Integration Report

Sample Name:	**1131Cal1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:08**	*Operator:*	**Jeff Phifer**

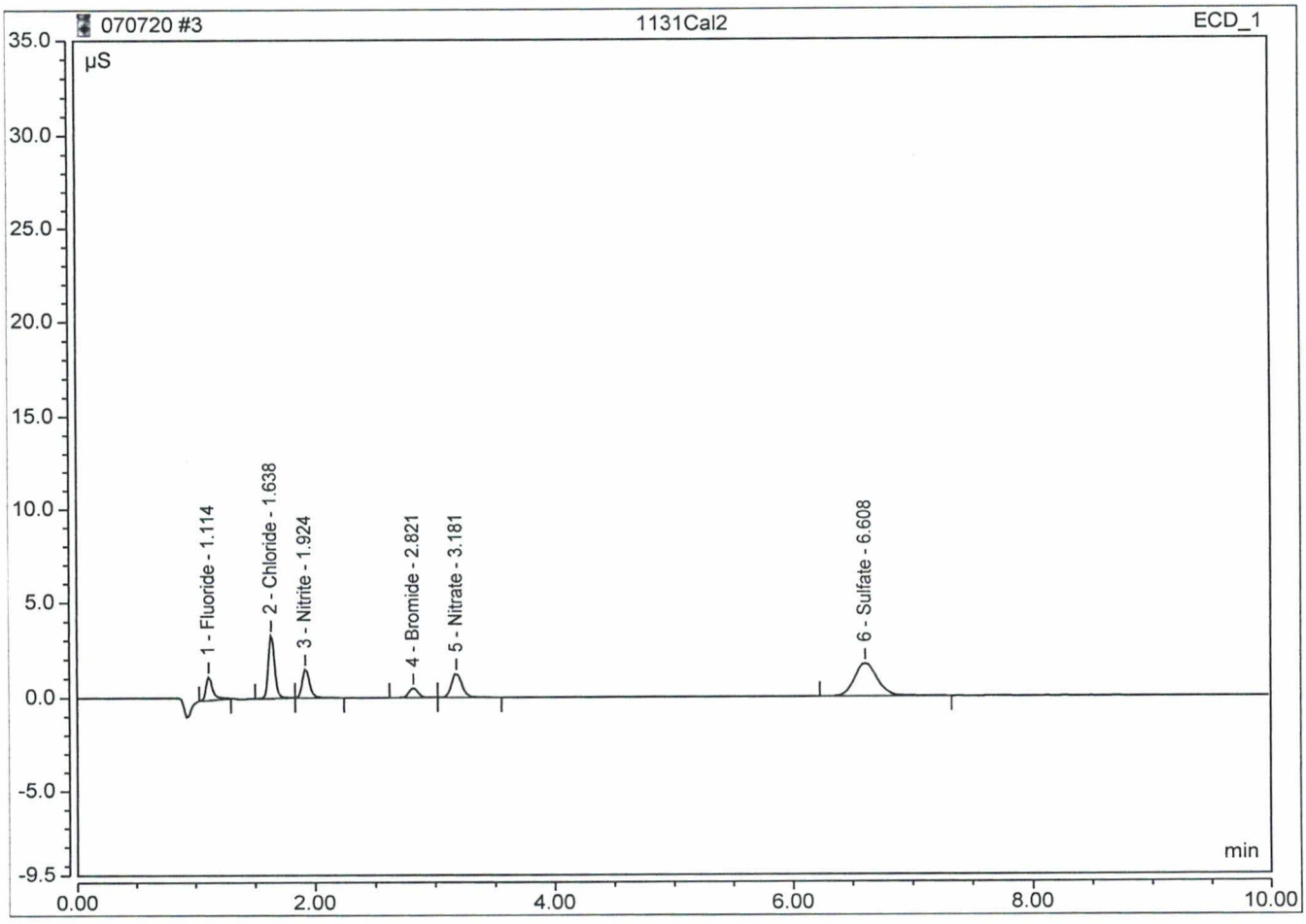
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	Fluoride	BMB	0.039	0.521	n.a.
2	1.64	Chloride	BMB	0.101	1.651	n.a.
3	1.93	Nitrite	BMB	0.021	0.296	n.a.
4	2.83	Bromide	BMB	0.022	0.250	n.a.
5	3.19	Nitrate	BMB	0.027	0.268	n.a.
6	6.62	Sulfate	BMB	0.082	0.364	n.a.
TOTAL:				0.29	3.35	0.00



Peak Integration Report

Sample Name:	**1131Cal2**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:21**	*Operator:*	**Jeff Phifer**

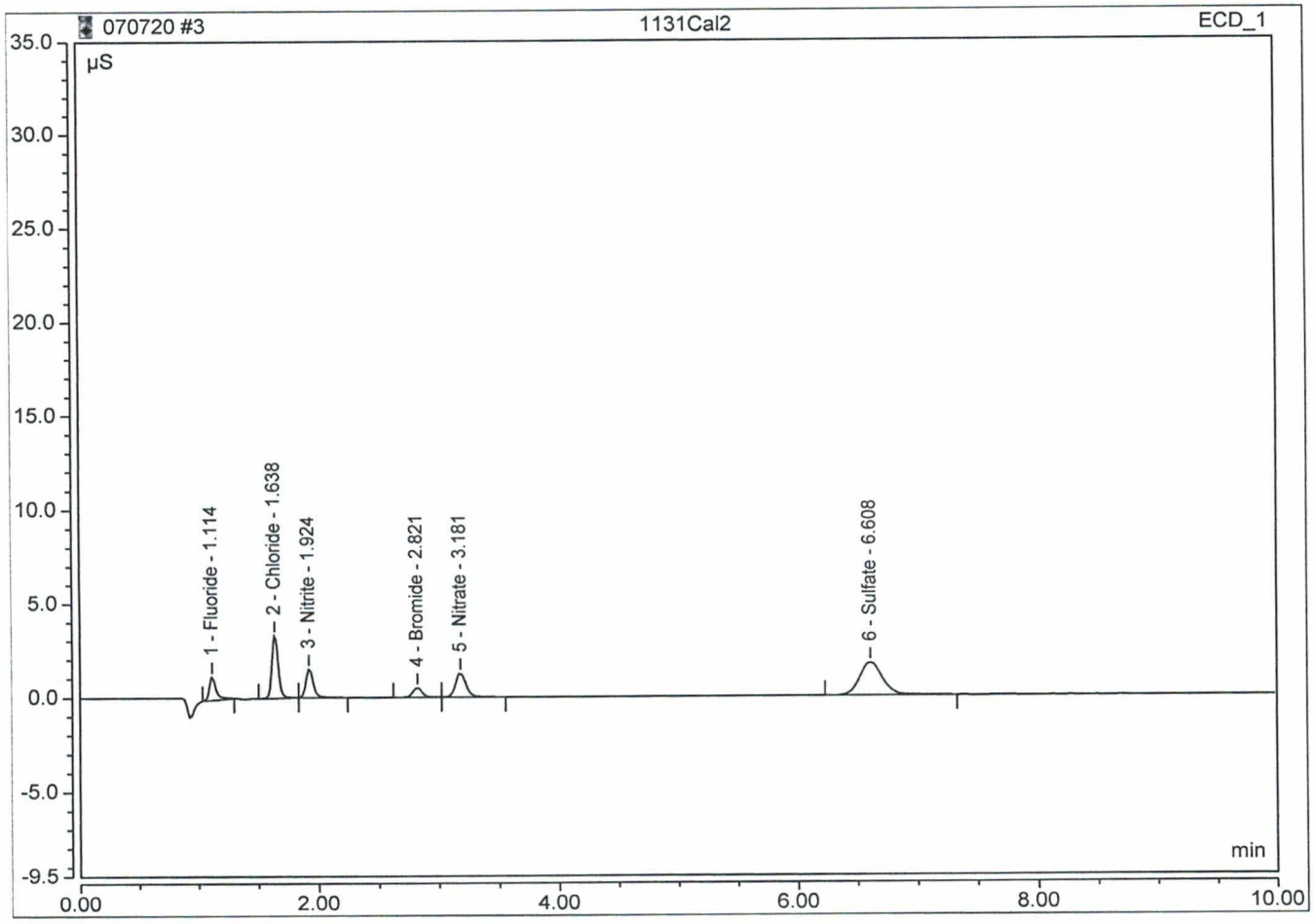
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	**Fluoride**	BMB	0.082	1.223	0.5 0.4881
2	1.64	**Chloride**	BMB	0.202	3.302	2 1.9118
3	1.92	**Nitrite**	BMB	0.106	1.494	0.5 0.4786
4	2.82	**Bromide**	BMB	0.043	0.489	1 1.0026
5	3.18	**Nitrate**	BMB	0.126	1.252	0.5 0.4819
6	6.61	**Sulfate**	BMB	0.383	1.734	5 4.8320
TOTAL:				0.94	9.49	9.19



Peak Integration Report

Sample Name:	**1131Cal2**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:21**	*Operator:*	**Jeff Phifer**

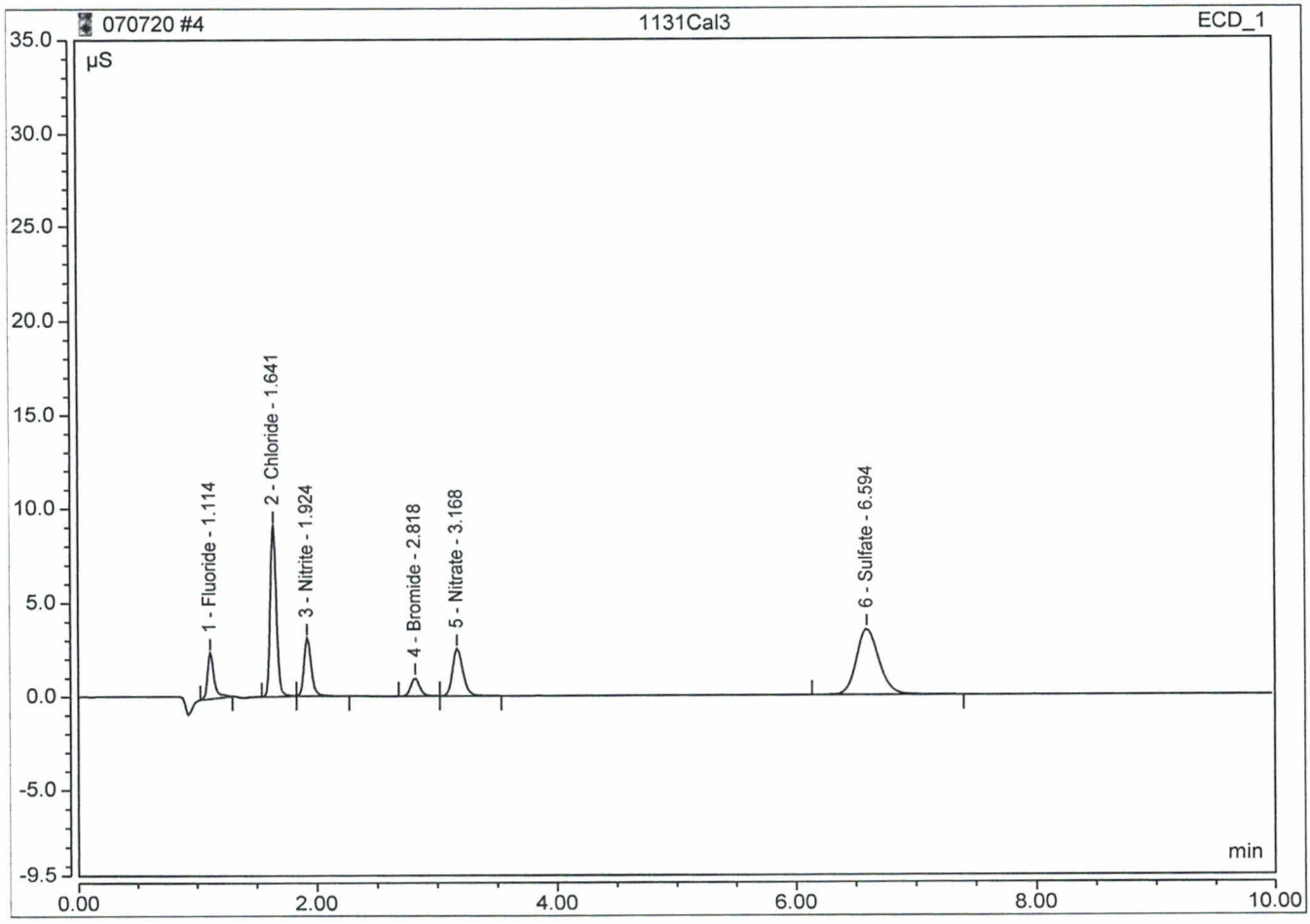
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	**Fluoride**	BMB	0.082	1.223	0.5000
2	1.64	**Chloride**	BMB	0.202	3.302	2.0000
3	1.92	**Nitrite**	BMB	0.106	1.494	0.5000
4	2.82	**Bromide**	BMB	0.043	0.489	1.0000
5	3.18	**Nitrate**	BMB	0.126	1.252	0.5000
6	6.61	**Sulfate**	BMB	0.383	1.734	5.0000
TOTAL:				0.94	9.49	9.50



Peak Integration Report

Sample Name:	**1131Cal3**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:34**	*Operator:*	**Jeff Phifer**

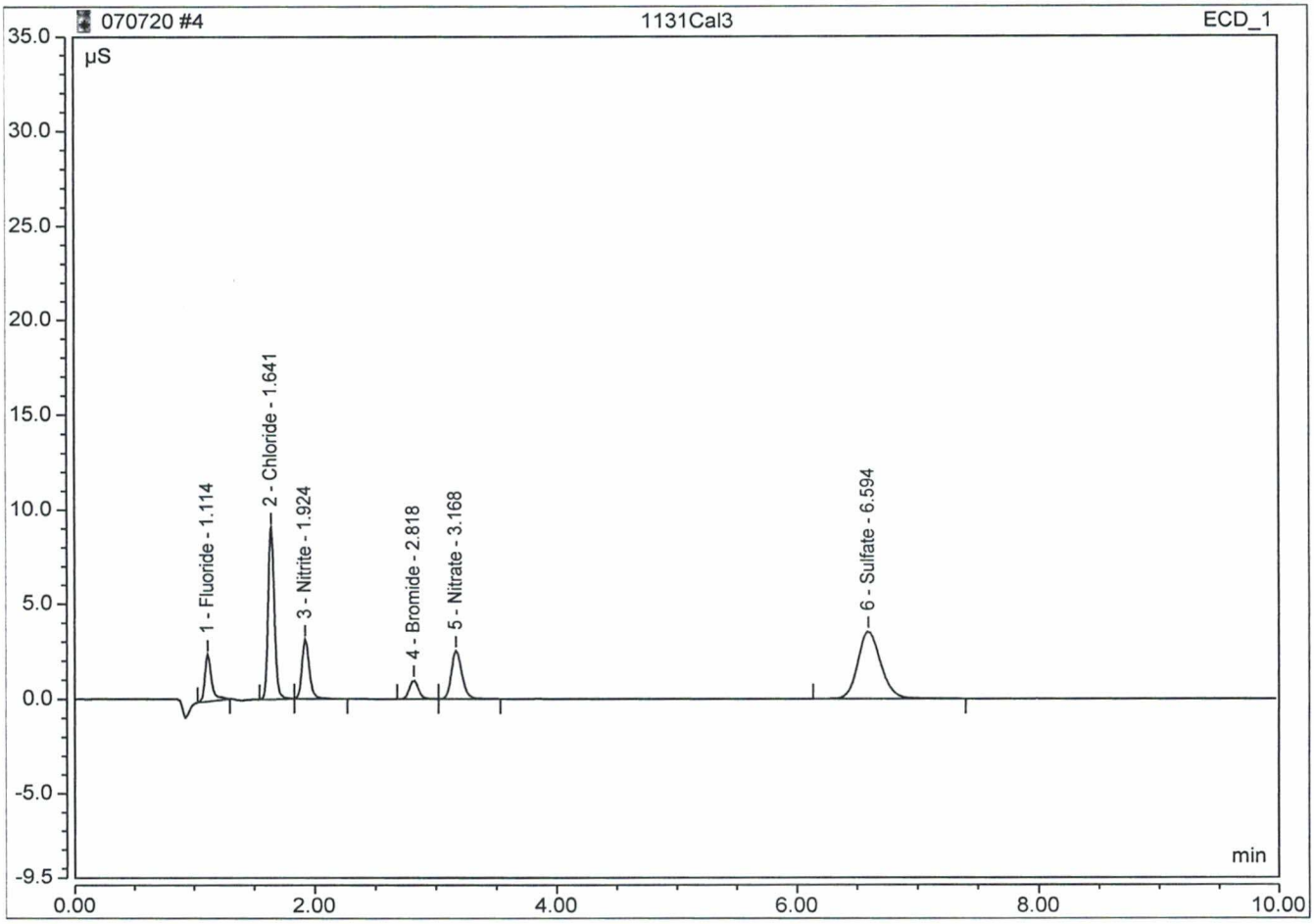
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	**Fluoride**	BMB	0.155	2.427	1 0.9656
2	1.64	**Chloride**	BMB	0.540	9.060	5 4.6937
3	1.92	**Nitrite**	BMB	0.216	3.083	1 0.9661
4	2.82	**Bromide**	BMB	0.085	0.977	2 1.9598
5	3.17	**Nitrate**	BMB	0.251	2.511	1 0.9588
6	6.59	**Sulfate**	BMB	0.768	3.517	10 9.6641
TOTAL:				2.02	21.57	19.21



Peak Integration Report

Sample Name:	**1131Cal3**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:34**	*Operator:*	**Jeff Phifer**

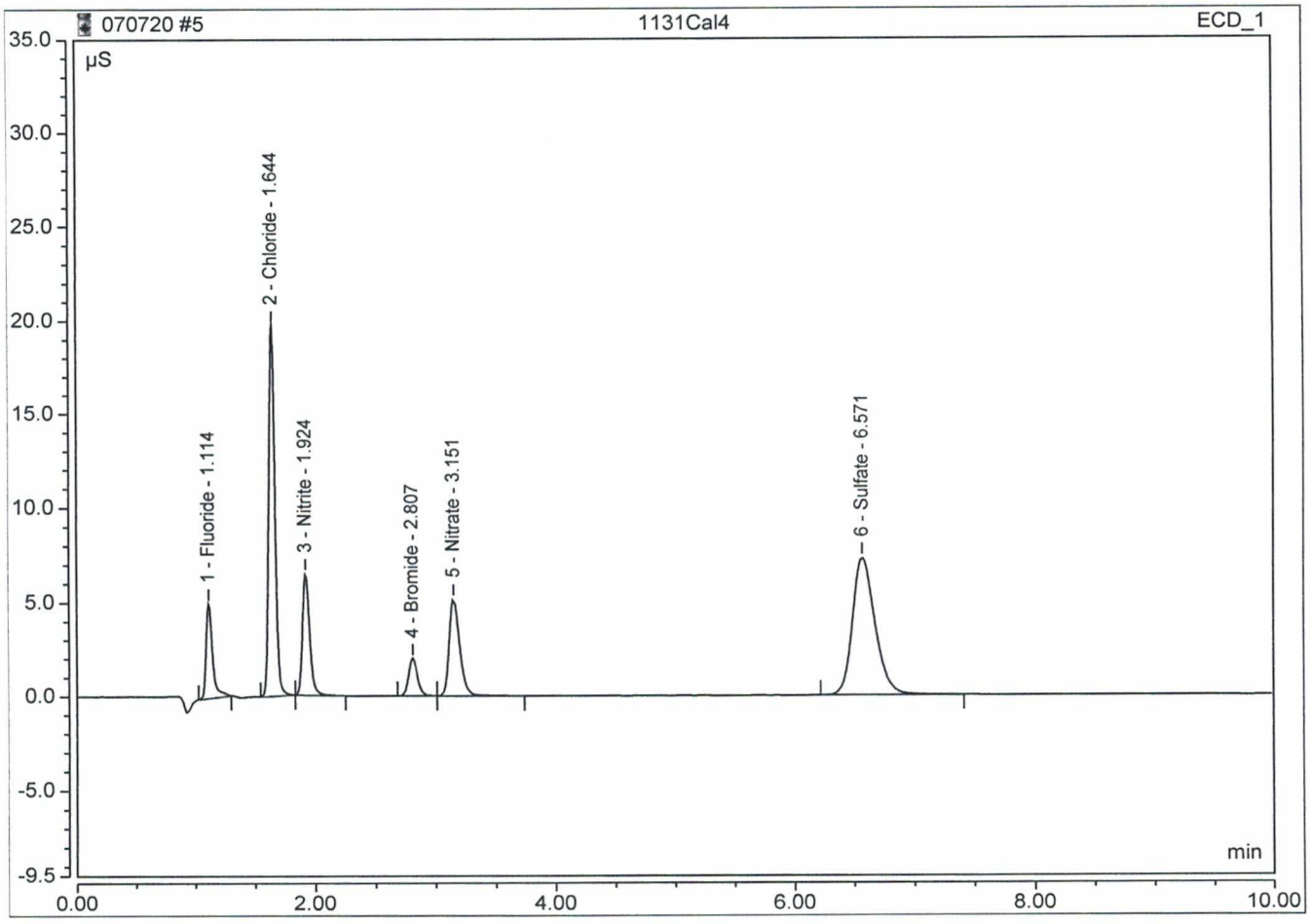
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	Fluoride	BMB	0.155	2.427	1.0028
2	1.64	Chloride	BMB	0.540	9.060	5.0381
3	1.92	Nitrite	BMB	0.216	3.083	1.0063
4	2.82	Bromide	BMB	0.085	0.977	1.9960
5	3.17	Nitrate	BMB	0.251	2.511	1.0021
6	6.59	Sulfate	BMB	0.768	3.517	10.0296
TOTAL:				2.02	21.57	20.07



Peak Integration Report

Sample Name:	**1131Cal4**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:46**	*Operator:*	**Jeff Phifer**

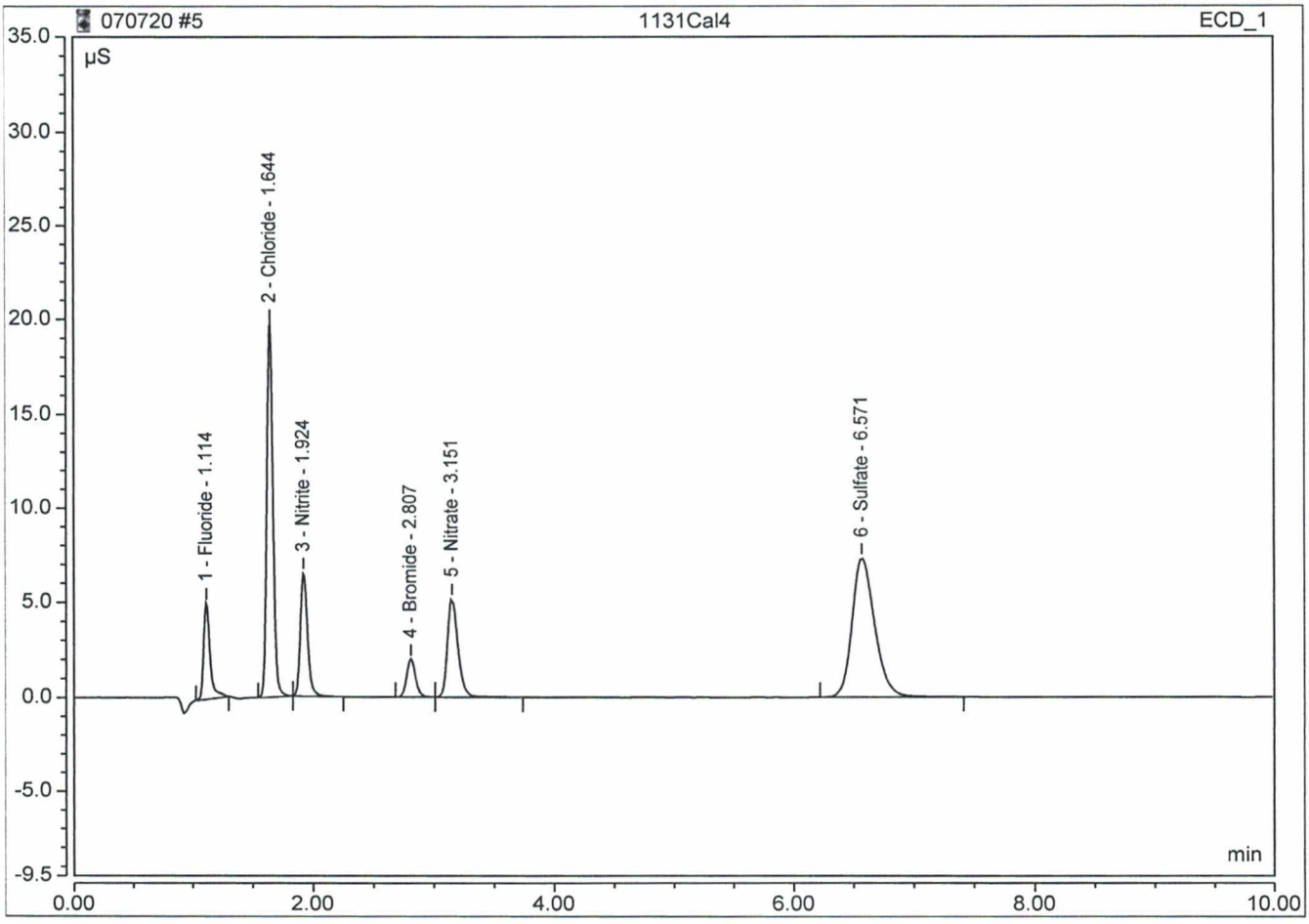
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	Fluoride	BMB	0.313	5.047	2 1.9874
2	1.64	Chloride	BMB	1.171	19.722	10 9.8670
3	1.92	Nitrite	BMB	0.447	6.494	2 1.9838
4	2.81	Bromide	BMB	0.172	1.992	4 3.9335
5	3.15	Nitrate	BMB	0.523	5.181	2 1.9899
6	6.57	Sulfate	BMB	1.586	7.313	20 19.9329
TOTAL:				4.21	45.75	39.69



Peak Integration Report

Sample Name:	**1131Cal4**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:46**	*Operator:*	**Jeff Phifer**

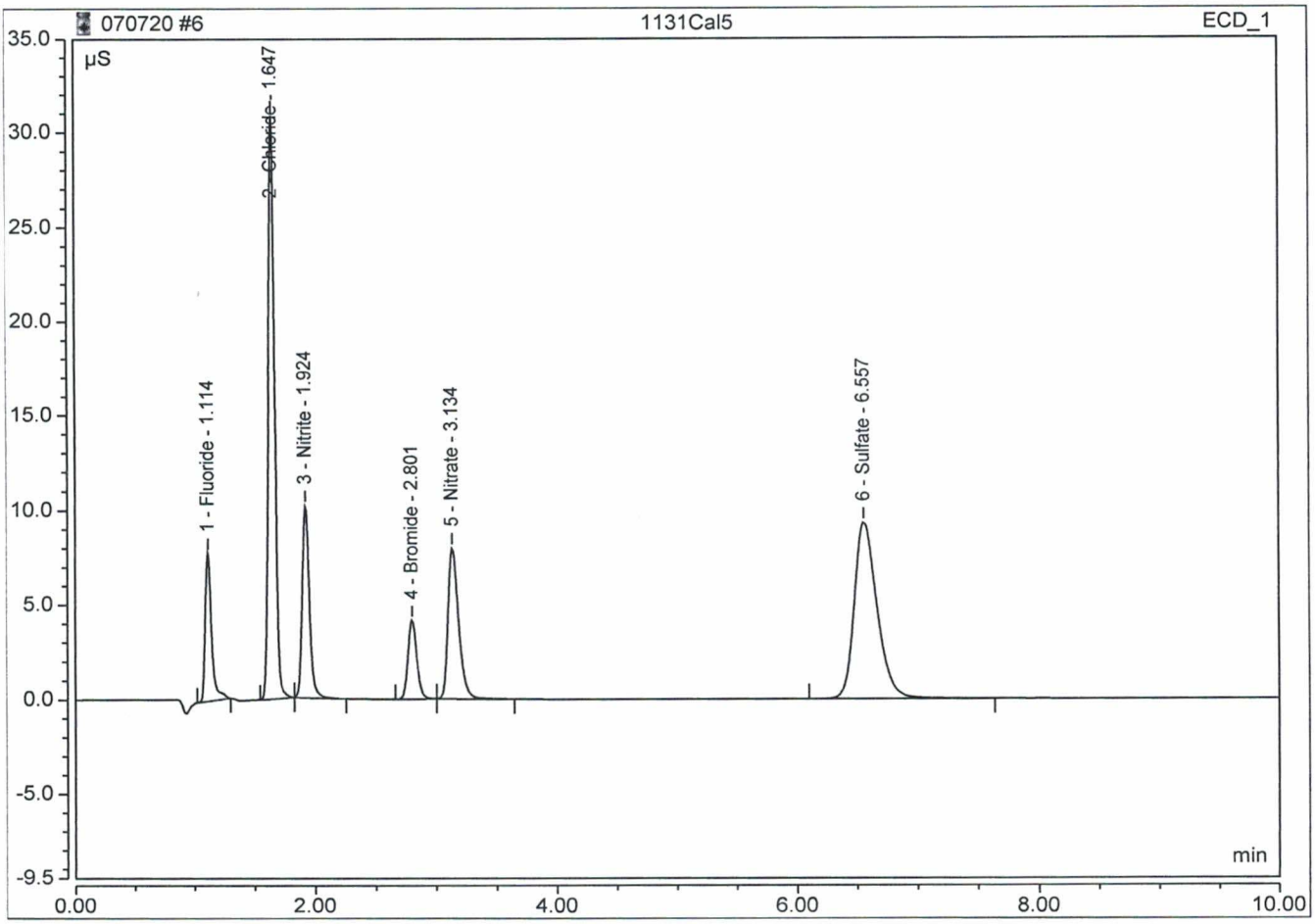
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	Fluoride	BMB	0.313	5.047	2.0249
2	1.64	Chloride	BMB	1.171	19.722	10.2103
3	1.92	Nitrite	BMB	0.447	6.494	2.0275
4	2.81	Bromide	BMB	0.172	1.992	4.0098
5	3.15	Nitrate	BMB	0.523	5.181	2.0325
6	6.57	Sulfate	BMB	1.586	7.313	20.2778
TOTAL:				4.21	45.75	40.58



Peak Integration Report

Sample Name:	**1131Cal5**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 038777**
Inj. Date / Time:	**07-Jul-2020 / 10:59**	*Operator:*	**Jeff Phifer**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount mg/L
1	1.11	Fluoride	BMB	0.476	7.811	3 3.0493
2	1.65	Chloride	BMB	1.849	30.847	15 15.4380
3	1.92	Nitrite	BMB	0.692	10.161	3 3.0652
4	2.80	Bromide	BMB	0.354	4.145	8 8.0928
5	3.13	Nitrate	BMB	0.805	7.979	3 3.0633
6	6.56	Sulfate	BMB	2.031	9.317	25 25.5213
TOTAL:				6.21	70.26	58.23



Sequence: 082020
Last Update Operator: pcuser

ICS-1100 B Dionex IC / Meth 300.0

ECD_1	Name	Type	Level	Position	Instrument Method	Processing Method	Status	Inject Time
	water blank	Unknown		1	Norm Method	Anion	Finished	7/7/2020 10:40:04 AM -0
	1131Cal1	Calibration Standard	01	2	Norm Method	Anion	Finished	7/7/2020 10:52:24 AM -0
	1131Cal2	Calibration Standard	02	3	Norm Method	Anion	Finished	7/7/2020 11:05:16 AM -0
	1131Cal3	Calibration Standard	03	4	Norm Method	Anion	Finished	7/7/2020 11:18:08 AM -0
	1131Cal4	Calibration Standard	04	5	Norm Method	Anion	Finished	7/7/2020 11:31:00 AM -0
	1131Cal5	Calibration Standard	05	6	Norm Method	Anion	Finished	7/7/2020 11:43:51 AM -0
	Blank	Unknown		1	Norm Method	Anion	Finished	8/20/2020 8:48:04 AM -0
	BSpike 11738BS1	Check Standard		2	Norm Method	Anion	Finished	8/20/2020 9:00:23 AM -0
	LCS 11738LCS1	Check Standard		3	Norm Method	Anion	Finished	8/20/2020 9:13:15 AM -0
	16725.01	Unknown		4	Norm Method	Anion	Finished	8/20/2020 9:26:07 AM -0
	16725.02	Unknown		5	Norm Method	Anion	Finished	8/20/2020 9:38:59 AM -0
	16725.03	Unknown		6	Norm Method	Anion	Finished	8/20/2020 9:51:51 AM -0
	16695.02	Unknown		7	Norm Method	Anion	Finished	8/20/2020 10:04:43 AM ·
	16695.03	Unknown		8	Norm Method	Anion	Finished	8/20/2020 10:17:35 AM ·
	16695.04	Unknown		9	Norm Method	Anion	Finished	8/20/2020 10:30:26 AM ·
	16695.05	Unknown		10	Norm Method	Anion	Finished	8/20/2020 10:43:18 AM ·
	16695.06	Unknown		11	Norm Method	Anion	Finished	8/20/2020 10:56:10 AM ·
	16695.03 dup	Unknown		12	Norm Method	Anion	Finished	8/20/2020 11:09:01 AM ·
	16695.03 MS 13061MS	Unknown		13	Norm Method	Anion	Finished	8/20/2020 11:21:54 AM ·
	16695.03 MSD 13061M	Unknown		14	Norm Method	Anion	Finished	8/20/2020 11:34:46 AM ·
	16695.06	Unknown		15	Norm Method	Anion	Finished	8/20/2020 11:47:37 AM ·
	BSpike 11738BS1	Check Standard		16	Norm Method	Anion	Finished	8/20/2020 12:00:29 PM ·
	Blank	Unknown		17	Norm Method	Anion	Finished	8/20/2020 12:13:21 PM ·

CALIBR ICSB072020CAL

CL200820-wl-B
SFT200820-wl-B
NTRA 200820-wl-B
NTRI 200820-wl-B

Weight	Dilution	IntStd	Replicate ID	Comment	Spike Group
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	10.0000	1.0000		Jeff Phifer	
1.0000	10.0000	1.0000		Jeff Phifer	
1.0000	10.0000	1.0000		Jeff Phifer	
1.0000	25.0000	1.0000		Jeff Phifer	
1.0000	10.0000	1.0000		Jeff Phifer	
1.0000	50.0000	1.0000		Jeff Phifer	
1.0000	10.0000	1.0000		Jeff Phifer	
1.0000	50.0000	1.0000		Jeff Phifer	
1.0000	10.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	10.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	

Norm Method	16/06/15 12:18	Jeff Phifer	**METHOD 300.0**	
Stage	Time	Command	Value	Comment
	min	8.20.20		
Instrument Setup				
	initial			
		Sampler.HomeNeedle		
		Sampler.ResetVials	1, 50	
		Pump_ECD.Pressure.UpperLimit	4500 [psi]	
		Sampler.DelayVolume	125 [µl]	
		Pump_ECD.%A.Equate	"Carb - BiCarb"	
		Pump_ECD.Pressure.LowerLimit	100 [psi]	
		Pump_ECD.CellTemperature.Nominal	35.0 [°C]	
		Pump_ECD.Data_Collection_Rate	5.0 [Hz]	
		Pump_ECD.Suppressor_Type	ASRS_4mm	
		Pump_ECD.Suppressor_Carbonate	1.8 [mM]	
		Pump_ECD.Suppressor_Bicarbonate	1.7 [mM]	
		Pump_ECD.Suppressor_Hydroxide	0.0 [mM]	
		Pump_ECD.Suppressor_Tetraborate	0.0 [mM]	
		Pump_ECD.Suppressor_OtherEluent	0.0 [mN]	
		Pump_ECD.Suppressor_RecommendedCurrent	27 [mA]	
		Pump_ECD.Suppressor_Current	27 [mA]	
		Sampler.FlushFactor	10	
		Sampler.DeliverSpeed	4.0 [ml/min]	
		Pump_ECD.Flow	2.00	
		Sampler.LoadPosition		
		Sampler.DeliverSample	Full	
		Sampler.EndSamplePrep		
Inject				
	0.000			
		Wait	Sampler.CycleTimeState, Hold,	
		Sampler.Inject		
Start Run				
	0.000			
		Pump_ECD.Channel_Pressure.AcqOn		
		Pump_ECD.Autozero		
		Pump_ECD.ECD_1.AcqOn		
		Pump_ECD.ECD_Total.AcqOn		
Run			Duration = 10.000 [min]	
	0.000			
	0.500			
		Sampler.BeginOverlap		
Stop Run				
	10.000			
		Pump_ECD.Channel_Pressure.AcqOff		
		Pump_ECD.ECD_1.AcqOff		
		Pump_ECD.ECD_Total.AcqOff		
End				

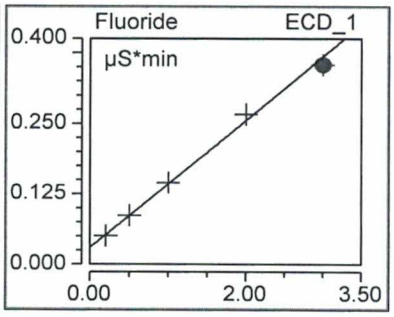
Calibration Batch Report
CAL ID# ICSB070720CAL

Sequence:	**082020**	*Injection Volu*	**2,500.00**
Instrument Method:	**Norm Method**	*Operator:*	**Jeff Phifer**
Inj. Date / Time:	**07-Jul-2020 / 11:43**	*Column:*	**AS4A-SC 040144**

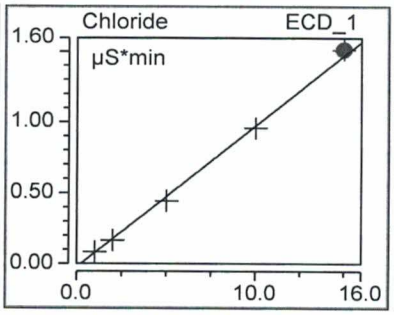
Calibration Summary

Peak Name	Eval.Type	Cal.Type	Window Width min	Offset (C0)	Slope (C1)	Curve (C2)	Corr.Coeff.
Fluoride	Area	Lin, WithOffset, 1/A	0.02	0.029	0.113	0.000	0.9985
Chloride	Area	Lin, WithOffset, 1/A	0.05	-0.023	0.100	0.000	0.9988
Nitrite	Area	Lin, WithOffset, 1/A	0.07	-0.002	0.191	0.000	0.9996
Bromide	Area	Lin, WithOffset, 1/A	0.16	0.000	0.036	0.000	0.9998
Nitrate	Area	Lin, WithOffset, 1/A	0.18	-0.001	0.214	0.000	0.9997
Sulfate	Area	Lin, WithOffset, 1/A	0.51	-0.003	0.064	0.000	0.9997
		AVERAGE:		-0.0002	0.1196	0.0000	0.9994

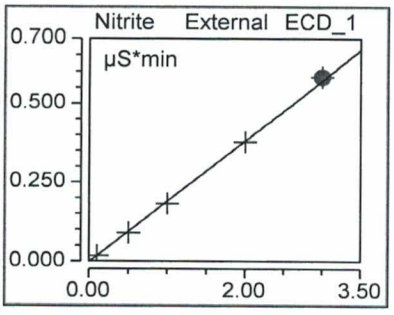
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Fluoride	Fluoride	Fluoride	Fluoride
1131Cal1	1.084	0.0508	0.484	0.189
1131Cal2	1.084	0.0870	0.999	0.510
1131Cal3	1.081	0.1450	1.848	1.024
1131Cal4	1.081	0.2666	3.636	2.101
1131Cal5	1.081	0.3541	5.285	2.876
Average	1.082			
Rel. Std. Dev.	0.164 %			



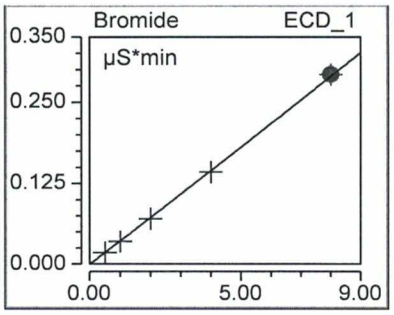
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Chloride	Chloride	Chloride	Chloride
1131Cal1	1.627	0.0849	1.387	1.089
1131Cal2	1.627	0.1668	2.765	1.912
1131Cal3	1.628	0.4444	7.521	4.701
1131Cal4	1.631	0.9564	16.335	9.846
1131Cal5	1.634	1.5142	25.720	15.452
Average	1.629			
Rel. Std. Dev.	0.180 %			



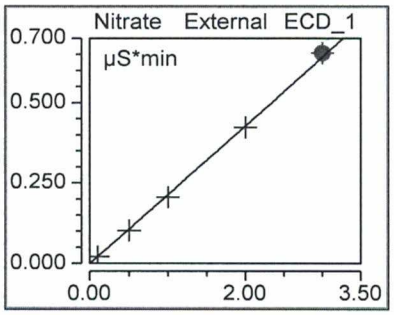
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Nitrite	Nitrite	Nitrite	Nitrite
1131Cal1	1.934	0.0181	0.252	0.106
1131Cal2	1.934	0.0900	1.251	0.483
1131Cal3	1.931	0.1818	2.556	0.963
1131Cal4	1.931	0.3773	5.333	1.987
1131Cal5	1.931	0.5827	8.298	3.062
Average	1.932			
Rel. Std. Dev.	0.092 %			



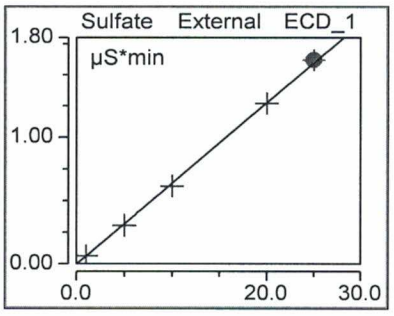
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Bromide	Bromide	Bromide	Bromide
1131Cal1	2.887	0.0182	0.193	0.515
1131Cal2	2.884	0.0355	0.378	0.993
1131Cal3	2.878	0.0705	0.760	1.960
1131Cal4	2.871	0.1427	1.549	3.949
1131Cal5	2.864	0.2925	3.206	8.083
Average	2.877			
Rel. Std. Dev.	0.332 %			



Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Nitrate	Nitrate	Nitrate	Nitrate
1131Cal1	3.271	0.0215	0.202	0.105
1131Cal2	3.257	0.1026	0.952	0.485
1131Cal3	3.248	0.2057	1.911	0.967
1131Cal4	3.234	0.4230	3.909	1.982
1131Cal5	3.217	0.6540	6.009	3.062
Average	3.245			
Rel. Std. Dev.	0.636 %			



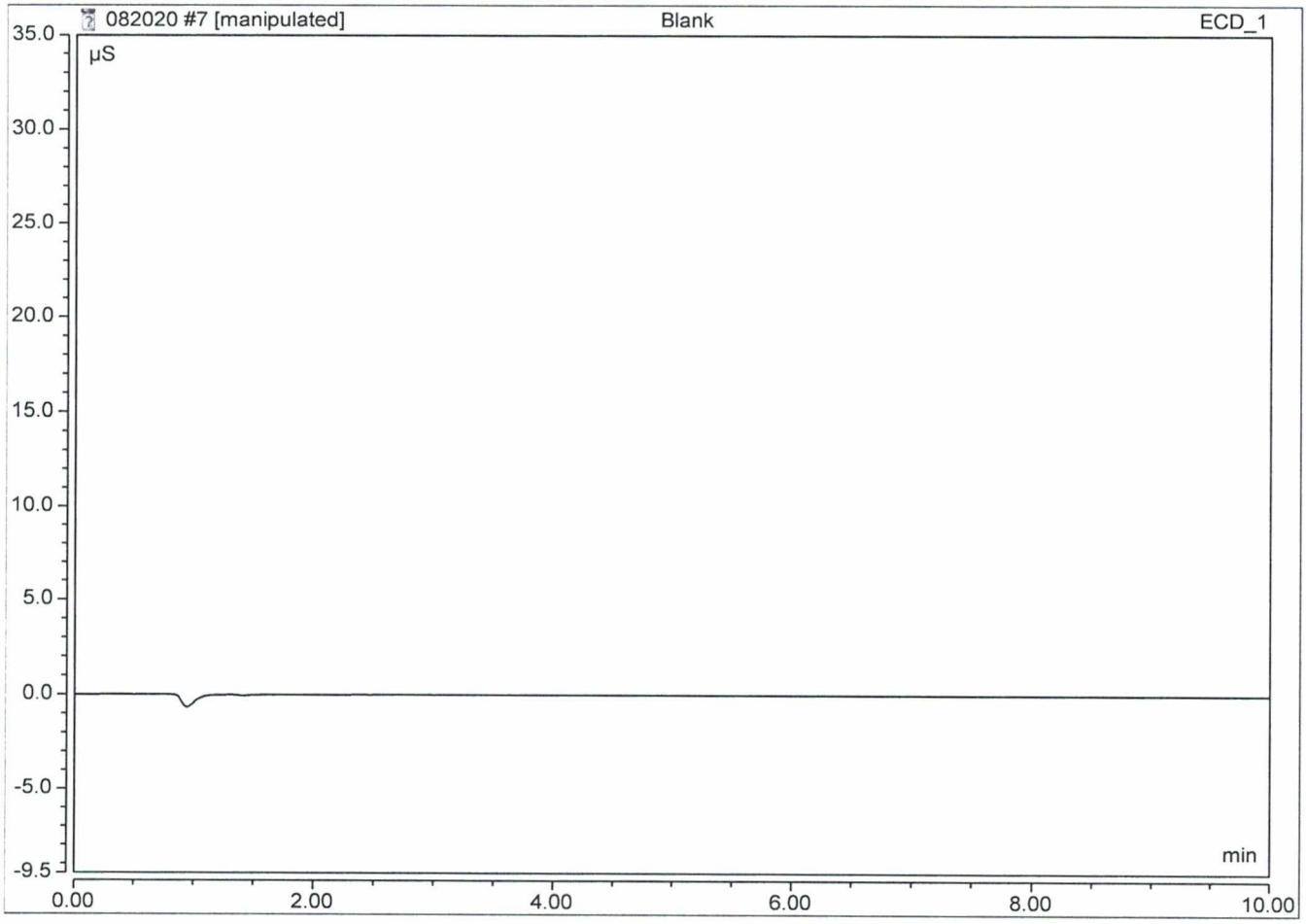
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Sulfate	Sulfate	Sulfate	Sulfate
1131Cal1	6.867	0.0635	0.271	1.047
1131Cal2	6.867	0.3050	1.300	4.836
1131Cal3	6.854	0.6147	2.631	9.693
1131Cal4	6.837	1.2706	5.439	19.981
1131Cal5	6.824	1.6188	6.926	25.443
Average	6.850			
Rel. Std. Dev.	0.279 %			



Peak Integration Report

Sample Name:	**Blank**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 08:48**	*Operator:*	**Jeff Phifer**

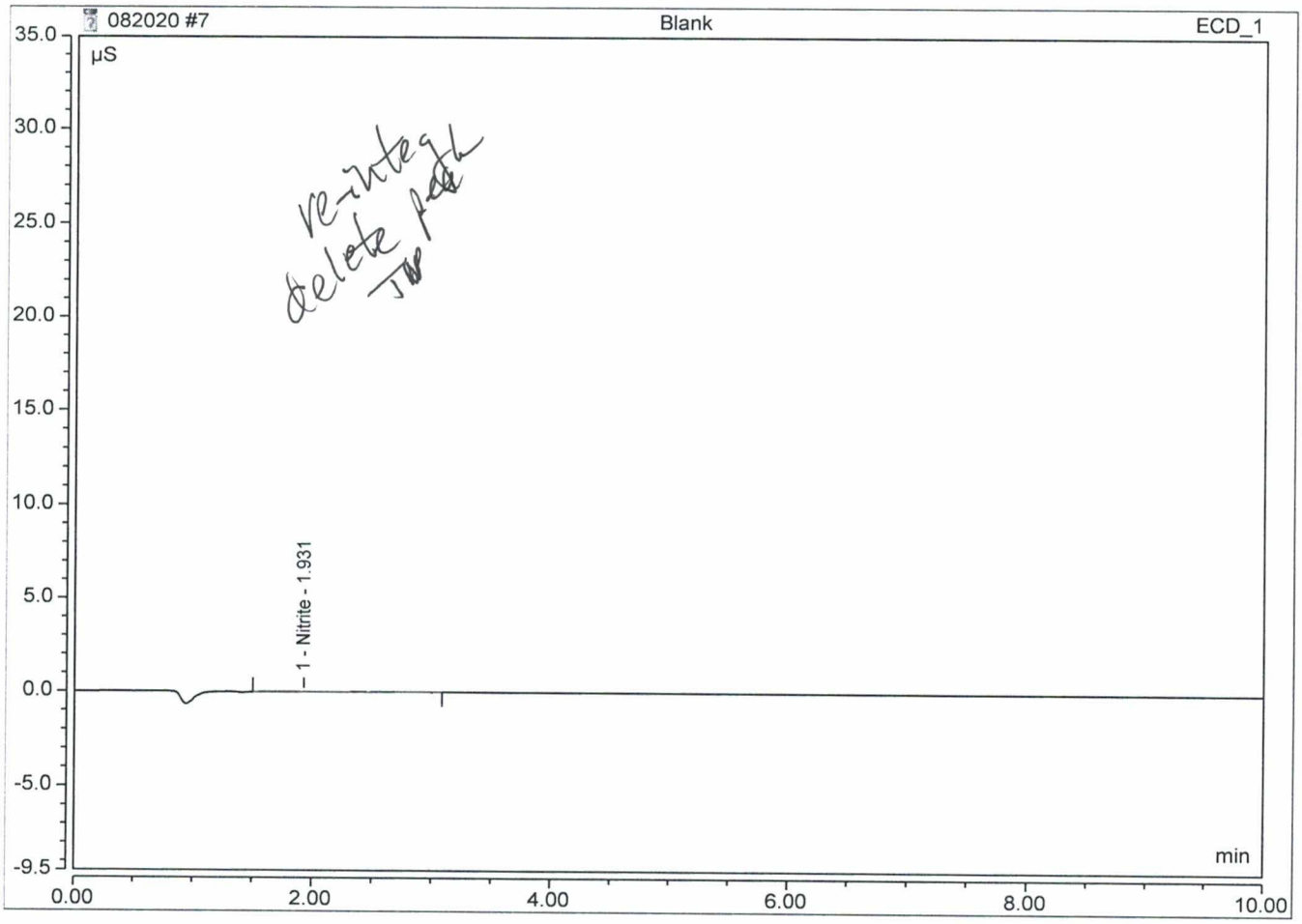
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount n.a.
TOTAL:				0.00	0.00	0.00



Peak Integration Report

Sample Name:	**Blank**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 08:48**	*Operator:*	**Jeff Phifer**

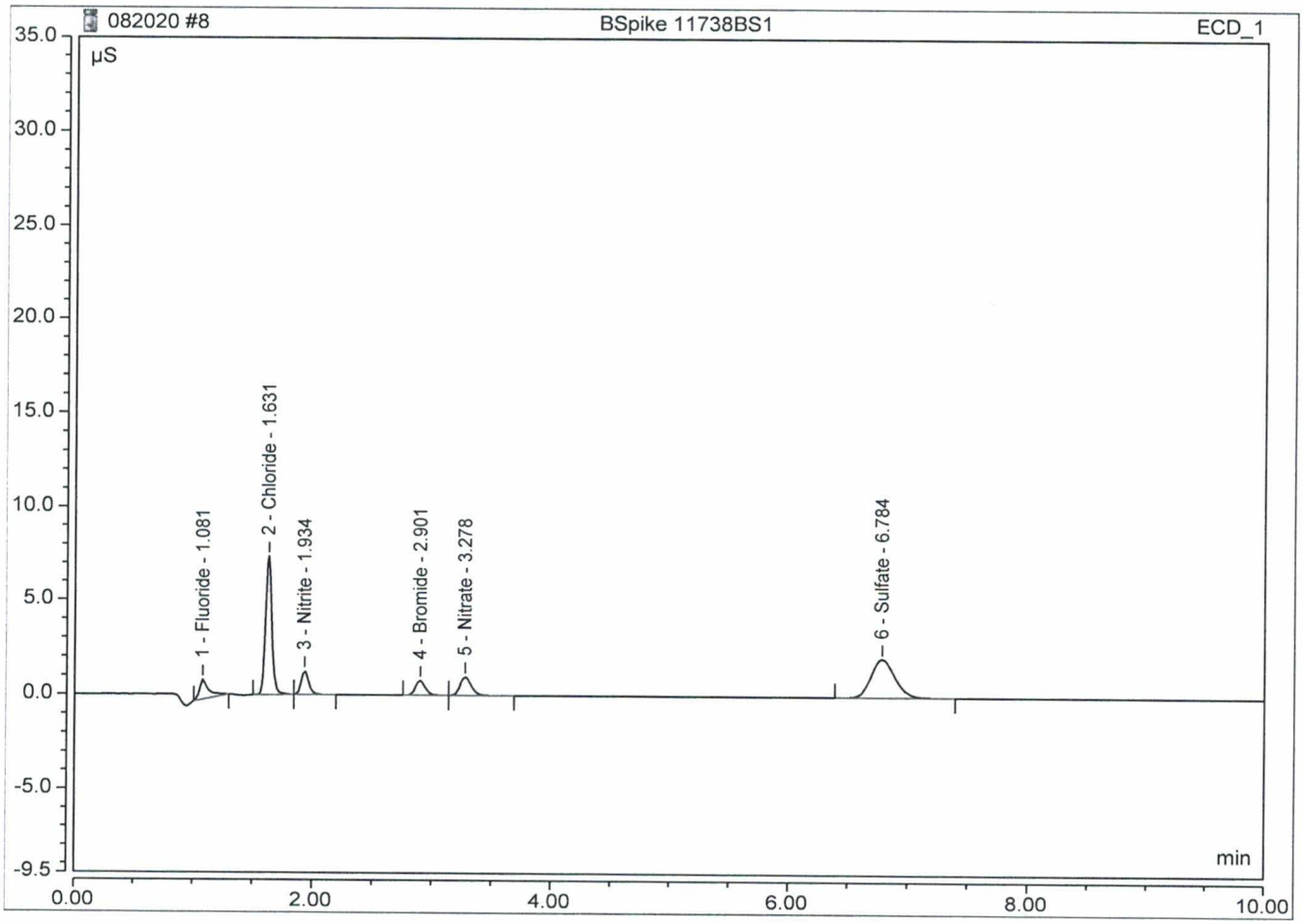
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.93	Nitrite	BMB	0.014	0.015	0.0859
		TOTAL:		0.01	0.02	0.09



Peak Integration Report

Sample Name:	**BSpike 11738BS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 09:00**	*Operator:*	**Jeff Phifer**

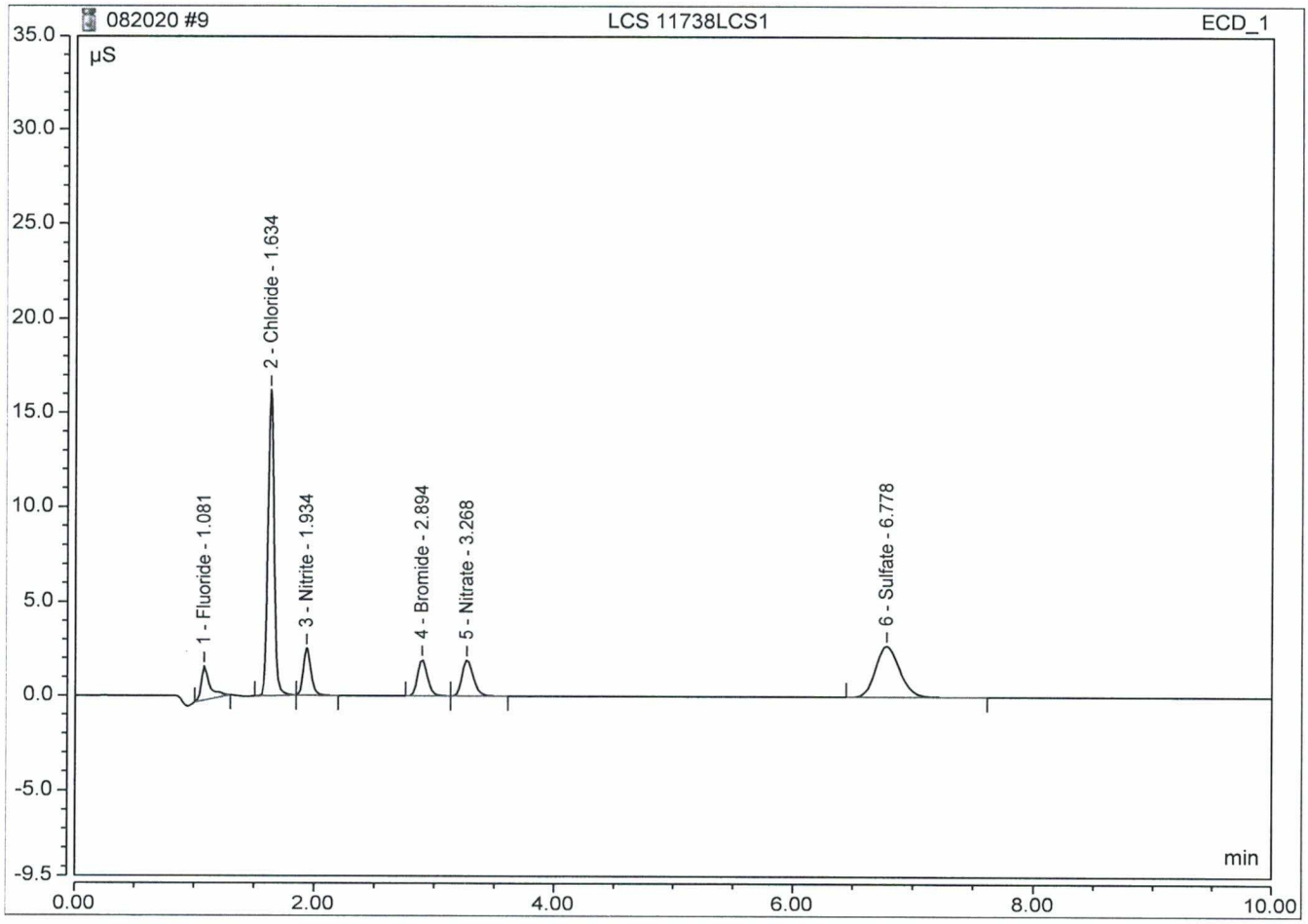
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount	
1	1.08	Fluoride	BMB	0.091	1.023	0.5487	
2	1.63	Chloride	BMB	0.448	7.367	4.7416	94.8
3	1.93	Nitrite	BMB	0.090	1.236	0.4835	96.6
4	2.90	Bromide	BMB	0.073	0.763	2.0224	
5	3.28	Nitrate	BMB	0.106	0.967	0.5010	100.2
6	6.78	Sulfate	BMB	0.469	2.022	7.4002	99.2
TOTAL:				1.28	13.38	15.70	



Peak Integration Report

Sample Name:	**LCS 11738LCS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 09:13**	*Operator:*	**Jeff Phifer**

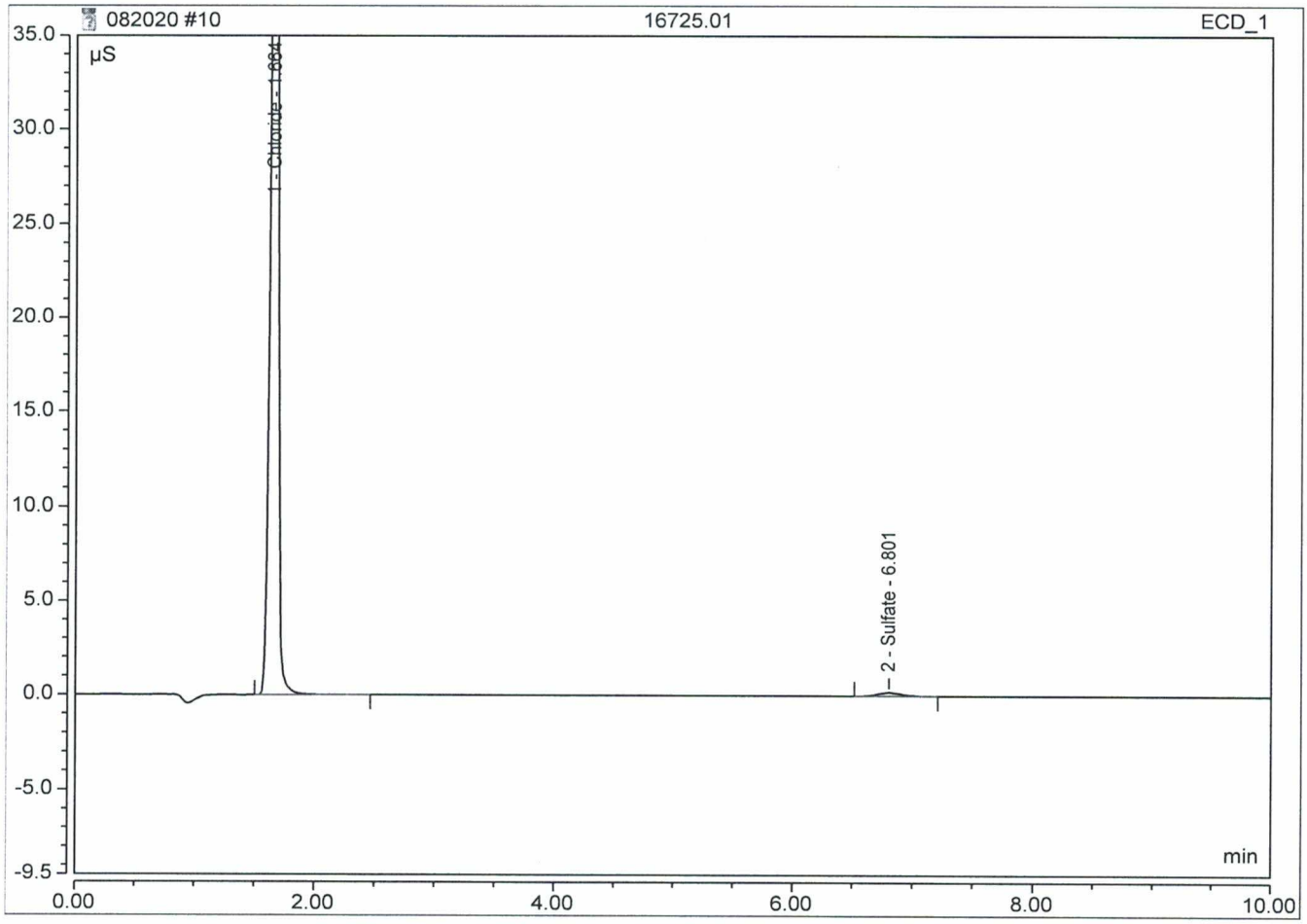
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount		
1	1.08	**Fluoride**	BMB	0.151	1.813		1.0791	
2	1.63	**Chloride**	BMB	0.971	16.226	10	9.9903	100%
3	1.93	**Nitrite**	BMB	0.184	2.526	1	0.9725	97%
4	2.89	**Bromide**	BMB	0.183	1.934		5.0663	
5	3.27	**Nitrate**	BMB	0.210	1.912	1	0.9846	98%
6	6.78	**Sulfate**	BMB	0.628	2.717	10	9.9088	99%
TOTAL:				2.33	27.13		28.00	



Peak Integration Report

Sample Name:	**16725.01**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**10.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 09:26**	*Operator:*	**Jeff Phifer**

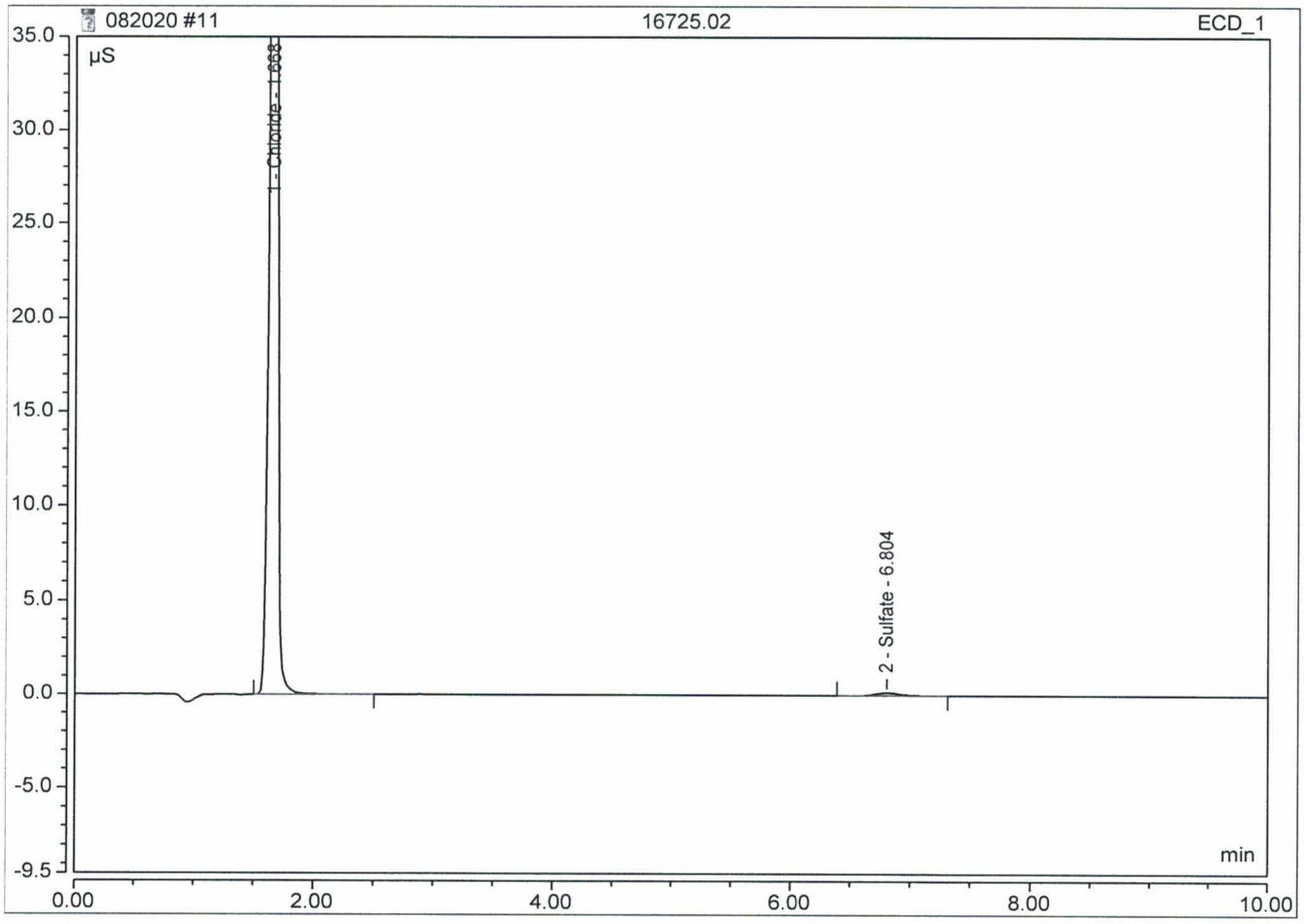
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.66	**Chloride**	BMB	4.271	64.463	431.5017
2	6.80	**Sulfate**	BMB	0.044	0.191	7.4326
TOTAL:				4.31	64.65	438.93



Peak Integration Report

Sample Name:	**16725.02**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**10.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 09:38**	*Operator:*	**Jeff Phifer**

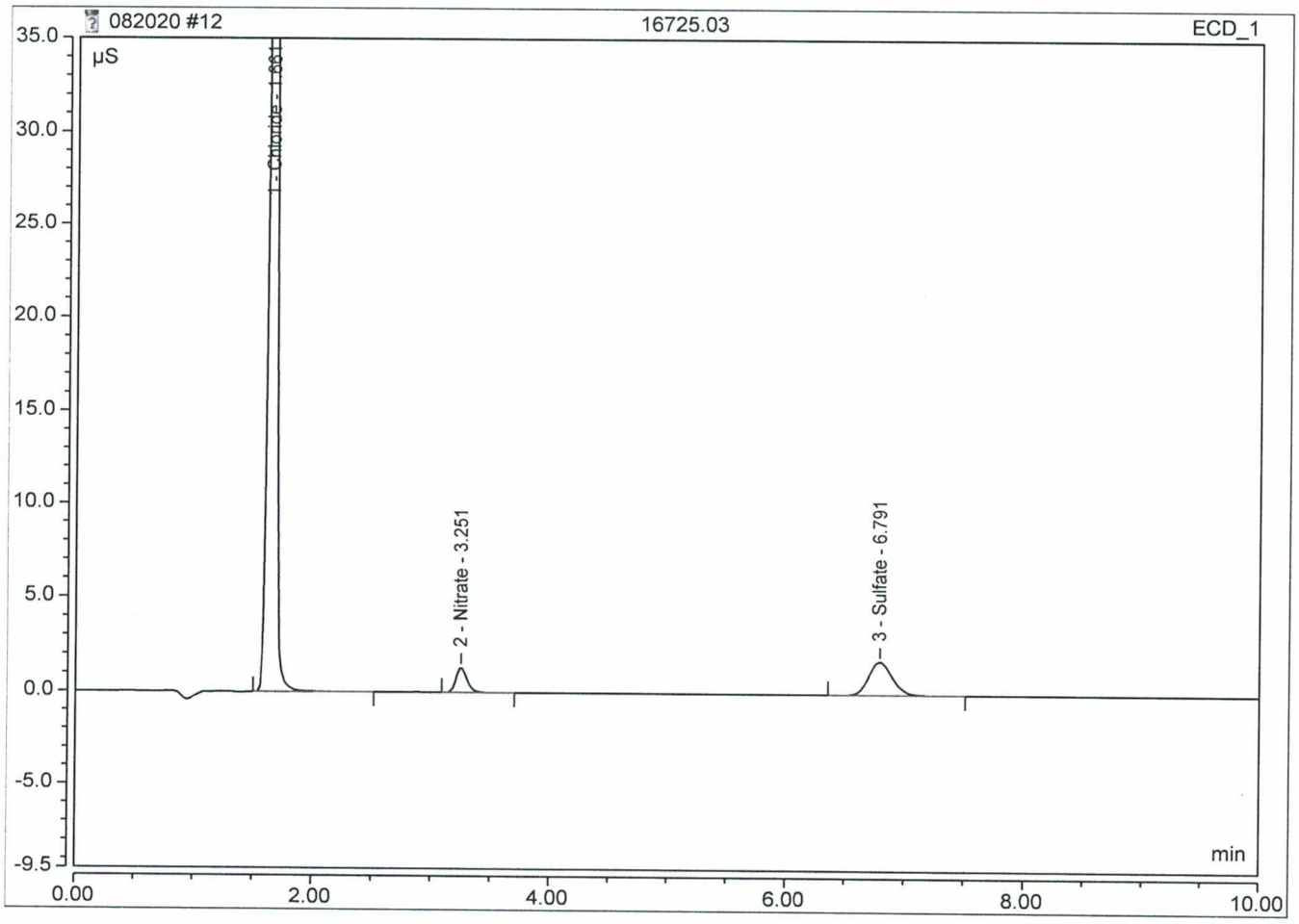
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.67	**Chloride**	BMB	4.959	72.530	500.6522
2	6.80	**Sulfate**	BMB	0.036	0.151	6.1037
TOTAL:				4.99	72.68	506.76



Peak Integration Report

Sample Name:	**16725.03**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**10.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 09:51**	*Operator:*	**Jeff Phifer**

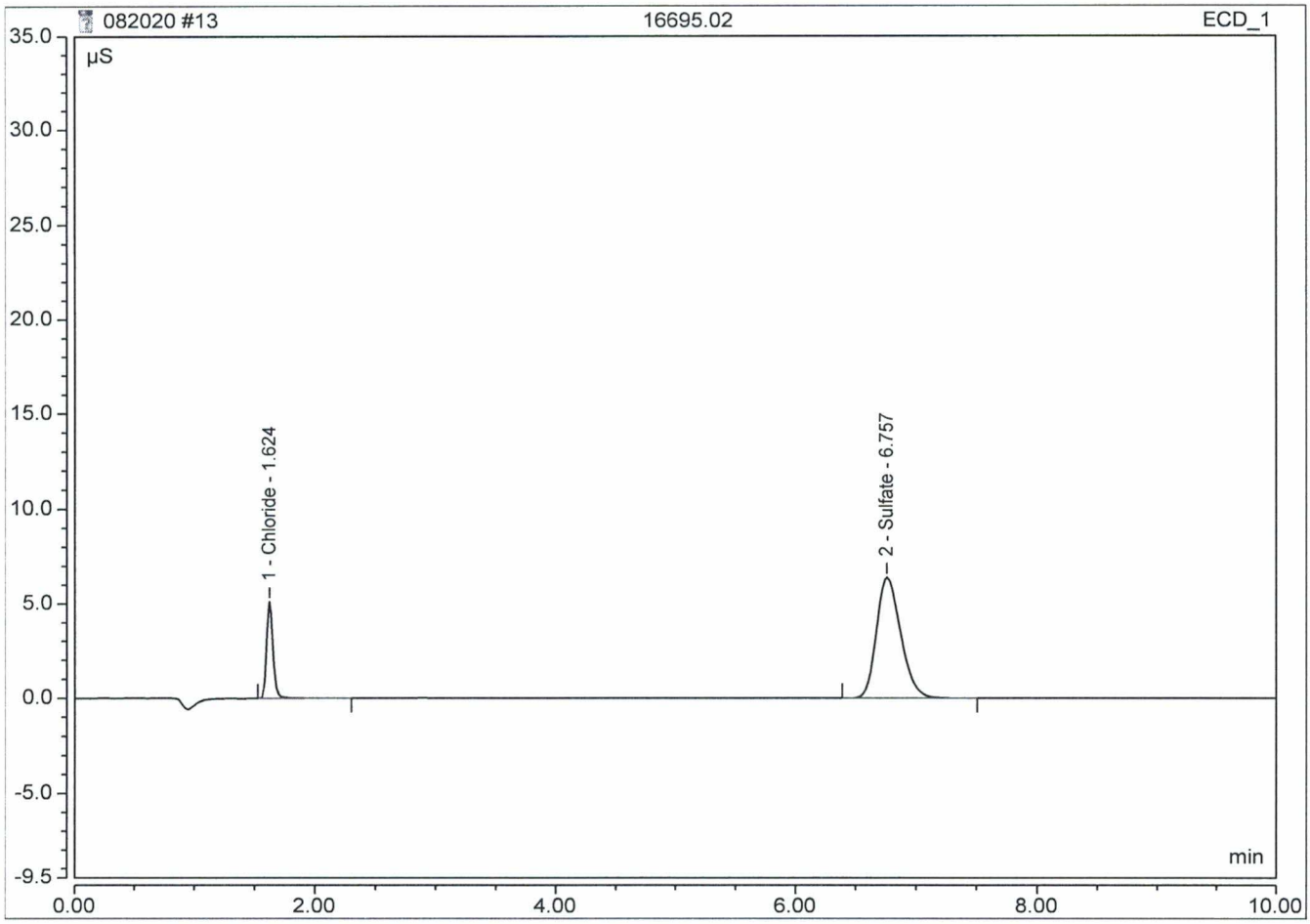
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.66	**Chloride**	BMB	4.856	71.590	490.2885
2	3.25	**Nitrate**	BMB	0.145	1.326	6.8203
3	6.79	**Sulfate**	BMB	0.413	1.783	65.2870
TOTAL:				5.41	74.70	562.40



Peak Integration Report

Sample Name:	**16695.02**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**25.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 10:04**	*Operator:*	**Jeff Phifer**

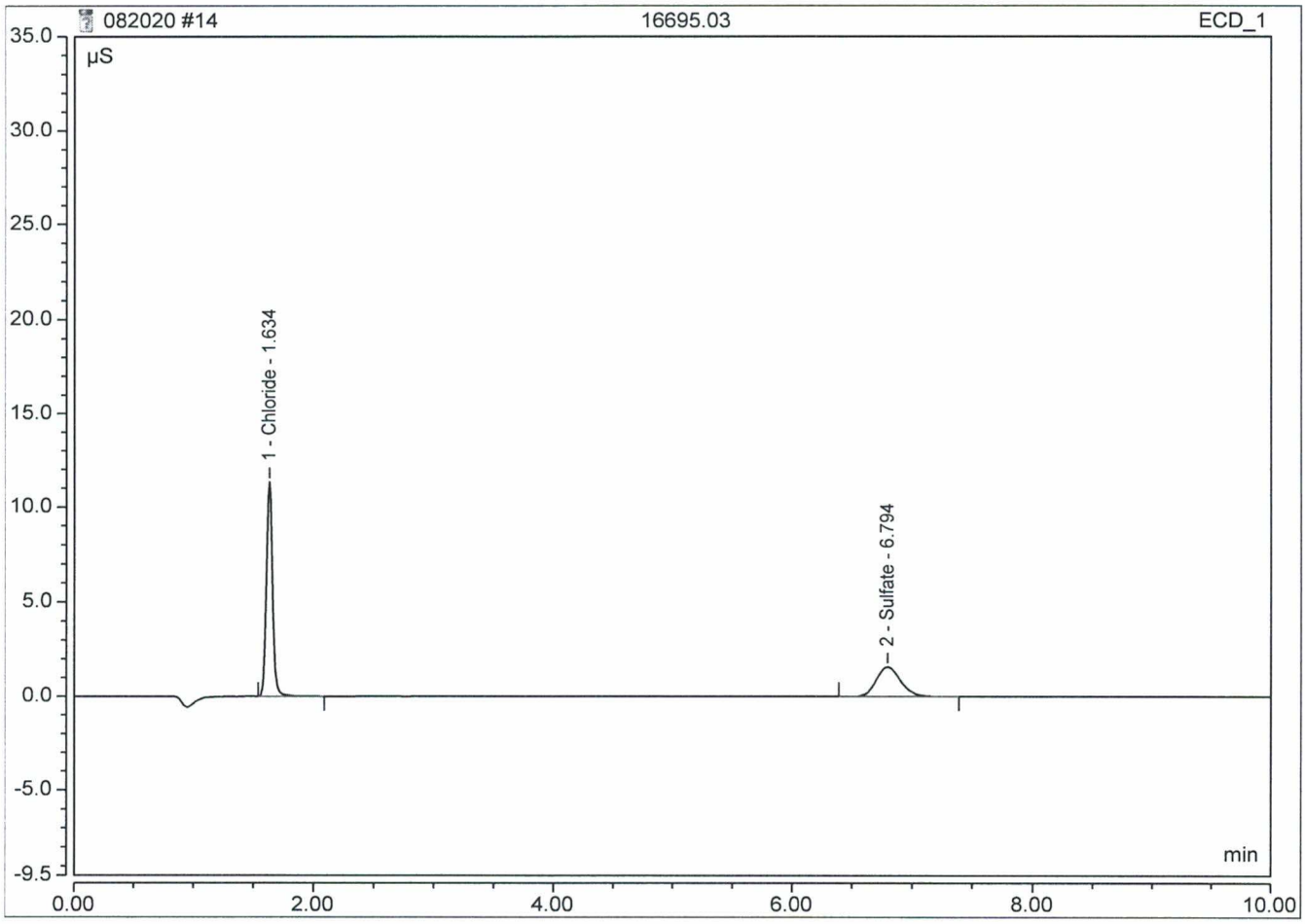
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.62	Chloride	BMB	0.314	5.121	84.6938
2	6.76	Sulfate	BMB	1.477	6.407	580.4633
TOTAL:				1.79	11.53	665.16



Peak Integration Report

Sample Name:	**16695.03**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**10.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 10:17**	*Operator:*	**Jeff Phifer**

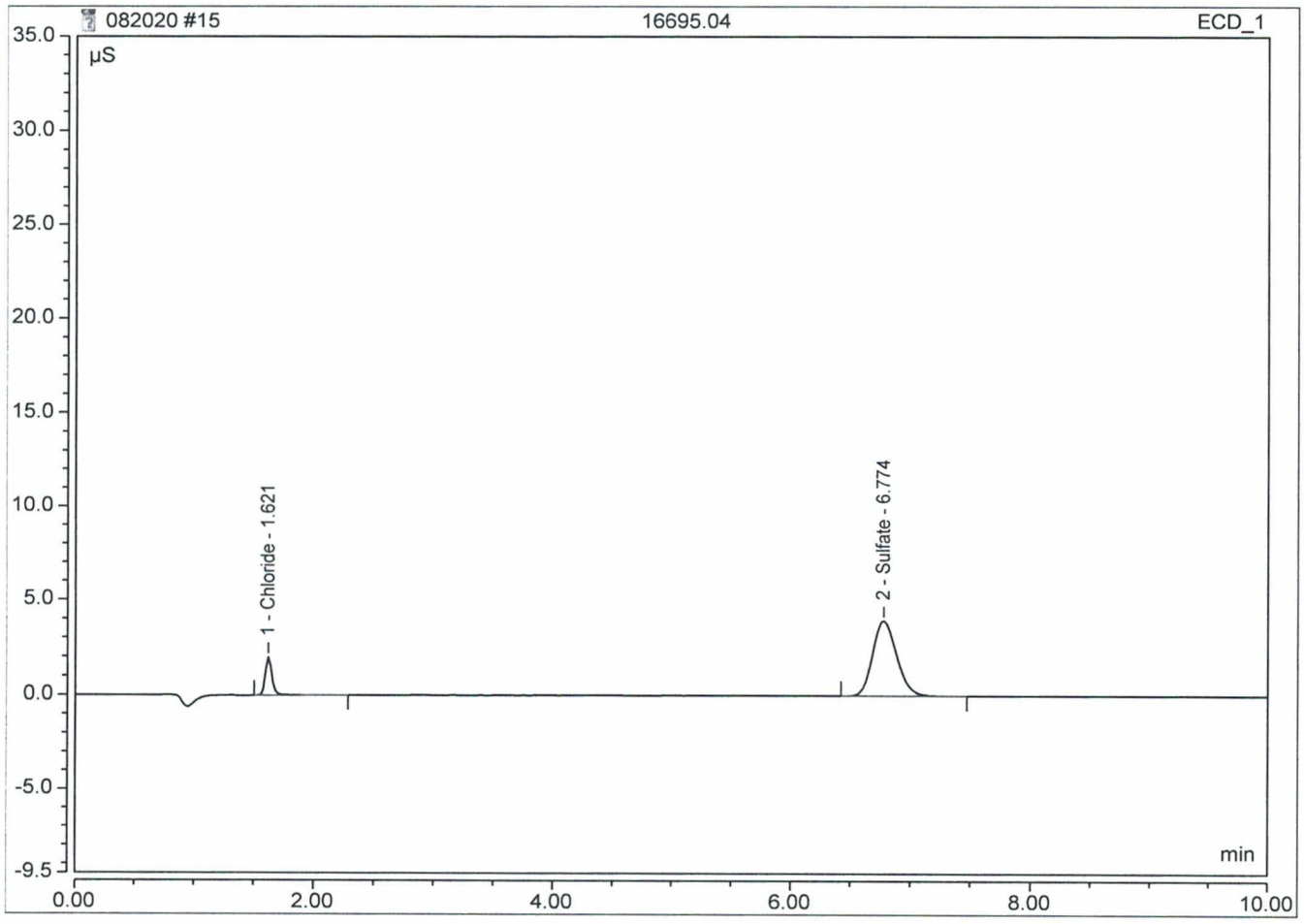
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.63	**Chloride**	BMB	0.675	11.338	70.1809
2	6.79	**Sulfate**	BMB	0.369	1.590	58.3467
TOTAL:				1.04	12.93	128.53



Peak Integration Report

Sample Name:	**16695.04**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**50.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 10:30**	*Operator:*	**Jeff Phifer**

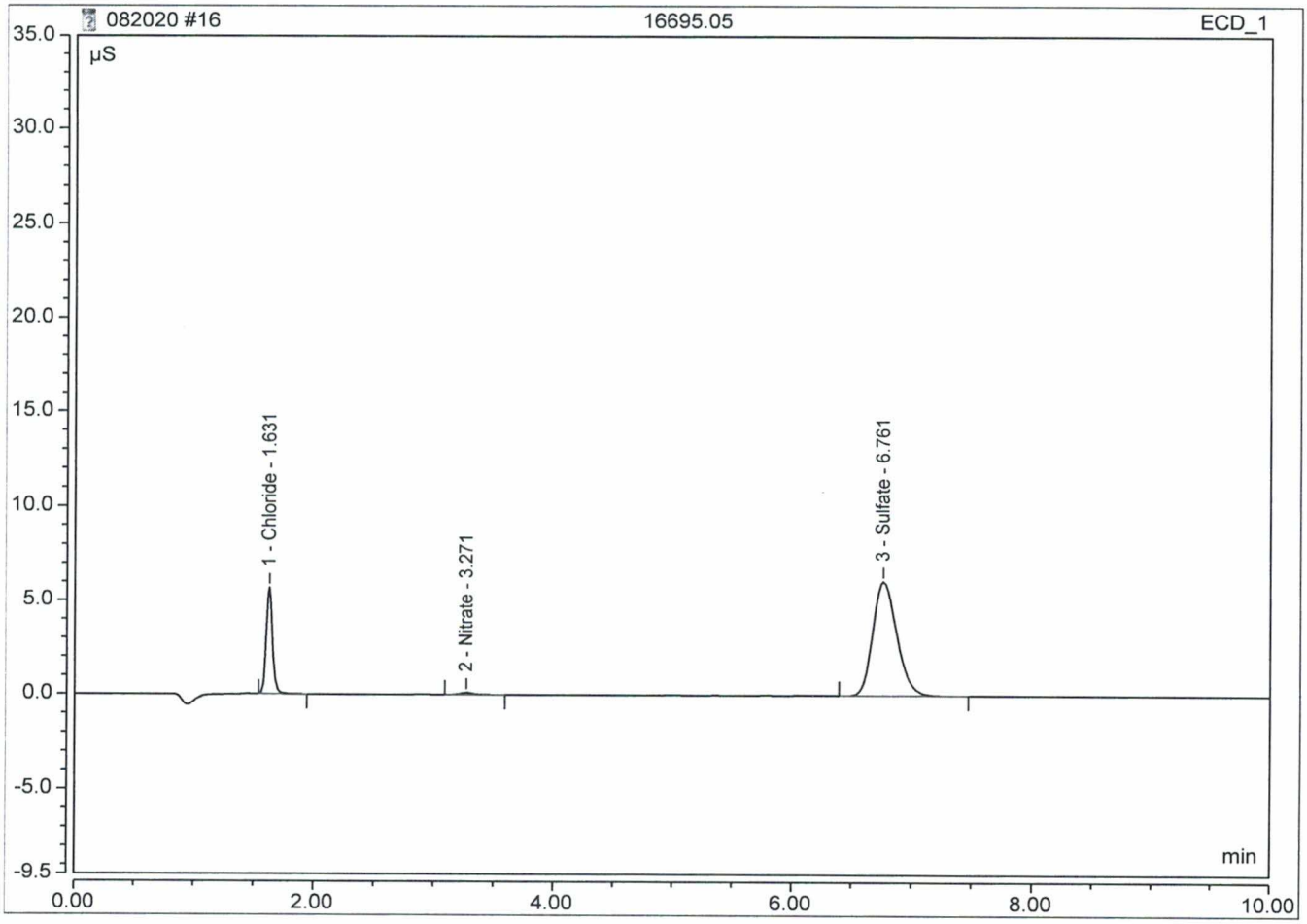
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.62	**Chloride**	BMB	0.127	1.974	75.5160
2	6.77	**Sulfate**	BMB	0.907	3.932	714.1055
TOTAL:				1.03	5.91	789.62



Peak Integration Report

Sample Name:	**16695.05**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**10.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 10:43**	*Operator:*	**Jeff Phifer**

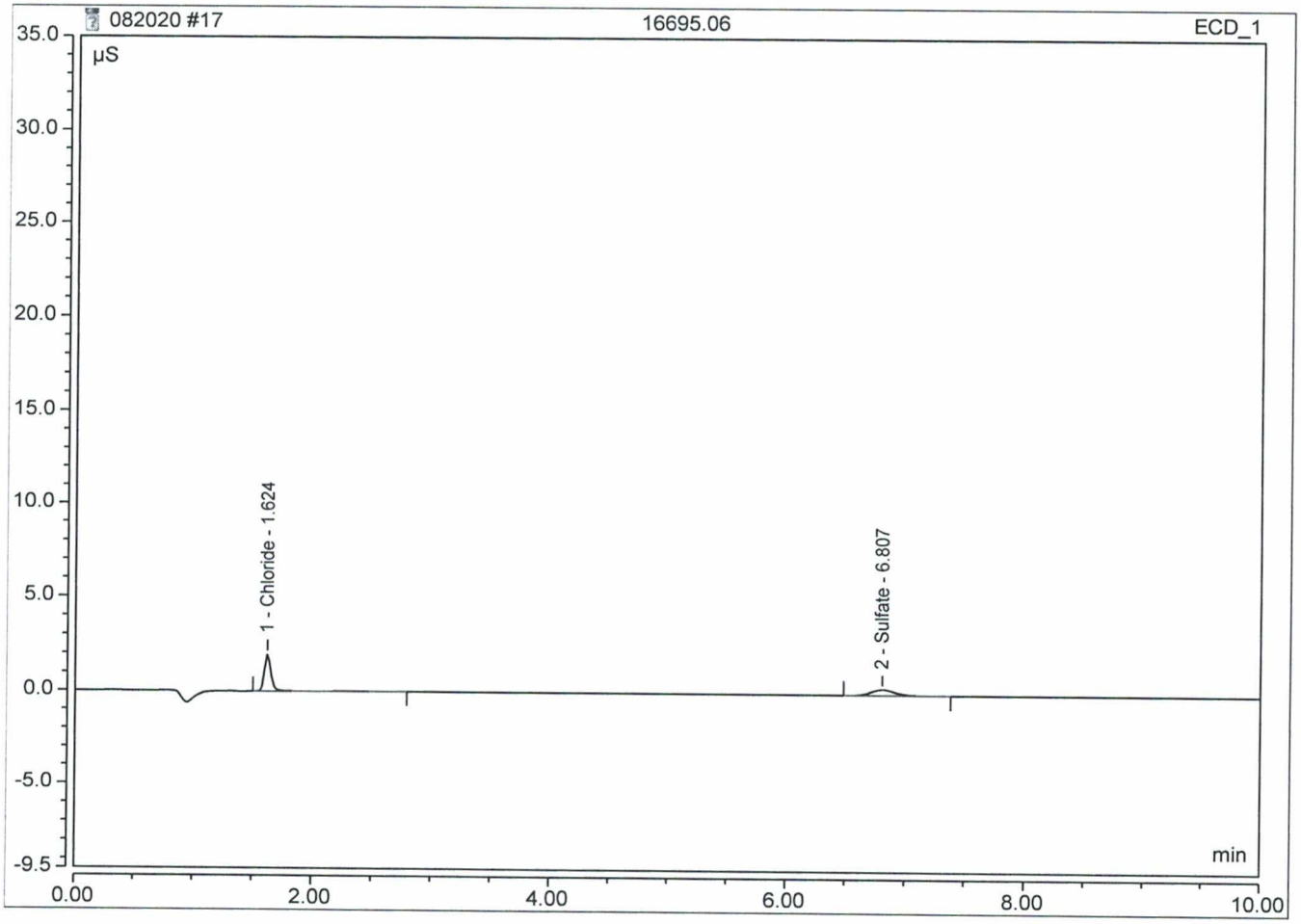
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.63	**Chloride**	BMB	0.343	5.691	36.8736
2	3.27	**Nitrate**	BMB	0.012	0.103	0.5875
3	6.76	**Sulfate**	BMB	1.410	6.116	221.6700
TOTAL:				1.76	11.91	259.13



Peak Integration Report

Sample Name:	**16695.06**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**50.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 10:56**	*Operator:*	**Jeff Phifer**

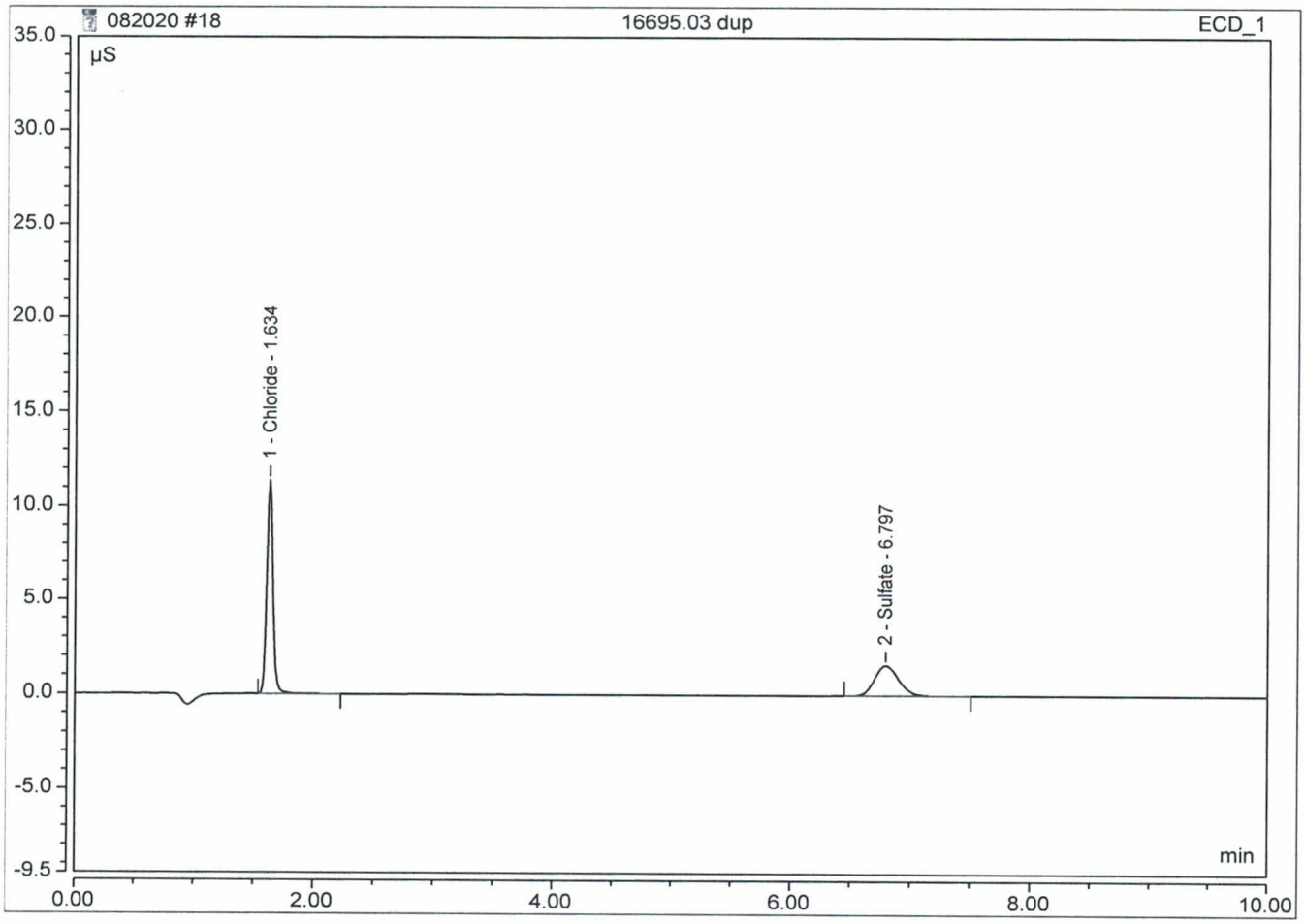
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.62	Chloride	BMB	0.131	1.971	77.5261
2	6.81	Sulfate	BMB	0.074	0.316	60.5340
TOTAL:				0.20	2.29	138.06



Peak Integration Report

Sample Name:	**16695.03 dup**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**10.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 11:09**	*Operator:*	**Jeff Phifer**

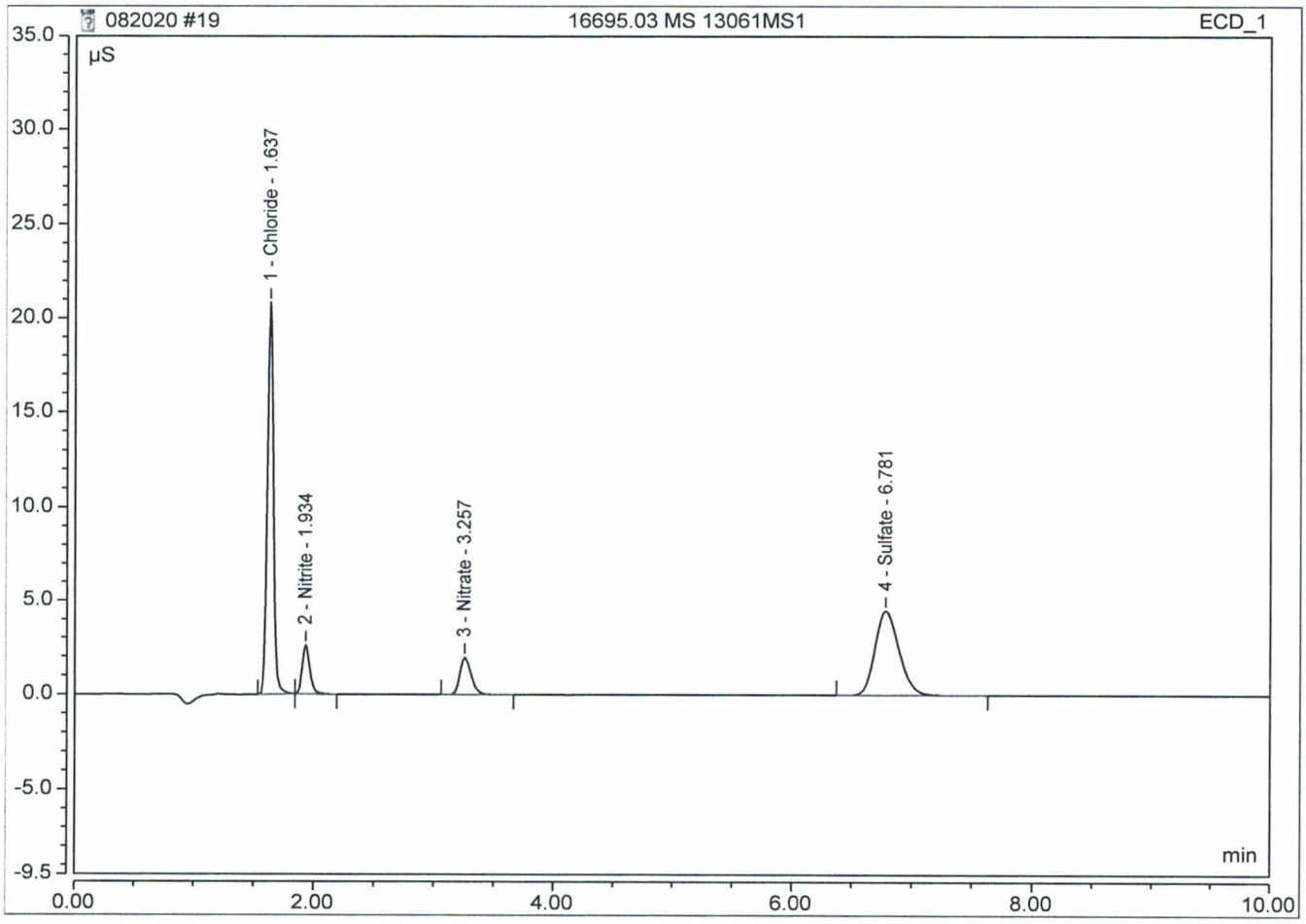
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.63	**Chloride**	BMB	0.677	11.375	70.3924
2	6.80	**Sulfate**	BMB	0.369	1.594	58.4193
TOTAL:				1.05	12.97	128.81



Peak Integration Report

Sample Name:	**16695.03 MS 13061MS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 11:21**	*Operator:*	**Jeff Phifer**

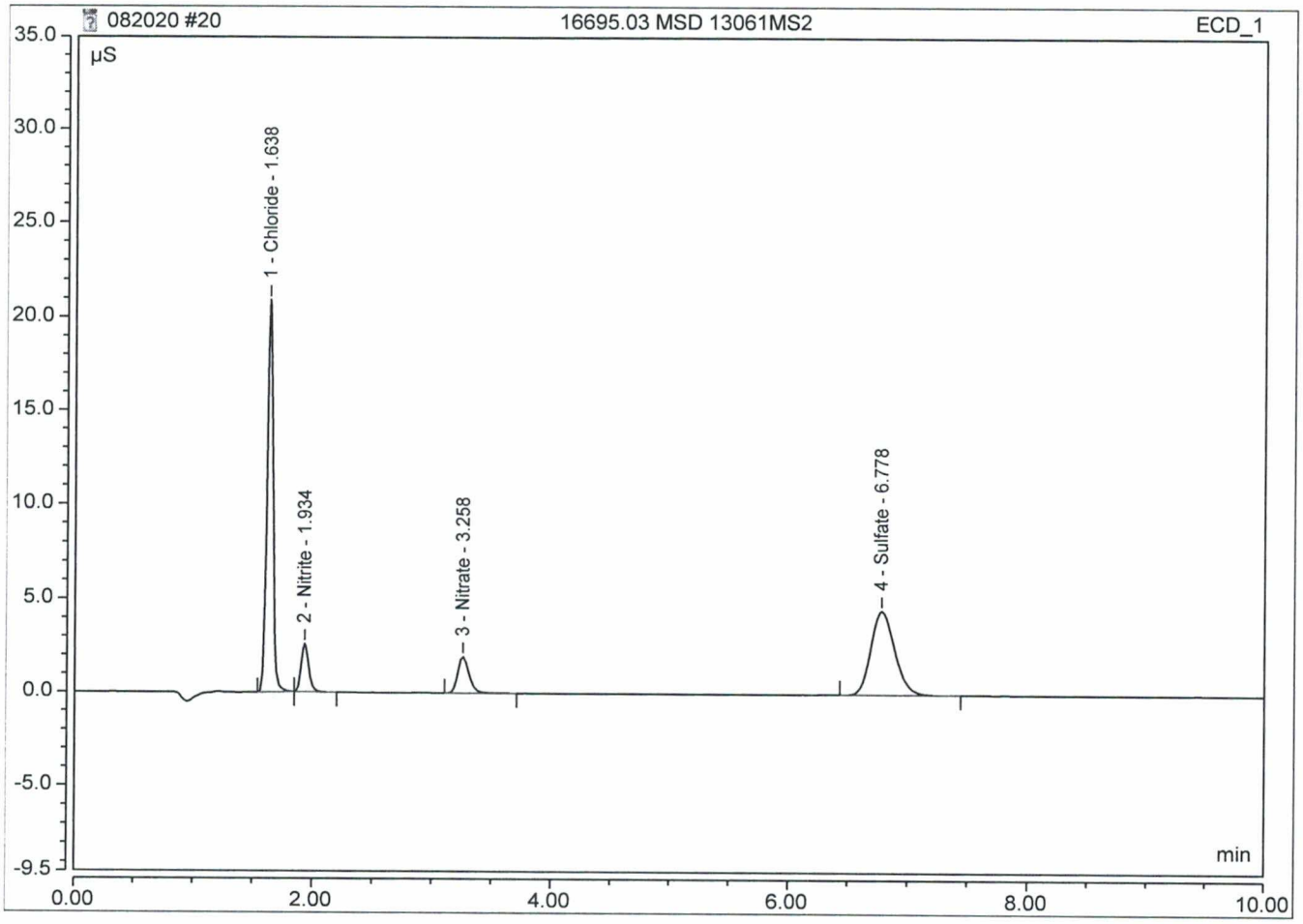
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount			
1	1.64	Chloride	BMB	1.234	20.836	5	12.6359	−7.0 =	112 %
2	1.93	Nitrite	BMB	0.186	2.578	1	0.9852	−NA =	98 %
3	3.26	Nitrate	BMB	0.214	1.952	1	1.0072	−NA =	101 %
4	6.78	Sulfate	BMB	1.036	4.488	10	16.3068	−5.8 =	105 %
TOTAL:				2.67	29.85		30.94		



Peak Integration Report

Sample Name:	**16695.03 MSD 13061MS2**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 11:34**	*Operator:*	**Jeff Phifer**

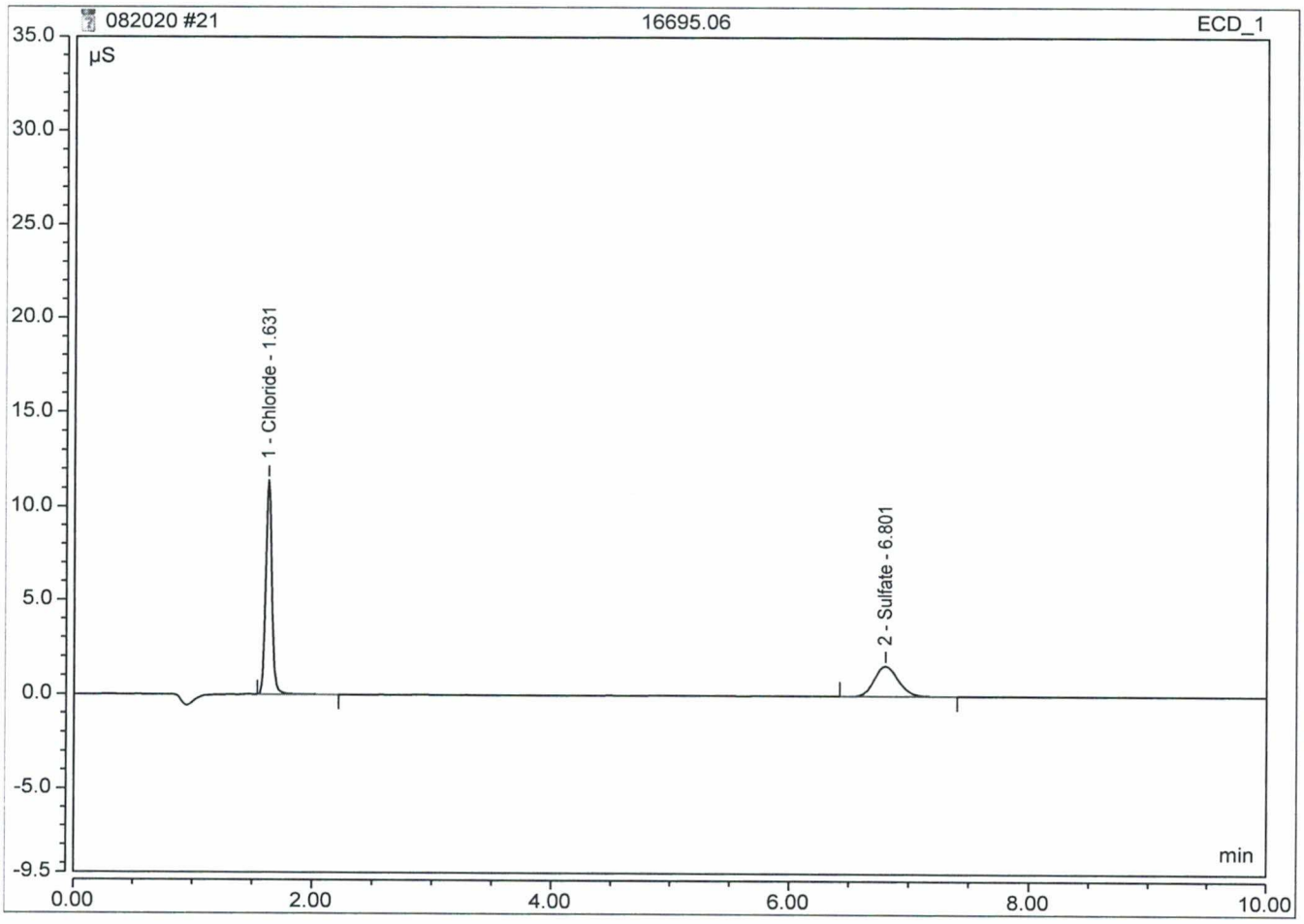
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount			
1	1.64	**Chloride**	BMB	1.236	20.910	3	12.6548	− 7.0 =	112%
2	1.93	**Nitrite**	BMB	0.186	2.585	1	0.9868	− mb =	99%
3	3.26	**Nitrate**	BMB	0.215	1.957	1	1.0094	− mb =	101%
4	6.78	**Sulfate**	BMB	1.037	4.493	10	16.3204	− 5.8 =	105%
TOTAL:				2.67	29.94		30.97		



Peak Integration Report

Sample Name:	**16695.06**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**10.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 11:47**	*Operator:*	**Jeff Phifer**

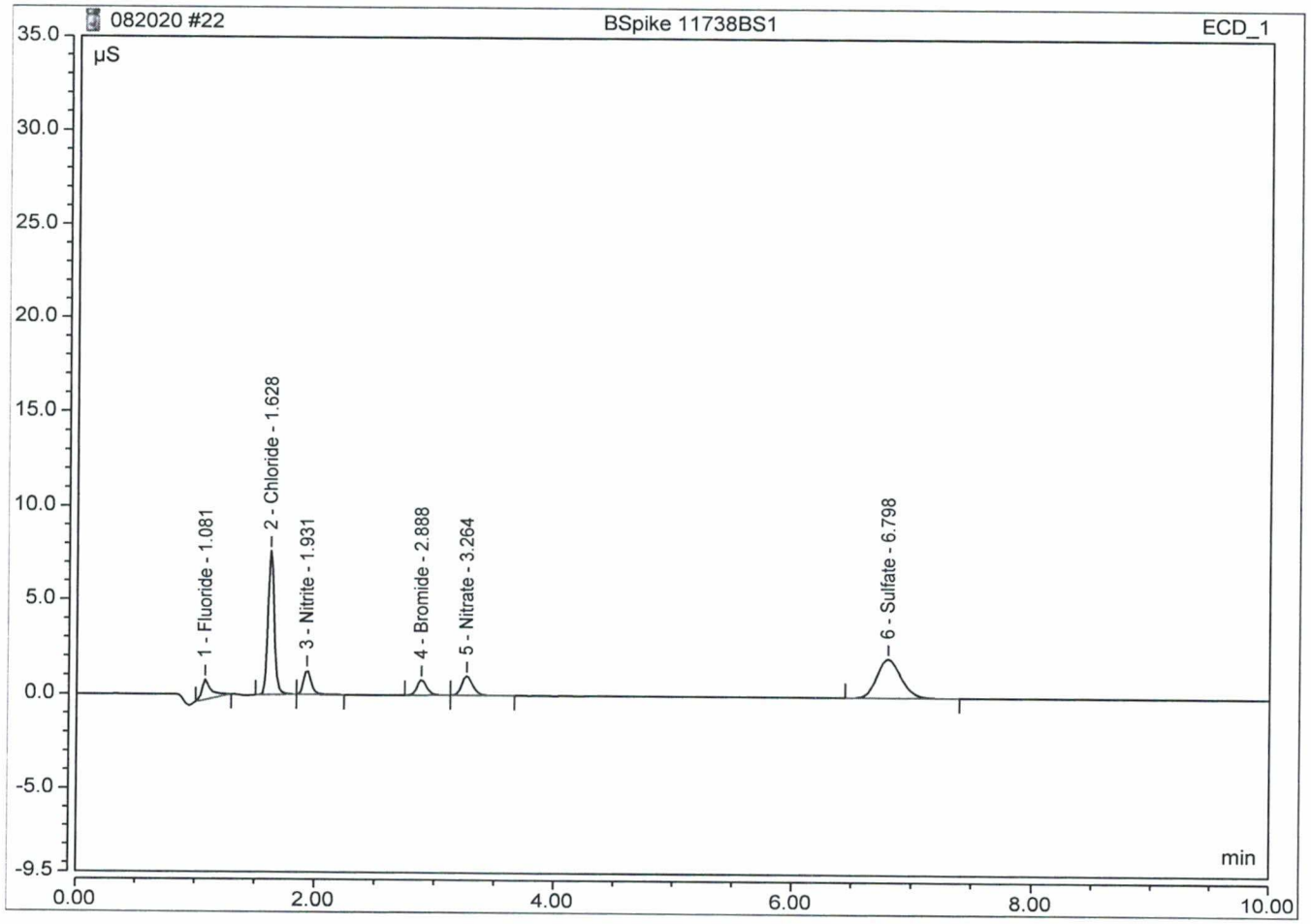
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.63	**Chloride**	BMB	0.680	11.420	70.7172
2	6.80	**Sulfate**	BMB	0.371	1.599	58.7280
TOTAL:				1.05	13.02	129.45



Peak Integration Report

Sample Name:	**BSpike 11738BS1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Check Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 12:00**	*Operator:*	**Jeff Phifer**

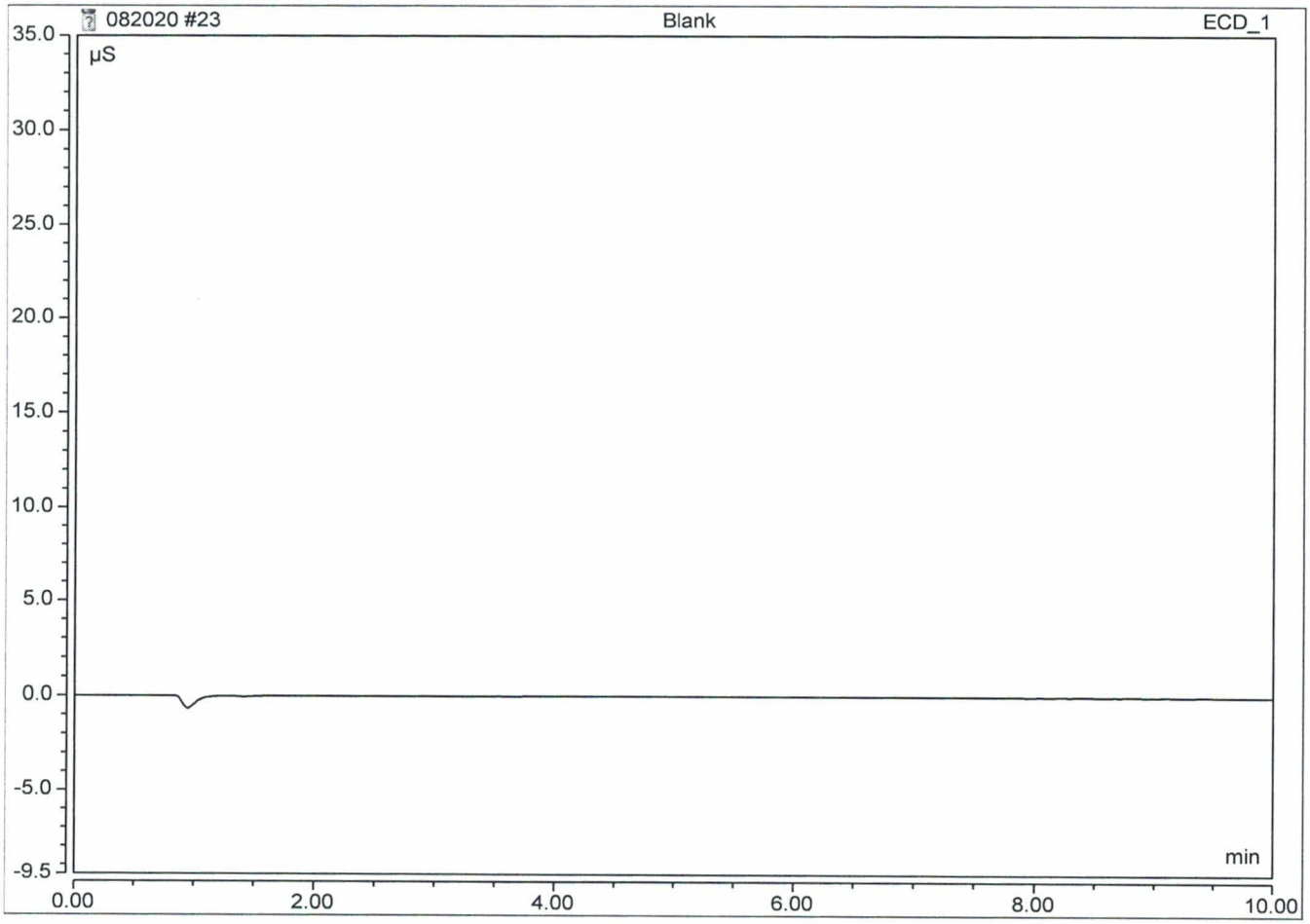
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount	
1	1.08	**Fluoride**	BMB	0.094	1.042	0.5766	
2	1.63	**Chloride**	BMB	0.464	7.651	5 4.8972	98%
3	1.93	**Nitrite**	BMB	0.093	1.270	0.5 0.4963	100%
4	2.89	**Bromide**	BMB	0.075	0.788	2.0754	
5	3.26	**Nitrate**	BMB	0.110	1.006	0.5 0.5178	104%
6	6.80	**Sulfate**	BMB	0.475	2.048	7.5 7.5000	100%
TOTAL:				1.31	13.81	16.06	



Peak Integration Report

Sample Name:	**Blank**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**20-Aug-2020 / 12:13**	*Operator:*	**Jeff Phifer**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount n.a.
TOTAL:				0.00	0.00	0.00



Sequence: 070720
Last Update Operator: pcuser

ICS-1100 B Dionex IC/Meth 3020

New Cal

ECD_1	Name	Type	Level	Position	Instrument Method	Processing Method	Status	Inject Time
	water blank	Unknown		1	Norm Method	Anion	Finished	7/7/2020 10:40:04 AM -0
	1131Cal1	Calibration Standard	01	2	Norm Method	Anion	Finished	7/7/2020 10:52:24 AM -0
	1131Cal2	Calibration Standard	02	3	Norm Method	Anion	Finished	7/7/2020 11:05:16 AM -0
	1131Cal3	Calibration Standard	03	4	Norm Method	Anion	Finished	7/7/2020 11:18:08 AM -0
	1131Cal4	Calibration Standard	04	5	Norm Method	Anion	Finished	7/7/2020 11:31:00 AM -0
	1131Cal5	Calibration Standard	05	6	Norm Method	Anion	Finished	7/7/2020 11:43:51 AM -0

CAL ID# ICSB070720CAL

Weight	Dilution	IntStd	Replicate ID	Comment	Spike Group
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	
1.0000	1.0000	1.0000		Jeff Phifer	

Norm Method	16/06/15 12:18	Jeff Phifer	**METHOD 300.0**	
Stage	Time	Command	Value	Comment
	min			
Instrument Setup				
	initial			
		Sampler.HomeNeedle		
		Sampler.ResetVials	1, 50	
		Pump_ECD.Pressure.UpperLimit	4500 [psi]	
		Sampler.DelayVolume	125 [µl]	
		Pump_ECD.%A.Equate	"Carb - BiCarb"	
		Pump_ECD.Pressure.LowerLimit	100 [psi]	
		Pump_ECD.CellTemperature.Nominal	35.0 [°C]	
		Pump_ECD.Data_Collection_Rate	5.0 [Hz]	
		Pump_ECD.Suppressor_Type	ASRS_4mm	
		Pump_ECD.Suppressor_Carbonate	1.8 [mM]	
		Pump_ECD.Suppressor_Bicarbonate	1.7 [mM]	
		Pump_ECD.Suppressor_Hydroxide	0.0 [mM]	
		Pump_ECD.Suppressor_Tetraborate	0.0 [mM]	
		Pump_ECD.Suppressor_OtherEluent	0.0 [mN]	
		Pump_ECD.Suppressor_RecommendedCurrent	27 [mA]	
		Pump_ECD.Suppressor_Current	27 [mA]	
		Sampler.FlushFactor	10	
		Sampler.DeliverSpeed	4.0 [ml/min]	
		Pump_ECD.Flow	2.00	
		Sampler.LoadPosition		
		Sampler.DeliverSample	Full	
		Sampler.EndSamplePrep		
Inject				
	0.000			
		Wait	Sampler.CycleTimeState, Hold,	
		Sampler.Inject		
Start Run				
	0.000			
		Pump_ECD.Channel_Pressure.AcqOn		
		Pump_ECD.Autozero		
		Pump_ECD.ECD_1.AcqOn		
		Pump_ECD.ECD_Total.AcqOn		
Run			Duration = 10.000 [min]	
	0.000			
	0.500			
		Sampler.BeginOverlap		
Stop Run				
	10.000			
		Pump_ECD.Channel_Pressure.AcqOff		
		Pump_ECD.ECD_1.AcqOff		
		Pump_ECD.ECD_Total.AcqOff		
End				

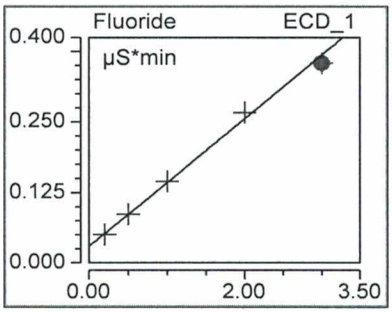
Calibration Batch Report
CAL ID# ICSB070720CAL

Sequence:	**070720**	*Injection Volu*	**2,500.00**
Instrument Method:	**Norm Method**	*Operator:*	**Jeff Phifer**
Inj. Date / Time:	**07-Jul-2020 / 11:43**	*Column:*	**AS4A-SC 040144**

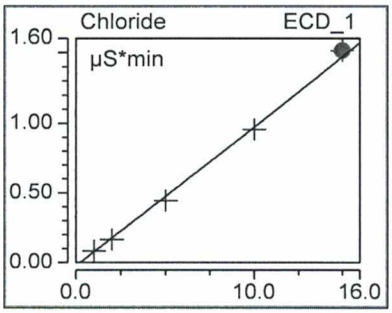
Calibration Summary

Peak Name	Eval.Type	Cal.Type	Window Width min	Offset (C0)	Slope (C1)	Curve (C2)	Corr.Coeff.
Fluoride	Area	Lin, WithOffset, 1/A	0.02	0.029	0.113	0.000	0.9985
Chloride	Area	Lin, WithOffset, 1/A	0.05	-0.023	0.100	0.000	0.9988
Nitrite	Area	Lin, WithOffset, 1/A	0.07	-0.002	0.191	0.000	0.9996
Bromide	Area	Lin, WithOffset, 1/A	0.16	0.000	0.036	0.000	0.9998
Nitrate	Area	Lin, WithOffset, 1/A	0.18	-0.001	0.214	0.000	0.9997
Sulfate	Area	Lin, WithOffset, 1/A	0.51	-0.003	0.064	0.000	0.9997
		AVERAGE:		-0.0002	0.1196	0.0000	0.9994

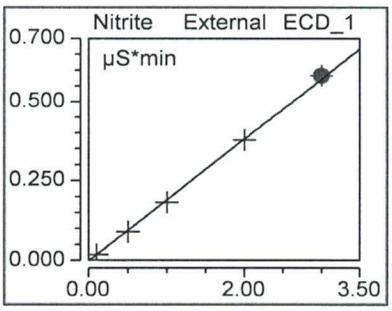
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Fluoride	Fluoride	Fluoride	Fluoride
1131Cal1	1.084	0.0508	0.484	0.189
1131Cal2	1.084	0.0870	0.999	0.510
1131Cal3	1.081	0.1450	1.848	1.024
1131Cal4	1.081	0.2666	3.636	2.101
1131Cal5	1.081	0.3541	5.285	2.876
Average	1.082			
Rel. Std. Dev.	0.164 %			



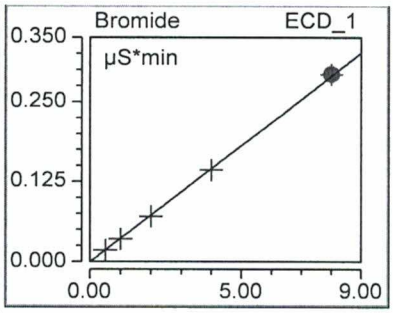
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Chloride	Chloride	Chloride	Chloride
1131Cal1	1.627	0.0849	1.387	1.089
1131Cal2	1.627	0.1668	2.765	1.912
1131Cal3	1.628	0.4444	7.521	4.701
1131Cal4	1.631	0.9564	16.335	9.846
1131Cal5	1.634	1.5142	25.720	15.452
Average	1.629			
Rel. Std. Dev.	0.180 %			



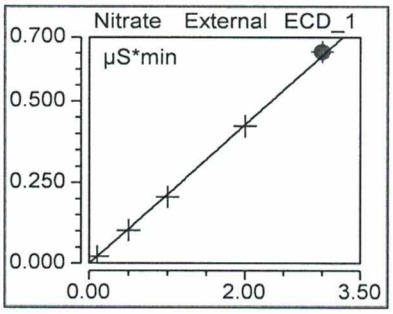
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Nitrite	Nitrite	Nitrite	Nitrite
1131Cal1	1.934	0.0181	0.252	0.106
1131Cal2	1.934	0.0900	1.251	0.483
1131Cal3	1.931	0.1818	2.556	0.963
1131Cal4	1.931	0.3773	5.333	1.987
1131Cal5	1.931	0.5827	8.298	3.062
Average	1.932			
Rel. Std. Dev.	0.092 %			



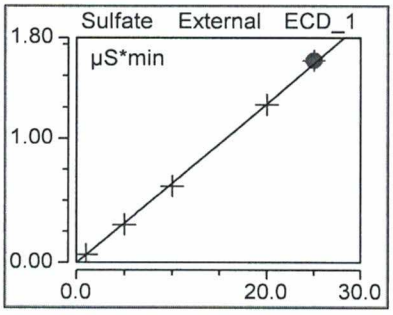
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Bromide	Bromide	Bromide	Bromide
1131Cal1	2.887	0.0182	0.193	0.515
1131Cal2	2.884	0.0355	0.378	0.993
1131Cal3	2.878	0.0705	0.760	1.960
1131Cal4	2.871	0.1427	1.549	3.949
1131Cal5	2.864	0.2925	3.206	8.083
Average	2.877			
Rel. Std. Dev.	0.332 %			



Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Nitrate	Nitrate	Nitrate	Nitrate
1131Cal1	3.271	0.0215	0.202	0.105
1131Cal2	3.257	0.1026	0.952	0.485
1131Cal3	3.248	0.2057	1.911	0.967
1131Cal4	3.234	0.4230	3.909	1.982
1131Cal5	3.217	0.6540	6.009	3.062
Average	3.245			
Rel. Std. Dev.	0.636 %			



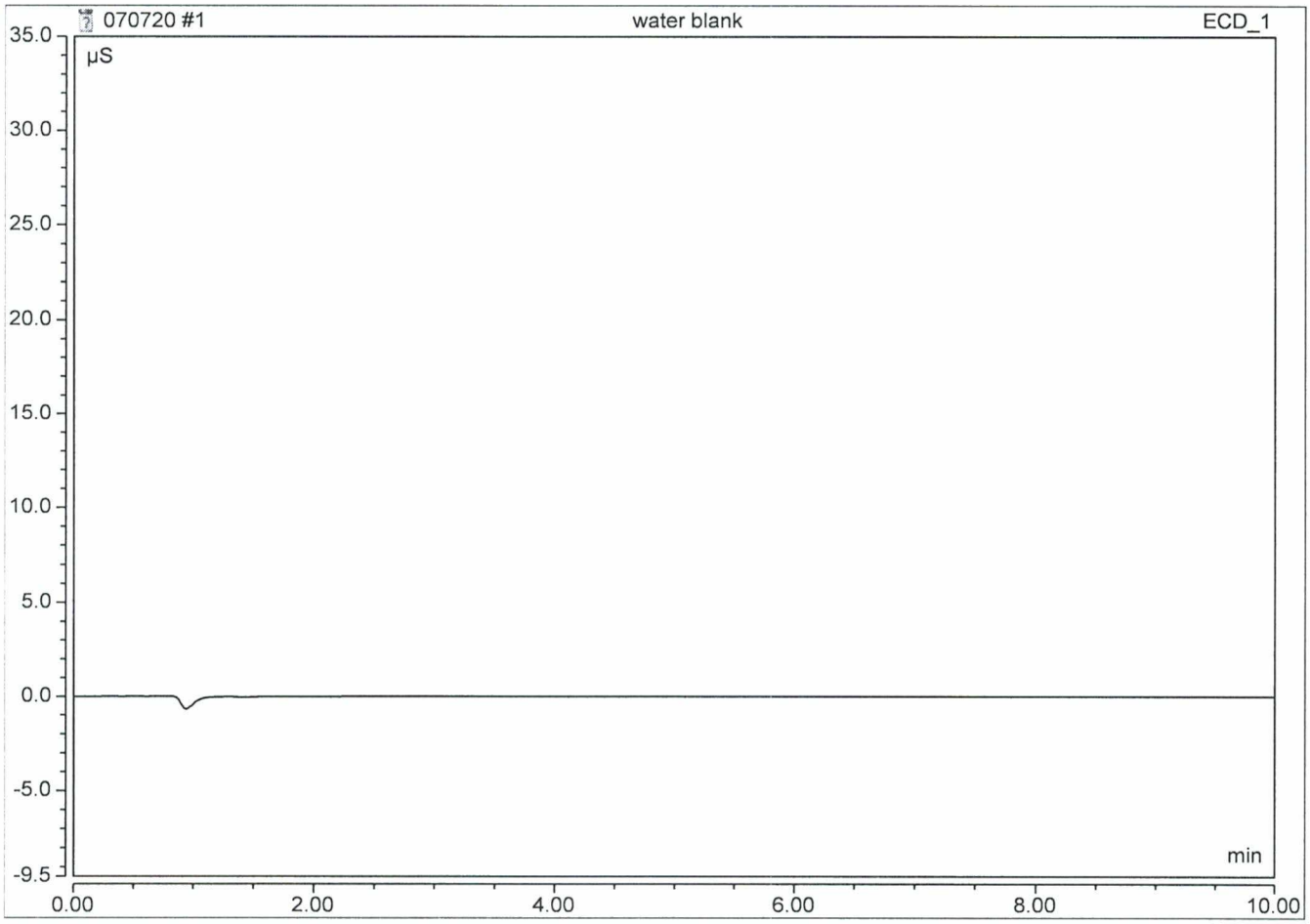
Injection Name	Ret.Time min ECD_1	Area µS*min ECD_1	Height µS ECD_1	Amount ECD_1
	Sulfate	Sulfate	Sulfate	Sulfate
1131Cal1	6.867	0.0635	0.271	1.047
1131Cal2	6.867	0.3050	1.300	4.836
1131Cal3	6.854	0.6147	2.631	9.693
1131Cal4	6.837	1.2706	5.439	19.981
1131Cal5	6.824	1.6188	6.926	25.443
Average	6.850			
Rel. Std. Dev.	0.279 %			



Peak Integration Report

Sample Name:	**water blank**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Unknown**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 10:40**	*Operator:*	**Jeff Phifer**

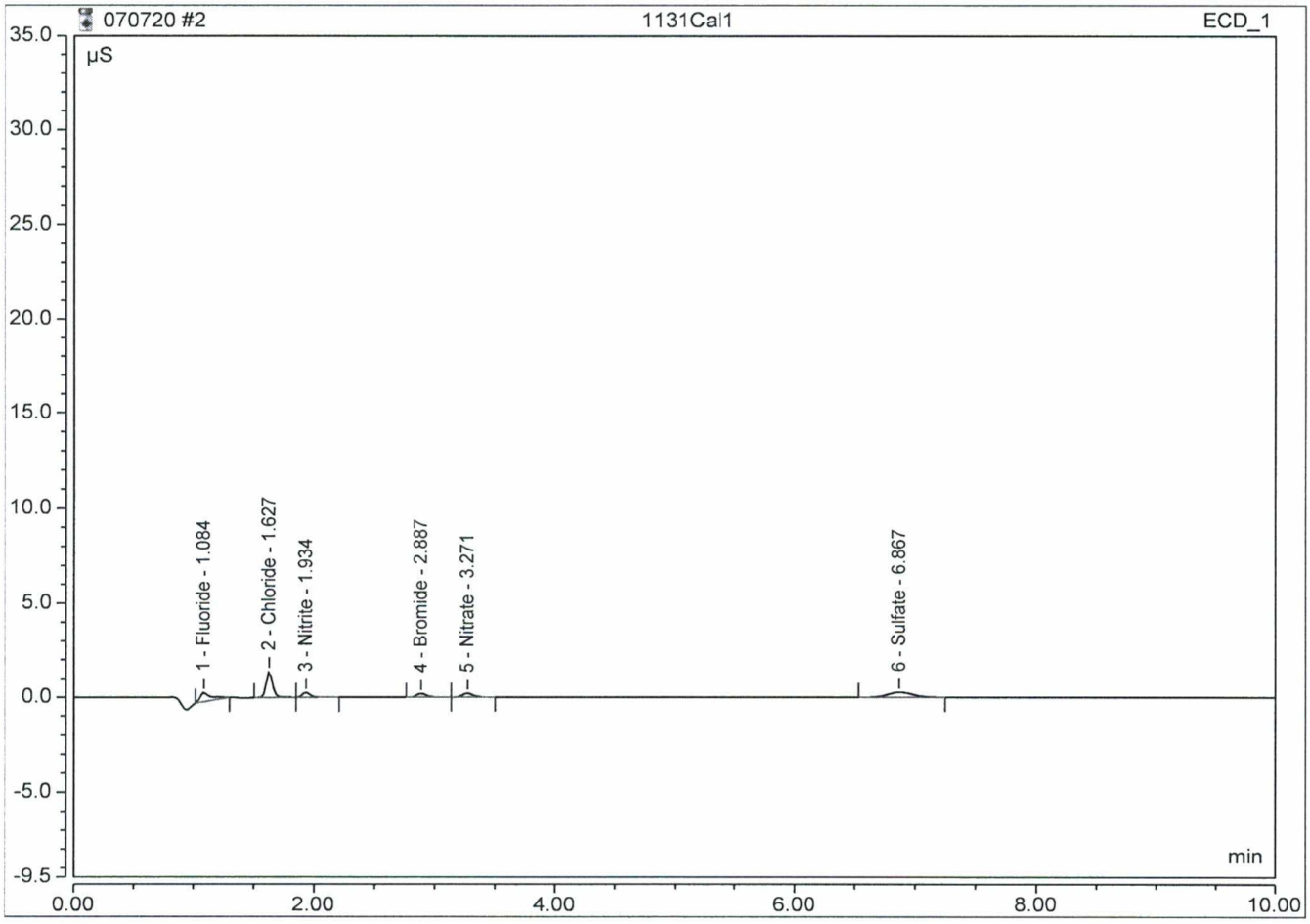
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount n.a.
TOTAL:				0.00	0.00	0.00



Peak Integration Report

Sample Name:	**1131Cal1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 10:52**	*Operator:*	**Jeff Phifer**

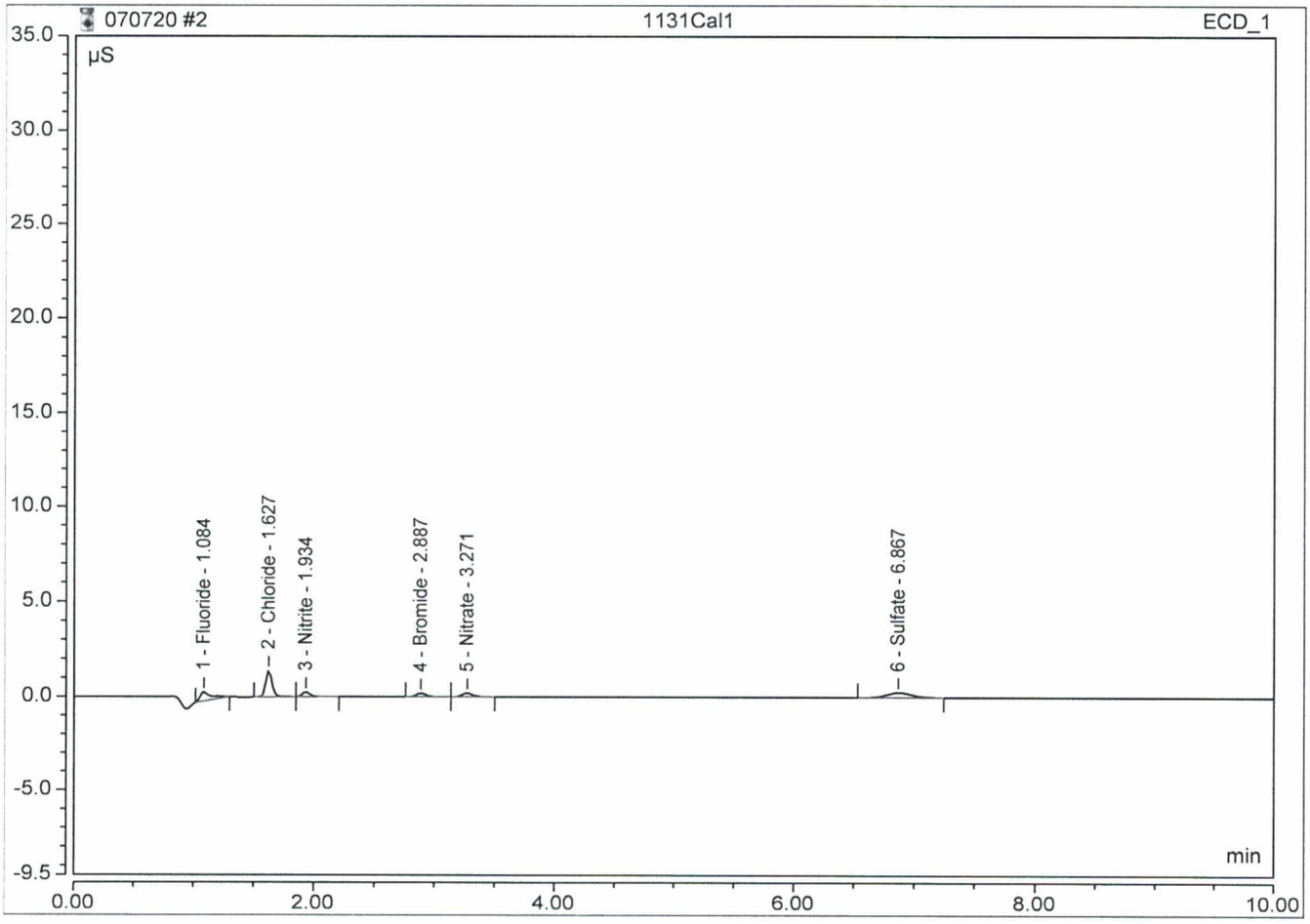
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount	
1	1.08	**Fluoride**	BMB	0.051	0.484	0.2	0.1893
2	1.63	**Chloride**	BMB	0.085	1.387	1	1.0891
3	1.93	**Nitrite**	BMB	0.018	0.252	0.1	0.1058
4	2.89	**Bromide**	BMB	0.018	0.193	0.5	0.5148
5	3.27	**Nitrate**	BMB	0.021	0.202	0.1	0.1053
6	6.87	**Sulfate**	BMB	0.063	0.271	1	1.0467
TOTAL:				0.26	2.79		3.05



Peak Integration Report

Sample Name:	**1131Cal1**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 10:52**	*Operator:*	**Jeff Phifer**

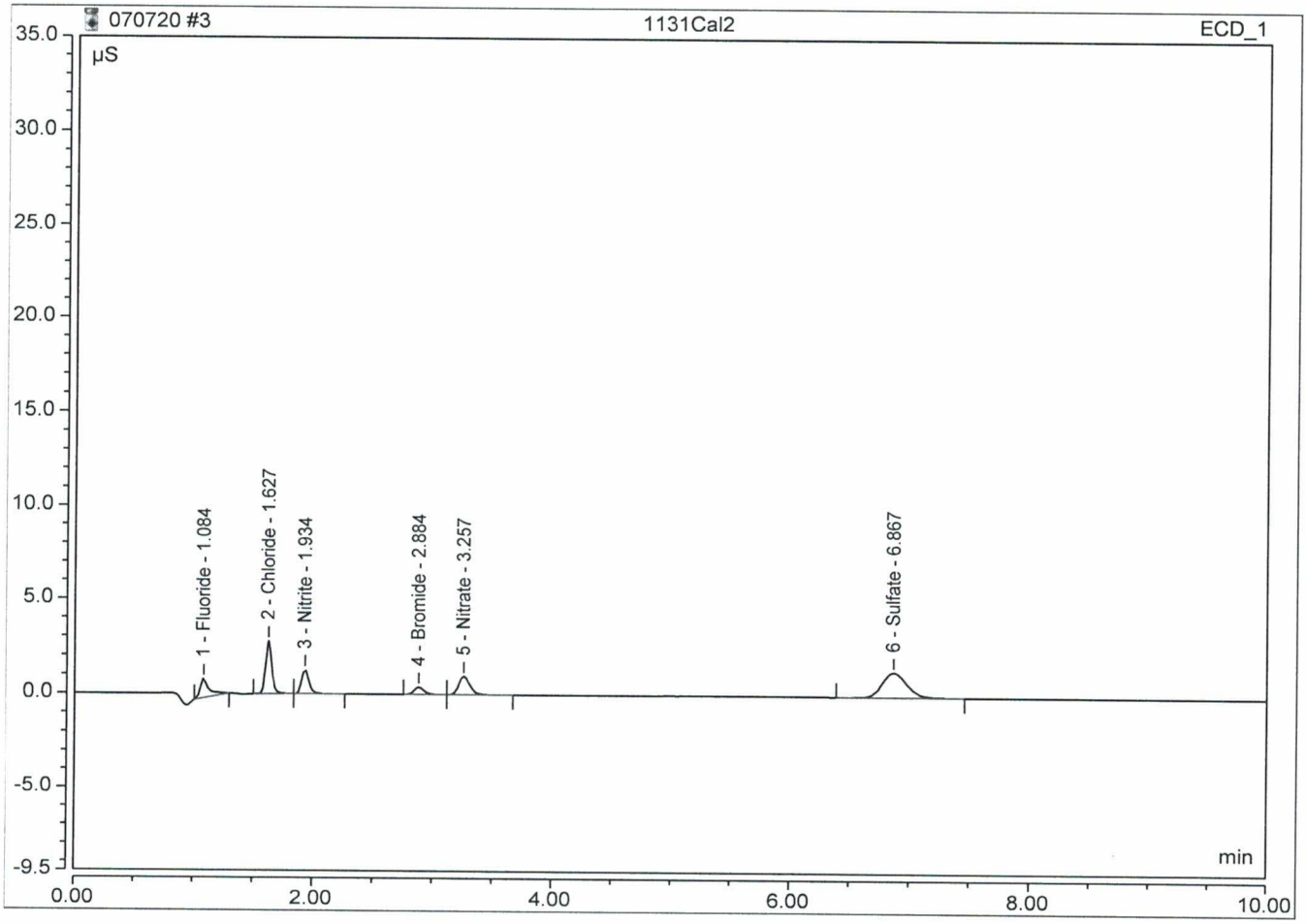
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.08	Fluoride	BMB	0.051	0.484	n.a.
2	1.63	Chloride	BMB	0.085	1.387	n.a.
3	1.93	Nitrite	BMB	0.018	0.252	n.a.
4	2.89	Bromide	BMB	0.018	0.193	n.a.
5	3.27	Nitrate	BMB	0.021	0.202	n.a.
6	6.87	Sulfate	BMB	0.063	0.271	n.a.
TOTAL:				0.26	2.79	0.00



Peak Integration Report

Sample Name:	**1131Cal2**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 11:05**	*Operator:*	**Jeff Phifer**

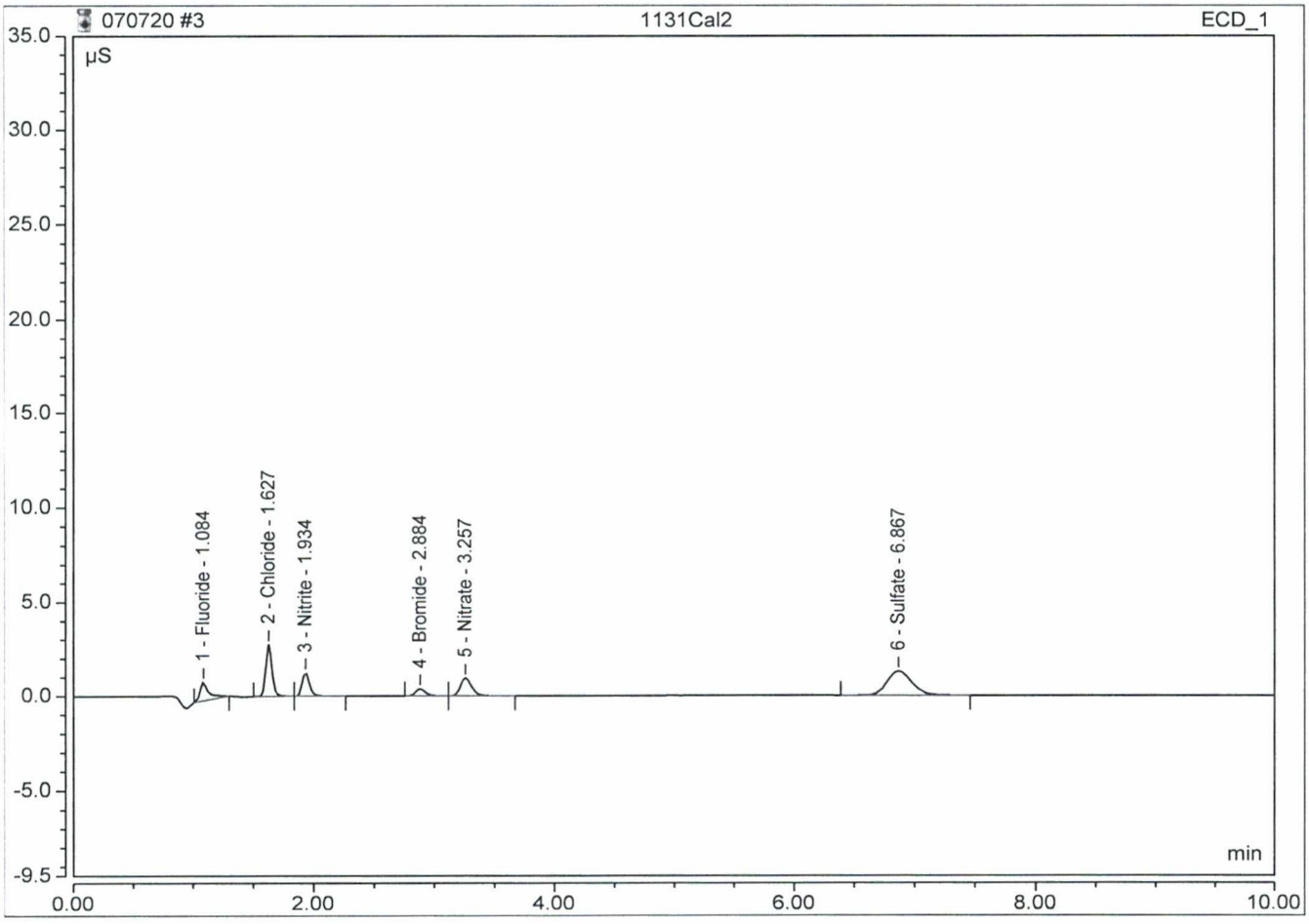
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount	
1	1.08	Fluoride	BMB	0.087	0.999	0.5	0.5103
2	1.63	Chloride	BMB	0.167	2.765	2	1.9118
3	1.93	Nitrite	BMB	0.090	1.251	0.5	0.4826
4	2.88	Bromide	BMB	0.035	0.378	1	0.9928
5	3.26	Nitrate	BMB	0.103	0.952	0.5	0.4846
6	6.87	Sulfate	BMB	0.305	1.300	5	4.8360
TOTAL:				0.79	7.65		9.22



Peak Integration Report

Sample Name:	**1131Cal2**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 11:05**	*Operator:*	**Jeff Phifer**

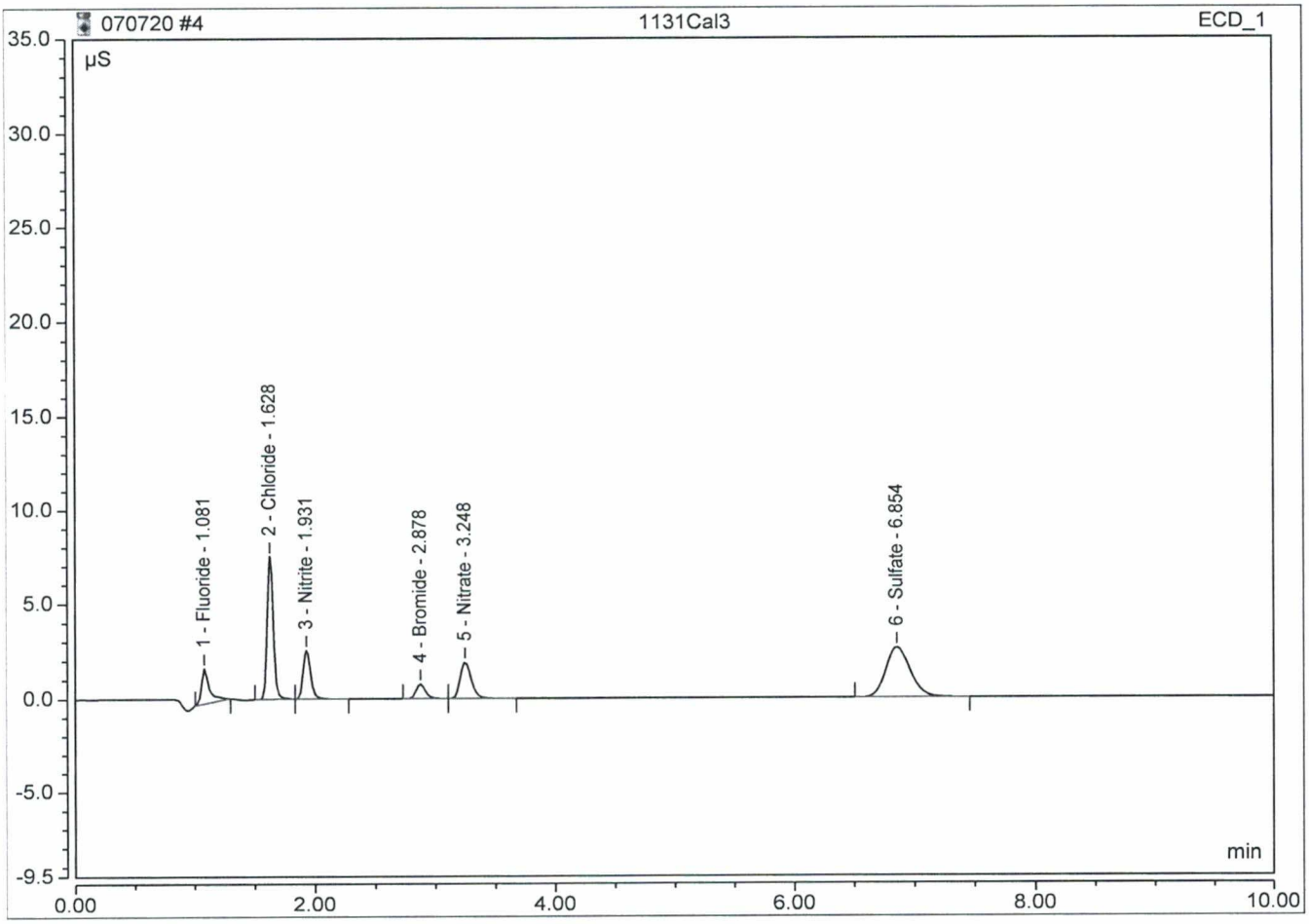
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.08	Fluoride	BMB	0.087	0.999	0.5000
2	1.63	Chloride	BMB	0.167	2.765	2.0000
3	1.93	Nitrite	BMB	0.090	1.251	0.5000
4	2.88	Bromide	BMB	0.035	0.378	1.0000
5	3.26	Nitrate	BMB	0.103	0.952	0.5000
6	6.87	Sulfate	BMB	0.305	1.300	5.0000
TOTAL:				0.79	7.65	9.50



Peak Integration Report

Sample Name:	**1131Cal3**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 11:18**	*Operator:*	**Jeff Phifer**

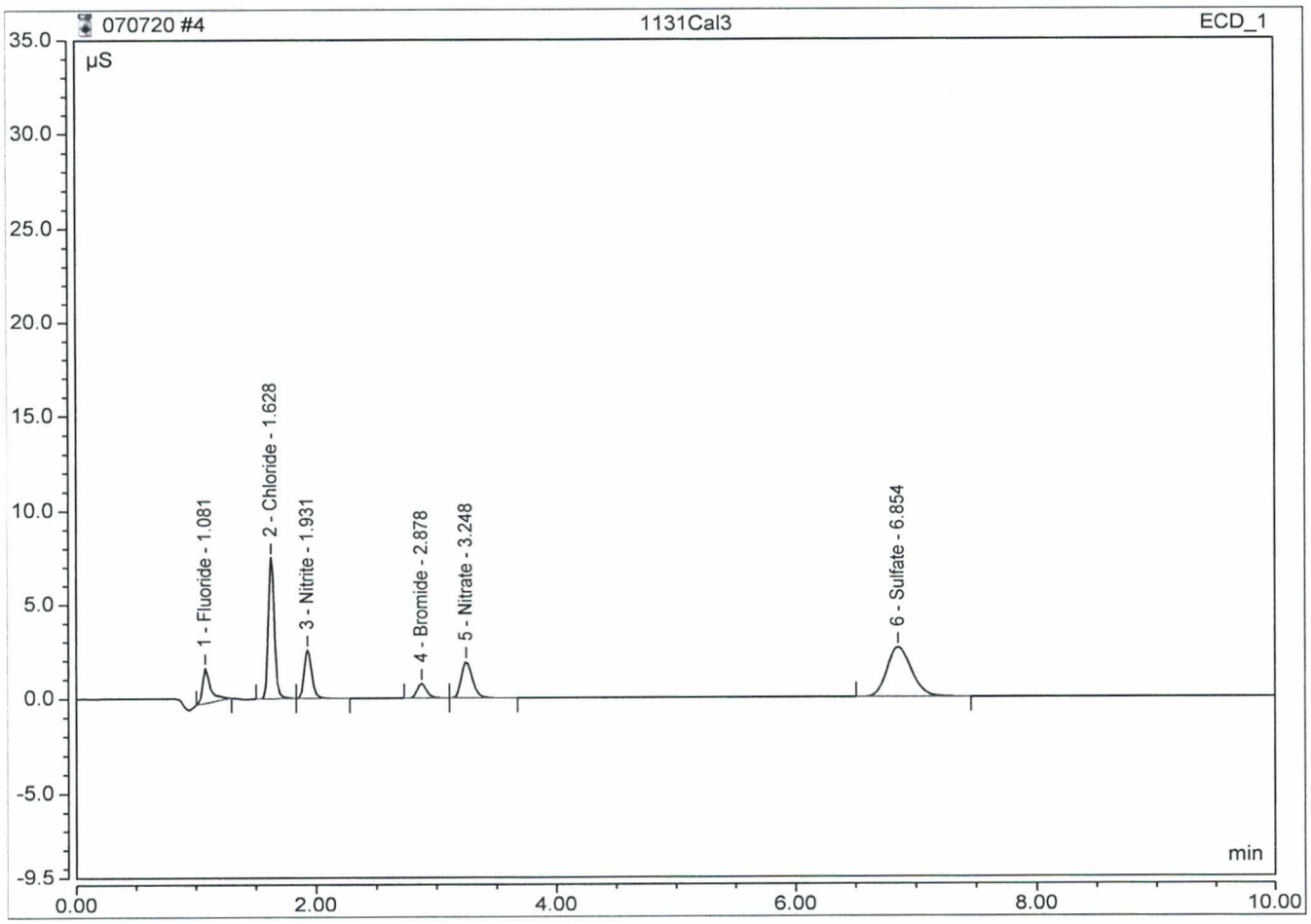
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount	
1	1.08	Fluoride	BMB	0.145	1.848	1	1.0239
2	1.63	Chloride	BMB	0.444	7.521	5	4.7010
3	1.93	Nitrite	BMB	0.182	2.556	1	0.9630
4	2.88	Bromide	BMB	0.071	0.760	2	1.9599
5	3.25	Nitrate	BMB	0.206	1.911	1	0.9666
6	6.85	Sulfate	BMB	0.615	2.631	10	9.6928
TOTAL:				1.66	17.23		19.31



Peak Integration Report

Sample Name:	**1131Cal3**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 11:18**	*Operator:*	**Jeff Phifer**

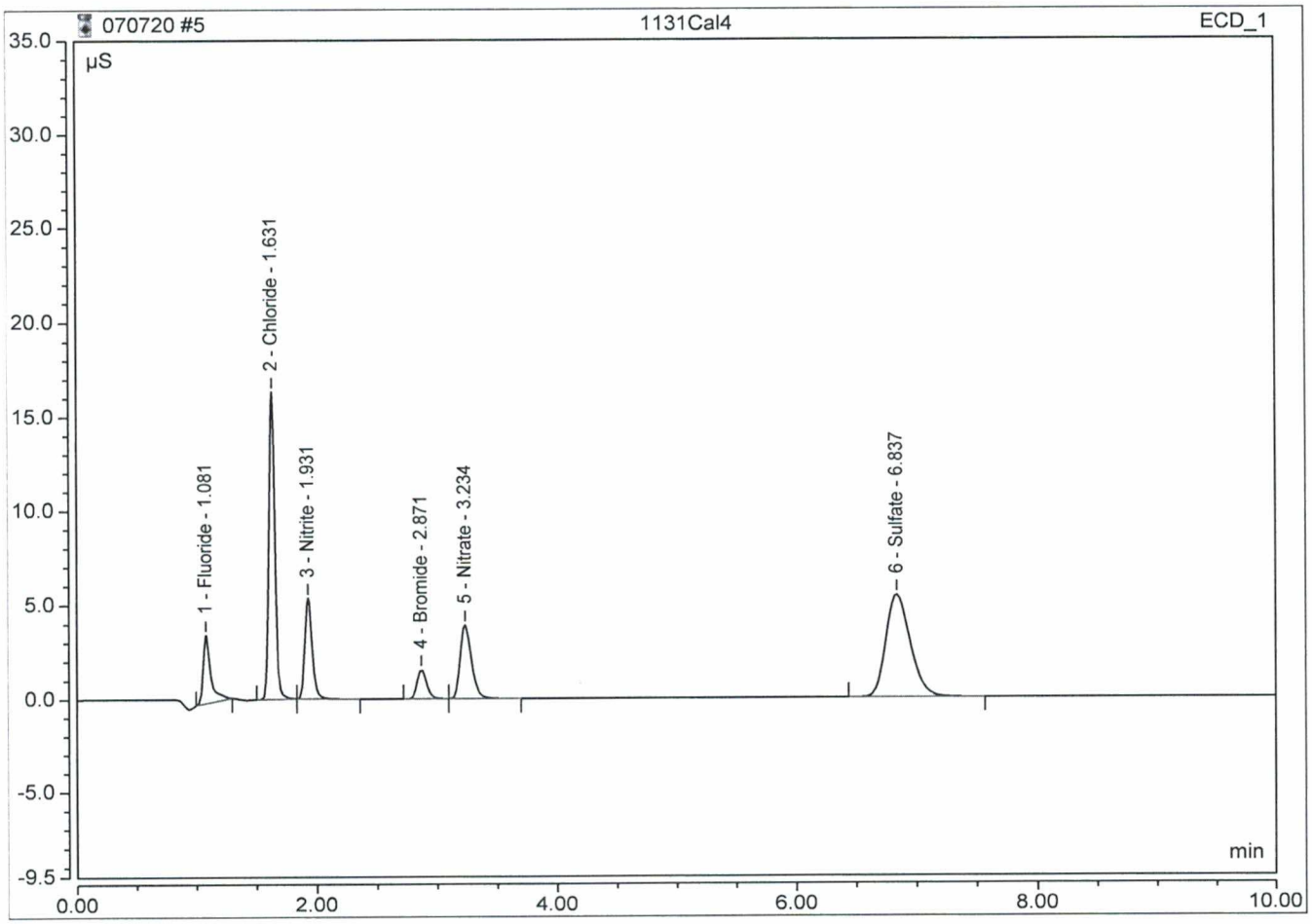
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.08	Fluoride	BMB	0.145	1.848	0.9960
2	1.63	Chloride	BMB	0.444	7.521	5.0388
3	1.93	Nitrite	BMB	0.182	2.556	1.0027
4	2.88	Bromide	BMB	0.071	0.760	2.0018
5	3.25	Nitrate	BMB	0.206	1.911	1.0022
6	6.85	Sulfate	BMB	0.615	2.631	10.0340
TOTAL:				1.66	17.23	20.08



Peak Integration Report

Sample Name:	**1131Cal4**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 11:31**	*Operator:*	**Jeff Phifer**

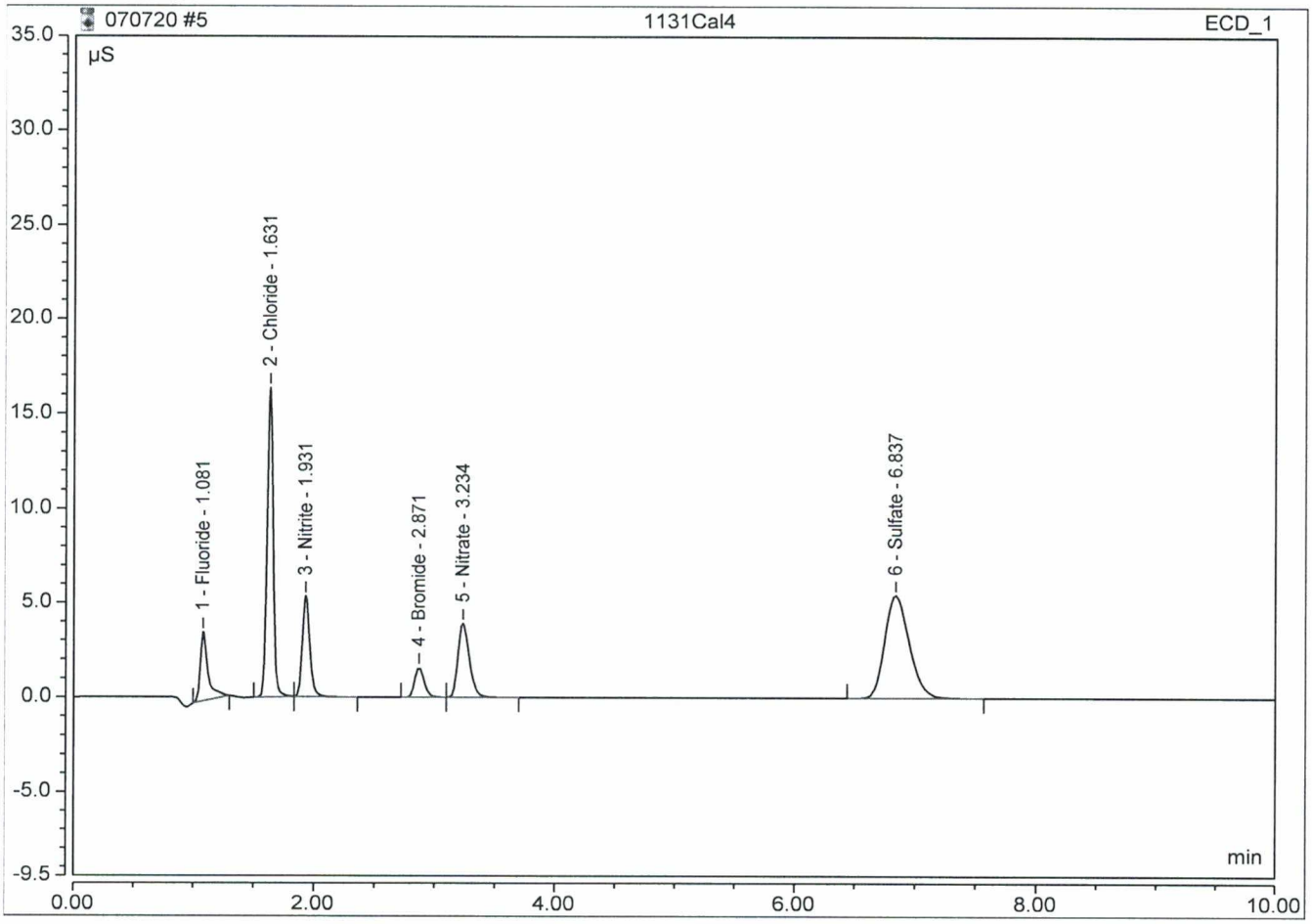
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount	
1	1.08	Fluoride	BMB	0.267	3.636	2	2.1005
2	1.63	Chloride	BMB	0.956	16.335	10	9.8464
3	1.93	Nitrite	BMB	0.377	5.333	2	1.9867
4	2.87	Bromide	BMB	0.143	1.549	4	3.9493
5	3.23	Nitrate	BMB	0.423	3.909	2	1.9820
6	6.84	Sulfate	BMB	1.271	5.439	20	19.9814
TOTAL:				3.44	36.20		39.85



Peak Integration Report

Sample Name:	**1131Cal4**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 11:31**	*Operator:*	**Jeff Phifer**

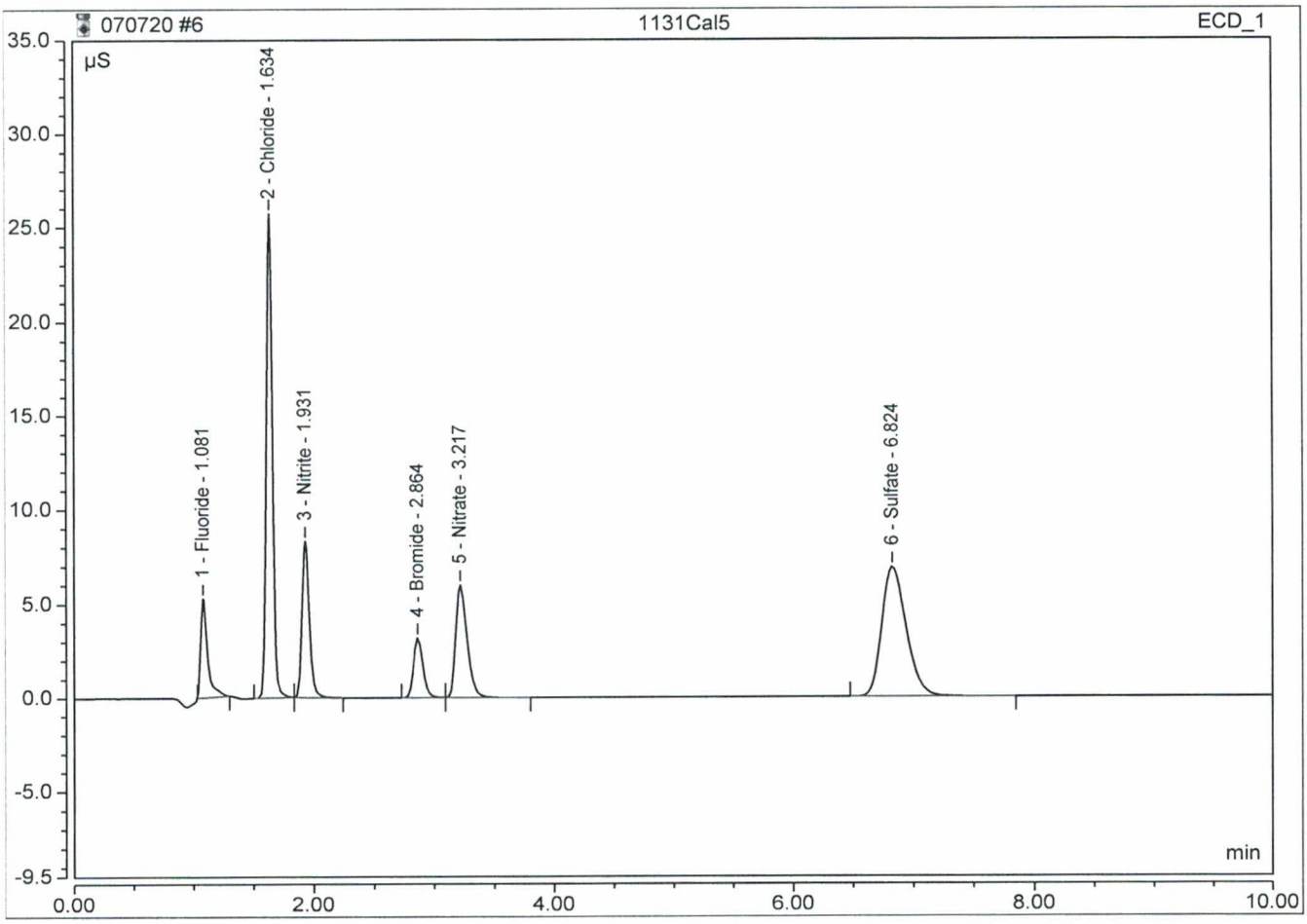
No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.08	Fluoride	BMB	0.267	3.636	2.0072
2	1.63	Chloride	BMB	0.956	16.335	10.2000
3	1.93	Nitrite	BMB	0.377	5.333	2.0283
4	2.87	Bromide	BMB	0.143	1.549	4.0180
5	3.23	Nitrate	BMB	0.423	3.909	2.0231
6	6.84	Sulfate	BMB	1.271	5.439	20.2745
TOTAL:				3.44	36.20	40.55



Peak Integration Report

Sample Name:	**1131Cal5**	*Inj. Vol.:*	**2500.00**
Injection Type:	**Calibration Standard**	*Dilution Factor:*	**1.0000**
Program:	**Norm Method**	*Column:*	**AS4A-SC 040144**
Inj. Date / Time:	**07-Jul-2020 / 11:43**	*Operator:*	**Jeff Phifer**

No.	Time min	Peak Name	Peak Type	Area µS*min	Height µS	Amount
1	1.08	Fluoride	BMB	0.354	5.285	3 2.8759
2	1.63	Chloride	BMB	1.514	25.720	15 15.4517
3	1.93	Nitrite	BMB	0.583	8.298	3 3.0619
4	2.86	Bromide	BMB	0.293	3.206	8 8.0833
5	3.22	Nitrate	BMB	0.654	6.009	3 3.0615
6	6.82	Sulfate	BMB	1.619	6.926	25 25.4431
TOTAL:				5.02	55.44	57.98



B/A

Total Suspended Solids

TSS: VLIMS Code: 4630; EPA Method: 2540D

Date Started: 23Aug20 | Date Finished: 24AUG20
Time Started: 2145 | Time Finished: 1405
Analyst: Ag | Reviewed by: BB
Batch ID: TSS200823A | Review Date: 9/24/2020
Temperature: 105°C | Balance ID: I3
Time in Oven: 16:20 | Oven ID/Thermometer ID: ON5/Quincy

Merit #	Tin #	MLs sample	g. Filter	g. dry solids + filter 103°C	g. reweigh 15 min. 103°C	TSS mg/L	DF	TVSS Y/N	TVSS Tin #
Blank	I8DXA	1000	0.1130	0.1130		6.00 / ND	1.00	N	
LCS Lot 8209-09	XB	100	0.1138	0.1221		83	10.0		
16707.01	XC ~~XC~~	75 ~~100~~	0.1145	0.1386		321.33 / 321	13.33		RL=4
Dup 16707.01	XD ~~XD~~	75 ~~100~~	0.1160	0.1390		306.67	13.33		
16689.01	XE	250	0.1155	0.1311		62.4 / 62	4.00		
16695.01	XF	350	0.1152	0.1322		48.57 / 48	2.857		
.02	XG	1000	0.1148	0.1288		14.0	1.00		
.03	XH	1000	0.1139	0.1156		1.70 / ND	1.00		
.04	XI	1000	0.1154	0.1353		19.90 / 20	1.00		
.05	XJ	1000	0.1158	0.1163		0.50 / ND	1.00		
.06	XK	1000	0.1155	0.1171		1.60 / ND	1.00		
.07	XL	1000	0.1141	0.1144		6.30 / ND	1.00		
16709.01	XM	200	0.1131	0.1194		31.50 / 32	5.00		

LCS value = 78.7 mg/L | Acceptance Criteria (mg/L): 64.1 - 87.8 mg/L
% Rec = 105.5% | Acceptance Criteria (%): 81.4 - 112%
% RPD = 4.7% | Acceptance Criteria: ± 5% of average

Total Dissolved Solids

TDS: VLIMS Code: 4615; EPA Method: 2540C

Date Started: 25Aug20 | Date Finished: 28Aug20

Time Started: 1805 | Time Finished: 1245

Analyst: AJ | Reviewed by: BB

Batch ID: TDS200825A | Review Date: 9/24/2020

Temperature: 181°C | Balance ID: I3

Time in Oven: 66:40 | Oven ID/Thermometer ID: Ov2/AC10365

Merit #	Tin #	sample (mls)	Tin (grams)	dry solids + tin 180°C (grams)	reweigh 15 min. 180°C (grams)	Cond.	TDS (mg/L)
Blank	A0570057	50	3.8269	3.8271			4 / ND
LCS Lot 8209-09	058	25	3.7897	3.8055			632
16695.01	059	50	3.7466	3.7854			776
Dup .01	060	50	3.7861	3.8256			790
.02	061	50	3.7530	3.8243			1430* / 1426
.03	062	50	3.7583	3.7874			582
.04	063	50	3.7129	3.7887			1520* / 1516
.05	064	50	3.7551	3.7961			820
.06	065	50	3.7869	3.8145			552
.07	066	50	3.7701	3.7700			-2/ND
16812.01	067	25	3.7590	3.9497			7630* / 7628
.02	068	25	3.7966	4.0035			8280* / 8276
.03	069	25	3.8345	3.9627			5130* / 5128

LCS value = 632 mg/L | Acceptance Criteria (mg/L): 568-695 mg/L

% Rec = 100.0% | Acceptance Criteria (%): 89.9-110%

% RPD = 1.8% | Acceptance Criteria: ± 5% of average

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Jennifer Caporale
COMPANY: Lansing Board of Water and Light
ADDRESS: PO Box 13007 48901-3007
CITY: Lansing STATE: Mi ZIP CODE: 48901
PHONE NO.: 517-702-6372 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: Environmental_Laboratory@lbwl.com QUOTE NO.:

INVOICE TO

CONTACT NAME: Kelly Gleason ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS: Kelly.Gleason@lbwl.com

PROJECT NO./NAME: Erickson GMP
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Marc Wahrer

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ~~☒ QC1~~ ☐ LEVEL II ☒ LEVEL III ☐ LEVEL IV ☒ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☒ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other
Special Instructions

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Metals	TSS	TDS, Cl-, SO4-, F	Radium 226	Radium 228	Special Instructions
160695.01	8/18/20	1324	MW-1 L008009-01	GW	5	2		3					✓	✓	✓	✓	✓	Metals to analyse:
.02		1645	MW-2 -02	GW	5	2		3					✓	✓	✓	✓	✓	Sb, As, Ba, Be, B, Cd, Ca, Cr,
.03		1005	MW-4 -03	GW	5	2		3					✓	✓	✓	✓	✓	Co,Pb, Li, Hg, Mo, Se, Tl
.04		1725	MW-5 -04	GW	5	2		3					✓	✓	✓	✓	✓	
.05		1562	MW-6 -05	GW	5	2		3					✓	✓	✓	✓	✓	Please send a preliminary report
.06		1005	MW-4 Duplicate -06	GW	5	2		3					✓	✓	✓	✓	✓	
.07	↓	725	Field Blank ↓ -07	DI	5	2		3					✓	✓	✓	✓	✓	

		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION	☒ Sampler	8-19-20	0927
RECEIVED BY: SIGNATURE/ORGANIZATION		8/19/20	0927
RELINQUISHED BY: SIGNATURE/ORGANIZATION			
RECEIVED BY: SIGNATURE/ORGANIZATION			

		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION			
RECEIVED BY: SIGNATURE/ORGANIZATION			

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 2.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: John Laverty
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing | STATE: MI | ZIP CODE: 48823
PHONE NO.: 517-332-0167 | FAX NO.: 517-332-4034 | P.O. NO.:
E-MAIL ADDRESS: results@meritlabs.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: Julie Teague | ☒ SAME
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing | STATE: MI | ZIP CODE: 48823
PHONE NO.: 517-332-0167 | E-MAIL ADDRESS: juliet@meritlabs.com

PROJECT NO./NAME: S16695 | SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐1 DAY ☐2 DAYS ☐3 DAYS ☒STANDARD ☐OTHER _____

DELIVERABLES REQUIRED ☐STD ☐LEVEL II ☐LEVEL III ☒LEVEL IV ☐EDD ☐OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐OHIO VAP ☐Drinking Water ☐DoD ☐NPDES
Project Locations: ☐Detroit ☐New York ☐Other _____
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Radium 226*	Radium 228**	Special Instructions
	8/18/20	1324	S16695.01	GW	2			2					✓	✓	* E903.1 Mod.
	8/18/20	1645	S16695.02	GW	2			2					✓	✓	** E904.0/SW 9320 Mod.
	8/18/20	1005	S16695.03	GW	2			2					✓	✓	
	8/18/20	1725	S16695.04	GW	2			2					✓	✓	Please use calculation product &
	8/18/20	1502	S16695.05	GW	2			2					✓	✓	provide Radium 226/228 combined
	8/18/20	1005	S16695.06	GW	2			2					✓	✓	results on the report
	8/18/20	0725	S16695.07 (Field Blank)	L	2			2					✓	✓	
															** Subcontracted to
															GEL Laboratories, Inc.
															2040 Savage Road
															Charleston, SC 29407

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Sam Smith ☐Sampler	DATE: 8/19/20	TIME: 1640	RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: UPS	DATE: 8/19/20	TIME: 1640	RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:
RELINQUISHED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	SEAL NO.:	SEAL INTACT YES☐ NO☐	INITIALS:
RECEIVED BY: SIGNATURE/ORGANIZATION:	DATE:	TIME:	SEAL NO.:	SEAL INTACT YES☐ NO☐	INITIALS:

NOTES: TEMP. ON ARRIVAL _____

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Merit Laboratories Login Checklist

Lab Set ID: S16695
Client: BWL01 (Board of Water & Light)
Project: Erickson GMP
Submitted: 08/19/2020 09:27 Login User: SRS

Attention: Jennifer Caporale
Address: Board of Water & Light
P.O. Box 13007
Lansing, MI 48901

Phone: 517-702-6372 FAX:
Email: Environmental_Laboratory@LBWL.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 2.3
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[X] Yes	[ ] No	[ ] N/A	Subcontracting needed? Subcontacted to:	GEL
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Prepared by Merit Laboratories

Merit Laboratories Bottle Preservation Check

Lab Set ID: S16695 Submitted: 08/19/2020 09:27

Client: BWL01 (Board of Water & Light)

Project: Erickson GMP

Initial Preservation Check: 08/19/2020 09:53 SRS

Preservation Recheck (E200.8): N/A

Attention: Jennifer Caporale
Address: Board of Water & Light
P.O. Box 13007
Lansing, MI 48901

Phone: 517-702-6372 FAX:
Email: Environmental_Laboratory@LBWL.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S16695.01	125ml Plastic HNO3	<2			
S16695.01	1L Plastic HNO3	<2			
S16695.01	1L Plastic HNO3	<2			
S16695.02	125ml Plastic HNO3	<2			
S16695.02	1L Plastic HNO3	<2			
S16695.02	1L Plastic HNO3	<2			
S16695.03	125ml Plastic HNO3	<2			
S16695.03	1L Plastic HNO3	<2			
S16695.03	1L Plastic HNO3	<2			
S16695.04	125ml Plastic HNO3	<2			
S16695.04	1L Plastic HNO3	<2			
S16695.04	1L Plastic HNO3	<2			
S16695.05	125ml Plastic HNO3	<2			
S16695.05	1L Plastic HNO3	<2			
S16695.05	1L Plastic HNO3	<2			
S16695.06	125ml Plastic HNO3	<2			
S16695.06	1L Plastic HNO3	<2			
S16695.06	1L Plastic HNO3	<2			
S16695.07	125ml Plastic HNO3	<2			
S16695.07	1L Plastic HNO3	<2			
S16695.07	1L Plastic HNO3	<2			

Sample Set Receipt

Report to

Attention: Jennifer Caporale

Address: Board of Water & Light
P.O. Box 13007
Lansing, MI 48901

Phone: 517-702-6372 FAX:

Email: Environmental_Laboratory@LBWL.com

Contacts:

Invoice to

Attention: Kelly Gleason

Address: Board of Water & Light
PO Box 13007
Lansing, MI 48901

Phone: 517-702-6372 FAX: 517-702-6373

Email: kelly.gleason@lbwl.com

Set ID: S16695 Location: BWL01 (Board of Water & Light) PO #: Login by: SRS

Project: Erickson GMP Backlog Note:

Submitted: 08/19/2020 09:27 Due Date: 09/02/2020 Rush: No Collected by: Marc Wahrer QC Level: 3 Custom Limits Present: No

Approved by: Site: Work Order#: Bill to Acct: Bill to Dept:

Sample ID	Sample Tag	Matrix	Date/Time Collected	COC Ref
S16695.01	MW-1 L008009-01	Groundwater	08/18/2020 13:24	
S16695.02	MW-2 L008009-02	Groundwater	08/18/2020 16:45	
S16695.03	MW-4 L008009-03	Groundwater	08/18/2020 10:05	
S16695.04	MW-5 L008009-04	Groundwater	08/18/2020 17:25	
S16695.05	MW-6 L008009-05	Groundwater	08/18/2020 15:02	
S16695.06	MW-4 Duplicate L008009-06	Groundwater	08/18/2020 10:05	
S16695.07	Field Blank L008009-07	Water	08/18/2020 07:25	

Samples: S16695.01-07

Analysis Code	Analysis Title	Method	Units	Holding Date
2140WMS	Calcium	E200.8	mg/L	02/14/2021
2145WMS	Chromium	E200.8	mg/L	02/14/2021
2130WMS	Boron	E200.8	mg/L	02/14/2021
2115WMS	Arsenic	E200.8	mg/L	02/14/2021
2205WMS	Selenium	E200.8	mg/L	02/14/2021
2190WMS	Molybdenum	E200.8	mg/L	02/14/2021
2135WMS	Cadmium	E200.8	mg/L	02/14/2021
2110WMS	Antimony	E200.8	mg/L	02/14/2021
2120WMS	Barium	E200.8	mg/L	02/14/2021
2225WMS	Thallium	E200.8	mg/L	02/14/2021
2165WMS	Lead	E200.8	mg/L	02/14/2021
2125WMS	Beryllium	E200.8	mg/L	02/14/2021
2150WMS	Cobalt	E200.8	mg/L	02/14/2021
2170WMS	Lithium	E200.8	mg/L	02/14/2021
2185W	Mercury	E245.1	mg/L	09/15/2020
4425W	Chloride	E300.0	mg/L	09/15/2020
4530W	Sulfate	E300.0	mg/L	09/15/2020
4455W	Fluoride (Undistilled)	E300.0	mg/L	09/15/2020
MISCSUB	Misc. Special Project			05/14/2023
1605W	Metal Digestion	SW3015A		02/14/2021
1605HGW	Mercury Digestion	E245.1		09/15/2020
SUBCONT	Subcontracting			05/14/2023
4630	Total Suspended Solids	SM2540D	mg/L	08/25/2020
4615	Total Dissolved Solids	SM2540C	mg/L	08/25/2020

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

gel.com

September 15, 2020

John Laverty
Merit Laboratories Inc.
2680 East Lansing Drive
East Lansing, Michigan 48823

Re: Routine Analysis
Work Order: 519365
SDG: S16695

Dear John Laverty:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 21, 2020. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4443.

Sincerely,

Lindsay Fabra

Lindsay Fabra
Project Manager

Purchase Order: GELP20-0018
Enclosures

Table of Contents

Case Narrative

Receipt Narrative
for
Merit Laboratories, Inc.
SDG: S16695
Work Order: 519365

September 15, 2020

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on August 21, 2020 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
519365001	S16695.01
519365002	S16695.02
519365003	S16695.03
519365004	S16695.04
519365005	S16695.05
519365006	S16695.06
519365007	S16695.07 (Field Blank)

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

Lindsay Fabra
Project Manager

Chain of Custody and Supporting Documentation

519365

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: John Laverty
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing | STATE: MI | ZIP CODE: 48823
PHONE NO.: 517-332-0167 | FAX NO.: 517-332-4034 | P.O. NO.:
E-MAIL ADDRESS: results@meritlabs.com | QUOTE NO.:

INVOICE TO

CONTACT NAME: Julie Teague | ☒ SAME
COMPANY: Merit Laboratories
ADDRESS: 2680 East Lansing Drive
CITY: East Lansing | STATE: MI | ZIP CODE: 48823
PHONE NO.: 517-332-0167 | E-MAIL ADDRESS: juliet@meritlabs.com

PROJECT NO./NAME: S16695 | SAMPLER(S) - PLEASE PRINT/SIGN NAME:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☒ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Radium 226*	Radium 228**	Special Instructions
	8/18/20	1324	S16695.01	GW	2			2					✓	✓	* E903.1 Mod.
	8/18/20	1645	S16695.02	GW	2			2					✓	✓	** E904.0/SW 9320 Mod.
	8/18/20	1005	S16695.03	GW	2			2					✓	✓	
	8/18/20	1725	S16695.04	GW	2			2					✓	✓	Please use calculation product &
	8/18/20	1502	S16695.05	GW	2			2					✓	✓	provide Radium 226/228 combined
	8/18/20	1005	S16695.06	GW	2			2					✓	✓	results on the report
	8/18/20	0725	S16695.07 (Field Blank)	L	2			2					✓	✓	
															** Subcontracted to
															GEL Laboratories, Inc.
															2040 Savage Road
															Charleston, SC 29407

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Sam Smith UPS ☐ Sampler | DATE: 8/19/20 | TIME: 1640
RECEIVED BY: SIGNATURE/ORGANIZATION: | DATE: 8/19/20 | TIME: 1640
RELINQUISHED BY: SIGNATURE/ORGANIZATION: | DATE | TIME
RECEIVED BY: SIGNATURE/ORGANIZATION: | DATE | TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: | DATE | TIME
RECEIVED BY: SIGNATURE/ORGANIZATION: VSB | DATE: 8/20/20 | TIME: 10:20

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: TEMP. ON ARRIVAL _____

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: MERI	SDG/AR/COC/Work Order: 519365
Received By: Stacy Boone	Date Received: August 21, 2020
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services Courier Other 1Z 466 477 03 6330 3694

Suspected Hazard Information	Yes	No	
			*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
A)Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#: If UN2910, Is the Radioactive Shipment Survey Compliant? Yes___ No___
B) Did the client designate the samples are to be received as radioactive?		✓	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3
D) Did the client designate samples are hazardous?		✓	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?		✓	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	✓			Circle Applicable: Client contacted and provided COC COC created upon receipt
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*			✓	Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: 21 °C
4	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: IR1-20 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	✓			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?				If Yes, are Encores or Soil Kits present for solids? Yes___ No___ NA___(If yes, take to VOA Freezer) Do liquid VOA vials contain acid preservation? Yes___ No___ NA___(If unknown, select No) Are liquid VOA vials free of headspace? Yes___ No___ NA___ Sample ID's and containers affected:
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11	Number of containers received match number indicated on COC?	✓			Circle Applicable: No container count on COC Other (describe)
12	Are sample containers identifiable as GEL provided by use of GEL labels?	✓			
13	COC form is properly signed in relinquished/received sections?	✓			Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed): SB 8/24 NKC 8/24/20 NKC 8/24/20

PM (or PMA) review: Initials NKC Date 8/24/20 Page 1 of 1

GL-CHL-SR-001 Rev 7

Laboratory Certifications

List of current GEL Certifications as of 15 September 2020

State	Certification
Alabama	42200
Alaska	17−018
Alaska Drinking Water	SC00012
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M−SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122020−1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R−158
Oklahoma	2019−165
Pennsylvania NELAP	68−00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−20−17
Utah NELAP	SC000122020−32
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiological Analysis

Case Narrative

Radiochemistry
Technical Case Narrative
Merit Laboratories, Inc.
SDG #: S16695
Work Order #: 519365

Product: **GFPC Ra228, Liquid**
Analytical Method: EPA 904.0/SW846 9320 Modified
Analytical Procedure: GL-RAD-A-009 REV# 17
Analytical Batch: 2032930

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
519365001	S16695.01
519365002	S16695.02
519365003	S16695.03
519365004	S16695.04
519365005	S16695.05
519365006	S16695.06
519365007	S16695.07 (Field Blank)
1204626500	Method Blank (MB)
1204626501	519272004(NonSDG) Sample Duplicate (DUP)
1204626502	519272004(NonSDG) Matrix Spike (MS)
1204626503	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Technical Information

Recounts
Sample 519365006 (S16695.06) was re-eluted and recounted to verify sample result. The recount is reported.

Miscellaneous Information

Additional Comments
The matrix spike, 1204626502 (Non SDG 519272004MS), aliquot was reduced to conserve sample volume.

Product: **Lucas Cell, Ra226, Liquid**
Analytical Method: EPA 903.1 Modified
Analytical Procedure: GL-RAD-A-008 REV# 15
Analytical Batch: 2032768

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
519365001	S16695.01
519365002	S16695.02
519365003	S16695.03
519365004	S16695.04
519365005	S16695.05
519365006	S16695.06
519365007	S16695.07 (Field Blank)
1204626095	Method Blank (MB)
1204626096	519365001(S16695.01) Sample Duplicate (DUP)
1204626097	519365001(S16695.01) Matrix Spike (MS)
1204626098	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

MERI001 Merit Laboratories, Inc.

Client SDG: S16695 GEL Work Order: 519365

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria
** Analyte is a Tracer compound
U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:  **Name: Kate Gellatly**

Date: 17 SEP 2020 **Title: Analyst I**

Sample Data Summary

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 17, 2020

Company :	Merit Laboratories Inc.
Address :	2680 East Lansing Drive
	East Lansing, Michigan 48823
Contact:	John Laverty
Project:	Routine Analysis

Client Sample ID:	S16695.01	Project:	MERI00120
Sample ID:	519365001	Client ID:	MERI001
Matrix:	Ground Water		
Collect Date:	18-AUG-20 13:24		
Receive Date:	21-AUG-20		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	1.47	+/-1.30	2.12	3.00	pCi/L			JXC9	09/04/20	0848	2032930	1
Radium-226+Radium-228 Calculation "See Parent Products"													
Radium-226+228 Sum		1.87	+/-1.32			pCi/L		1	AEA	09/15/20	1210	2032950	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226		0.400	+/-0.221	0.260	1.00	pCi/L			MXH8	09/15/20	0816	2032768	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	Calculation	
3	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			73.8	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 17, 2020

Company :	Merit Laboratories Inc.
Address :	2680 East Lansing Drive
	East Lansing, Michigan 48823
Contact:	John Laverty
Project:	Routine Analysis

Client Sample ID:	S16695.02	Project:	MERI00120
Sample ID:	519365002	Client ID:	MERI001
Matrix:	Ground Water		
Collect Date:	18-AUG-20 16:45		
Receive Date:	21-AUG-20		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	0.573	+/-1.22	2.17	3.00	pCi/L			JXC9	09/04/20	0849	2032930	1
Radium-226+Radium-228 Calculation "See Parent Products"													
Radium-226+228 Sum		0.745	+/-1.24			pCi/L		1	AEA	09/15/20	1210	2032950	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226	U	0.171	+/-0.230	0.395	1.00	pCi/L			MXH8	09/15/20	0816	2032768	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	Calculation	
3	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			69	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 17, 2020

Company :	Merit Laboratories Inc.
Address :	2680 East Lansing Drive
	East Lansing, Michigan 48823
Contact:	John Laverty
Project:	Routine Analysis

Client Sample ID:	S16695.03	Project:	MERI00120
Sample ID:	519365003	Client ID:	MERI001
Matrix:	Ground Water		
Collect Date:	18-AUG-20 10:05		
Receive Date:	21-AUG-20		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	2.46	+/-1.70	2.70	3.00	pCi/L			JXC9	09/04/20	0849	2032930	1
Radium-226+Radium-228 Calculation "See Parent Products"													
Radium-226+228 Sum		2.99	+/-1.72			pCi/L		1	AEA	09/15/20	1210	2032950	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226		0.527	+/-0.236	0.192	1.00	pCi/L			MXH8	09/15/20	0816	2032768	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	Calculation	
3	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			67.2	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 17, 2020

Company :	Merit Laboratories Inc.
Address :	2680 East Lansing Drive
	East Lansing, Michigan 48823
Contact:	John Laverty
Project:	Routine Analysis

Client Sample ID:	S16695.04	Project:	MERI00120
Sample ID:	519365004	Client ID:	MERI001
Matrix:	Ground Water		
Collect Date:	18-AUG-20 17:25		
Receive Date:	21-AUG-20		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	0.253	+/-0.998	1.84	3.00	pCi/L			JXC9	09/04/20	0849	2032930	1
Radium-226+Radium-228 Calculation "See Parent Products"													
Radium-226+228 Sum		0.552	+/-1.03			pCi/L		1	AEA	09/15/20	1210	2032950	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226	U	0.300	+/-0.245	0.365	1.00	pCi/L			MXH8	09/15/20	0816	2032768	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	Calculation	
3	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			68.8	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 17, 2020

Company :	Merit Laboratories Inc.
Address :	2680 East Lansing Drive
	East Lansing, Michigan 48823
Contact:	John Laverty
Project:	Routine Analysis

Client Sample ID:	S16695.05	Project:	MERI00120
Sample ID:	519365005	Client ID:	MERI001
Matrix:	Ground Water		
Collect Date:	18-AUG-20 15:02		
Receive Date:	21-AUG-20		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	1.06	+/-1.54	2.64	3.00	pCi/L			JXC9	09/04/20	0849	2032930	1
Radium-226+Radium-228 Calculation "See Parent Products"													
Radium-226+228 Sum		1.48	+/-1.55			pCi/L		1	AEA	09/15/20	1210	2032950	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226		0.415	+/-0.202	0.177	1.00	pCi/L			MXH8	09/15/20	0816	2032768	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	Calculation	
3	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			66.9	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 17, 2020

Company :	Merit Laboratories Inc.
Address :	2680 East Lansing Drive
	East Lansing, Michigan 48823
Contact:	John Laverty
Project:	Routine Analysis

Client Sample ID:	S16695.06	Project:	MERI00120
Sample ID:	519365006	Client ID:	MERI001
Matrix:	Ground Water		
Collect Date:	18-AUG-20 10:05		
Receive Date:	21-AUG-20		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	1.22	+/-0.990	1.58	3.00	pCi/L			JXC9	09/09/20	1205	2032930	1
Radium-226+Radium-228 Calculation "See Parent Products"													
Radium-226+228 Sum		1.56	+/-1.02			pCi/L		1	AEA	09/15/20	1210	2032950	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226	U	0.340	+/-0.256	0.377	1.00	pCi/L			MXH8	09/15/20	0816	2032768	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	Calculation	
3	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			84.2	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: September 17, 2020

Company : Merit Laboratories Inc.
Address : 2680 East Lansing Drive

East Lansing, Michigan 48823
Contact: John Laverty
Project: Routine Analysis

Client Sample ID: S16695.07 (Field Blank)
Sample ID: 519365007
Matrix: Water
Collect Date: 18-AUG-20 07:25
Receive Date: 21-AUG-20
Collector: Client

Project: MERI00120
Client ID: MERI001

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	-0.376	+/-1.01	2.00	3.00	pCi/L			JXC9	09/04/20	0849	2032930	1
Radium-226+Radium-228 Calculation "See Parent Products"													
Radium-226+228 Sum		0.0483	+/-1.03			pCi/L		1	AEA	09/15/20	1210	2032950	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226	U	0.0483	+/-0.189	0.370	1.00	pCi/L			MXH8	09/15/20	0816	2032768	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	Calculation	
3	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"			72	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Quality Control Summary

QC Summary

Report Date: September 17, 2020

Merit Laboratories Inc.
2680 East Lansing Drive
East Lansing, Michigan

Contact: **John Laverty**

Workorder: **519365**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gas Flow										
Batch 2032930										
QC1204626501 519272004 DUP										
Radium-228	U	0.0334	U	1.81	pCi/L	N/A		N/A	JXC9	09/04/20 08:48
	Uncertainty	+/-0.944		+/-1.34						
QC1204626503 LCS										
Radium-228	54.7			48.7	pCi/L		89.1	(75%-125%)		09/04/20 08:50
	Uncertainty			+/-3.84						
QC1204626500 MB										
Radium-228			U	0.744	pCi/L					09/04/20 08:48
	Uncertainty			+/-0.924						
QC1204626502 519272004 MS										
Radium-228	165 U	0.0334		169	pCi/L		102	(75%-125%)		09/04/20 08:51
	Uncertainty	+/-0.944		+/-12.3						
Rad Ra-226										
Batch 2032768										
QC1204626096 519365001 DUP										
Radium-226		0.400	U	0.283	pCi/L	34.2		(0% - 100%)	MXH8	09/15/20 08:57
	Uncertainty	+/-0.221		+/-0.227						
QC1204626098 LCS										
Radium-226	27.1			27.0	pCi/L		99.8	(75%-125%)		09/15/20 08:57
	Uncertainty			+/-1.64						
QC1204626095 MB										
Radium-226			U	0.165	pCi/L					09/15/20 08:16
	Uncertainty			+/-0.194						
QC1204626097 519365001 MS										
Radium-226	27.1	0.400		25.7	pCi/L		93.4	(75%-125%)		09/15/20 08:57
	Uncertainty	+/-0.221		+/-1.61						

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported

QC Summary

Workorder: **519365**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

BD	Results are either below the MDC or tracer recovery is low
FA	Failed analysis.
H	Analytical holding time was exceeded
J	See case narrative for an explanation
J	Value is estimated
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
M	M if above MDC and less than LLD
M	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
UI	Gamma Spectroscopy--Uncertain identification
UJ	Gamma Spectroscopy--Uncertain identification
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
h	Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Gas Flow Raw Data

Batch 2032930 Check-list

This check-list was completed on 11-SEP-20 by Kenshalla Oston

This batch was reviewed by Angela Johnson on 11-SEP-20 and Kenshalla Oston on 11-SEP-20.

Batch ID:	**Product:**	**Description:** Gas Flow Radium 228
2032930	GFC28RAL	GL-RAD-A-009

#	Criteria	Yes	No	Comments
Preparation Information				
1	Were all of the samples homogenous? Include sample description if not homogenous	Yes		
2	Was the preservation correct for this analysis?	Yes		
Internal Checklist Information				
3	Are instrument source checks within limits?	Yes		
4	Has an Aliquot Correction been completed for this batch?		No	
5	Have sample historical results been reviewed for this batch?	Yes		
Technical Information				
6	Were all the samples prepared/analyzed within the required holding time period?	Yes		
7	Are any sample results more negative than 3xTPU?		No	
Quality Control (QC) Information				
8	Was the method blank (MB) within the acceptance criteria?	Yes		
9	Were the laboratory control sample (LCS/LCSD) recoveries within the acceptance limits?	Yes		
10	Were the matrix spike (MS/MSD) recoveries within the acceptance limits?	Yes		
11	Were the relative percent differences and/or error (RPD/RER) between the sample and its duplicate within acceptable limits?	Yes		
12	Has the method required detection limit been met?	Yes		
Miscellaneous Information				
13	Are sample-specific MDA/MDC calculated and reported?	Yes		

Prep Logbook

Radium−228 in Liquid

Batch ID: **2032930**
Analyst: Jasmine Conley (JXC9)
Method: EPA 904.0/SW846 9320 Modified
Lab SOP: GL−RAD−A−009 REV# 17
Instrument: GFC−8949708441

Due Dates for Lab: 16−SEP−2020 **Package: 19−SEP−2020** **SDG: 17−SEP−2020**

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1204626503	Radium−228 SPIKE	1919−A	.2	mL
MS	1204626502	Radium−228 SPIKE	1919−A	.2	mL

#	Sample ID	Prep Date	Min RDL (pCi/L)	Aliquot (mL)	Ac−228 Ingrow (date)	Ac−228 Separation (date)
1	519042001	01−SEP−2020	20	50	09/02/20 12:00	09/04/20 06:43
2	519042002	01−SEP−2020	20	50	09/02/20 12:00	09/04/20 06:43
3	519042003	01−SEP−2020	20	50	09/02/20 12:00	09/04/20 06:43
4	519272001	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
5	519272002	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
6	519272003	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
7	519272004	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
8	519272005	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
9	519272006	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
10	519272007	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
11	519272008	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
12	519272009	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
13	519272010	01−SEP−2020	3	300	09/04/20 06:43	09/09/20 10:11
14	519365001	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
15	519365002	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
16	519365003	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
17	519365004	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
18	519365005	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
19	519365006	01−SEP−2020	3	300	09/04/20 06:43	09/09/20 10:11
20	519365007	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
21	1204626500 MB	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
22	1204626501 DUP (519272004)	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43
23	1204626502 MS (519272004)	01−SEP−2020	3	100	09/02/20 12:00	09/04/20 06:43
24	1204626503 LCS	01−SEP−2020	3	300	09/02/20 12:00	09/04/20 06:43

Reagent/Solvent Lot ID	Description	Amount
WORK 0487−G	Barium−133 TRACER	.1 mL
REGNT 2947553	RGF−Neodymium 500mg/L	.2 mL
REGNT 3064966	RGF−50% Potassium Carbonate	2 mL
REGNT 3075531.4	Acetic Acid Glacial ACS Poly Coated Bottle	10 mL
REGNT 3099514	RGF−Neodymium Subtrate	5 mL
REGNT 3101645.1	RGF−Nitric Acid	5 mL
REGNT 3109131	7M HNO3	25 mL
REGNT 3109797.7	RGF−Hydrofluoric Acid	4 mL
REGNT 3112196	RGF−1M Citric Acid	5 mL
REGNT 3116629	2M HCL	20 mL
REGNT 3116748	Lot #DGA0016	2 g

Comments:

Pipet Id: RAD−GFC−1795419
Data Entry Date2: 01−SEP−2020 00:00

Prep Logbook

#	Sample ID	Prep Date	Min RDL (pCi/L)	Aliquot (mL)	Ac−228 Ingrow (date)	Ac−228 Separation (date)

Reagent/Solvent Lot ID	Description	Amount
REGNT 3116957	RGF−1.5M Ammonium Sulfate	10 mL
REGNT 3116964	Barium Carrier Ra228 REG	1 mL

Comments:

Radium-228 Liquid

Filename : RA228.XLS
File type : Excel
Version # : 1.4.2

Tracer S/N : 0487-G
Tracer Exp Date : 2/27/2021
Tracer Volume Added: 0.10

Batch : 2032930
Analyst : JAS02031
Prep Date : 9/1/2020
Ra-228 Method Uncertainty : 0.1268

Geometry: 25mm Filter

Procedure Code : GFC28RAL
Parmname : Radium-228
Required MDA : 3 pCi/L
Ra-228 Abundance : 1.00
Halflife of Ra-228 : 5.75 years
Halflife of Ac-228 : 6.15 hours

Sample Characteristics					Tracer Calculations					
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Tracer Ref. Activity (CPM)	Tracer Ref. Count Uncertainty (%)	Tracer Samp. Activity (CPM)	Tracer Samp. Count Uncertainty (%)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	519042001.1	0.0500	7.8337E-06	8/12/2020 12:00	342.8	3.12%	210.6	3.98%	0.1	0.000200
2	519042002.1	0.0500	7.8337E-06	8/12/2020 12:00	342.8	3.12%	219.8	3.89%	0.1	0.000200
3	519042003.1	0.0500	7.8337E-06	8/12/2020 12:00	342.8	3.12%	245.5	3.68%	0.1	0.000200
4	519272001.1	0.3000	1.8459E-05	8/11/2020 12:30	342.8	3.12%	252.3	3.63%	0.1	0.000200
5	519272002.1	0.3000	1.8459E-05	8/12/2020 10:25	342.8	3.12%	265.1	3.55%	0.1	0.000200
6	519272003.1	0.3000	1.8459E-05	8/11/2020 12:50	342.8	3.12%	244.6	3.69%	0.1	0.000200
7	519272004.1	0.3000	1.8459E-05	8/11/2020 15:30	342.8	3.12%	242.3	3.71%	0.1	0.000200
8	519272005.1	0.3000	1.8459E-05	8/11/2020 16:55	342.8	3.12%	243.6	3.70%	0.1	0.000200
9	519272006.1	0.3000	1.8459E-05	8/12/2020 10:45	342.8	3.12%	237.8	3.74%	0.1	0.000200
10	519272007.1	0.3000	1.8459E-05	8/12/2020 12:20	342.8	3.12%	258.6	3.59%	0.1	0.000200
11	519272008.1	0.3000	1.8459E-05	8/12/2020 11:40	342.8	3.12%	254.8	3.62%	0.1	0.000200
12	519272009.1	0.3000	1.8459E-05	8/12/2020 11:20	342.8	3.12%	238.0	3.74%	0.1	0.000200
13	519272010.1	0.3000	1.8459E-05	8/12/2020 12:40	279.8	3.45%	243.0	3.70%	0.1	0.000200
14	519365001.1	0.3000	1.8459E-05	8/18/2020 13:24	342.8	3.12%	253.0	3.63%	0.1	0.000200
15	519365002.1	0.3000	1.8459E-05	8/18/2020 16:45	342.8	3.12%	236.6	3.75%	0.1	0.000200
16	519365003.1	0.3000	1.8459E-05	8/18/2020 10:05	342.8	3.12%	230.5	3.80%	0.1	0.000200
17	519365004.1	0.3000	1.8459E-05	8/18/2020 17:25	342.8	3.12%	235.8	3.76%	0.1	0.000200
18	519365005.1	0.3000	1.8459E-05	8/18/2020 15:02	342.8	3.12%	229.5	3.81%	0.1	0.000200
19	519365006.1	0.3000	1.8459E-05	8/18/2020 10:05	279.8	3.45%	235.6	3.76%	0.1	0.000200
20	519365007.1	0.3000	1.8459E-05	8/18/2020 7:25	342.8	3.12%	246.8	3.67%	0.1	0.000200
21	1204626500.1	0.3000	1.8459E-05	9/1/2020 0:00	342.8	3.12%	218.5	3.91%	0.1	0.000200
22	1204626501.1	0.3000	1.8459E-05	8/11/2020 15:30	342.8	3.12%	261.4	3.57%	0.1	0.000200
23	1204626502.1	0.1000	1.1370E-05	8/11/2020 15:30	342.8	3.12%	246.6	3.68%	0.1	0.000200
24	1204626503.1	0.3000	1.8459E-05	9/1/2020 0:00	342.8	3.12%	258.4	3.59%	0.1	0.000200

Pipet, 0.1 ml Stdev : +/-	0.000200	ml
Pipet, 0.5 ml Stdev : +/-	0.001000	ml
Pipet, 1 ml Stdev : +/-	0.002000	ml

Analytical SOP: GL-RAD-A-009
Instrument SOP: GL-RAD-I-016

Count raw Data

Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Counts Beta	Beta cpm	Count Start Date/Time	Ac-228 Ingrowth Date/Time	Ac-228 Decay Date/Time	Ra-228 Decay	Ac-228 Decay	Ac-228 Ingrowth	Ac-228 Count Correction	Calculated Sample Recovery %	Sample Recovery Error %
1	1B	60	9	45	0.750	9/4/2020 8:32	9/2/2020 12:00	9/4/2020 6:43	0.992	0.814	0.992	1.057	61.4%	2.54%
2	3D	60	6	40	0.667	9/4/2020 8:32	9/2/2020 12:00	9/4/2020 6:43	0.992	0.814	0.992	1.057	64.1%	2.51%
3	4D	60	9	69	1.150	9/4/2020 8:32	9/2/2020 12:00	9/4/2020 6:43	0.992	0.814	0.992	1.057	71.6%	2.43%
4	5D	60	8	74	1.233	9/4/2020 8:32	9/2/2020 12:00	9/4/2020 6:43	0.992	0.814	0.992	1.057	73.6%	2.41%
5	6A	60	15	124	2.067	9/4/2020 8:47	9/2/2020 12:00	9/4/2020 6:43	0.992	0.791	0.992	1.057	77.3%	2.38%
6	6C	60	8	81	1.350	9/4/2020 8:47	9/2/2020 12:00	9/4/2020 6:43	0.992	0.791	0.992	1.057	71.4%	2.43%
7	7A	60	8	38	0.633	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.992	0.791	0.992	1.057	70.7%	2.44%
8	7C	60	8	33	0.550	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.992	0.791	0.992	1.057	71.1%	2.44%
9	7D	60	18	34	0.567	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.992	0.791	0.992	1.057	69.4%	2.45%
10	9D	60	7	25	0.417	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.992	0.790	0.992	1.057	75.4%	2.39%
11	10A	60	12	29	0.483	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.992	0.790	0.992	1.057	74.3%	2.41%
12	10B	60	4	98	1.633	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.992	0.790	0.992	1.057	69.4%	2.45%
13	8C	60	14	93	1.550	9/9/2020 12:05	9/4/2020 6:43	9/9/2020 10:11	0.991	0.806	1.000	1.057	86.8%	2.55%
14	10D	60	12	80	1.333	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.994	0.790	0.992	1.057	73.8%	2.41%
15	11A	60	5	61	1.017	9/4/2020 8:49	9/2/2020 12:00	9/4/2020 6:43	0.995	0.789	0.992	1.057	69.0%	2.46%
16	11B	60	10	121	2.017	9/4/2020 8:49	9/2/2020 12:00	9/4/2020 6:43	0.994	0.789	0.992	1.057	67.2%	2.47%
17	11C	60	3	43	0.717	9/4/2020 8:49	9/2/2020 12:00	9/4/2020 6:43	0.995	0.789	0.992	1.057	68.8%	2.46%
18	12B	60	5	91	1.517	9/4/2020 8:49	9/2/2020 12:00	9/4/2020 6:43	0.994	0.789	0.992	1.057	66.9%	2.48%
19	8D	60	6	58	0.967	9/9/2020 12:05	9/4/2020 6:43	9/9/2020 10:11	0.993	0.806	1.000	1.057	84.2%	2.57%
20	13D	60	7	46	0.767	9/4/2020 8:49	9/2/2020 12:00	9/4/2020 6:43	0.994	0.789	0.992	1.057	72.0%	2.43%
21	14A	60	8	31	0.517	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.999	0.789	0.992	1.057	63.7%	2.52%
22	14C	60	9	91	1.517	9/4/2020 8:48	9/2/2020 12:00	9/4/2020 6:43	0.992	0.789	0.992	1.057	76.3%	2.39%
23	13B	60	13	837	13.950	9/4/2020 8:51	9/2/2020 12:00	9/4/2020 6:43	0.992	0.786	0.992	1.057	72.0%	2.43%
24	1D	60	29	712	11.867	9/4/2020 8:50	9/2/2020 12:00	9/4/2020 6:43	0.999	0.787	0.992	1.057	75.4%	2.39%

Calibration Data								
Pos.	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Bkg cpm	Weekly Bkg Count Start Date/Time	Bkg Count Time (min.)
1	PIC	6/1/2020	5/31/2021	0.6327	0.00711	0.829	8/28/2020 16:29	1000
2	PIC	6/1/2020	5/31/2021	0.6234	0.02297	0.525	8/28/2020 16:29	1000
3	PIC	6/1/2020	5/31/2021	0.5764	0.00773	0.954	8/28/2020 16:30	1000
4	PIC	6/1/2020	5/31/2021	0.6511	0.00925	1.154	8/28/2020 16:30	1000
5	PIC	6/1/2020	5/31/2021	0.5743	0.02228	1.743	8/28/2020 16:38	1000
6	PIC	6/1/2020	5/31/2021	0.6036	0.01970	1.267	8/28/2020 16:39	1000
7	PIC	6/1/2020	5/31/2021	0.6340	0.00594	0.626	8/28/2020 16:39	1000
8	PIC	6/1/2020	5/31/2021	0.6361	0.00790	0.528	8/28/2020 16:39	1000
9	PIC	6/1/2020	5/31/2021	0.6337	0.01113	0.529	8/28/2020 16:39	1000
10	PIC	6/1/2020	5/31/2021	0.6435	0.02610	0.445	8/28/2020 17:39	1000
11	PIC	6/1/2020	5/31/2021	0.6416	0.00651	0.404	8/28/2020 16:40	1000
12	PIC	6/1/2020	5/31/2021	0.6420	0.00652	1.630	8/28/2020 16:40	1000
13	PIC	6/1/2020	5/31/2021	0.6437	0.01955	1.364	9/4/2020 16:56	500
14	PIC	6/1/2020	5/31/2021	0.6337	0.00557	0.995	8/28/2020 16:40	1000
15	PIC	6/1/2020	5/31/2021	0.6323	0.01317	0.894	8/28/2020 16:37	1000
16	PIC	6/1/2020	5/31/2021	0.6546	0.00697	1.486	8/28/2020 16:37	1000
17	PIC	6/1/2020	5/31/2021	0.6536	0.01278	0.661	8/28/2020 16:37	1000
18	PIC	6/1/2020	5/31/2021	0.6317	0.01114	1.296	8/28/2020 16:37	1000
19	PIC	6/1/2020	5/31/2021	0.6158	0.00609	0.648	9/4/2020 16:56	500
20	PIC	6/1/2020	5/31/2021	0.6429	0.01144	0.852	8/28/2020 16:38	1000
21	PIC	6/1/2020	5/31/2021	0.6404	0.02119	0.367	8/28/2020 16:38	1000
22	PIC	6/1/2020	5/31/2021	0.6354	0.01828	1.087	8/28/2020 16:38	1000
23	PIC	6/1/2020	5/31/2021	0.6564	0.00967	0.989	8/28/2020 16:38	1000
24	PIC	6/1/2020	5/31/2021	0.6146	0.00692	0.784	8/28/2020 16:29	1000

Notes:
1 - Results are decay corrected to Sample Date/Time
2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
3 - Spike Nominals are decay corrected to Sample Date/Time

* - RPD changed to 0% due to sample & dup activity below MDA

Spike S/N : 1919-A
Spike Exp Date : 4/7/2021
Spike Activity (dpm/ml): 182.01
Spike Volume Added: 0.20

LCS S/N : 1919-A
LCS Exp Date : 4/7/2021
LCS Activity (dpm/ml): 182.01
LCS Volume Added: 0.20

Results

Pos.	Decision Level pCi/L	Critical Level pCi/L	Required MDA pCi/L	MDA pCi/L	Sample Act. Conc. pCi/L	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty pCi/L	2 SIGMA Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
1	8.6200	6.0858	20	13.7000	**-2.4150**	146.16%	-0.0790	0.1155	6.9175	6.9187		SAMPLE				
2	6.6729	4.7111	20	10.9091	**4.2128**	76.22%	0.1417	0.1079	6.2873	6.3800		SAMPLE				
3	8.7116	6.1505	20	13.7409	**5.6448**	72.42%	0.1960	0.1418	8.0069	8.1338		SAMPLE				
4	1.3762	0.9716	3	2.1500	**0.3282**	185.74%	0.0793	0.1473	1.1946	1.1975		SAMPLE				
5	1.8773	1.3254	3	2.8803	**1.4861**	58.86%	0.3237	0.1902	1.7119	1.7539		SAMPLE				
6	1.6510	1.1656	3	2.5680	**0.3931**	185.77%	0.0830	0.1542	1.4311	1.4346		SAMPLE				
7	1.1156	0.7876	3	1.8028	**0.0334**	1441.95%	0.0073	0.1057	0.9436	0.9438		SAMPLE				
8	1.0156	0.7170	3	1.6597	**0.0993**	447.56%	0.0220	0.0985	0.8710	0.8713		SAMPLE				
9	1.0455	0.7381	3	1.7083	**0.1748**	265.15%	0.0377	0.0999	0.9085	0.9096		SAMPLE				
10	0.8685	0.6131	3	1.4365	**-0.1191**	303.42%	-0.0283	0.0860	0.7083	0.7085		SAMPLE				
11	0.8424	0.5948	3	1.4035	**0.3395**	115.96%	0.0793	0.0920	0.7715	0.7763		SAMPLE				
12	1.8110	1.2786	3	2.7862	**0.0153**	5095.78%	0.0033	0.1699	1.5249	1.5250		SAMPLE				
13	1.3226	0.9338	3	2.0454	**0.6617**	90.92%	0.1860	0.1690	1.1784	1.1905		SAMPLE				
14	1.3461	0.9504	3	2.1186	**1.4743**	45.10%	0.3383	0.1524	1.3014	1.3539		SAMPLE				
15	1.3684	0.9661	3	2.1658	**0.5732**	108.92%	0.1227	0.1336	1.2233	1.2320		SAMPLE				
16	1.7498	1.2354	3	2.7025	**2.4596**	35.40%	0.5307	0.1873	1.7019	1.8126		SAMPLE				
17	1.1424	0.8066	3	1.8400	**0.2526**	201.71%	0.0557	0.1123	0.9984	1.0005		SAMPLE				
18	1.7011	1.2010	3	2.6433	**1.0647**	73.92%	0.2207	0.1630	1.5416	1.5652		SAMPLE				
19	0.9810	0.6926	3	1.5765	**1.2199**	41.49%	0.3187	0.1319	0.9899	1.0372		SAMPLE				
20	1.2605	0.8899	3	2.0003	**-0.3763**	136.84%	-0.0853	0.1167	1.0090	1.0091		SAMPLE				
21	0.9330	0.6587	3	1.5661	**0.7443**	63.39%	0.1497	0.0948	0.9236	0.9432		MB				
22	1.3617	0.9614	3	2.1336	**1.8120**	37.91%	0.4297	0.1624	1.3422	1.4197	519272004.1	DUP	* 0.0%			
23	4.0145	2.8343	3	6.3203	**168.9418**	4.55%	12.9610	0.4832	12.3449	44.6119	519272004.1	MS			165.0825	102.3%
24	1.2055	0.8511	3	1.9220	**48.7209**	4.73%	11.0827	0.4456	3.8395	12.9238		LCS			54.6591	89.1%

ASSAY 8-Sep-20 11:38:16

Protocol	id	8 Ba-133
Time	limit	
Count	limit	
Isotope	Ba-133	
Protocol	date	9/8/2020
Run	id.	1844

Samp_ID	POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
REF	1	93	1	180	1028.5	342.77	3.12		11:38:16
519042001	2	93	2	180	632	210.62	3.98	61.45	11:41:30
519042002	3	93	3	180	659.5	219.77	3.89	64.12	11:44:45
519042003	4	93	4	180	736.5	245.47	3.68	71.61	11:47:58
519272001	5	93	5	180	757	252.28	3.63	73.60	11:51:12
519272002	1	14	1	180	795.5	265.11	3.55	77.34	11:54:56
519272003	2	14	2	180	734	244.62	3.69	71.37	11:58:10
519272004	3	14	3	180	727	242.28	3.71	70.68	12:01:25
519272005	4	14	4	180	731	243.62	3.7	71.07	12:04:39
519272006	5	14	5	180	713.5	237.78	3.74	69.37	12:07:52
519272007	1	6	1	180	776	258.61	3.59	75.45	12:11:28
519272008	2	6	2	180	764.5	254.8	3.62	74.34	12:14:42
519272009	3	6	3	180	714	237.95	3.74	69.42	12:17:56
~~519272010~~	~~4~~	~~6~~	~~4~~	~~180~~	~~752.5~~	~~250.76~~	~~3.65~~	~~73.16~~	~~12:21:10~~ MG 9/10/20
519365001	5	6	5	180	759	252.97	3.63	73.80	12:24:24
519365002	1	18	1	180	710	236.6	3.75	69.03	12:28:08
519365003	2	18	2	180	691.5	230.45	3.8	67.23	12:31:22
519365004	3	18	3	180	707.5	235.79	3.76	68.79	12:34:36
519365005	4	18	4	180	688.5	229.45	3.81	66.94	12:37:50
~~519365006~~	~~5~~	~~18~~	~~5~~	~~180~~	~~736~~	~~245.28~~	~~3.69~~	~~71.56~~	~~12:41:04~~ MG 9/10/20
519365007	1	21	1	180	740.5	246.78	3.67	72.00	12:44:48
1204626500	2	21	2	180	655.5	218.47	3.91	63.74	12:48:02
1204626501	3	21	3	180	784.5	261.44	3.57	76.27	12:51:17
1204626502	4	21	4	180	740	246.63	3.68	71.95	12:54:31
1204626503	5	21	5	180	775.5	258.44	3.59	75.40	12:57:44

END OF ASSAY

ASSAY 9-Sep-20 11:48:38

Protocol	id	8	Ba-133
Time	limit		
Count	limit		
Isotope	Ba-133		
Protocol	date	9/9/2020	
Run	id.	1853	

Samp_ID	POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
REF	1	93	1	180	839.5	279.8	3.45		11:48:38
519272010	2	93	2	180	729	242.97	3.7	86.84	11:51:52
519365006	3	93	3	180	707	235.62	3.76	84.21	11:55:06

END OF ASSAY

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
519042001	1B	60	9	45	9/4/2020 8:32	9/4/2020 9:32	PIC	2032930
519042002	3D	60	6	40	9/4/2020 8:32	9/4/2020 9:32	PIC	2032930
519042003	4D	60	9	69	9/4/2020 8:32	9/4/2020 9:32	PIC	2032930
519272001	5D	60	8	74	9/4/2020 8:32	9/4/2020 9:32	PIC	2032930
519272002	6A	60	15	124	9/4/2020 8:47	9/4/2020 9:47	PIC	2032930
519272003	6C	60	8	81	9/4/2020 8:47	9/4/2020 9:47	PIC	2032930
519272004	7A	60	8	38	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
519272005	7C	60	8	33	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
519272006	7D	60	18	34	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
519272007	9D	60	7	25	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
519272008	10A	60	12	29	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
519272009	10B	60	4	98	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
519272010	8C	60	14	93	9/9/2020 12:05	9/9/2020 13:05	PIC	2032930
519365001	10D	60	12	80	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
519365002	11A	60	5	61	9/4/2020 8:49	9/4/2020 9:49	PIC	2032930
519365003	11B	60	10	121	9/4/2020 8:49	9/4/2020 9:49	PIC	2032930
519365004	11C	60	3	43	9/4/2020 8:49	9/4/2020 9:49	PIC	2032930
519365005	12B	60	5	91	9/4/2020 8:49	9/4/2020 9:49	PIC	2032930
519365006	8D	60	6	58	9/9/2020 12:05	9/9/2020 13:05	PIC	2032930
519365007	13D	60	7	46	9/4/2020 8:49	9/4/2020 9:49	PIC	2032930
1204626500	14A	60	8	31	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
1204626501	14C	60	9	91	9/4/2020 8:48	9/4/2020 9:48	PIC	2032930
1204626502	13B	60	13	837	9/4/2020 8:51	9/4/2020 9:51	PIC	2032930
1204626503	1D	60	29	712	9/4/2020 8:50	9/4/2020 9:50	PIC	2032930

Continuing Calibration Data

Gas Flow Proportional Counter Checks for 04-Sep-2020

Detectors LB4100 A1 through J4 and PIC 1A through 14D and G5400W 1W through 1Z

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100C1	Above	Beta bkg	04-Sep 03:23	60	10.517	0.534	3.326	+18.45
LB4100C2	Below	Alpha eff	04-Sep 05:07	5	8379	10240	13030	-7.00
LB4100C2	Above	Alpha XTalk	04-Sep 05:07	5	0.349	0.257	0.306	+8.29
LB4100E1	Above	Alpha bkg	04-Sep 03:23	60	0.383	-5.45E-2	0.290	+4.63
LB4100E2	need 2nd	Alpha bkg	04-Sep 03:23	60	0.233	-7.23E-2	0.347	+1.38
LB4100E2	Above	Beta bkg	04-Sep 03:23	60	2.383	0.950	2.756	+1.76
LB4100E3	Above	Alpha bkg	04-Sep 03:23	60	2.050	-4.47E-2	0.174	+54.39
LB4100E3	Above	Beta bkg	04-Sep 03:23	60	2.783	-1.31E+0	6.766	+0.04
LB4100E3	need 2nd	Beta XTalk	04-Sep 04:35	5	4.54E-4	8.54E-5	4.65E-4	+2.84
LB4100E4	Above	Beta bkg	04-Sep 03:23	60	2.017	0.326	2.646	+1.37
LB4100F3	Above	Alpha bkg	04-Sep 06:13	60	0.317	-7.68E-2	0.332	+2.77
LB4100G2	Above	Alpha XTalk	04-Sep 04:35	5	0.382	0.224	0.342	+5.06
LB4100G2	Above	Beta bkg	04-Sep 03:26	60	1262	0.721	1.648	+8,162.61
LB4100G2	need 2nd	Beta eff	04-Sep 04:45	5	16393	15480	16780	+1.21
LB4100G3	Above	Beta bkg	04-Sep 03:26	60	16.900	0.810	1.674	+108.74
LB4100G4	Below	Alpha eff	04-Sep 04:35	5	9256	9501	10450	-4.55
LB4100I1	Below	Alpha eff	04-Sep 04:52	5	6294	9278	11600	-10.71
LB4100I1	Above	Alpha XTalk	04-Sep 04:52	5	0.438	0.155	0.201	+33.67
LB4100I2	Below	Alpha eff	04-Sep 04:52	5	6644	12260	13540	-29.33
LB4100I2	Above	Alpha XTalk	04-Sep 04:52	5	0.499	0.206	0.251	+36.15
LB4100I2	Below	Beta eff	04-Sep 04:58	5	14981	15270	17180	-3.91
LB4100I3	Below	Alpha eff	04-Sep 04:52	5	4689	8847	10310	-20.05
LB4100I3	Above	Alpha XTalk	04-Sep 04:52	5	0.477	0.174	0.229	+30.42
LB4100I4	Below	Alpha eff	04-Sep 04:52	5	5065	9674	12150	-14.17
LB4100I4	Above	Alpha XTalk	04-Sep 04:52	5	0.512	0.179	0.224	+40.89
LB4100I4	Below	Beta eff	04-Sep 04:58	5	15998	16210	20770	-3.28
PIC1C	Above	Beta bkg	04-Sep 05:38	60	2.650	-4.47E-1	2.104	+4.28
PIC2B	Above	Alpha XTalk	04-Sep 05:40	5	0.290	0.245	0.287	+3.50
PIC5A	Above	Alpha bkg	04-Sep 07:02	60	0.317	0.021	0.432	+1.31

PIC6B	Above	Beta bkg	04-Sep 05:00	60	2.317	0.886	2.210	+3.48
PIC11D	Above	Alpha bkg	04-Sep 05:25	60	0.483	0.007	0.361	+5.08
PIC11D	Above	Beta bkg	04-Sep 05:25	60	3.483	0.609	2.096	+8.60
PIC12A	Above	Beta bkg	04-Sep 05:25	60	2.617	1.462	2.978	+1.57
PIC12C	need 2nd	Alpha bkg	04-Sep 06:29	60	0.267	-2.99E-2	0.379	+1.35
PIC12C	Above	Beta bkg	04-Sep 06:29	60	2.333	0.004	2.702	+2.18
PIC12D	Above	Alpha eff	04-Sep 05:16	5	15023	13060	14210	+7.24
PIC12D	Below	Alpha XTalk	04-Sep 05:16	5	0.313	0.323	0.348	-5.38
PIC14D	Above	Alpha bkg	04-Sep 06:29	60	0.333	-1.35E-1	0.344	+2.87
PIC14D	need 2nd	Beta bkg	04-Sep 06:29	60	1.817	-3.77E-1	1.863	+2.88

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100B1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100B2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100B3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100B4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC3A	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R. Beals-Hansen

Date 9-4-2020

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 09-Sep-2020

Detectors LB4100 A1 through J4 and PIC 1A through 14D and G5400W 1W through 1Z

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100C1	Above	Beta eff	09-Sep 04:53	5	19457	15090	16900	+11.48
LB4100C2	Below	Alpha eff	09-Sep 05:02	5	8617	10240	13030	-6.49
LB4100C2	Above	Alpha XTalk	09-Sep 05:02	5	0.345	0.257	0.306	+7.85
LB4100C2	Above	Beta eff	09-Sep 04:53	5	20381	15870	17590	+12.74
LB4100C3	Above	Beta eff	09-Sep 04:53	5	20689	16080	17090	+24.38
LB4100C4	Above	Beta eff	09-Sep 04:53	5	23456	18000	20220	+11.75
LB4100E1	Above	Alpha bkg	09-Sep 03:25	60	0.483	-5.45E-2	0.290	+6.38
LB4100E2	Above	Beta bkg	09-Sep 03:25	60	2.200	0.950	2.756	+1.15
LB4100E3	Above	Alpha bkg	09-Sep 03:25	60	2.400	-4.47E-2	0.174	+63.98
LB4100E3	Above	Beta bkg	09-Sep 03:25	60	2.833	-1.31E+0	6.766	+0.08
LB4100E3	need 2nd	Beta XTalk	09-Sep 04:33	5	4.18E-4	8.54E-5	4.65E-4	+2.26
LB4100E4	Above	Beta bkg	09-Sep 03:25	60	2.067	0.326	2.646	+1.50
LB4100G2	Above	Alpha XTalk	09-Sep 04:33	5	0.550	0.224	0.342	+13.64
LB4100G2	Above	Beta bkg	09-Sep 03:29	60	2786	0.721	1.648	+18,032.47
LB4100G2	Above	Beta eff	09-Sep 04:40	5	18520	15480	16780	+11.03
LB4100G3	Above	Beta bkg	09-Sep 03:29	60	29.450	0.810	1.674	+195.89
LB4100G3	need 2nd	Beta eff	09-Sep 04:40	5	21898	21640	22870	-1.74
LB4100I1	Below	Alpha eff	09-Sep 04:46	5	6025	9278	11600	-11.41
LB4100I1	Above	Alpha XTalk	09-Sep 04:46	5	0.448	0.155	0.201	+34.97
LB4100I2	Below	Alpha eff	09-Sep 04:46	5	6356	12260	13540	-30.68
LB4100I2	Above	Alpha XTalk	09-Sep 04:46	5	0.519	0.206	0.251	+38.86
LB4100I2	Above	Beta bkg	09-Sep 03:25	60	2.283	0.425	2.438	+2.54
LB4100I2	Below	Beta eff	09-Sep 04:59	5	15009	15270	17180	-3.82
LB4100I3	Below	Alpha eff	09-Sep 04:46	5	4887	8847	10310	-19.24
LB4100I3	Above	Alpha XTalk	09-Sep 04:46	5	0.469	0.174	0.229	+29.53
LB4100I4	Below	Alpha eff	09-Sep 04:46	5	5138	9674	12150	-13.99
LB4100I4	Above	Alpha XTalk	09-Sep 04:46	5	0.506	0.179	0.224	+40.10
LB4100I4	Below	Beta eff	09-Sep 04:59	5	15851	16210	20770	-3.47
LB4100I4	need 2nd	Beta XTalk	09-Sep 04:59	5	1.26E-4	7.59E-5	3.86E-4	-2.03
PIC1C	Above	Beta bkg	09-Sep 05:38	60	4.217	-4.47E-1	2.104	+7.97

PIC5A	Above	Alpha bkg	09-Sep 05:59	60	0.317	0.021	0.432	+1.31
PIC7A	Above	Alpha bkg	09-Sep 06:11	60	0.367	-7.46E-2	0.299	+4.09
PIC7A	need 2nd	Beta bkg	09-Sep 06:11	60	1.017	0.110	1.442	+1.08
PIC7D	Above	Alpha bkg	09-Sep 07:41	60	0.317	-7.13E-2	0.432	+1.62
PIC11D	Above	Alpha bkg	09-Sep 05:21	60	0.333	0.007	0.361	+2.53
PIC11D	Above	Beta bkg	09-Sep 05:21	60	3.450	0.609	2.096	+8.46
PIC12A	Above	Beta bkg	09-Sep 05:21	60	2.100	1.462	2.978	-0.47
PIC12D	Above	Alpha eff	09-Sep 05:12	5	15178	13060	14210	+8.05
PIC12D	Below	Alpha XTalk	09-Sep 05:12	5	0.307	0.323	0.348	-6.67
PIC12D	Above	Beta eff	09-Sep 04:59	5	41276	40190	41240	+3.21

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100B1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100B2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100B3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100B4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100J4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC3A	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R Beth-Hannan

Date 9-9-2020

GEL Laboratories LLC

Runlogs

Instrument Run Log

Instrument Type: GFPC **Batch ID: 2032930**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
519042001	SAMPLE	JXC9	PIC1B	SEP-04-20 08:32:23	DONE	25mm Filter	01-JUN-20 00:00
519042002	SAMPLE	JXC9	PIC3D	SEP-04-20 08:32:29	DONE	25mm Filter	01-JUN-20 00:00
519042003	SAMPLE	JXC9	PIC4D	SEP-04-20 08:32:33	DONE	25mm Filter	01-JUN-20 00:00
519272001	SAMPLE	JXC9	PIC5D	SEP-04-20 08:32:38	DONE	25mm Filter	01-JUN-20 00:00
519272002	SAMPLE	JXC9	PIC6A	SEP-04-20 08:47:55	DONE	25mm Filter	01-JUN-20 00:00
519272003	SAMPLE	JXC9	PIC6C	SEP-04-20 08:47:57	DONE	25mm Filter	01-JUN-20 00:00
519272004	SAMPLE	JXC9	PIC7A	SEP-04-20 08:48:01	DONE	25mm Filter	01-JUN-20 00:00
519272005	SAMPLE	JXC9	PIC7C	SEP-04-20 08:48:05	DONE	25mm Filter	01-JUN-20 00:00
519272006	SAMPLE	JXC9	PIC7D	SEP-04-20 08:48:09	DONE	25mm Filter	01-JUN-20 00:00
519272007	SAMPLE	JXC9	PIC9D	SEP-04-20 08:48:18	DONE	25mm Filter	01-JUN-20 00:00
519272008	SAMPLE	JXC9	PIC10A	SEP-04-20 08:48:23	DONE	25mm Filter	01-JUN-20 00:00
519272009	SAMPLE	JXC9	PIC10B	SEP-04-20 08:48:25	DONE	25mm Filter	01-JUN-20 00:00
519365001	SAMPLE	JXC9	PIC10D	SEP-04-20 08:48:34	DONE	25mm Filter	01-JUN-20 00:00
1204626500	MB	JXC9	PIC14A	SEP-04-20 08:48:54	DONE	25mm Filter	01-JUN-20 00:00
1204626501	DUP	JXC9	PIC14C	SEP-04-20 08:48:57	DONE	25mm Filter	01-JUN-20 00:00
519365002	SAMPLE	JXC9	PIC11A	SEP-04-20 08:49:02	DONE	25mm Filter	01-JUN-20 00:00
519365003	SAMPLE	JXC9	PIC11B	SEP-04-20 08:49:06	DONE	25mm Filter	01-JUN-20 00:00
519365004	SAMPLE	JXC9	PIC11C	SEP-04-20 08:49:11	DONE	25mm Filter	01-JUN-20 00:00
519365005	SAMPLE	JXC9	PIC12B	SEP-04-20 08:49:14	DONE	25mm Filter	01-JUN-20 00:00
519365007	SAMPLE	JXC9	PIC13D	SEP-04-20 08:49:20	DONE	25mm Filter	01-JUN-20 00:00
1204626503	LCS	JXC9	PIC1D	SEP-04-20 08:50:47	DONE	25mm Filter	01-JUN-20 00:00
1204626502	MS	JXC9	PIC13B	SEP-04-20 08:51:05	DONE	25mm Filter	01-JUN-20 00:00
519272010	SAMPLE	JXC9	PIC8C	SEP-09-20 12:05:56	DONE	25mm Filter	01-JUN-20 00:00
519365006	SAMPLE	JXC9	PIC8D	SEP-09-20 12:05:59	DONE	25mm Filter	01-JUN-20 00:00

Lucas Cell Raw Data

Batch 2032768 Check-list

This check-list was completed on 15-SEP-20 by Lyndsey Pace

This batch was reviewed by Elizabeth Krouse on 15-SEP-20 and Lyndsey Pace on 15-SEP-20.

Batch ID: 2032768 **Product:** LUC26RAL **Description:** Lucas Cell Radium 226 GL-RAD-A-008

#	Criteria	Yes	No	Comments
Preparation Information				
1	Were all of the samples homogenous? Include sample description if not homogenous	Yes		
2	Was the preservation correct for this analysis?	Yes		
Internal Checklist Information				
3	Are instrument source checks within limits?	Yes		
4	Has an Aliquot Correction been completed for this batch?		No	
5	Have sample historical results been reviewed for this batch?	Yes		
Technical Information				
6	Were all the samples prepared/analyzed within the required holding time period?	Yes		
7	Are any sample results more negative than 3xTPU?		No	
Quality Control (QC) Information				
8	Was the method blank (MB) within the acceptance criteria?	Yes		
9	Were the laboratory control sample (LCS/LCSD) recoveries within the acceptance limits?	Yes		
10	Were the matrix spike (MS/MSD) recoveries within the acceptance limits?	Yes		
11	Were the relative percent differences and/or error (RPD/RER) between the sample and its duplicate within acceptable limits?	Yes		
12	Has the method required detection limit been met?	Yes		
Miscellaneous Information				
13	Are sample-specific MDA/MDC calculated and reported?	Yes		

Prep Logbook

Radium−226 in Liquid

Batch ID: **2032768**
Analyst: Michael Hance (MXH8)
Method: EPA 903.1 Modified
Lab SOP: GL−RAD−A−008 REV# 15
Instrument: GFC−18150253

Due Dates for Lab: 17−SEP−2020 **Package: 19−SEP−2020** **SDG: 21−SEP−2020**

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1204626098	Radium−226 SPIKE	1715−E	.1	mL
MS	1204626097	Radium−226 SPIKE	1715−E	.1	mL

#	Sample ID	Prep Date	Min RDL (pCi/L)	Aliquot (mL)	End Degas (date)	CELL #	End Transfer (date)	Start Count Time (date)	Background Counts	Total Counts
1	519365001	09−SEP−2020	1	500	09/09/20 11:30	108	09/15/20 05:20	09/15/20 08:16	3	20
2	519365002	09−SEP−2020	1	500	09/09/20 11:30	205	09/15/20 05:20	09/15/20 08:16	8	15
3	519365003	09−SEP−2020	1	500	09/09/20 11:30	303	09/15/20 05:20	09/15/20 08:16	1	22
4	519365004	09−SEP−2020	1	500	09/09/20 11:30	403	09/15/20 05:20	09/15/20 08:16	5	16
5	519365005	09−SEP−2020	1	500	09/09/20 11:30	507	09/15/20 05:20	09/15/20 08:16	1	19
6	519365006	09−SEP−2020	1	500	09/09/20 11:30	602	09/15/20 05:20	09/15/20 08:16	6	19
7	519365007	09−SEP−2020	1	500	09/09/20 11:30	707	09/15/20 05:20	09/15/20 08:16	7	9
8	1204626095 MB	09−SEP−2020	1	500	09/09/20 11:30	807	09/15/20 05:20	09/15/20 08:16	2	7
9	1204626096 DUP (519365001)	09−SEP−2020	1	500	09/09/20 11:30	105	09/15/20 05:55	09/15/20 08:57	6	18
10	1204626097 MS (519365001)	09−SEP−2020	1	500	09/09/20 11:30	201	09/15/20 05:55	09/15/20 08:57	7	1003
11	1204626098 LCS	09−SEP−2020	1	500	09/09/20 11:30	306	09/15/20 05:55	09/15/20 08:57	3	1050

Reagent/Solvent Lot ID	Description	Amount

Comments:
Spike Pipet ID: RAD−RA226−2766953
Bkg Count Time: 30 Minutes
Sample Count Time: 30 Minutes
Data Entry Date2: 09−SEP−2020 00:00

Radium-226 Liquid

Filename : RA226.XLS
File type : Excel
Version # : 1.3.2

Batch : 2032768
Analyst : MIC02086
Prep Date : 9/9/2020
Ra-226 Method Uncertainty : 0.073648

Procedure Code : LUC26RAL
Parmname : Radium-226
Required MDA : 1 pCi/L
Halflife of Ra-226 : 1600 years
Ra-226 Abundance : 1.00
Halflife of Rn-222: 3.8235 days

Batch counted on : LUCAS CELL DETECTOR
BKG Count time : 30 min

Sample Characteristics					Count Raw Data							
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Background Counts	Background CPM	Background Count Time (min.)	Cell Efficiency (cpm/dpm)
1	519365001.1	0.5000	2.0256E-05	8/18/2020 13:24	108	30	20	0.667	3	0.100	30	2.0199
2	519365002.1	0.5000	2.0256E-05	8/18/2020 16:45	205	30	15	0.500	8	0.267	30	1.9430
3	519365003.1	0.5000	2.0256E-05	8/18/2020 10:05	303	30	22	0.733	1	0.033	30	1.8940
4	519365004.1	0.5000	2.0256E-05	8/18/2020 17:25	403	30	16	0.533	5	0.167	30	1.7460
5	519365005.1	0.5000	2.0256E-05	8/18/2020 15:02	507	30	19	0.633	1	0.033	30	2.0600
6	519365006.1	0.5000	2.0256E-05	8/18/2020 10:05	602	30	19	0.633	6	0.200	30	1.8180
7	519365007.1	0.5000	2.0256E-05	8/18/2020 7:25	707	30	9	0.300	7	0.233	30	1.9700
8	1204626095.1	0.5000	2.0256E-05	9/9/2020 0:00	807	30	7	0.233	2	0.067	30	1.4400
9	1204626096.1	0.5000	2.0256E-05	8/18/2020 13:24	105	30	18	0.600	6	0.200	30	2.0111
10	1204626097.1	0.5000	2.0256E-05	8/18/2020 13:24	201	30	1003	33.433	7	0.233	30	1.8420
11	1204626098.1	0.5000	2.0256E-05	9/9/2020 0:00	306	30	1050	35.000	3	0.100	30	1.8401

Pipet, 0.1 ml Stdev : +/-	0.000200	ml
Pipet, 0.5 ml Stdev : +/-	0.001000	ml
Pipet, 1 ml Stdev : +/-	0.002000	ml

Analytical SOP: GL-RAD-A-008
Instrument SOP: GL-RAD-I-007

Cell Efficiency Error (%)	Cell Calibration Date	Cell Calibration Due Date	De-Gas Date/Time	Rn-222 Ingrow End Date/Time	Count Start Date/Time	Rn-222 Corrections			
						De-Gas to Ingrowth	Ingrowth to Count	During Count	Ra-226 Decay
6.875%	5/1/2020	4/30/2021	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
3.400%	8/1/2020	7/31/2021	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
9.523%	1/20/2020	12/31/2020	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
5.200%	3/1/2020	1/31/2021	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
2.300%	6/2/2020	5/31/2021	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
2.600%	7/2/2020	6/30/2021	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
2.900%	11/1/2019	10/31/2020	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
7.500%	3/31/2020	3/31/2021	9/9/2020 11:30	9/15/2020 5:20	9/15/2020 8:16	0.647	0.978	1.002	1.000
8.623%	5/1/2020	4/30/2021	9/9/2020 11:30	9/15/2020 5:55	9/15/2020 8:57	0.648	0.977	1.002	1.000
5.600%	8/1/2020	7/31/2021	9/9/2020 11:30	9/15/2020 5:55	9/15/2020 8:57	0.648	0.977	1.002	1.000
6.024%	1/20/2020	12/31/2020	9/9/2020 11:30	9/15/2020 5:55	9/15/2020 8:57	0.648	0.977	1.002	1.000

Notes:
1 - Results are decay corrected to Sample Date/Time
2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1715-E
Spike Exp Date : 5/21/2021
Spike Activity (dpm/ml): 300.26
Spike Volume Added: 0.10

LCS S/N : 1715-E
LCS Exp Date : 5/21/2021
LCS Activity (dpm/ml): 300.26
LCS Volume Added: 0.10

Results

Pos.	Decision Level pCi/L	Critical Level pCi/L	Required MDA pCi/L	MDA pCi/L	Sample Act. Conc. pCi/L	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	**2 SIGMA** Counting Uncertainty pCi/L	**2 SIGMA** Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
1	0.1344	0.0949	1	0.2603	**0.4002**	29.04%	0.5667	0.1599	0.2213	0.2350		SAMPLE				
2	0.2281	0.1610	1	0.3955	**0.1713**	68.60%	0.2333	0.1599	0.2300	0.2316		SAMPLE				
3	0.0827	0.0584	1	0.1921	**0.5272**	24.74%	0.7000	0.1599	0.2360	0.2668		SAMPLE				
4	0.2007	0.1417	1	0.3650	**0.2996**	41.98%	0.3667	0.1528	0.2446	0.2503		SAMPLE				
5	0.0761	0.0537	1	0.1766	**0.4155**	24.95%	0.6000	0.1491	0.2023	0.2119		SAMPLE				
6	0.2111	0.1490	1	0.3765	**0.3400**	38.55%	0.4333	0.1667	0.2563	0.2615		SAMPLE				
7	0.2104	0.1486	1	0.3695	**0.0483**	200.02%	0.0667	0.1333	0.1892	0.1894		SAMPLE				
8	0.1539	0.1086	1	0.3163	**0.1651**	60.47%	0.1667	0.1000	0.1942	0.1971		MB				
9	0.1905	0.1345	1	0.3398	**0.2833**	41.73%	0.4000	0.1633	0.2266	0.2352	519365001.1	DUP	34.2%			
10	0.2247	0.1586	1	0.3946	**25.6684**	6.45%	33.2000	1.0593	1.6053	4.9237	519365001.1	MS			27.0514	93.4%
11	0.1472	0.1039	1	0.2853	**27.0099**	6.77%	34.9000	1.0817	1.6408	5.2976		LCS			27.0508	99.8%

Continuing Calibration Data

[IMAGE]

Ludlum Alpha Scintillation Counter Checks for 15-SEP-2020

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LUCAS1	EFF	06:57	1	1.27E+05	126820	0.22		
LUCAS2	EFF	07:12	1	1.36E+05	136248	2.23		
LUCAS3	EFF	06:55	1	1.39E+05	138653	2.1		
LUCAS4	EFF	06:54	1	1.32E+05	132012	2.83		
LUCAS5	EFF	06:53	1	1.34E+05	133708	1.98		
LUCAS6	EFF	06:52	1	1.36E+05	135634	1.33		
LUCAS7	EFF	06:51	1	1.38E+05	137973	1.76		
LUCAS8	EFF	06:50	1	1.34E+05	133725	1.11		

Reviewed by: Lyndsey Pace **Date:** 15-SEP-20

GEL Laboratories LLC

Runlogs

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR **Batch ID: 2032768**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
519365001	SAMPLE	MXH8	LUCAS1	SEP-15-20 08:16:00	DONE	Lucas Cell	01-MAY-20 00:00
519365002	SAMPLE	MXH8	LUCAS2	SEP-15-20 08:16:00	DONE	Lucas Cell	01-AUG-20 00:00
519365003	SAMPLE	MXH8	LUCAS3	SEP-15-20 08:16:00	DONE	Lucas Cell	20-JAN-20 00:00
519365004	SAMPLE	MXH8	LUCAS4	SEP-15-20 08:16:00	DONE	Lucas Cell	01-MAR-20 00:00
519365005	SAMPLE	MXH8	LUCAS5	SEP-15-20 08:16:00	DONE	Lucas Cell	02-JUN-20 00:00
519365006	SAMPLE	MXH8	LUCAS6	SEP-15-20 08:16:00	DONE	Lucas Cell	02-JUL-20 00:00
519365007	SAMPLE	MXH8	LUCAS7	SEP-15-20 08:16:00	DONE	Lucas Cell	01-NOV-19 00:00
1204626095	MB	MXH8	LUCAS8	SEP-15-20 08:16:00	DONE	Lucas Cell	31-MAR-20 00:00
1204626096	DUP	MXH8	LUCAS1	SEP-15-20 08:57:00	DONE	Lucas Cell	01-MAY-20 00:00
1204626097	MS	MXH8	LUCAS2	SEP-15-20 08:57:00	DONE	Lucas Cell	01-AUG-20 00:00
1204626098	LCS	MXH8	LUCAS3	SEP-15-20 08:57:00	DONE	Lucas Cell	20-JAN-20 00:00

CHAIN OF CUSTODY

Environmental Laboratory
1232 Haco Drive
Lansing
Michigan, 48910

Phone: (517)702-6372

Lab Work Order Number L008009

Client Name	Project Name
BWL - Erickson Station	Erickson GMP
Client Contact	**Project Number**
Cheryl Louden	[none]
Address	**Project Description**
3725 S. Canal	
City	**PO Number**
Lansing	
State/Zip	**Shipped By**
MI, 48917	
Phone / **Fax**	**Tracking Number**
(517) 702-6396 / 517-702-6373	
Sampler	
Marc Wahrer	

Requested Analyses

Sample Name or Field ID	Sampled Date	Sampled Time	Sample Type Grab/Composite	Matrix Code	Container Count	Sb, As, Ba, Be, B, Cd, Ca, Cr, Co, Pb, Li, Hg, Mo, Se, Tl	TSS	TDS, Cl^-, $SO_4^{=}$, F^-	Radium 226	Radium 228						Sample Comments
						Preservation Code										
MW-1	8/18/2020	1324	G	GW	1	b	a	a	b	b						
MW-2	8/18/2020	1645	G	GW	1	b	a	a	b	b						
MW-4	8/18/2020	1005	G	GW	1	b	a	a	b	b						
MW-5	8/18/2020	1725	G	GW	1	b	a	a	b	b						
MW-6	8/18/2020	1502	G	GW	1	b	a	a	b	b						
MW-4 Duplicate	8/18/2020	1005	G	GW	1	b	a	a	b	b						
Field Blank	8/18/2020	725	G	DI	1	b	a	a	b	b						

Requested Turn Around

Rush requests subject to additional charge.

Rush requests subject to lab approval.

Relinquished By	Date/Time	Received By	Date/Time	
[signature]	8/19/20 0700	K Gleason	8/19/20 0700	
Relinquished By	Date/Time	Received By	Date/Time	Comments
Relinquished By	Date/Time	Received By	Date/Time	
Cooler Numbers and Temperatures				

Matrix Codes: WW=Waste Water

Preserv. Codes: a=none, b=HNO3

Lansing Board of Water and Light
Environmental Services Laboratory
1232 Haco Dr.
Lansing, Michigan 48901

30 October 2020

BWL - Erickson Station

Attn: Cheryl Louden

3725 S. Canal

Lansing, MI 48917

Project: Erickson GMP

Dear Cheryl Louden,

Enclosed is a copy of the laboratory report for the following work order(s) received by Lansing Board of Water and Light Environmental Services Laboratory:

Work Order	Received	Account Number
L009005	9/16/2020 9:00:00AM	30926 10021

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Caporale

Jennifer Caporale, Supervisor

Lansing Board of Water and Light
Environmental Services Laboratory
1232 Haco Dr.
Lansing, Michigan 48901

Analytical Report

Client: BWL - Erickson Station
Address: 3725 S. Canal
Lansing MI, 48917

Client Project Manager: Cheryl Louden

Report Date: 10/30/2020

Sample Name: MW-1

Lab #: L009005-01 Ground Water **Collected: 15-Sep-20 12:39** **By: Marc Wahrer**

Analyte	Result	Reporting Limit	Units	Dilution	Regulatory Limit	Analysis Date/Time	By	Method	Notes
Conductivity	1200	1.0	uS/cm	1		15-Sep-20 12:39	maw	SM 2510B	
Dissolved oxygen	ND	0.100	mg/L	1		15-Sep-20 12:39	maw	FIELD	
Gallons Purged	2.50		Gallons	1		15-Sep-20 12:39	maw	FIELD	
Oxidation Reduction Potential	-109.8	-999.0	mV	1		15-Sep-20 12:39	maw	FIELD	
pH	6.9	7.0	pH Units	1		15-Sep-20 12:39	maw	SM 4500H+B	
Static Head Measurement	14.7		Feet	1		15-Sep-20 12:39	maw	FIELD	
Temperature	16		°C	1		15-Sep-20 12:39	maw	SM 2550B	
Turbidity	16	0.10	NTU	1		15-Sep-20 12:39	maw	SM 2130B	

Sample Name: MW-2

Lab #: L009005-02 Ground Water **Collected: 15-Sep-20 16:00** **By: Marc Wahrer**

Analyte	Result	Reporting Limit	Units	Dilution	Regulatory Limit	Analysis Date/Time	By	Method	Notes
Conductivity	1800	1.0	uS/cm	1		15-Sep-20 16:00	maw	SM 2510B	
Dissolved oxygen	0.120	0.100	mg/L	1		15-Sep-20 16:00	maw	FIELD	
Gallons Purged	2.50		Gallons	1		15-Sep-20 16:00	maw	FIELD	
Oxidation Reduction Potential	-75.80	-999.0	mV	1		15-Sep-20 16:00	maw	FIELD	
pH	6.8	7.0	pH Units	1		15-Sep-20 16:00	maw	SM 4500H+B	
Static Head Measurement	20.3		Feet	1		15-Sep-20 16:00	maw	FIELD	
Temperature	14		°C	1		15-Sep-20 16:00	maw	SM 2550B	
Turbidity	4.2	0.10	NTU	1		15-Sep-20 16:00	maw	SM 2130B	

Lansing Board of Water and Light
Environmental Services Laboratory
1232 Haco Dr.
Lansing, Michigan 48901

Analytical Report

Client: BWL - Erickson Station
Address: 3725 S. Canal
Lansing MI, 48917

Client Project Manager: Cheryl Louden

Report Date: 10/30/2020

Sample Name: MW-4

Lab #: L009005-03 Ground Water **Collected: 15-Sep-20 10:27** **By: Marc Wahrer**

Analyte	Result	Reporting Limit	Units	Dilution	Regulatory Limit	Analysis Date/Time	By	Method	Notes
Conductivity	890	1.0	uS/cm	1		15-Sep-20 10:27	maw	SM 2510B	
Dissolved oxygen	ND	0.100	mg/L	1		15-Sep-20 10:27	maw	FIELD	
Gallons Purged	2.50		Gallons	1		15-Sep-20 10:27	maw	FIELD	
Oxidation Reduction Potential	-153.2	-999.0	mV	1		15-Sep-20 10:27	maw	FIELD	
pH	7.3	7.0	pH Units	1		15-Sep-20 10:27	maw	SM 4500H+B	
Static Head Measurement	17.9		Feet	1		15-Sep-20 10:27	maw	FIELD	
Temperature	14		°C	1		15-Sep-20 10:27	maw	SM 2550B	
Turbidity	1.6	0.10	NTU	1		15-Sep-20 10:27	maw	SM 2130B	

Sample Name: MW-5

Lab #: L009005-04 Ground Water **Collected: 15-Sep-20 16:36** **By: Marc Wahrer**

Analyte	Result	Reporting Limit	Units	Dilution	Regulatory Limit	Analysis Date/Time	By	Method	Notes
Conductivity	1700	1.0	uS/cm	1		15-Sep-20 16:36	maw	SM 2510B	
Dissolved oxygen	2.15	0.100	mg/L	1		15-Sep-20 16:36	maw	FIELD	
Gallons Purged	3.50		Gallons	1		15-Sep-20 16:36	maw	FIELD	
Oxidation Reduction Potential	18.51	-999.0	mV	1		15-Sep-20 16:36	maw	FIELD	
pH	7.2	7.0	pH Units	1		15-Sep-20 16:36	maw	SM 4500H+B	
Static Head Measurement	18.2		Feet	1		15-Sep-20 16:36	maw	FIELD	
Temperature	12		°C	1		15-Sep-20 16:36	maw	SM 2550B	
Turbidity	15	0.10	NTU	1		15-Sep-20 16:36	maw	SM 2130B	

Lansing Board of Water and Light
Environmental Services Laboratory
1232 Haco Dr.
Lansing, Michigan 48901

Analytical Report

Client: BWL - Erickson Station
Address: 3725 S. Canal
Lansing MI, 48917

Client Project Manager: Cheryl Louden

Report Date: 10/30/2020

Sample Name: MW-6

Lab #: L009005-05 Ground Water **Collected: 15-Sep-20 14:18** **By: Marc Wahrer**

Analyte	Result	Reporting Limit	Units	Dilution	Regulatory Limit	Analysis Date/Time	By	Method	Notes
Conductivity	1300	1.0	uS/cm	1		15-Sep-20 14:18	maw	SM 2510B	
Dissolved oxygen	ND	0.100	mg/L	1		15-Sep-20 14:18	maw	FIELD	
Gallons Purged	2.50		Gallons	1		15-Sep-20 14:18	maw	FIELD	
Oxidation Reduction Potential	66.50	-999.0	mV	1		15-Sep-20 14:18	maw	FIELD	
pH	6.8	7.0	pH Units	1		15-Sep-20 14:18	maw	SM 4500H+B	
Static Head Measurement	20.1		Feet	1		15-Sep-20 14:18	maw	FIELD	
Temperature	14		°C	1		15-Sep-20 14:18	maw	SM 2550B	
Turbidity	7.0	0.10	NTU	1		15-Sep-20 14:18	maw	SM 2130B	

Lansing Board of Water and Light
Environmental Services Laboratory
1232 Haco Dr.
Lansing, Michigan 48901

Analytical Report

Client: BWL - Erickson Station
Address: 3725 S. Canal
Lansing MI, 48917

Client Project Manager: Cheryl Louden

Report Date: 10/30/2020

Approved By: Jennifer Caporale

Notes and Definitions

AL	Action Level (Action Level = Regulatory Limit)
MCL	Maximum Contaminant Level
PEL	Permissible Exposure Limit (Permissible Exposure Limit = Regulatory Limit)
RPD	Relative Percent Difference
OT	Odor Threshold
ND	Non Detect

All drinking water regulatory limits are MCL's with the exception of Lead and Copper unless otherwise noted.

MERIT LABORATORIES, INC.
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BOARD OF WATER & LIGHT

ERICKSON GMP

SDG Batch:

17448

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BOARD OF WATER & LIGHT

PROJECT:
ERICKSON GMP

SDG Batch:
17448.01

Prepared by:
Merit Laboratories, Inc.

October 20, 2020

Laboratory Name: Merit Laboratories, Inc.
City / State: East Lansing, MI
Sample Delivery Group: S17448.01 - .07

	References		Pages		Checklist	
Deliverable	**Form**	**CLP**	**From**	**To**	**Lab**	**Audit**
1. **Inventory Sheet** (not numbered)	This	DC-2			☑	☐
2. **SDG Case Narrative**			1	2	☑	☐
3. **Analytical Summary Report**			3	34	☑	☐
4. **ICP/MS Metals Data**			35	137		
Sequence / Injection Log		F.0			☑	☐
Data Sheet		F. I			☑	☐
Initial Calibration and Calibration Verification		F. IIA			☑	☐
CRDL Standards		F. IIB			☐	☐
Blanks		F. III			☑	☐
Interference Check Sample		F. IVB			☑	☐
Spike Sample Recovery		F. VA			☑	☐
Post-Digest Spike Sample Recovery		F. VB			☑	☐
Duplicates		F. VI			☐	☐
Laboratory Control Sample		F. VII			☑	☐
Serial Dilutions		F. VIII			☑	☐
Analysis Run Log		F. XIII			☑	☐
ICP/MS Tune		F. XIV			☑	☐
Internal Standard Relative Intensity Summary		F. XV			☑	☐
Instrument Detection Limits (IDL) & MDLs		F. IX			☑	☐
Linear Ranges		F. XI			☑	☐
ICP/MS Raw Data					☑	☐
Preparation / Digestion Log		F. XII			☑	☐
5. **Mercury Data**			138	156		
Sequence / Injection Log		F.0			☑	☐
Data Sheet		F. I			☑	☐
Initial Calibration and Calibration Verification		F. IIA			☑	☐
CRDL Standards		F. IIB			☐	☐
Blanks		F. III			☑	☐
Spike Sample Recovery		F. VA			☑	☐
Post-Digest Spike Sample Recovery		F. VB			☑	☐
Duplicates		F. VI			☐	☐
Laboratory Control Sample		F. VII			☑	☐
Analysis Run Log		F. XIII			☑	☐
Mercury Cold Vapor Raw Data					☑	☐
Preparation / Digestion Log					☑	☐
6. **Ion Chromatography Data**			157	249		
Bench Sheet - sample and QC sample evaluation					☑	☐
Calibration Curve - data and evaluation					☑	☐
7. **Total Suspended Solids Data**			250	251		
Bench Sheet - sample and QC sample evaluation					☑	☐

Deliverable	References Form	References CLP	Pages From	Pages To	Checklist Lab	Checklist Audit
8. **Total Dissolved Solids Data**			252	252		
Bench Sheet - sample and QC sample evaluation					☑	☐
9. **Shipping / Receiving Documents**			253	257		
Chain-of-Custody					☑	☐
Sample log-in sheet					☑	
Sample Receipt					☑	☐
10. **Subcontracted Analysis Report**						
GEL Laboratories – Radiological Analysis (Total Pages 50)					☑	☐

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CASE NARRATIVE
CLIENT: BOARD OF WATER & LIGHT
PROJECT: ERICKSON GMP
Merit IDs: S17448.01-S17448.07

Field Sampling: Marc Wahrer performed the fieldwork.

Analytical Bottles: All bottles were sent with the appropriate preservation in it. Please see the bottle list attached.

Sample Receiving: All samples were received by the laboratory (09/16/2020). Dates and signatures can be found on the Chain of Custody Records. The sample receipts specify the actual tags and bottles received and logged into the laboratory "vlims" system.

ANALYSES

Metals: All metal analyses were performed according to Method 200.8. The metal digestion was performed according to Method 3015A. The QC requirements were followed for this specific project and method-specified criteria were met. *Outliers*: None

Notes: Dilution test not applicable if measured concentration is less than 100 times MDL.

Mercury: All mercury QC requirements were met according to the specifications in Method 245.1. *Outliers*: None

Fluoride: All fluoride QC requirements were met according to the specifications in Method 300.0. *Outliers:* None

Chloride: All chloride QC requirements were met according to the specifications in Method 300.0. *Outliers*: None

Sulfate: All Sulfate QC requirements were met according to the specifications in Method 300.0. *Outliers:* None

Total Suspended Solids: All total suspended solids QC requirements were met according to the specifications in Method 2540 D. *Outliers*: None

Total Dissolved Solids: All total suspended solids QC requirements were met according to the specifications in Method 2540 C. *Outliers*: None

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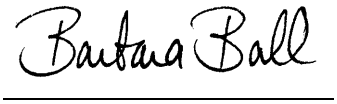
Radium 226 & 228: All radiological analysis were subcontracted out to GEL Laboratories. GEL Laboratories analytical report is included.

Data Reporting: The analytical reports are reflective of what is on a given Chain-of-Custody record (COC). Merit's IDs were assigned to the samples as they were delivered and accepted by our log-in staff.

"I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness, for other than the condition detailed above. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager or his/her designee, as verified by the following signature."



Barb Ball
QA Officer

10/20/2020
Date

Analytical Laboratory Report

Report ID: S17448.01(01)
Generated on 10/15/2020

Report to

Attention: Jennifer Caporale
Board of Water & Light
P.O. Box 13007
Lansing, MI 48901

Phone: 517-702-6372 FAX:
Email: Environmental_Laboratory@LBWL.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S17448.01-S17448.07
Project: Erickson GMP
Collected Date(s): 09/15/2020
Submitted Date/Time: 09/16/2020 11:45
Sampled by: Marc Wahrer
P.O. #:

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

All Metal Results Are Reported As Total

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E245.1	EPA Method 245.1 Revision 3.0
E300.0	EPA Method 300.0 Revision 2.1
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S17448.01	MW-1 L009005-01	Groundwater	09/15/20 12:39
S17448.02	MW-2 L009005-02	Groundwater	09/15/20 16:00
S17448.03	MW-4 L009005-03	Groundwater	09/15/20 10:27
S17448.04	MW-5 L009005-04	Groundwater	09/15/20 16:36
S17448.05	MW-6 L009005-05	Groundwater	09/15/20 14:18
S17448.06	MW-4 Duplicate L009005-06	Groundwater	09/15/20 10:27
S17448.07	Field Blank L009005-07	Water	09/15/20 07:50

Lab Sample ID: S17448.01
Sample Tag: MW-1 L009005-01
Collected Date/Time: 09/15/2020 12:39
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	HNO3	Yes	5.5	IR
2	1L Plastic	None	Yes	5.5	IR
1	125ml Plastic	HNO3	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	09/24/20 11:15	JRH	
Metal Digestion	Completed	SW3015A	09/25/20 09:30	JRH	

Inorganics

Method: E300.0, Run Date: 09/17/20 08:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	

Method: E300.0, Run Date: 09/17/20 08:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	59	10	0.16	mg/L	10	16887-00-6	
Sulfate	77	10	0.59	mg/L	10	14808-79-8	

Method: SM2540C, Run Date: 09/19/20 16:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids	768	20	1	mg/L	2		

Method: SM2540D, Run Date: 09/17/20 18:30, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	55	3	1	mg/L	3.33		

Metals

Method: E200.8, Run Date: 09/25/20 14:15, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	170	2.5	0.22	mg/L	25	7440-70-2	

Method: E200.8, Run Date: 09/25/20 12:01, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Antimony	Not detected	0.005	0.0026	mg/L	5	7440-36-0	
Arsenic	0.006	0.002	0.00026	mg/L	5	7440-38-2	
Barium	0.148	0.005	0.00016	mg/L	5	7440-39-3	
Beryllium	Not detected	0.001	0.00022	mg/L	5	7440-41-7	
Boron	0.44	0.04	0.0018	mg/L	5	7440-42-8	
Cadmium	Not detected	0.0005	0.00019	mg/L	5	7440-43-9	
Chromium	Not detected	0.005	0.000097	mg/L	5	7440-47-3	
Cobalt	Not detected	0.005	0.00011	mg/L	5	7440-48-4	
Lead	Not detected	0.003	0.00019	mg/L	5	7439-92-1	
Lithium*	0.039	0.005	0.0016	mg/L	5	7439-93-2	
Molybdenum	Not detected	0.005	0.00022	mg/L	5	7439-98-7	
Selenium	Not detected	0.005	0.0021	mg/L	5	7782-49-2	

Lab Sample ID: S17448.01 (continued)

Sample Tag: MW-1 L009005-01

Method: E200.8, Run Date: 09/25/20 12:01, Analyst: JRH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Thallium	Not detected	0.002	0.000086	mg/L	5	7440-28-0	

Method: E245.1, Run Date: 09/24/20 13:59, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002	0.000016	mg/L	1	7439-97-6	

Other / Misc.

Method: , Run Date: 10/15/20 13:30, Analyst: GEL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S17448.02
Sample Tag: MW-2 L009005-02
Collected Date/Time: 09/15/2020 16:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	HNO3	Yes	5.5	IR
2	1L Plastic	None	Yes	5.5	IR
1	125ml Plastic	HNO3	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	09/24/20 11:15	JRH	
Metal Digestion	Completed	SW3015A	09/25/20 09:30	JRH	

Inorganics

Method: E300.0, Run Date: 09/17/20 08:27, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	

Method: E300.0, Run Date: 09/17/20 08:30, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	88	50	0.80	mg/L	50	16887-00-6	
Sulfate	560	50	3.0	mg/L	50	14808-79-8	

Method: SM2540C, Run Date: 09/19/20 16:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids	1,390	20	1	mg/L	2		

Method: SM2540D, Run Date: 09/17/20 18:30, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	Not detected	3	1	mg/L	1.00		

Metals

Method: E200.8, Run Date: 09/25/20 14:18, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	270	2.5	0.22	mg/L	25	7440-70-2	

Method: E200.8, Run Date: 09/25/20 12:05, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Antimony	Not detected	0.005	0.0026	mg/L	5	7440-36-0	
Arsenic	Not detected	0.002	0.00026	mg/L	5	7440-38-2	
Barium	0.039	0.005	0.00016	mg/L	5	7440-39-3	
Beryllium	Not detected	0.001	0.00022	mg/L	5	7440-41-7	
Boron	5.97	0.04	0.0018	mg/L	5	7440-42-8	
Cadmium	Not detected	0.0005	0.00019	mg/L	5	7440-43-9	
Chromium	Not detected	0.005	0.000097	mg/L	5	7440-47-3	
Cobalt	Not detected	0.005	0.00011	mg/L	5	7440-48-4	
Lead	Not detected	0.003	0.00019	mg/L	5	7439-92-1	
Lithium*	0.066	0.005	0.0016	mg/L	5	7439-93-2	
Molybdenum	0.011	0.005	0.00022	mg/L	5	7439-98-7	
Selenium	Not detected	0.005	0.0021	mg/L	5	7782-49-2	

Lab Sample ID: S17448.02 (continued)

Sample Tag: MW-2 L009005-02

Method: E200.8, Run Date: 09/25/20 12:05, Analyst: JRH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Thallium	Not detected	0.002	0.000086	mg/L	5	7440-28-0	

Method: E245.1, Run Date: 09/24/20 14:01, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002	0.000016	mg/L	1	7439-97-6	

Other / Misc.

Method: , Run Date: 10/15/20 13:30, Analyst: GEL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S17448.03
Sample Tag: MW-4 L009005-03
Collected Date/Time: 09/15/2020 10:27
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	HNO3	Yes	5.5	IR
2	1L Plastic	None	Yes	5.5	IR
1	125ml Plastic	HNO3	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	09/24/20 11:15	JRH	
Metal Digestion	Completed	SW3015A	09/25/20 09:30	JRH	

Inorganics

Method: E300.0, Run Date: 09/17/20 08:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	

Method: E300.0, Run Date: 09/17/20 08:43, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	68	10	0.16	mg/L	10	16887-00-6	
Sulfate	58	10	0.59	mg/L	10	14808-79-8	

Method: SM2540C, Run Date: 09/19/20 16:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids	572	20	1	mg/L	2		

Method: SM2540D, Run Date: 09/17/20 18:30, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	Not detected	3	1	mg/L	1.00		

Metals

Method: E200.8, Run Date: 09/25/20 14:20, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	108	2.5	0.22	mg/L	25	7440-70-2	

Method: E200.8, Run Date: 09/25/20 12:08, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Antimony	Not detected	0.005	0.0026	mg/L	5	7440-36-0	
Arsenic	0.009	0.002	0.00026	mg/L	5	7440-38-2	
Barium	0.163	0.005	0.00016	mg/L	5	7440-39-3	
Beryllium	Not detected	0.001	0.00022	mg/L	5	7440-41-7	
Boron	0.07	0.04	0.0018	mg/L	5	7440-42-8	
Cadmium	Not detected	0.0005	0.00019	mg/L	5	7440-43-9	
Chromium	Not detected	0.005	0.000097	mg/L	5	7440-47-3	
Cobalt	Not detected	0.005	0.00011	mg/L	5	7440-48-4	
Lead	Not detected	0.003	0.00019	mg/L	5	7439-92-1	
Lithium*	0.010	0.005	0.0016	mg/L	5	7439-93-2	
Molybdenum	0.005	0.005	0.00022	mg/L	5	7439-98-7	
Selenium	Not detected	0.005	0.0021	mg/L	5	7782-49-2	

Lab Sample ID: S17448.03 (continued)

Sample Tag: MW-4 L009005-03

Method: E200.8, Run Date: 09/25/20 12:08, Analyst: JRH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Thallium	Not detected	0.002	0.000086	mg/L	5	7440-28-0	

Method: E245.1, Run Date: 09/24/20 14:03, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002	0.000016	mg/L	1	7439-97-6	

Other / Misc.

Method: , Run Date: 10/15/20 13:30, Analyst: GEL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S17448.04
Sample Tag: MW-5 L009005-04
Collected Date/Time: 09/15/2020 16:36
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	HNO3	Yes	5.5	IR
2	1L Plastic	None	Yes	5.5	IR
1	125ml Plastic	HNO3	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	09/24/20 11:15	JRH	
Metal Digestion	Completed	SW3015A	09/25/20 09:30	JRH	

Inorganics

Method: E300.0, Run Date: 09/17/20 08:53, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	

Method: E300.0, Run Date: 09/17/20 08:56, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	77	50	0.80	mg/L	50	16887-00-6	
Sulfate	791	50	3.0	mg/L	50	14808-79-8	

Method: SM2540C, Run Date: 09/19/20 16:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids	1,540	20	1	mg/L	2		

Method: SM2540D, Run Date: 09/17/20 18:30, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	61	3	1	mg/L	2.00		

Metals

Method: E200.8, Run Date: 09/25/20 14:22, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	266	2.5	0.22	mg/L	25	7440-70-2	

Method: E200.8, Run Date: 09/25/20 12:12, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Antimony	Not detected	0.005	0.0026	mg/L	5	7440-36-0	
Arsenic	Not detected	0.002	0.00026	mg/L	5	7440-38-2	
Barium	0.043	0.005	0.00016	mg/L	5	7440-39-3	
Beryllium	Not detected	0.001	0.00022	mg/L	5	7440-41-7	
Boron	5.00	0.04	0.0018	mg/L	5	7440-42-8	
Cadmium	Not detected	0.0005	0.00019	mg/L	5	7440-43-9	
Chromium	Not detected	0.005	0.000097	mg/L	5	7440-47-3	
Cobalt	Not detected	0.005	0.00011	mg/L	5	7440-48-4	
Lead	Not detected	0.003	0.00019	mg/L	5	7439-92-1	
Lithium*	0.091	0.005	0.0016	mg/L	5	7439-93-2	
Molybdenum	0.053	0.005	0.00022	mg/L	5	7439-98-7	
Selenium	Not detected	0.005	0.0021	mg/L	5	7782-49-2	

Lab Sample ID: S17448.04 (continued)

Sample Tag: MW-5 L009005-04

Method: E200.8, Run Date: 09/25/20 12:12, Analyst: JRH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Thallium	Not detected	0.002	0.000086	mg/L	5	7440-28-0	

Method: E245.1, Run Date: 09/24/20 14:05, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002	0.000016	mg/L	1	7439-97-6	

Other / Misc.

Method: , Run Date: 10/15/20 13:30, Analyst: GEL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S17448.05
Sample Tag: MW-6 L009005-05
Collected Date/Time: 09/15/2020 14:18
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	HNO3	Yes	5.5	IR
2	1L Plastic	None	Yes	5.5	IR
1	125ml Plastic	HNO3	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	09/24/20 11:15	JRH	
Metal Digestion	Completed	SW3015A	09/25/20 09:30	JRH	

Inorganics

Method: E300.0, Run Date: 09/17/20 09:09, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	43	10	0.16	mg/L	10	16887-00-6	

Method: E300.0, Run Date: 09/17/20 09:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	

Method: E300.0, Run Date: 09/17/20 12:22, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfate	264	25	1.5	mg/L	25	14808-79-8	

Method: SM2540C, Run Date: 09/19/20 16:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids	880	20	1	mg/L	2		

Method: SM2540D, Run Date: 09/18/20 17:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	Not detected	3	1	mg/L	1.00		

Metals

Method: E200.8, Run Date: 09/25/20 14:24, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	192	2.5	0.22	mg/L	25	7440-70-2	

Method: E200.8, Run Date: 09/25/20 12:16, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Antimony	Not detected	0.005	0.0026	mg/L	5	7440-36-0	
Arsenic	Not detected	0.002	0.00026	mg/L	5	7440-38-2	
Barium	0.054	0.005	0.00016	mg/L	5	7440-39-3	
Beryllium	Not detected	0.001	0.00022	mg/L	5	7440-41-7	
Boron	1.05	0.04	0.0018	mg/L	5	7440-42-8	
Cadmium	Not detected	0.0005	0.00019	mg/L	5	7440-43-9	
Chromium	Not detected	0.005	0.000097	mg/L	5	7440-47-3	
Cobalt	Not detected	0.005	0.00011	mg/L	5	7440-48-4	
Lead	Not detected	0.003	0.00019	mg/L	5	7439-92-1	

Lab Sample ID: S17448.05 (continued)

Sample Tag: MW-6 L009005-05

Method: E200.8, Run Date: 09/25/20 12:16, Analyst: JRH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Lithium*	0.055	0.005	0.0016	mg/L	5	7439-93-2	
Molybdenum	0.031	0.005	0.00022	mg/L	5	7439-98-7	
Selenium	Not detected	0.005	0.0021	mg/L	5	7782-49-2	
Thallium	Not detected	0.002	0.000086	mg/L	5	7440-28-0	

Method: E245.1, Run Date: 09/24/20 14:07, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002	0.000016	mg/L	1	7439-97-6	

Other / Misc.

Method: , Run Date: 10/15/20 13:30, Analyst: GEL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S17448.06
Sample Tag: MW-4 Duplicate L009005-06
Collected Date/Time: 09/15/2020 10:27
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	HNO3	Yes	5.5	IR
2	1L Plastic	None	Yes	5.5	IR
1	125ml Plastic	HNO3	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	09/24/20 11:15	JRH	
Metal Digestion	Completed	SW3015A	09/25/20 09:30	JRH	

Inorganics

Method: E300.0, Run Date: 09/17/20 09:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8	

Method: E300.0, Run Date: 09/17/20 09:22, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	70	10	0.16	mg/L	10	16887-00-6	
Sulfate	58	10	0.59	mg/L	10	14808-79-8	

Method: SM2540C, Run Date: 09/19/20 16:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids	542	20	1	mg/L	2		

Method: SM2540D, Run Date: 09/18/20 17:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	Not detected	3	1	mg/L	1.00		

Metals

Method: E200.8, Run Date: 09/25/20 14:27, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	110	2.5	0.22	mg/L	25	7440-70-2	

Method: E200.8, Run Date: 09/25/20 12:19, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Antimony	Not detected	0.005	0.0026	mg/L	5	7440-36-0	
Arsenic	0.007	0.002	0.00026	mg/L	5	7440-38-2	
Barium	0.163	0.005	0.00016	mg/L	5	7440-39-3	
Beryllium	Not detected	0.001	0.00022	mg/L	5	7440-41-7	
Boron	0.07	0.04	0.0018	mg/L	5	7440-42-8	
Cadmium	Not detected	0.0005	0.00019	mg/L	5	7440-43-9	
Chromium	Not detected	0.005	0.000097	mg/L	5	7440-47-3	
Cobalt	Not detected	0.005	0.00011	mg/L	5	7440-48-4	
Lead	Not detected	0.003	0.00019	mg/L	5	7439-92-1	
Lithium*	0.010	0.005	0.0016	mg/L	5	7439-93-2	
Molybdenum	Not detected	0.005	0.00022	mg/L	5	7439-98-7	
Selenium	Not detected	0.005	0.0021	mg/L	5	7782-49-2	

Lab Sample ID: S17448.06 (continued)

Sample Tag: MW-4 Duplicate L009005-06

Method: E200.8, Run Date: 09/25/20 12:19, Analyst: JRH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Thallium	Not detected	0.002	0.000086	mg/L	5	7440-28-0	

Method: E245.1, Run Date: 09/24/20 14:08, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002	0.000016	mg/L	1	7439-97-6	

Other / Misc.

Method: , Run Date: 10/15/20 13:30, Analyst: GEL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Lab Sample ID: S17448.07
Sample Tag: Field Blank L009005-07
Collected Date/Time: 09/15/2020 07:50
Matrix: Water
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	HNO3	Yes	5.5	IR
2	1L Plastic	None	Yes	5.5	IR
1	125ml Plastic	HNO3	Yes	5.5	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Mercury Digestion	Completed	E245.1	09/24/20 11:15	JRH	
Metal Digestion	Completed	SW3015A	09/25/20 09:30	JRH	

Inorganics

Method: E300.0, Run Date: 09/17/20 10:35, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Fluoride (Undistilled)	Not detected	0.5	0.04	mg/L	2.5	16984-48-8	

Method: E300.0, Run Date: 09/17/20 09:35, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	Not detected	2.5	0.04	mg/L	2.5	16887-00-6	
Sulfate	Not detected	2.5	0.15	mg/L	2.5	14808-79-8	

Method: SM2540C, Run Date: 09/19/20 16:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids	Not detected	20	1	mg/L	2		

Method: SM2540D, Run Date: 09/18/20 17:40, Analyst: ASB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids	Not detected	3	1	mg/L	1.00		

Metals

Method: E200.8, Run Date: 09/25/20 14:11, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	Not detected	0.5	0.017	mg/L	2	7440-70-2	

Method: E200.8, Run Date: 09/25/20 11:56, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Antimony	Not detected	0.005	0.0010	mg/L	2	7440-36-0	
Arsenic	Not detected	0.002	0.00010	mg/L	2	7440-38-2	
Barium	Not detected	0.005	0.000065	mg/L	2	7440-39-3	
Beryllium	Not detected	0.001	0.000086	mg/L	2	7440-41-7	
Boron	Not detected	0.04	0.00070	mg/L	2	7440-42-8	
Cadmium	Not detected	0.0005	0.000076	mg/L	2	7440-43-9	
Chromium	Not detected	0.005	0.000039	mg/L	2	7440-47-3	
Cobalt	Not detected	0.005	0.000043	mg/L	2	7440-48-4	
Lead	Not detected	0.003	0.000076	mg/L	2	7439-92-1	
Lithium*	Not detected	0.005	0.00065	mg/L	2	7439-93-2	
Molybdenum	Not detected	0.005	0.000087	mg/L	2	7439-98-7	
Selenium	Not detected	0.005	0.00084	mg/L	2	7782-49-2	

Lab Sample ID: S17448.07 (continued)

Sample Tag: Field Blank L009005-07

Method: E200.8, Run Date: 09/25/20 11:56, Analyst: JRH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Thallium	Not detected	0.002	0.000034	mg/L	2	7440-28-0	

Method: E245.1, Run Date: 09/24/20 14:10, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	Not detected	0.0002	0.000016	mg/L	1	7439-97-6	

Other / Misc.

Method: , Run Date: 10/15/20 13:30, Analyst: GEL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Misc. Special Project*	Completed				1		O

O-Analysis performed by outside laboratory. See attached report.

Quality Control Cover Page

Report ID: S17448.01(01)
Report Date: 10/15/2020
Project: Erickson GMP
Lab Sample ID(s): S17448.01-S17448.07

Report to:

Attention: Jennifer Caporale
Board of Water & Light
P.O. Box 13007
Lansing, MI 48901

Sample ID	Sample Tag	Collected	Matrix	Analysis Departments
S17448.01	MW-1 L009005-01	09/15/2020 12:39	Groundwater	Inorganics, Metals
S17448.02	MW-2 L009005-02	09/15/2020 16:00	Groundwater	Inorganics, Metals
S17448.03	MW-4 L009005-03	09/15/2020 10:27	Groundwater	Inorganics, Metals
S17448.04	MW-5 L009005-04	09/15/2020 16:36	Groundwater	Inorganics, Metals
S17448.05	MW-6 L009005-05	09/15/2020 14:18	Groundwater	Inorganics, Metals
S17448.06	MW-4 Duplicate L009005-06	09/15/2020 10:27	Groundwater	Inorganics, Metals
S17448.07	Field Blank L009005-07	09/15/2020 07:50	Water	Inorganics, Metals

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Quality Control Report

Report ID: QC-S17448-01
Generated on 10/20/2020

Report to

Attention: Jennifer Caporale
Board of Water & Light
P.O. Box 13007
Lansing, MI 48901

Phone: 517-702-6372 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Report Summary

Lab Sample ID(s): S17448.01-S17448.07
Project: Erickson GMP
Submitted Date/Time: 09/16/2020 11:45
Sampled by: Marc Wahrer
P.O. #:

QC Report Sections

Report Flag Descriptions

*: QC result is outside of indicated control limits
W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball
Quality Assurance Manager

Lab Sample ID: S17448.01

Sample Tag: MW-1 L009005-01

Collected Date/Time: 09/15/2020 12:39

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chloride	E300.0	09/17/20 08:18	CL200917-W1-B	CL200917-W1-B	No	BLK/LCS/MS/MSD/DU
Fluoride (Undistilled)	E300.0	09/17/20 08:14	FL200917-W1-A	FL200917-W1-A	No	BLK/LCS/MS/MSD/DU
Sulfate	E300.0	09/17/20 08:18	SFT200917-W1-B	SFT200917-W1-B	No	BLK/LCS/MS/MSD/DU
Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A	TDS200919A	No	BLK/LCS/DUP
Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917	TSS200917	No	BLK/LCS/DUP
Metals						
Antimony	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Arsenic	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Barium	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Beryllium	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Boron	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cadmium	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Calcium	E200.8	09/25/20 14:15	MT5-20-0925B	MTD-092520-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cobalt	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lead	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lithium	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Mercury	E245.1	09/24/20 13:59	HG2-HG3-20-0924A	HGD-092420-2	No	BLK/LCS/MS/MSD
Molybdenum	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Selenium	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Thallium	E200.8	09/25/20 12:01	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD

Lab Sample ID: S17448.02

Sample Tag: MW-2 L009005-02

Collected Date/Time: 09/15/2020 16:00

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chloride	E300.0	09/17/20 08:30	CL200917-W1-B	CL200917-W1-B	No	BLK/LCS/MS/MSD/DU
Fluoride (Undistilled)	E300.0	09/17/20 08:27	FL200917-W1-A	FL200917-W1-A	No	BLK/LCS/MS/MSD/DU
Sulfate	E300.0	09/17/20 08:30	SFT200917-W1-B	SFT200917-W1-B	No	BLK/LCS/MS/MSD/DU
Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A	TDS200919A	No	BLK/LCS/DUP
Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917	TSS200917	No	BLK/LCS/DUP
Metals						
Antimony	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Arsenic	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Barium	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Beryllium	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Boron	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cadmium	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Calcium	E200.8	09/25/20 14:18	MT5-20-0925B	MTD-092520-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cobalt	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lead	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lithium	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Mercury	E245.1	09/24/20 14:01	HG2-HG3-20-0924A	HGD-092420-2	No	BLK/LCS/MS/MSD
Molybdenum	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Selenium	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Thallium	E200.8	09/25/20 12:05	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD

Lab Sample ID: S17448.03

Sample Tag: MW-4 L009005-03

Collected Date/Time: 09/15/2020 10:27

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chloride	E300.0	09/17/20 08:43	CL200917-W1-B	CL200917-W1-B	No	BLK/LCS/MS/MSD/DU
Fluoride (Undistilled)	E300.0	09/17/20 08:40	FL200917-W1-A	FL200917-W1-A	No	BLK/LCS/MS/MSD/DU
Sulfate	E300.0	09/17/20 08:43	SFT200917-W1-B	SFT200917-W1-B	No	BLK/LCS/MS/MSD/DU
Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A	TDS200919A	No	BLK/LCS/DUP
Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917	TSS200917	No	BLK/LCS/DUP
Metals						
Antimony	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Arsenic	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Barium	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Beryllium	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Boron	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cadmium	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Calcium	E200.8	09/25/20 14:20	MT5-20-0925B	MTD-092520-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cobalt	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lead	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lithium	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Mercury	E245.1	09/24/20 14:03	HG2-HG3-20-0924A	HGD-092420-2	No	BLK/LCS/MS/MSD
Molybdenum	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Selenium	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Thallium	E200.8	09/25/20 12:08	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD

Lab Sample ID: S17448.04

Sample Tag: MW-5 L009005-04

Collected Date/Time: 09/15/2020 16:36

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chloride	E300.0	09/17/20 08:56	CL200917-W1-B	CL200917-W1-B	No	BLK/LCS/MS/MSD/DU
Fluoride (Undistilled)	E300.0	09/17/20 08:53	FL200917-W1-A	FL200917-W1-A	No	BLK/LCS/MS/MSD/DU
Sulfate	E300.0	09/17/20 08:56	SFT200917-W1-B	SFT200917-W1-B	No	BLK/LCS/MS/MSD/DU
Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A	TDS200919A	No	BLK/LCS/DUP
Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917	TSS200917	No	BLK/LCS/DUP
Metals						
Antimony	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Arsenic	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Barium	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Beryllium	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Boron	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cadmium	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Calcium	E200.8	09/25/20 14:22	MT5-20-0925B	MTD-092520-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cobalt	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lead	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lithium	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Mercury	E245.1	09/24/20 14:05	HG2-HG3-20-0924A	HGD-092420-2	No	BLK/LCS/MS/MSD
Molybdenum	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Selenium	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Thallium	E200.8	09/25/20 12:12	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD

Lab Sample ID: S17448.05

Sample Tag: MW-6 L009005-05

Collected Date/Time: 09/15/2020 14:18

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chloride	E300.0	09/17/20 09:09	CL200917-W1-B	CL200917-W1-B	No	BLK/LCS/MS/MSD/DU
Fluoride (Undistilled)	E300.0	09/17/20 09:06	FL200917-W1-A	FL200917-W1-A	No	BLK/LCS/MS/MSD/DU
Sulfate	E300.0	09/17/20 12:22	SFT200917-W1-B	SFT200917-W1-B	No	BLK/LCS/MS/MSD/DU
Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A	TDS200919A	No	BLK/LCS/DUP
Total Suspended Solids	SM2540D	09/18/20 17:40	TSS200918	TSS200918	No	BLK/LCS/DUP
Metals						
Antimony	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Arsenic	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Barium	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Beryllium	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Boron	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cadmium	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Calcium	E200.8	09/25/20 14:24	MT5-20-0925B	MTD-092520-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cobalt	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lead	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lithium	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Mercury	E245.1	09/24/20 14:07	HG2-HG3-20-0924A	HGD-092420-2	No	BLK/LCS/MS/MSD
Molybdenum	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Selenium	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Thallium	E200.8	09/25/20 12:16	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD

Lab Sample ID: S17448.06

Sample Tag: MW-4 Duplicate L009005-06

Collected Date/Time: 09/15/2020 10:27

Matrix: Groundwater

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chloride	E300.0	09/17/20 09:22	CL200917-W1-B	CL200917-W1-B	No	BLK/LCS/MS/MSD/DU
Fluoride (Undistilled)	E300.0	09/17/20 09:18	FL200917-W1-A	FL200917-W1-A	No	BLK/LCS/MS/MSD/DU
Sulfate	E300.0	09/17/20 09:22	SFT200917-W1-B	SFT200917-W1-B	No	BLK/LCS/MS/MSD/DU
Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A	TDS200919A	No	BLK/LCS/DUP
Total Suspended Solids	SM2540D	09/18/20 17:40	TSS200918	TSS200918	No	BLK/LCS/DUP
Metals						
Antimony	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Arsenic	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Barium	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Beryllium	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Boron	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cadmium	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Calcium	E200.8	09/25/20 14:27	MT5-20-0925B	MTD-092520-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cobalt	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lead	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lithium	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Mercury	E245.1	09/24/20 14:08	HG2-HG3-20-0924A	HGD-092420-2	No	BLK/LCS/MS/MSD
Molybdenum	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Selenium	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Thallium	E200.8	09/25/20 12:19	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD

Lab Sample ID: S17448.07

Sample Tag: Field Blank L009005-07

Collected Date/Time: 09/15/2020 07:50

Matrix: Water

COC Reference:

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Inorganics						
Chloride	E300.0	09/17/20 09:35	CL200917-W1-B	CL200917-W1-B	No	BLK/LCS/MS/MSD/DU
Fluoride (Undistilled)	E300.0	09/17/20 10:35	FL200917-W1-A	FL200917-W1-A	No	BLK/LCS/MS/MSD/DU
Sulfate	E300.0	09/17/20 09:35	SFT200917-W1-B	SFT200917-W1-B	No	BLK/LCS/MS/MSD/DU
Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A	TDS200919A	No	BLK/LCS/DUP
Total Suspended Solids	SM2540D	09/18/20 17:40	TSS200918	TSS200918	No	BLK/LCS/DUP
Metals						
Antimony	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Arsenic	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Barium	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Beryllium	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Boron	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cadmium	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Calcium	E200.8	09/25/20 14:11	MT5-20-0925B	MTD-092520-1	No	BLK/LCS/MS/MSD
Chromium	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Cobalt	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lead	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Lithium	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Mercury	E245.1	09/24/20 14:10	HG2-HG3-20-0924A	HGD-092420-2	No	BLK/LCS/MS/MSD
Molybdenum	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Selenium	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD
Thallium	E200.8	09/25/20 11:56	MT5-20-0925A	MTD-092520-1	No	BLK/LCS/MS/MSD

Inorganics, Prep Batch ID: CL200917-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.01	Chloride	E300.0	09/17/20 08:18	CL200917-W1-B
S17448.02	Chloride	E300.0	09/17/20 08:30	CL200917-W1-B
S17448.03	Chloride	E300.0	09/17/20 08:43	CL200917-W1-B
S17448.04	Chloride	E300.0	09/17/20 08:56	CL200917-W1-B
S17448.05	Chloride	E300.0	09/17/20 09:09	CL200917-W1-B
S17448.06	Chloride	E300.0	09/17/20 09:22	CL200917-W1-B
S17448.07	Chloride	E300.0	09/17/20 09:35	CL200917-W1-B

Inorganics, Prep Batch ID: FL200917-W1-A

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.01	Fluoride (Undistilled)	E300.0	09/17/20 08:14	FL200917-W1-A
S17448.02	Fluoride (Undistilled)	E300.0	09/17/20 08:27	FL200917-W1-A
S17448.03	Fluoride (Undistilled)	E300.0	09/17/20 08:40	FL200917-W1-A
S17448.04	Fluoride (Undistilled)	E300.0	09/17/20 08:53	FL200917-W1-A
S17448.05	Fluoride (Undistilled)	E300.0	09/17/20 09:06	FL200917-W1-A
S17448.06	Fluoride (Undistilled)	E300.0	09/17/20 09:18	FL200917-W1-A
S17448.07	Fluoride (Undistilled)	E300.0	09/17/20 10:35	FL200917-W1-A

Inorganics, Prep Batch ID: SFT200917-W1-B

Surrogates: No, QC Types: BLK/LCS/MS/MSD/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.01	Sulfate	E300.0	09/17/20 08:18	SFT200917-W1-B
S17448.02	Sulfate	E300.0	09/17/20 08:30	SFT200917-W1-B
S17448.03	Sulfate	E300.0	09/17/20 08:43	SFT200917-W1-B
S17448.04	Sulfate	E300.0	09/17/20 08:56	SFT200917-W1-B
S17448.05	Sulfate	E300.0	09/17/20 12:22	SFT200917-W1-B
S17448.06	Sulfate	E300.0	09/17/20 09:22	SFT200917-W1-B
S17448.07	Sulfate	E300.0	09/17/20 09:35	SFT200917-W1-B

Inorganics, Prep Batch ID: TDS200919A

Surrogates: No, QC Types: BLK/LCS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.01	Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A
S17448.02	Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A
S17448.03	Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A
S17448.04	Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A
S17448.05	Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A
S17448.06	Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A
S17448.07	Total Dissolved Solids	SM2540C	09/19/20 16:40	TDS200919A

Inorganics, Prep Batch ID: TSS200917

Surrogates: No, QC Types: BLK/LCS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.01	Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917
S17448.02	Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917
S17448.03	Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917
S17448.04	Total Suspended Solids	SM2540D	09/17/20 18:30	TSS200917

Inorganics, Prep Batch ID: TSS200918

Surrogates: No, QC Types: BLK/LCS/DUP

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.05	Total Suspended Solids	SM2540D	09/18/20 17:40	TSS200918
S17448.06	Total Suspended Solids	SM2540D	09/18/20 17:40	TSS200918
S17448.07	Total Suspended Solids	SM2540D	09/18/20 17:40	TSS200918

Metals, Prep Batch ID: HGD-092420-2

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.01	Mercury	E245.1	09/24/20 13:59	HG2-HG3-20-0924A
S17448.02	Mercury	E245.1	09/24/20 14:01	HG2-HG3-20-0924A
S17448.03	Mercury	E245.1	09/24/20 14:03	HG2-HG3-20-0924A
S17448.04	Mercury	E245.1	09/24/20 14:05	HG2-HG3-20-0924A
S17448.05	Mercury	E245.1	09/24/20 14:07	HG2-HG3-20-0924A
S17448.06	Mercury	E245.1	09/24/20 14:08	HG2-HG3-20-0924A
S17448.07	Mercury	E245.1	09/24/20 14:10	HG2-HG3-20-0924A

Metals, Prep Batch ID: MTD-092520-1

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.01	Antimony	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Arsenic	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Barium	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Beryllium	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Boron	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Cadmium	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Calcium	E200.8	09/25/20 14:15	MT5-20-0925B
S17448.01	Chromium	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Cobalt	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Lead	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Lithium	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Molybdenum	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Selenium	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.01	Thallium	E200.8	09/25/20 12:01	MT5-20-0925A
S17448.02	Antimony	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Arsenic	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Barium	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Beryllium	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Boron	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Cadmium	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Calcium	E200.8	09/25/20 14:18	MT5-20-0925B
S17448.02	Chromium	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Cobalt	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Lead	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Lithium	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Molybdenum	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Selenium	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.02	Thallium	E200.8	09/25/20 12:05	MT5-20-0925A
S17448.03	Antimony	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Arsenic	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Barium	E200.8	09/25/20 12:08	MT5-20-0925A

Metals, Prep Batch ID: MTD-092520-1 (continued)

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.03	Beryllium	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Boron	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Cadmium	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Calcium	E200.8	09/25/20 14:20	MT5-20-0925B
S17448.03	Chromium	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Cobalt	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Lead	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Lithium	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Molybdenum	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Selenium	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.03	Thallium	E200.8	09/25/20 12:08	MT5-20-0925A
S17448.04	Antimony	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Arsenic	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Barium	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Beryllium	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Boron	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Cadmium	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Calcium	E200.8	09/25/20 14:22	MT5-20-0925B
S17448.04	Chromium	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Cobalt	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Lead	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Lithium	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Molybdenum	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Selenium	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.04	Thallium	E200.8	09/25/20 12:12	MT5-20-0925A
S17448.05	Antimony	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Arsenic	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Barium	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Beryllium	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Boron	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Cadmium	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Calcium	E200.8	09/25/20 14:24	MT5-20-0925B
S17448.05	Chromium	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Cobalt	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Lead	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Lithium	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Molybdenum	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Selenium	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.05	Thallium	E200.8	09/25/20 12:16	MT5-20-0925A
S17448.06	Antimony	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Arsenic	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Barium	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Beryllium	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Boron	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Cadmium	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Calcium	E200.8	09/25/20 14:27	MT5-20-0925B
S17448.06	Chromium	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Cobalt	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Lead	E200.8	09/25/20 12:19	MT5-20-0925A

Metals, Prep Batch ID: MTD-092520-1 (continued)

Surrogates: No, QC Types: BLK/LCS/MS/MSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S17448.06	Lithium	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Molybdenum	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Selenium	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.06	Thallium	E200.8	09/25/20 12:19	MT5-20-0925A
S17448.07	Antimony	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Arsenic	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Barium	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Beryllium	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Boron	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Cadmium	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Calcium	E200.8	09/25/20 14:11	MT5-20-0925B
S17448.07	Chromium	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Cobalt	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Lead	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Lithium	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Molybdenum	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Selenium	E200.8	09/25/20 11:56	MT5-20-0925A
S17448.07	Thallium	E200.8	09/25/20 11:56	MT5-20-0925A

Form 0: Sequence Log

Data Set ID: MT5-20-0925A
Analysis Date: 09/25/20

Instrument ID: PE NEXION 2
Analyst: JRH

Filename	*Run Time*	*Sample ID*	*Matrix*	*QC Type*
001	10:24:41 Fri 25-Sep-20	Blank	Liquid	
002	10:26:30 Fri 25-Sep-20	Std-0.0001	Liquid	
003	10:28:20 Fri 25-Sep-20	Std-0.0005	Liquid	
004	10:30:09 Fri 25-Sep-20	Std-0.001	Liquid	
005	10:31:58 Fri 25-Sep-20	Std-0.005	Liquid	
006	10:33:48 Fri 25-Sep-20	Std-0.02	Liquid	
007	10:35:38 Fri 25-Sep-20	Std-0.05	Liquid	
008	10:37:27 Fri 25-Sep-20	Std-0.2	Liquid	
009	10:39:16 Fri 25-Sep-20	rinse	Liquid	
010	10:49:49 Fri 25-Sep-20	ICV-0.1	Liquid	ICV
011	10:51:45 Fri 25-Sep-20	CCV-0.1	Liquid	CCV
012	10:53:34 Fri 25-Sep-20	rinse	Liquid	
013	10:59:13 Fri 25-Sep-20	ICB	Liquid	ICB
014	11:01:02 Fri 25-Sep-20	CCB	Liquid	CCB
015	11:02:52 Fri 25-Sep-20	BS-0.0001	Liquid	BS
016	11:14:23 Fri 25-Sep-20	BS-0.0005	Liquid	BS
017	11:17:37 Fri 25-Sep-20	BS-0.001	Liquid	BS
018	11:23:25 Fri 25-Sep-20	BS-0.005	Liquid	BS
019	11:31:25 Fri 25-Sep-20	BS-0.0025	Liquid	BS
020	11:33:15 Fri 25-Sep-20	Solu-AB	Liquid	AB
021	11:35:04 Fri 25-Sep-20	Solu-AA	Liquid	AA
022	11:37:41 Fri 25-Sep-20	092520_1 LCS-0.05	Liquid	LCS
023	11:39:30 Fri 25-Sep-20	Rinse	Liquid	
024	11:45:10 Fri 25-Sep-20	092520_1 LRB	Liquid	LRB
025	11:56:56 Fri 25-Sep-20	17448.07s	Liquid	S
026	11:59:50 Fri 25-Sep-20	17448.01 dil	Liquid	DIL
027	12:01:38 Fri 25-Sep-20	17448.01s	Liquid	S
028	12:03:27 Fri 25-Sep-20	Rinse	Liquid	
029	12:05:15 Fri 25-Sep-20	17448.02s	Liquid	S
030	12:07:05 Fri 25-Sep-20	Rinse	Liquid	
031	12:08:53 Fri 25-Sep-20	17448.03s	Liquid	S
032	12:10:42 Fri 25-Sep-20	Rinse	Liquid	
033	12:12:31 Fri 25-Sep-20	17448.04s	Liquid	S
034	12:14:20 Fri 25-Sep-20	Rinse	Liquid	
035	12:16:09 Fri 25-Sep-20	17448.05s	Liquid	S
036	12:17:58 Fri 25-Sep-20	Rinse	Liquid	
037	12:19:47 Fri 25-Sep-20	17448.06s	Liquid	S
038	12:21:36 Fri 25-Sep-20	Rinse	Liquid	
039	12:30:33 Fri 25-Sep-20	17502.19s diss	Liquid	S
040	12:32:22 Fri 25-Sep-20	Rinse	Liquid	
041	12:34:11 Fri 25-Sep-20	17612.01s	Liquid	S
042	12:36:00 Fri 25-Sep-20	Rinse	Liquid	
043	12:39:05 Fri 25-Sep-20	17448.06 MS-0.05	Liquid	MS
044	12:40:54 Fri 25-Sep-20	17448.06 MSD	Liquid	MSD
045	12:42:43 Fri 25-Sep-20	CCV2-0.1	Liquid	CCV
046	12:44:32 Fri 25-Sep-20	Rinse	Liquid	
047	12:48:20 Fri 25-Sep-20	CCB2	Liquid	CCB

Form 0: Sequence Log

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Filename	*Run Time*	*Sample ID*	*Matrix*	*QC Type*
001	13:38:06 Fri 25-Sep-20	Blank	Liquid	
002	13:39:15 Fri 25-Sep-20	Std-0.20	Liquid	
003	13:40:24 Fri 25-Sep-20	Std-0.50	Liquid	
004	13:41:34 Fri 25-Sep-20	Std-1.0	Liquid	
005	13:42:43 Fri 25-Sep-20	Std-2.0	Liquid	
006	13:43:53 Fri 25-Sep-20	Std-5.0	Liquid	
007	13:45:02 Fri 25-Sep-20	ICV-2.0	Liquid	ICV
008	13:46:12 Fri 25-Sep-20	CCV-2.0	Liquid	CCV
009	13:47:21 Fri 25-Sep-20	ICB	Liquid	ICB
010	13:48:31 Fri 25-Sep-20	CCB	Liquid	CCB
011	14:03:55 Fri 25-Sep-20	BS-0.05	Liquid	BS
012	14:08:00 Fri 25-Sep-20	092520_1 LCS-1.0	Liquid	LCS
013	14:37:31 Fri 25-Sep-20	092520_1 LRB	Liquid	LRB
014	14:11:58 Fri 25-Sep-20	17448.07s	Liquid	S
015	14:14:12 Fri 25-Sep-20	17448.01 dil	Liquid	DIL
016	14:15:20 Fri 25-Sep-20	17448.01s	Liquid	S
017	14:16:58 Fri 25-Sep-20	rinse	Liquid	
018	14:18:06 Fri 25-Sep-20	17448.02s	Liquid	S
019	14:19:15 Fri 25-Sep-20	rinse	Liquid	
020	14:20:23 Fri 25-Sep-20	17448.03s	Liquid	S
021	14:21:33 Fri 25-Sep-20	rinse	Liquid	
022	14:22:41 Fri 25-Sep-20	17448.04s	Liquid	S
023	14:23:50 Fri 25-Sep-20	rinse	Liquid	
024	14:24:59 Fri 25-Sep-20	17448.05s	Liquid	S
025	14:26:08 Fri 25-Sep-20	rinse	Liquid	
026	14:27:17 Fri 25-Sep-20	17448.06s	Liquid	S
027	14:28:26 Fri 25-Sep-20	rinse	Liquid	
028	14:31:26 Fri 25-Sep-20	17448.03 MS-2.0	Liquid	MS
029	14:32:34 Fri 25-Sep-20	17448.03 MSD	Liquid	MSD
030	14:34:02 Fri 25-Sep-20	CCV2-2.0	Liquid	CCV
031	14:35:11 Fri 25-Sep-20	CCB2	Liquid	CCB

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.01
Sample Tag: MW-1 L009005-01
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-47-3	Chromium	Not detected	0.005	0.000097	mg/L	5	09/25/2020	
7440-42-8	Boron	0.44	0.04	0.0018	mg/L	5	09/25/2020	
7440-38-2	Arsenic	0.006	0.002	0.00026	mg/L	5	09/25/2020	
7782-49-2	Selenium	Not detected	0.005	0.0021	mg/L	5	09/25/2020	
7439-98-7	Molybdenum	Not detected	0.005	0.00022	mg/L	5	09/25/2020	
7440-43-9	Cadmium	Not detected	0.0005	0.00019	mg/L	5	09/25/2020	
7440-36-0	Antimony	Not detected	0.005	0.0026	mg/L	5	09/25/2020	
7440-39-3	Barium	0.148	0.005	0.00016	mg/L	5	09/25/2020	
7440-28-0	Thallium	Not detected	0.002	0.000086	mg/L	5	09/25/2020	
7439-92-1	Lead	Not detected	0.003	0.00019	mg/L	5	09/25/2020	
7440-41-7	Beryllium	Not detected	0.001	0.00022	mg/L	5	09/25/2020	
7440-48-4	Cobalt	Not detected	0.005	0.00011	mg/L	5	09/25/2020	
7439-93-2	Lithium	0.039	0.005	0.0016	mg/L	5	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.01
Sample Tag: MW-1 L009005-01
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-70-2	Calcium	170	2.5	0.22	mg/L	25	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.02
Sample Tag: MW-2 L009005-02
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-47-3	Chromium	Not detected	0.005	0.000097	mg/L	5	09/25/2020	
7440-42-8	Boron	5.97	0.04	0.0018	mg/L	5	09/25/2020	
7440-38-2	Arsenic	Not detected	0.002	0.00026	mg/L	5	09/25/2020	
7782-49-2	Selenium	Not detected	0.005	0.0021	mg/L	5	09/25/2020	
7439-98-7	Molybdenum	0.011	0.005	0.00022	mg/L	5	09/25/2020	
7440-43-9	Cadmium	Not detected	0.0005	0.00019	mg/L	5	09/25/2020	
7440-36-0	Antimony	Not detected	0.005	0.0026	mg/L	5	09/25/2020	
7440-39-3	Barium	0.039	0.005	0.00016	mg/L	5	09/25/2020	
7440-28-0	Thallium	Not detected	0.002	0.000086	mg/L	5	09/25/2020	
7439-92-1	Lead	Not detected	0.003	0.00019	mg/L	5	09/25/2020	
7440-41-7	Beryllium	Not detected	0.001	0.00022	mg/L	5	09/25/2020	
7440-48-4	Cobalt	Not detected	0.005	0.00011	mg/L	5	09/25/2020	
7439-93-2	Lithium	0.066	0.005	0.0016	mg/L	5	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.02
Sample Tag: MW-2 L009005-02
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-70-2	Calcium	270	2.5	0.22	mg/L	25	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.03
Sample Tag: MW-4 L009005-03
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-47-3	Chromium	Not detected	0.005	0.000097	mg/L	5	09/25/2020	
7440-42-8	Boron	0.07	0.04	0.0018	mg/L	5	09/25/2020	
7440-38-2	Arsenic	0.009	0.002	0.00026	mg/L	5	09/25/2020	
7782-49-2	Selenium	Not detected	0.005	0.0021	mg/L	5	09/25/2020	
7439-98-7	Molybdenum	0.005	0.005	0.00022	mg/L	5	09/25/2020	
7440-43-9	Cadmium	Not detected	0.0005	0.00019	mg/L	5	09/25/2020	
7440-36-0	Antimony	Not detected	0.005	0.0026	mg/L	5	09/25/2020	
7440-39-3	Barium	0.163	0.005	0.00016	mg/L	5	09/25/2020	
7440-28-0	Thallium	Not detected	0.002	0.000086	mg/L	5	09/25/2020	
7439-92-1	Lead	Not detected	0.003	0.00019	mg/L	5	09/25/2020	
7440-41-7	Beryllium	Not detected	0.001	0.00022	mg/L	5	09/25/2020	
7440-48-4	Cobalt	Not detected	0.005	0.00011	mg/L	5	09/25/2020	
7439-93-2	Lithium	0.010	0.005	0.0016	mg/L	5	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.03
Sample Tag: MW-4 L009005-03
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-70-2	Calcium	108	2.5	0.22	mg/L	25	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.04
Sample Tag: MW-5 L009005-04
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-47-3	Chromium	Not detected	0.005	0.000097	mg/L	5	09/25/2020	
7440-42-8	Boron	5.00	0.04	0.0018	mg/L	5	09/25/2020	
7440-38-2	Arsenic	Not detected	0.002	0.00026	mg/L	5	09/25/2020	
7782-49-2	Selenium	Not detected	0.005	0.0021	mg/L	5	09/25/2020	
7439-98-7	Molybdenum	0.053	0.005	0.00022	mg/L	5	09/25/2020	
7440-43-9	Cadmium	Not detected	0.0005	0.00019	mg/L	5	09/25/2020	
7440-36-0	Antimony	Not detected	0.005	0.0026	mg/L	5	09/25/2020	
7440-39-3	Barium	0.043	0.005	0.00016	mg/L	5	09/25/2020	
7440-28-0	Thallium	Not detected	0.002	0.000086	mg/L	5	09/25/2020	
7439-92-1	Lead	Not detected	0.003	0.00019	mg/L	5	09/25/2020	
7440-41-7	Beryllium	Not detected	0.001	0.00022	mg/L	5	09/25/2020	
7440-48-4	Cobalt	Not detected	0.005	0.00011	mg/L	5	09/25/2020	
7439-93-2	Lithium	0.091	0.005	0.0016	mg/L	5	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.04
Sample Tag: MW-5 L009005-04
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-70-2	Calcium	266	2.5	0.22	mg/L	25	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.05
Sample Tag: MW-6 L009005-05
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-47-3	Chromium	Not detected	0.005	0.000097	mg/L	5	09/25/2020	
7440-42-8	Boron	1.05	0.04	0.0018	mg/L	5	09/25/2020	
7440-38-2	Arsenic	Not detected	0.002	0.00026	mg/L	5	09/25/2020	
7782-49-2	Selenium	Not detected	0.005	0.0021	mg/L	5	09/25/2020	
7439-98-7	Molybdenum	0.031	0.005	0.00022	mg/L	5	09/25/2020	
7440-43-9	Cadmium	Not detected	0.0005	0.00019	mg/L	5	09/25/2020	
7440-36-0	Antimony	Not detected	0.005	0.0026	mg/L	5	09/25/2020	
7440-39-3	Barium	0.054	0.005	0.00016	mg/L	5	09/25/2020	
7440-28-0	Thallium	Not detected	0.002	0.000086	mg/L	5	09/25/2020	
7439-92-1	Lead	Not detected	0.003	0.00019	mg/L	5	09/25/2020	
7440-41-7	Beryllium	Not detected	0.001	0.00022	mg/L	5	09/25/2020	
7440-48-4	Cobalt	Not detected	0.005	0.00011	mg/L	5	09/25/2020	
7439-93-2	Lithium	0.055	0.005	0.0016	mg/L	5	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.05
Sample Tag: MW-6 L009005-05
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-70-2	Calcium	192	2.5	0.22	mg/L	25	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.06
Sample Tag: MW-4 Duplicate L009005-06
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-47-3	Chromium	Not detected	0.005	0.000097	mg/L	5	09/25/2020	
7440-42-8	Boron	0.07	0.04	0.0018	mg/L	5	09/25/2020	
7440-38-2	Arsenic	0.007	0.002	0.00026	mg/L	5	09/25/2020	
7782-49-2	Selenium	Not detected	0.005	0.0021	mg/L	5	09/25/2020	
7439-98-7	Molybdenum	Not detected	0.005	0.00022	mg/L	5	09/25/2020	
7440-43-9	Cadmium	Not detected	0.0005	0.00019	mg/L	5	09/25/2020	
7440-36-0	Antimony	Not detected	0.005	0.0026	mg/L	5	09/25/2020	
7440-39-3	Barium	0.163	0.005	0.00016	mg/L	5	09/25/2020	
7440-28-0	Thallium	Not detected	0.002	0.000086	mg/L	5	09/25/2020	
7439-92-1	Lead	Not detected	0.003	0.00019	mg/L	5	09/25/2020	
7440-41-7	Beryllium	Not detected	0.001	0.00022	mg/L	5	09/25/2020	
7440-48-4	Cobalt	Not detected	0.005	0.00011	mg/L	5	09/25/2020	
7439-93-2	Lithium	0.010	0.005	0.0016	mg/L	5	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.06
Sample Tag: MW-4 Duplicate L009005-06
Date Collected: 09/15/2020
Matrix: Groundwater

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-70-2	Calcium	110	2.5	0.22	mg/L	25	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.07
Sample Tag: Field Blank L009005-07
Date Collected: 09/15/2020
Matrix: Water

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-47-3	Chromium	Not detected	0.005	0.000039	mg/L	2	09/25/2020	
7440-42-8	Boron	Not detected	0.04	0.00070	mg/L	2	09/25/2020	
7440-38-2	Arsenic	Not detected	0.002	0.00010	mg/L	2	09/25/2020	
7782-49-2	Selenium	Not detected	0.005	0.00084	mg/L	2	09/25/2020	
7439-98-7	Molybdenum	Not detected	0.005	0.000087	mg/L	2	09/25/2020	
7440-43-9	Cadmium	Not detected	0.0005	0.000076	mg/L	2	09/25/2020	
7440-36-0	Antimony	Not detected	0.005	0.0010	mg/L	2	09/25/2020	
7440-39-3	Barium	Not detected	0.005	0.000065	mg/L	2	09/25/2020	
7440-28-0	Thallium	Not detected	0.002	0.000034	mg/L	2	09/25/2020	
7439-92-1	Lead	Not detected	0.003	0.000076	mg/L	2	09/25/2020	
7440-41-7	Beryllium	Not detected	0.001	0.000086	mg/L	2	09/25/2020	
7440-48-4	Cobalt	Not detected	0.005	0.000043	mg/L	2	09/25/2020	
7439-93-2	Lithium	Not detected	0.005	0.00065	mg/L	2	09/25/2020	

Form 1: Metals Analysis Data Sheet

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Lab Sample ID: S17448.07
Sample Tag: Field Blank L009005-07
Date Collected: 09/15/2020
Matrix: Water

CAS #	Analyte	Result	RL	MDL	Units	Dilute	Run Date	Notes
7440-70-2	Calcium	Not detected	0.5	0.017	mg/L	2	09/25/2020	

Form 1: Metals Analysis Data Sheet - Flag Description Key

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Note/Qualifier Key	
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
m	Duplicate injection precision not met
n	Spiked sample recovery outside control limits
s	Reported value determined by the MSA
u	Analyte not detected above reporting limit
A	TIC is a suspected aldol-condensation product
B	Compound also found in associated method blank
C	Analyte presence confirmed by GC/MS
D	Identified in an analysis at a secondary dilution factor
E	Concentration exceeds calibration range
J	Estimated value less than reporting limit, but greater than MDL
N	Presumptive evidence of TIC
P	Pesticide/Aroclor 2-column RPD exceeds limit
U	Analyte not detected above reporting limit
!	Result is outside of stated limit criteria
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
K	Elevated reporting limit due to low total solids
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
Q	Reported result represents most abundant aroclor
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
V	Accurate value not available due to presence of multiple aroclors
W	Surrogate result not applicable due to sample dilution
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
Z	Estimated result due to matrix interference
a	ASTM prep method F963-11
d	Duplicate analysis not within control limits
f	Filtered and preserved in lab
i	Incremental sampling
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one
r	This analyte is being reported as the best result from multiple
v	VOCs analyzed outside of holding time based on the measurement of
x	Preserved from bulk sample
c	Filtered in lab

Form 2A: Initial and Continuing Calibration Verification

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Sample Name	QC Type	Dilute	Element	Sample Conc	Actual Conc	%Rec	LCL/UCL	Units	Matrix
010 ICV-0.1	ICV	1	Cr	0.0986	0.1	99	90/110	mg/L	Liquid
			Co	0.0987	0.1	99	90/110		
			As	0.0971	0.1	97	90/110		
			Mo	0.0965	0.1	97	90/110		
			Cd	0.0983	0.1	98	90/110		
			Sb	0.0940	0.1	94	90/110		
			Ba	0.0994	0.1	99	90/110		
			Tl	0.0986	0.1	99	90/110		
			Pb	0.0970	0.1	97	90/110		
			Li	0.103	0.1	103	90/110		
			Be	0.106	0.1	106	90/110		
			B	0.106	0.1	106	90/110		
			Se	0.0983	0.1	98	90/110		
011 CCV-0.1	CCV	1	Cr	0.100	0.1	100	90/110	mg/L	Liquid
			Co	0.0993	0.1	99	90/110		
			As	0.103	0.1	103	90/110		
			Mo	0.0999	0.1	100	90/110		
			Cd	0.102	0.1	102	90/110		
			Sb	0.100	0.1	100	90/110		
			Ba	0.100	0.1	100	90/110		
			Tl	0.0992	0.1	99	90/110		
			Pb	0.0990	0.1	99	90/110		
			Li	0.103	0.1	103	90/110		
			Be	0.107	0.1	107	90/110		
			B	0.104	0.1	104	90/110		
			Se	0.0988	0.1	99	90/110		
045 CCV2-0.1	CCV	1	Cr	0.100	0.1	100	90/110	mg/L	Liquid
			Co	0.0999	0.1	100	90/110		
			As	0.100	0.1	100	90/110		
			Mo	0.0972	0.1	97	90/110		
			Cd	0.101	0.1	101	90/110		
			Sb	0.0999	0.1	100	90/110		
			Ba	0.101	0.1	101	90/110		
			Tl	0.0975	0.1	98	90/110		
			Pb	0.0962	0.1	96	90/110		
			Li	0.103	0.1	103	90/110		
			Be	0.105	0.1	105	90/110		
			B	0.107	0.1	107	90/110		
			Se	0.0993	0.1	99	90/110		

Form 2A: Initial and Continuing Calibration Verification

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Sample Name	*QC Type*	*Dilute*	*Element*	*Sample Conc*	*Actual Conc*	*%Rec*	*LCL/UCL*	*Units*	*Matrix*
007 ICV-2.0	ICV	1	Ca	2.11	2.0	106	90/110	mg/L	Liquid
008 CCV-2.0	CCV	1	Ca	2.10	2.0	105	90/110	mg/L	Liquid
030 CCV2-2.0	CCV	1	Ca	2.14	2.0	107	90/110	mg/L	Liquid

Form 3: Blanks

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Sample Name	QC Type	Dilute	Element	Sample Conc	Raw Conc	Units	Matrix
013 ICB	ICB	1	Cr	<0.001	-0.000008	mg/L	Liquid
			Co	<0.001	0.000011		
			As	<0.0004	0.000168		
			Mo	<0.001	0.000504		
			Cd	<0.0001	-0.000013		
			Sb	<0.001	0.000403		
			Ba	<0.001	0.000000		
			Tl	<0.0004	0.000012		
			Pb	<0.0004	0.000012		
			Li	<0.001	0.000020		
			Be	<0.0002	0.000000		
			B	<0.008	0.000380		
			Se	<0.001	-0.000127		
014 CCB	CCB	1	Cr	<0.001	-0.000009	mg/L	Liquid
			Co	<0.001	0.000004		
			As	<0.0004	0.000046		
			Mo	<0.001	0.000399		
			Cd	<0.0001	-0.000033		
			Sb	<0.001	0.000334		
			Ba	<0.001	0.000005		
			Tl	<0.0004	0.000007		
			Pb	<0.0004	0.000010		
			Li	<0.001	-0.000010		
			Be	<0.0002	0.000000		
			B	<0.008	0.000267		
			Se	<0.001	-0.000113		
024 092520_1 LRB	LRB	1	Cr	<0.001	0.000002	mg/L	Liquid
			Co	<0.001	0.000000		
			As	<0.0004	0.000035		
			Mo	<0.001	0.000647		
			Cd	<0.0001	-0.000019		
			Sb	<0.001	0.000094		
			Ba	<0.001	0.000003		
			Tl	<0.0004	0.000001		
			Pb	<0.0004	0.000003		
			Li	<0.001	0.000018		
			Be	<0.0002	0.000002		
			B	<0.008	0.002624		
			Se	<0.001	-0.000025		
047 CCB2	CCB	1	Cr	<0.001	-0.000004	mg/L	Liquid
			Co	<0.001	0.000005		
			As	<0.0004	0.000019		
			Mo	<0.001	0.000676		
			Cd	<0.0001	-0.000003		
			Sb	<0.001	0.000364		
			Ba	<0.001	0.000003		
			Tl	<0.0004	0.000010		
			Pb	<0.0004	0.000014		
			Li	<0.001	-0.000004		
			Be	<0.0002	0.000002		
			B	<0.008	0.000193		
			Se	<0.001	0.000319		

Form 3: Blanks

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Sample Name	*QC Type*	*Dilute*	*Element*	*Sample Conc*	*Raw Conc*	*Units*	*Matrix*
009 ICB	ICB	1	Ca	<0.01	-0.005792	mg/L	Liquid
010 CCB	CCB	1	Ca	<0.01	-0.010357	mg/L	Liquid
013 092520_1 LRB	LRB	1	Ca	<0.01	-0.011592	mg/L	Liquid
031 CCB2	CCB	1	Ca	<0.01	-0.010721	mg/L	Liquid

Form 4B: ICP Interference Check Sample

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Sample Name	*QC Type*	*Dilute*	*Element*	*Sample Conc*	*Actual Conc*	*%Rec*	*LCL/UCL*	*Units*	*Matrix*
020 Solu-AB	AB	1	Cr	0.0225	0.02	113	65/135	mg/L	Liquid
			Co	0.0223	0.02	112	65/135		
			As	0.0225	0.02	113	65/135		
			Mo	0.234	0.20	117	65/135		
			Cd	0.0226	0.02	113	65/135		
021 Solu-AA	AA	1	Cr	<0.005	0.0	N/A	N/A	mg/L	Liquid
			Co	<0.005	0.0	N/A	N/A		
			As	<0.002	0.0	N/A	N/A		
			Cd	<0.0005	0.0	N/A	N/A		
			Sb	<0.005	0.0	N/A	N/A		
			Ba	<0.005	0.0	N/A	N/A		
			Tl	<0.002	0.0	N/A	N/A		
			Pb	<0.003	0.0	N/A	N/A		
			Li	<0.010	0.0	N/A	N/A		
			Be	<0.001	0.0	N/A	N/A		
			B	<0.04	0.0	N/A	N/A		
			Se	<0.005	0.0	N/A	N/A		

Form 5A: Matrix Spike Sample Recovery

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Spike Name	Sample Name	Dilute	Element	Spike Conc	Sample Conc	Spike Amount	%Rec	LCL/UCL	Units	Matrix
015 BS-0.0001		1	Cr	0.00010	ND	0.0001	100	70/130	mg/L	Liquid
			Co	0.00012	ND	0.0001	120	70/130		
			Cd	0.00008	ND	0.0001	80	70/130		
			Ba	0.00010	ND	0.0001	100	70/130		
			Tl	0.00010	ND	0.0001	100	70/130		
			Pb	0.000106	ND	0.0001	106	70/130		
			Be	0.00013	ND	0.0001	130	70/130		
016 BS-0.0005		1	Cr	0.00052	ND	0.0005	104	70/130	mg/L	Liquid
			Co	0.00053	ND	0.0005	106	70/130		
			As	0.00043	ND	0.0005	86	70/130		
			Mo	0.00058	ND	0.0005	116	70/130		
			Cd	0.00049	ND	0.0005	98	70/130		
			Ba	0.00049	ND	0.0005	98	70/130		
			Tl	0.00051	ND	0.0005	102	70/130		
			Pb	0.000495	ND	0.0005	99	70/130		
			Li	0.00051	ND	0.0005	102	70/130		
			Be	0.00063	ND	0.0005	126	70/130		
			Se	0.00057	ND	0.0005	114	70/130		
017 BS-0.001		1	Cr	0.00102	ND	0.001	102	70/130	mg/L	Liquid
			Co	0.00103	ND	0.001	103	70/130		
			As	0.00124	ND	0.001	124	70/130		
			Mo	0.00107	ND	0.001	107	70/130		
			Cd	0.00108	ND	0.001	108	70/130		
			Sb	0.00118	ND	0.001	118	70/130		
			Ba	0.00106	ND	0.001	106	70/130		
			Tl	0.00102	ND	0.001	102	70/130		
			Pb	0.00101	ND	0.001	101	70/130		
			Li	0.00109	ND	0.001	109	70/130		
			Be	0.00122	ND	0.001	122	70/130		
			Se	0.00088	ND	0.001	88	70/130		
018 BS-0.005		1	Cr	0.00492	ND	0.005	98	70/130	mg/L	Liquid
			Co	0.00524	ND	0.005	105	70/130		
			As	0.00562	ND	0.005	112	70/130		
			Mo	0.00478	ND	0.005	96	70/130		
			Cd	0.00510	ND	0.005	102	70/130		
			Sb	0.00577	ND	0.005	115	70/130		
			Ba	0.00526	ND	0.005	105	70/130		
			Tl	0.00522	ND	0.005	104	70/130		
			Pb	0.00506	ND	0.005	101	70/130		
			Li	0.00555	ND	0.005	111	70/130		
			Be	0.00583	ND	0.005	117	70/130		
			B	0.00601	ND	0.005	120	70/130		
			Se	0.00492	ND	0.005	98	70/130		
019 BS-0.0025		1	Cr	0.00271	ND	0.0025	108	70/130	mg/L	Liquid
			Co	0.00269	ND	0.0025	108	70/130		
			As	0.00282	ND	0.0025	113	70/130		
			Mo	0.00314	ND	0.0025	126	70/130		
			Cd	0.00264	ND	0.0025	106	70/130		
			Sb	0.00291	ND	0.0025	116	70/130		
			Ba	0.00271	ND	0.0025	108	70/130		
			Tl	0.00256	ND	0.0025	102	70/130		
			Pb	0.00256	ND	0.0025	102	70/130		
			Li	0.00303	ND	0.0025	121	70/130		
			Be	0.00291	ND	0.0025	116	70/130		
			B	0.00315	ND	0.0025	126	70/130		
			Se	0.002855	ND	0.0025	114	70/130		

Form 5A: Matrix Spike Sample Recovery

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Spike Name	Sample Name	Dilute	Element	Spike Conc	Sample Conc	Spike Amount	%Rec	LCL/UCL	Units	Matrix
043 17448.06	**037 17448.06s**	5	Cr	0.251	<0.005	0.25	100	75/125	mg/L	Liquid
			Co	0.247	<0.005	0.25	99	75/125		
			As	0.264	0.007	0.25	103	75/125		
			Mo	0.235	0.005	0.25	92	75/125		
			Cd	0.248	<0.0005	0.25	99	75/125		
			Sb	0.239	<0.005	0.25	96	75/125		
			Ba	0.407	0.163	0.25	98	75/125		
			Tl	0.233	<0.002	0.25	93	75/125		
			Pb	0.229	<0.003	0.25	92	75/125		
			Li	0.269	0.010	0.25	104	75/125		
			Be	0.264	<0.001	0.25	106	75/125		
			B	0.319	0.07	0.25	100	75/125		
			Se	0.246	<0.005	0.25	98	75/125		

Form 5A: Matrix Spike Sample Recovery

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Spike Name	Sample Name	Dilute	Element	Spike Conc	Sample Conc	Spike Amount	%Rec	LCL/UCL	Units	Matrix
011 BS-0.05		1	Ca	0.043	ND	0.05	86	70/130	mg/L	Liquid
028 17448.03 MS-2.0	**020 17448.03s**	5	Ca	119	108	10.0	110	75/125	mg/L	Liquid

Form 5B: Matrix Spike Duplicate Evaluation

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Duplicate Name	Sample Name	Dilute	Element	Dup Conc	Samp Conc	%RPD	LCL/UCL	Units	Matrix
044 17448.06 MSD	**043 17448.06 MS-0.05**	5	Cr	0.246	0.251	2	0/20	mg/L	Liquid
			Co	0.247	0.247	0	0/20		
			As	0.256	0.264	3	0/20		
			Mo	0.247	0.235	5	0/20		
			Cd	0.246	0.248	1	0/20		
			Sb	0.239	0.239	0	0/20		
			Ba	0.415	0.407	2	0/20		
			Tl	0.231	0.233	1	0/20		
			Pb	0.228	0.229	0	0/20		
			Li	0.267	0.269	1	0/20		
			Be	0.267	0.264	1	0/20		
			B	0.325	0.319	2	0/20		
			Se	0.251	0.246	2	0/20		

Form 5B: Matrix Spike Duplicate Evaluation

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Duplicate Name	Sample Name	Dilute	Element	Dup Conc	Samp Conc	%RPD	LCL/UCL	Units	Matrix
029 17448.03 MSD	**028 17448.03 MS-2.0**	5	Ca	117	119	2	0/20	mg/L	Liquid

Form 7: Laboratory Control Sample

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Sample Name	Dilute	Element	Sample Conc	Actual Conc	%Rec	LCL/UCL	Units	Matrix
022 092520_1 LCS-0.05	1	Cr	0.0493	0.05	99	85/115	mg/L	Liquid
		Co	0.0494	0.05	99	85/115		
		As	0.0492	0.05	98	85/115		
		Mo	0.0513	0.05	103	85/115		
		Cd	0.0494	0.05	99	85/115		
		Sb	0.0470	0.05	94	85/115		
		Ba	0.0482	0.05	96	85/115		
		Tl	0.0490	0.05	98	85/115		
		Pb	0.0487	0.05	97	85/115		
		Li	0.0534	0.05	107	85/115		
		Be	0.0547	0.05	109	85/115		
		B	0.0554	0.05	111	85/115		
		Se	0.0491	0.05	98	85/115		

Form 7: Laboratory Control Sample

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Sample Name	Dilute	Element	Sample Conc	Actual Conc	%Rec	LCL/UCL	Units	Matrix
012 092520_1 LCS-1.0	1	Ca	1.03	1.0	103	85/115	mg/L	Liquid

Form 8: Serial Dilutions

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Duplicate Name	Sample Name	Dilute	Element	Dup Conc	Samp Conc	%D	LCL/UCL	Units	Matrix
026 17448.01 dil	**027 17448.01s**	5	Cr	<0.005	<0.005	NC	0/10	mg/L	Liquid
			Co	<0.005	<0.005	NC	0/10		
			As	0.005	0.006	17*	0/10		
			Mo	0.006	<0.005	NC	0/10		
			Cd	<0.0005	<0.0005	NC	0/10		
			Sb	<0.005	<0.005	NC	0/10		
			Ba	0.144	0.148	3	0/10		
			Tl	<0.002	<0.002	NC	0/10		
			Pb	<0.003	<0.003	NC	0/10		
			Li	0.040	0.039	3	0/10		
			Be	<0.001	<0.001	NC	0/10		
			B	0.43	0.44	2	0/10		
			Se	<0.005	<0.005	NC	0/10		

Serial Dilution test not applicable if measured sample concentration is < 100 x MDL.

Form 8: Serial Dilutions

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Duplicate Name	Sample Name	Dilute	Element	Dup Conc	Samp Conc	%D	LCL/UCL	Units	Matrix
015 17448.01 dil	**016 17448.01s**	5	Ca	168	170	1	0/10	mg/L	Liquid

Serial Dilution test not applicable if measured sample concentration is < 100 x MDL.

Form 13: Analysis Run Log

Data Set ID: MT5-20-0925A
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Filename	*Run Time*	*Matrix*	*Analytes*
001 Blank	10:24:41 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
002 Std-0.0001	10:26:30 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
003 Std-0.0005	10:28:20 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
004 Std-0.001	10:30:09 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
005 Std-0.005	10:31:58 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
006 Std-0.02	10:33:48 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
007 Std-0.05	10:35:38 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
008 Std-0.2	10:37:27 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
009 rinse	10:39:16 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
010 ICV-0.1	10:49:49 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
011 CCV-0.1	10:51:45 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
012 rinse	10:53:34 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
013 ICB	10:59:13 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
014 CCB	11:01:02 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
015 BS-0.0001	11:02:52 Fri	Liquid	Ba,Be,Cd,Co,Cr,Pb,Tl
016 BS-0.0005	11:14:23 Fri	Liquid	As,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Se,Tl
017 BS-0.001	11:17:37 Fri	Liquid	As,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
018 BS-0.005	11:23:25 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
019 BS-0.0025	11:31:25 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
020 Solu-AB	11:33:15 Fri	Liquid	As,Cd,Co,Cr,Mo
021 Solu-AA	11:35:04 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Pb,Sb,Se,Tl
022 092520_1 LCS-0.05	11:37:41 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
023 Rinse	11:39:30 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
024 092520_1 LRB	11:45:10 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
025 17448.07s	11:56:56 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
026 17448.01 dil	11:59:50 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
027 17448.01s	12:01:38 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
028 Rinse	12:03:27 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
029 17448.02s	12:05:15 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
030 Rinse	12:07:05 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
031 17448.03s	12:08:53 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
032 Rinse	12:10:42 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
033 17448.04s	12:12:31 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
034 Rinse	12:14:20 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
035 17448.05s	12:16:09 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
036 Rinse	12:17:58 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
037 17448.06s	12:19:47 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
038 Rinse	12:21:36 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
039 17502.19s diss	12:30:33 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
040 Rinse	12:32:22 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
041 17612.01s	12:34:11 Fri	Liquid	B
042 Rinse	12:36:00 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
043 17448.06 MS-0.05	12:39:05 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
044 17448.06 MSD	12:40:54 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
045 CCV2-0.1	12:42:43 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
046 Rinse	12:44:32 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl
047 CCB2	12:48:20 Fri	Liquid	As,B,Ba,Be,Cd,Co,Cr,Li,Mo,Pb,Sb,Se,Tl

Form 13: Analysis Run Log

Data Set ID: MT5-20-0925B
Instrument ID: PE NEXION 2
Analysis Date: 09/25/20
Analyst: JRH

Filename	*Run Time*	*Matrix*	*Analytes*
001 Blank	13:38:06 Fri	Liquid	Ca
002 Std-0.20	13:39:15 Fri	Liquid	Ca
003 Std-0.50	13:40:24 Fri	Liquid	Ca
004 Std-1.0	13:41:34 Fri	Liquid	Ca
005 Std-2.0	13:42:43 Fri	Liquid	Ca
006 Std-5.0	13:43:53 Fri	Liquid	Ca
007 ICV-2.0	13:45:02 Fri	Liquid	Ca
008 CCV-2.0	13:46:12 Fri	Liquid	Ca
009 ICB	13:47:21 Fri	Liquid	Ca
010 CCB	13:48:31 Fri	Liquid	Ca
011 BS-0.05	14:03:55 Fri	Liquid	Ca
012 092520_1 LCS-1.0	14:08:00 Fri	Liquid	Ca
013 092520_1 LRB	14:37:31 Fri	Liquid	Ca
014 17448.07s	14:11:58 Fri	Liquid	Ca
015 17448.01 dil	14:14:12 Fri	Liquid	Ca
016 17448.01s	14:15:20 Fri	Liquid	Ca
017 rinse	14:16:58 Fri	Liquid	Ca
018 17448.02s	14:18:06 Fri	Liquid	Ca
019 rinse	14:19:15 Fri	Liquid	Ca
020 17448.03s	14:20:23 Fri	Liquid	Ca
021 rinse	14:21:33 Fri	Liquid	Ca
022 17448.04s	14:22:41 Fri	Liquid	Ca
023 rinse	14:23:50 Fri	Liquid	Ca
024 17448.05s	14:24:59 Fri	Liquid	Ca
025 rinse	14:26:08 Fri	Liquid	Ca
026 17448.06s	14:27:17 Fri	Liquid	Ca
027 rinse	14:28:26 Fri	Liquid	Ca
028 17448.03 MS-2.0	14:31:26 Fri	Liquid	Ca
029 17448.03 MSD	14:32:34 Fri	Liquid	Ca
030 CCV2-2.0	14:34:02 Fri	Liquid	Ca
031 CCB2	14:35:11 Fri	Liquid	Ca

SmartTune Wizard - Summary

Optimization Summary

SmartTune file: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Wizard\SmartTune\Tune 2018\daily Optimiz

Start Time: 9/25/2020 9:30:39 AM
End Time: 9/25/2020 9:39:59 AM

Torch Alignment - [Passed]
Vertical: 0.26 mm
Horizontal: 0.33 mm
Intensity: 64652.97

[STD/KED] Nebulizer Gas Flow - [Passed] Optimum value(s): 1
Obtained Intensity (In 115): 69210.25
Obtained Formula (CeO 156 / Ce 140): 0.0140 (=783.02 / 55908.19)

Mass Calibration and Resolution - [Passed] Optimum value(s): N/A
Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.713)
Target/Obtained mass (23.985/24.025), Target/Obtained resolution (0.7/0.692)
Target/Obtained mass (114.904/114.925), Target/Obtained resolution (0.7/0.700)
Target/Obtained mass (207.977/207.975), Target/Obtained resolution (0.7/0.692)
Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.708)

[KED] QID - Optimum value(s): Correlation Coefficient = 0.968; Intercept = -14.28

[STD/DRC] QID - Optimum value(s): Correlation Coefficient = 0.985; Intercept = -13.91

[STD] Performance Check - [Passed] Optimum value(s): N/A
Obtained Intensity (Be 9): 5560.82
Obtained Intensity (In 115): 67967.10
Obtained Intensity (U 238): 72620.59
Obtained Intensity (Bkgd 220): 0.03
Obtained Formula (Ce++ 70 / Ce 140): 0.009 (=520.48 / 59456.00)
Obtained Formula (CeO 156 / Ce 140): 0.012 (=720.88 / 59456.00)

SmartTune Wizard - Details

Optimization Details

SmartTune file: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Wizard\SmartTune\Tune 2018\daily Optimiza

Optimization Status

Start Time: 9/25/2020 9:30:39 AM

Torch Alignment
	Optimization Settings:
		Method: Torch Alignment.mth.
		Intensity Criterion: In 115 Maximum

	Optimization Results:

	[Passed]
		Vertical:		0.26 mm
		Horizontal:		0.33 mm
		Intensity:		64652.97

[STD/KED] Nebulizer Gas Flow
	Optimization Settings:
		Method: Optimize.mth.
			Initial Try - Start/End/Step: 0.9/1.2/0.02.
		Intensity Criterion: In 115 Maximum
		Formula Criterion: CeO 156 / Ce 140 <= 0.025

	Optimization Results:
	Initial Try

		Obtained Intensity (In 115): 69210.25
		Obtained Formula (CeO 156 / Ce 140): 0.0140 (=783.02 / 55908.19)
[Passed] Optimum value(s): 1

Mass Calibration and Resolution
	Optimization Settings:
		Method: Tuning.mth.
		MassCal File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\defaultNEW.tun
		Iterations: 6
		Target accuracy (+/- amu): 0.05 for Mass Cal. and 0.03 for Resolution
		Peak height (%) for Res. Opt.: 10

	Optimization Results:
	Initial Try
		Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.713)
		Target/Obtained mass (23.985/24.025), Target/Obtained resolution (0.7/0.692)
		Target/Obtained mass (114.904/114.925), Target/Obtained resolution (0.7/0.700)
		Target/Obtained mass (207.977/207.975), Target/Obtained resolution (0.7/0.692)
		Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.708)
[Passed] Optimum value(s): N/A

[KED] QID
	Optimization Settings:
		Method: QID Calibration.mth.
			Initial Try - Start/End/Step: -20/0/0.5.

	Optimization Results:
	Initial Try

Optimum value(s): Correlation Coefficient = 0.968; Intercept = -14.28

Analyte	Mass	Points	DAC	MaxIntensity
Li	7	41	-14	20827.2
Mg	24	41	-14.5	38925
In	115	41	-12.5	71430.1
Ce	140	41	-12	45287.7
Pb	208	41	-7	24849.6
U	238	41	-10.5	59748.7

[STD/DRC] QID

Optimization Settings:

Method: QID Calibration.mth.

Initial Try - Start/End/Step: -20/0/0.5.

Optimization Results:

Initial Try

Optimum value(s): Correlation Coefficient = 0.985; Intercept = -13.91

Analyte	Mass	Points	DAC	MaxIntensity
Li	7	41	-14	30151.8
Mg	24	41	-13.5	41355.8
In	115	41	-11	73524.7
Ce	140	41	-9	60017.8
Pb	208	41	-8	37806
U	238	41	-8	80204.5

[STD] Performance Check

Optimization Settings:

Method: STD Performance Check.mth.

Intensity Criterion: Be 9 > 4000

Intensity Criterion: In 115 > 40000

Intensity Criterion: U 238 > 35000

Intensity Criterion: Bkgd 220 <= 1

Formula Criterion: Ce++ 70 / Ce 140 <= 0.05

Formula Criterion: CeO 156 / Ce 140 <= 0.025

Optimization Results:

Initial Try

Obtained Intensity (Be 9): 5560.82

Obtained Intensity (In 115): 67967.10

Obtained Intensity (U 238): 72620.59

Obtained Intensity (Bkgd 220): 0.03

Obtained Formula (Ce++ 70 / Ce 140): 0.009 (=520.48 / 59456.00)

Obtained Formula (CeO 156 / Ce 140): 0.012 (=720.88 / 59456.00)

[Passed] Optimum value(s): N/A

End Time: 9/25/2020 9:39:59 AM

Form 15: Internal Standards Summary

IS Check Reference Sample: 001 Blank

Data Set ID: MT5-20-0925A

Instrument ID: PE NEXION 2

Analysis Date: 09/25/20

Analyst: JRH

		non-ICB/CCB/ICV/CCV		ICB/CCB/ICV/CCV		
Element	Count	LCL-UCL	Accept.Range	LCL-UCL	Accept.Range	Flags
Li	6097	70-125	4268-7621	80-120	4878-7316	0
Rh	123024	70-125	86117-153780	80-120	98419-147629	0
Re	178287	70-125	124801-222859	80-120	142630-213944	0
Rh-1	336001	70-125	235201-420001	80-120	268801-403201	0

Seq ID	QC Type	Li	Rh	Re	Rh-1
001		100	100	100	100
002		98	100	98	100
003		99	100	98	99
004		99	100	97	100
005		100	101	98	99
006		97	100	98	96
007		101	99	97	98
008		96	97	95	99
009		100	100	96	99
010	ICV	98	97	94	98
011	CCV	98	98	94	98
012		97	97	96	97
013	ICB	95	99	96	98
014	CCB	99	99	95	98
015	BS	99	98	97	99
016	BS	99	98	96	96
017	BS	100	98	96	98
018	BS	99	99	96	99
019	BS	101	100	96	101
020	AB	101	100	93	97
021	AA	104	100	92	101
022	LCS	105	102	94	103
023		104	103	95	103
024	LRB	104	102	97	104
025	S	103	101	98	101
026	DIL	102	101	96	100
027	S	99	98	96	97
028		104	101	97	101
029	S	101	97	93	95
030		104	102	97	101
031	S	103	97	95	98
032		108	103	97	101
033	S	99	98	95	96
034		107	103	97	103
035	S	102	97	95	98
036		110	101	97	101
037	S	103	97	95	95
038		102	101	96	98
039	S	103	98	97	97
040		105	100	97	98

Form 15: Internal Standards Summary

IS Check Reference Sample: 001 Blank

Data Set ID: MT5-20-0925A

Instrument ID: PE NEXION 2

Analysis Date: 09/25/20

Analyst: JRH

		non-ICB/CCB/ICV/CCV		ICB/CCB/ICV/CCV		
Element	Count	LCL-UCL	Accept.Range	LCL-UCL	Accept.Range	Flags
Li	6097	70-125	4268-7621	80-120	4878-7316	0
Rh	123024	70-125	86117-153780	80-120	98419-147629	0
Re	178287	70-125	124801-222859	80-120	142630-213944	0
Rh-1	336001	70-125	235201-420001	80-120	268801-403201	0

Seq ID	QC Type	Li	Rh	Re	Rh-1
041	S	107	99	97	97
042		104	99	97	99
043	MS	103	96	95	95
044	MSD	109	97	97	93
045	CCV	104	100	97	97
046		107	101	99	99
047	CCB	105	100	97	98

Form 15: Internal Standards Summary

IS Check Reference Sample: 001 Blank

Data Set ID: MT5-20-0925B

Instrument ID: PE NEXION 2

Analysis Date: 09/25/20

Analyst: JRH

		non-ICB/CCB/ICV/CCV		ICB/CCB/ICV/CCV		
Element	Count	LCL-UCL	Accept.Range	LCL-UCL	Accept.Range	Flags
Rh	12002	70-125	8401-15003	80-120	9602-14402	0

Seq ID	QC Type	Rh
001		100
002		101
003		100
004		99
005		99
006		100
007	ICV	101
008	CCV	103
009	ICB	102
010	CCB	103
011	BS	102
012	LCS	105
013	LRB	103
014	S	107
015	DIL	107
016	S	103
017		106
018	S	106
019		103
020	S	102
021		105
022	S	104
023		103
024	S	104
025		105
026	S	102
027		103
028	MS	103
029	MSD	105
030	CCV	103
031	CCB	104

Form 9

Analysis Date	varies	
Analytical Method	6020A/6020/200.8	
Digestion Date	varies	
Spiked Value	varies	(ug/L)
Estimated Limit	varies	(ug/L)

Element/Mass	Date	Spike (ug/l)	MDL (ug/l)	Prep Batch
Al-27	4/9/2012	0.50	0.189	MTD-040212-1
Sb-121	3/20/2012	1.00	0.105	MTD-032012-3
As-75	3/20/2012	0.05	0.032	MTD-032012-2
Ba-137	3/20/2012	0.50	0.202	MTD-032012-2
Be-9	4/10/2012	0.10	0.079	MTD-041012-1
B-10	3/20/2012	1.00	0.589	MTD-032012-3
B-11	3/20/2012	1.00	0.277	MTD-032012-3
Cd-111	3/20/2012	0.05	0.038	MTD-032012-2
Cd-114	3/20/2012	0.10	0.030	MTD-032012-2
Cr-52	3/20/2012	0.10	0.023	MTD-032012-2
Cr-53	3/20/2012	0.10	0.054	MTD-032012-2
Co-59	3/20/2012	0.10	0.035	MTD-032012-2
Cu-65	3/20/2012	0.50	0.068	MTD-032012-2
Fe-56	4/9/2012	2.00	0.470	MTD-040912-1
Fe-57	4/9/2012	2.00	0.824	MTD-040912-1
Pb-208	3/20/2012	0.10	0.052	MTD-032012-2
Li-7	3/20/2012	1.00	0.166	MTD-032012-3
Mn-55	3/20/2012	0.10	0.187	MTD-032012-2
Mo-95	4/9/2012	0.50	0.442	MTD-040212-1
Ni-60	4/13/2012	0.10	0.035	MTD-041012-1
Se-78	3/20/2012	0.10	0.058	MTD-032012-2
Se-82	3/20/2012	0.50	0.475	MTD-032012-2
Ag-107	3/20/2012	0.10	0.025	MTD-032012-2
Sr-88	3/20/2012	0.10	0.016	MTD-032012-2
Tl-205	4/9/2012	0.50	0.089	MTD-040212-1
Sn-118	3/20/2012	0.10	0.079	MTD-032012-2
Ti-47	3/20/2012	0.50	0.124	MTD-032012-2
V-51	3/20/2012	0.05	0.018	MTD-032012-2
Zn-66	4/9/2012	2.00	0.366	MTD-040912-1

Element/Mass	Date	Spike (mg/l)	MDL (mg/l)	Prep Batch
Ca-43	4/16/2012	0.01	0.0101	MTD-041012-4
Ca-44	4/16/2012	0.01	0.0041	MTD-041012-4
Mg-24	4/16/2012	0.01	0.0006	MTD-041012-4
K-39	4/16/2012	0.01	0.0030	MTD-041012-4
Na-23	4/16/2012	0.10	0.0101	MTD-041012-4

Linear Range June 2012

		Prep Batch	Run Batch
Aluminum	5.0ppm	MTD-061912-5	MT3-12-0619C
Antimony	5.0ppm	MTD-061912-5	MT3-12-0619C
Arsenic	1.0ppm	MTD-061912-5	MT3-12-0619C
Barium	5.0ppm	MTD-061912-5	MT3-12-0619C
Boron-10	5.0ppm	MTD-061912-5	MT3-12-0619C
Boron-11	5.0ppm	MTD-061912-5	MT3-12-0619C
Beryllium	2.0ppm	MTD-061912-5	MT3-12-0619C
Cadmium-111	5.0ppm	MTD-061912-5	MT3-12-0619C
Cadmium-114	5.0ppm	MTD-061912-5	MT3-12-0619C
Chromium	2.0ppm	MTD-061912-5	MT3-12-0619C
Cobalt	2.0ppm	MTD-061912-5	MT3-12-0619C
Copper	5.0ppm	MTD-061912-5	MT3-12-0619C
Iron-56	5.0ppm	MTD-061912-5	MT3-12-0619C
Iron-57	2.0ppm	MTD-061912-5	MT3-12-0619C
Lead	5.0ppm	MTD-061912-5	MT3-12-0619C
Lithium	2.0ppm	MTD-061912-5	MT3-12-0619C
Manganese	1.0ppm	MTD-061912-5	MT3-12-0619C
Molybdenum	1.0ppm	MTD-061912-5	MT3-12-0619C
Nickel	5.0ppm	MTD-061912-5	MT3-12-0619C
Selenium-78	5.0ppm	MTD-061912-5	MT3-12-0619C
Selenium-82	5.0ppm	MTD-061912-5	MT3-12-0619C
Silver	1.0ppm	MTD-061912-5	MT3-12-0619C
Strontium-86	5.0ppm	MTD-061912-5	MT3-12-0619C
Thallium	5.0ppm	MTD-061912-5	MT3-12-0619C
Tin	1.0ppm	MTD-061912-5	MT3-12-0619C
Titanium	1.0ppm	MTD-061912-5	MT3-12-0619C
Vanadium	1.0ppm	MTD-061912-5	MT3-12-0619C
Zinc	2.0ppm	MTD-061912-5	MT3-12-0619C

Sodium-23	50ppm	MTD-061912-5	MT3-12-0619B
Magnesium-24	50ppm	MTD-061912-5	MT3-12-0619B
Potassium-39	50ppm	MTD-061912-5	MT3-12-0619B
Calcium-43	50ppm	MTD-061912-5	MT3-12-0619B
Calcium-44	50ppm	MTD-061912-5	MT3-12-0619B

Maximum spiking levels are instated to ensure the safety and longevity of the instrument. Any sample results above this level result in extended wash runs and sample dilution.