

Chemical Analysis Report

NW-DIST-2018-02-02-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **NW RUN**
Request ID: **RQ-2018-01-29-19**
Customer: **NW-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
160 Government Center
Suite 208
Pensacola, FL 32502-5794
Attn: Cheryl Bunch

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Certified by: Colin Wright, Program Administrator

Date Certified: 28-FEB-2018 16:20

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light-colored rectangular background.

Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Moore Creek above Chamuckla Springs Road **Collection Date/Time: 02/01/2018 10:30**

Field ID: G4NW0355

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963943	EPA 180.1 Rev. 2.0	Turbidity	2.8	A	NTU	P339262	
	EPA 300.0 Rev. 2.1	Chloride	6.1		mg Cl/L	P339698	
		Sulfate	0.75		mg SO4/L	P339703	
	SM 2120 B	Color (true)	8.7		PCU	P339256	
	SM 2320 B-97	Total Alkalinity	2.0	I	mg CaCO3/L	P339612	
	SM 2540 C-97	TDS	43		mg/L	P339745	
	SM 2540 D-97	TSS	4	I	mg/L	P339684	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P340472	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P339373	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P339273	
1963948	EPA 353.2 Rev. 2.0	NO2NO3-N	2.5		mg N/L	P339335	
	EPA 365.1 Rev. 2.0	Total-P	0.004	I	mg P/L	P339458	
	SM 5310 B-00	Organic Carbon	1.1		mg C/L	P340070	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P339312	
	dissolved						

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: McCostill Mill Creek West Ebenezer Rd. **Collection Date/Time: 02/01/2018 11:10**

Field ID: G4NW0320

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963944	EPA 180.1 Rev. 2.0	Turbidity	0.45		NTU	P339262	
	EPA 300.0 Rev. 2.1	Chloride	6.2		mg Cl/L	P339698	
		Sulfate	0.63		mg SO4/L	P339703	
	SM 2120 B	Color (true)	3.4	I	PCU	P339256	
	SM 2320 B-97	Total Alkalinity	0.65	U	mg CaCO3/L	P339613	
	SM 2540 C-97	TDS	29		mg/L	P339745	
	SM 2540 D-97	TSS	2	I	mg/L	P339684	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P340472	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.002	U	mg N/L	P339373	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P339273	
1963949	EPA 353.2 Rev. 2.0	NO2NO3-N	2.2		mg N/L	P339335	
	EPA 365.1 Rev. 2.0	Total-P	0.002	U	mg P/L	P339458	
	SM 5310 B-00	Organic Carbon	0.61	I	mg C/L	P340070	
	EPA 365.1 Rev. 2.0	O-Phosphate-P	0.004	U	mg P/L	P339312	
	dissolved						

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Big Escambia River downstream of Fannie Rd. **Collection Date/Time: 02/01/2018 11:50**

Field ID: G4NW0421

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963945	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P339262	
	EPA 300.0 Rev. 2.1	Chloride	4.3		mg Cl/L	P339698	
		Sulfate	1.2		mg SO4/L	P339703	

Field ID: G4NW0421

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963945	SM 2120 B	Color (true)	22		PCU	P339256	
	SM 2320 B-97	Total Alkalinity	3.1		mg CaCO3/L	P339613	
	SM 2540 C-97	TDS	26		mg/L	P339745	
	SM 2540 D-97	TSS	3	I	mg/L	P339684	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P340472	
1963950	EPA 350.1 Rev. 2.0	Ammonia-N	0.019		mg N/L	P339678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.11	I	mg N/L	P339273	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.52		mg N/L	P339335	
	EPA 365.1 Rev. 2.0	Total-P	0.009		mg P/L	P339526	
	SM 5310 B-00	Organic Carbon	2.2		mg C/L	P340070	
1963955	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P339312	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Wiggins Branch below Hwy 29

Collection Date/Time: 02/01/2018 12:20

Field ID: G4NW0163

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963946	EPA 180.1 Rev. 2.0	Turbidity	5.6		NTU	P339262	
	EPA 300.0 Rev. 2.1	Chloride	3.3		mg Cl/L	P339698	
		Sulfate	1.4		mg SO4/L	P339703	
	SM 2120 B	Color (true)	32	A	PCU	P339260	
	SM 2320 B-97	Total Alkalinity	9.8		mg CaCO3/L	P339613	
	SM 2540 C-97	TDS	31		mg/L	P339745	
	SM 2540 D-97	TSS	7	I	mg/L	P339684	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P340472	
	EPA 350.1 Rev. 2.0	Ammonia-N	0.067		mg N/L	P339678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.25		mg N/L	P339273	
1963951	EPA 353.2 Rev. 2.0	NO2NO3-N	0.081		mg N/L	P339335	
	EPA 365.1 Rev. 2.0	Total-P	0.012		mg P/L	P339526	
	SM 5310 B-00	Organic Carbon	4.1		mg C/L	P340070	
	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P339312	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Mitchell Creek upstream of Hwy 29

Collection Date/Time: 02/01/2018 12:45

Field ID: G4NW0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963940	EPA 180.1 Rev. 2.0	Turbidity	0.95		NTU	P339262	
	EPA 300.0 Rev. 2.1	Chloride	3.1		mg Cl/L	P339698	
		Sulfate	0.96		mg SO4/L	P339703	
	SM 2120 B	Color (true)	22		PCU	P339256	
	SM 2320 B-97	Total Alkalinity	0.82	I	mg CaCO3/L	P339612	
	SM 2540 C-97	TDS	24	I	mg/L	P339745	
	SM 2540 D-97	TSS	2	I	mg/L	P339684	

Field ID: G4NW0116

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963940	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P340472	
1963941	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P339373	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.080	U	mg N/L	P339273	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.19		mg N/L	P339335	
	EPA 365.1 Rev. 2.0	Total-P	0.003	I	mg P/L	P339458	
	SM 5310 B-00	Organic Carbon	1.8		mg C/L	P340070	
1963942	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P339312	
1963995	EPA 200.7 Rev. 4.4	Calcium	0.47		mg/L	P339319	
		Iron	410		ug/L	P339319	
		Magnesium	0.54		mg/L	P340039	
		Potassium	0.30	U	mg/L	P339319	
		Sodium	2.0		mg/L	P339319	
		Zinc	5.0	U	ug/L	P339319	
	EPA 200.8 Rev. 5.4	Arsenic	0.13	I	ug/L	P339319	
		Cadmium	0.020	U	ug/L	P339319	
		Chromium	0.40	U	ug/L	P339319	
		Copper	0.20	U	ug/L	P339319	
		Lead	0.079	I	ug/L	P339319	
		Nickel	0.52	I	ug/L	P339319	
		Silver	0.010	U	ug/L	P339319	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Sample Location: Little Pine Barren Creek Above CR 99

Collection Date/Time: 02/01/2018 13:30

Field ID: G4NW0420

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1963947	EPA 180.1 Rev. 2.0	Turbidity	1.8		NTU	P339262	
	EPA 300.0 Rev. 2.1	Chloride	6.6	A	mg Cl/L	P339698	
		Sulfate	0.60	A	mg SO4/L	P339703	
	SM 2120 B	Color (true)	16		PCU	P339260	
	SM 2320 B-97	Total Alkalinity	4.2		mg CaCO3/L	P339613	
	SM 2540 C-97	TDS	28		mg/L	P339745	
	SM 2540 D-97	TSS	3	I	mg/L	P339684	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P340472	
1963952	EPA 350.1 Rev. 2.0	Ammonia-N	0.008		mg N/L	P339678	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.093	I	mg N/L	P339273	
	EPA 353.2 Rev. 2.0	NO2NO3-N	1.1		mg N/L	P339335	
	EPA 365.1 Rev. 2.0	Total-P	0.008		mg P/L	P339526	
	SM 5310 B-00	Organic Carbon	1.3		mg C/L	P340070	
1963957	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P339312	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

Quality Assurance Report

Method Blank Results

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339262

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339319

Component	Result	Code	Units
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340039

Component	Result	Code	Units
Magnesium	0.040	U	mg/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339319

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.20	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.20	U	ug/L
Silver	0.010	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339698

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339703

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339373

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339678

Component	Result	Code	Units
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Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339678

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339273

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339335

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339458

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339526

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339312

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2120 B
Batch ID: P339256

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P339260

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P339612

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2320 B-97
Batch ID: P339613

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO ₃ /L

Reference Method: SM 2540 C-97
Batch ID: P339745

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P339684

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P340472

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P340070

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	114		P	85 - 115
Iron	112		P	85 - 115
Potassium	110		P	85 - 115
Sodium	112		P	85 - 115
Zinc	109		P	85 - 115

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340039

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Magnesium	99.0		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	105		P	85 - 115
Cadmium	105		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P339319

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chromium	100		P	85 - 115
Copper	101		P	85 - 115
Lead	101		P	85 - 115
Nickel	104		P	85 - 115
Silver	88.2		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P339698

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	94.1		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P339703

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	92.2		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P339373

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P339678

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.1		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P339273

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	95.1		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
 Batch ID: P339335

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	104		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P339458

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	96.3		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P339526

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
 Batch ID: P339526

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	97.8		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
 Batch ID: P339312

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	94.2		P	90 - 110

Reference Method: SM 2320 B-97
 Batch ID: P339612

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	97.4		P	95 - 108

Reference Method: SM 2320 B-97
 Batch ID: P339613

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	96.8		P	95 - 108

Reference Method: SM 4500 F-C-97
 Batch ID: P340472

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	95.8		P	92 - 103

Reference Method: SM 5310 B-00
 Batch ID: P340070

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	96.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P339319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963444	Calcium	107		P	80 - 120
1963444	Iron	113		P	80 - 120
1963444	Potassium	107		P	80 - 120
1963444	Sodium	105		P	80 - 120
1963444	Zinc	109		P	80 - 120
1963995	Calcium	114	112	P/P	80 - 120
1963995	Iron	115	111	P/P	80 - 120
1963995	Potassium	116	112	P/P	80 - 120
1963995	Sodium	112	108	P/P	80 - 120
1963995	Zinc	109	109	P/P	80 - 120

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
 Batch ID: P340039

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963389	Magnesium	95.6		P	80 - 120
1963561	Magnesium	96.3	96.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
 Batch ID: P339319

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963444	Arsenic	104		P	80 - 120
1963444	Cadmium	105		P	80 - 120
1963444	Chromium	103		P	80 - 120
1963444	Copper	97.5		P	80 - 120
1963444	Lead	102		P	80 - 120
1963444	Nickel	102		P	80 - 120
1963444	Silver	88.8		P	80 - 120
1963995	Arsenic	102	102	P/P	80 - 120
1963995	Cadmium	104	103	P/P	80 - 120
1963995	Chromium	101	100	P/P	80 - 120
1963995	Copper	99.5	100	P/P	80 - 120
1963995	Lead	101	100	P/P	80 - 120
1963995	Nickel	100	100	P/P	80 - 120
1963995	Silver	89.3	88.3	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P339698

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963940	Chloride	96.0		P	90 - 110
1963947	Chloride	96.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
 Batch ID: P339703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963940	Sulfate	94.2		P	90 - 110
1963947	Sulfate	95.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P339373

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963895	Ammonia-N	101	103	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
 Batch ID: P339678

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963952	Ammonia-N	100	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
 Batch ID: P339273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
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Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339273

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963941	Kjeldahl Nitrogen	97.8	103	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339335

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963904	NO2NO3-N	105	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339458

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964069	Total-P	98.6	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339526

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964075	Total-P	97.9	98.6	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339312

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963852	O-Phosphate-P	94.9	96.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P340472

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1964092	Fluoride	98.7	102	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P340070

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1963861	Organic Carbon	97.8	97.4	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P339262

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963943	Turbidity	1.44	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P339319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963995	Calcium	1.76	Spike	P	0 - 20
1963995	Iron	3.39	Spike	P	0 - 20
1963995	Potassium	2.70	Spike	P	0 - 20
1963995	Sodium	2.59	Spike	P	0 - 20
1963995	Zinc	0.451	Spike	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P340039

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963561	Magnesium	0.333	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P339319

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963995	Arsenic	0.0948	Spike	P	0 - 20
1963995	Cadmium	1.11	Spike	P	0 - 20
1963995	Chromium	0.500	Spike	P	0 - 20
1963995	Copper	0.665	Spike	P	0 - 20
1963995	Lead	0.627	Spike	P	0 - 20
1963995	Nickel	0.244	Spike	P	0 - 20
1963995	Silver	1.09	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339698

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963947	Chloride	2.83	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P339703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963947	Sulfate	1.68	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339373

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963895	Ammonia-N	1.14	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P339678

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963952	Ammonia-N	1.66	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P339273

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963941	Kjeldahl Nitrogen	5.23	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P339335

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963904	NO2NO3-N	0.327	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339458

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964069	Total-P	1.19	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P339526

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964075	Total-P	0.661	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P339312

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963852	O-Phosphate-P	1.07	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P339256

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963894	Color (true)	0.755	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P339260

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963946	Color (true)	2.64	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2320 B-97
Batch ID: P339612

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963898	Total Alkalinity	0.0876	Sample	P	0 - 4.8

Reference Method: SM 2320 B-97
Batch ID: P339613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964091	Total Alkalinity	0.144	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P339745

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963900	TDS	1.83	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P340472

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1964092	Fluoride	2.39	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P340070

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1963861	Organic Carbon	0.359	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A81826
Included Lab Sample IDs: 1963940, 1963943, 1963944, 1963945

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	109	105	P/P	85 - 115

Reference Method: SM 2120 B
Run ID: A81828
Included Lab Sample IDs: 1963946, 1963947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	111	109	P/P	85 - 115

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A81829

Included Lab Sample IDs: 1963940, 1963943, 1963944, 1963945, 1963946, 1963947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	101	101	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A81844

Included Lab Sample IDs: 1963942, 1963953, 1963954, 1963955, 1963956, 1963957

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	97.7	P/P	90 - 110
O-Phosphate-P	98.5	98.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A81855

Included Lab Sample IDs: 1963941, 1963948, 1963949, 1963950, 1963951, 1963952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	101	102	P/P	90 - 110
NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A81870

Included Lab Sample IDs: 1963941, 1963948, 1963949, 1963950, 1963951, 1963952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.2	98.6	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A81871

Included Lab Sample IDs: 1963941, 1963948, 1963949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	103	101	P/P	90 - 110
Ammonia-N	103	103	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A81909

Included Lab Sample IDs: 1963995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	95.4	95.3	P/P	90 - 110
Cadmium	96.9	96.0	P/P	90 - 110
Chromium	93.4	93.4	P/P	90 - 110
Copper	95.6	95.1	P/P	90 - 110
Lead	96.7	95.3	P/P	90 - 110
Nickel	96.0	94.9	P/P	90 - 110
Silver	94.7	93.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A81940

Included Lab Sample IDs: 1963995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
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Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A81940

Included Lab Sample IDs: 1963995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	103	105	P/P	90 - 110
Iron	104	105	P/P	90 - 110
Potassium	101	103	P/P	90 - 110
Sodium	101	102	P/P	90 - 110
Zinc	104	104	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A81946

Included Lab Sample IDs: 1963940, 1963943, 1963944, 1963945, 1963946, 1963947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	95.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81948

Included Lab Sample IDs: 1963941, 1963948, 1963949

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	102	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A81956

Included Lab Sample IDs: 1963950, 1963951, 1963952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	105	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A81964

Included Lab Sample IDs: 1963950, 1963951, 1963952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110
Ammonia-N	103	101	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A81969

Included Lab Sample IDs: 1963940, 1963943, 1963944, 1963945, 1963946, 1963947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	100	P/P	90 - 110
Chloride	100	102	P/P	90 - 110
Chloride	99.3	100	P/P	90 - 110
Sulfate	101	99.0	P/P	90 - 110
Sulfate	98.7	101	P/P	90 - 110
Sulfate	99.0	102	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A82106

Included Lab Sample IDs: 1963941, 1963948, 1963949, 1963950, 1963951, 1963952

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	96.2	95.8	P/P	90 - 110
Organic Carbon	96.6	96.2	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A82127

Included Lab Sample IDs: 1963995

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Magnesium	96.8	97.8	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A82245

Included Lab Sample IDs: 1963940, 1963943, 1963944, 1963945, 1963946, 1963947

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.6	P/P	90 - 110
Fluoride	99.1	98.1	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery				Precision	
			LCS				SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						1.44	
EPA 200.7 Rev. 4.4	Calcium	114	107	114	112			1.76
	Iron	112	113	115	111			3.39
	Magnesium	99.0	95.6	96.3	96.7			0.333
	Potassium	110	107	116	112			2.70
	Sodium	112	105	112	108			2.59
	Zinc	109	109	109	109			0.451
EPA 200.8 Rev. 5.4	Arsenic	105	104	102	102			0.0948
	Cadmium	105	105	104	103			1.11
	Chromium	100	103	101	100			0.500
	Copper	101	97.5	99.5	100			0.665
	Lead	101	102	101	100			0.627
	Nickel	104	102	100	100			0.244
	Silver	88.2	88.8	89.3	88.3			1.09
EPA 300.0 Rev. 2.1	Chloride	94.1	96.3	96.0			2.83	
	Sulfate	92.2	95.5	94.2			1.68	
EPA 350.1 Rev. 2.0	Ammonia-N	102	101	103				1.14
	Ammonia-N	98.1	100	102				1.66
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	95.1	97.8	103				5.23
EPA 353.2 Rev. 2.0	NO2NO3-N	104	105	104				0.327
EPA 365.1 Rev. 2.0	Total-P	96.3	98.6	100				1.19
	Total-P	97.8	97.9	98.6				0.661
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	94.2	94.9	96.1				1.07

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	Precision		
				LCS	SMP	MS
SM 2120 B	Color (true)				0.755	
	Color (true)				2.64	
SM 2320 B-97	Total Alkalinity	97.4			0.0876	
	Total Alkalinity	96.8			0.144	
SM 2540 C-97	TDS				1.83	
SM 4500 F-C-97	Fluoride	95.8	98.7 102			2.39
SM 5310 B-00	Organic Carbon	96.4	97.8 97.4			0.359

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1963995
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1963995
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1963941, 1963948, 1963949, 1963950, 1963951, 1963952
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1963941, 1963948, 1963949, 1963950, 1963951, 1963952
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1963941, 1963948, 1963949, 1963950, 1963951, 1963952
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1963941, 1963948, 1963949, 1963950, 1963951, 1963952
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1963942, 1963953, 1963954, 1963955, 1963956, 1963957
SM 2120 B / E31780	True Color measured at 450 nm	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1963941, 1963948, 1963949, 1963950, 1963951, 1963952

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	02/02/2018			02/02/2018 14:20	Tanya Welborn	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
EPA 200.7 Rev. 4.4	02/02/2018	02/05/2018	Elliott D. Healy	02/08/2018	Betina Topolski	1963995
	02/02/2018	02/15/2018	Elliott D. Healy	02/16/2018	Betina Topolski	1963995
EPA 200.8 Rev. 5.4	02/02/2018	02/05/2018	Elliott D. Healy	02/07/2018	Robert K Palmer	1963995
EPA 300.0 Rev. 2.1	02/02/2018			02/09/2018	Julia Storbeck	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
EPA 350.1 Rev. 2.0	02/02/2018			02/05/2018	Ping Hua	1963941, 1963948, 1963949
	02/02/2018			02/09/2018	Julia Storbeck	1963950, 1963951, 1963952
EPA 351.2 Rev. 2.0	02/02/2018	02/05/2018	Adrian Shelby	02/06/2018	Joseph Suarez	1963941, 1963948, 1963949, 1963950, 1963951, 1963952
EPA 353.2 Rev. 2.0	02/02/2018			02/05/2018	Lauren Bottorf	1963941, 1963948, 1963949, 1963950, 1963951, 1963952
EPA 365.1 Rev. 2.0	02/02/2018	02/07/2018	Sima Feizi	02/08/2018	Lipi Saha	1963941, 1963948, 1963949
	02/02/2018	02/08/2018	Sima Feizi	02/09/2018	Lipi Saha	1963950, 1963951, 1963952
EPA 365.1 Rev. 2.0 dissolved	02/02/2018			02/02/2018 15:41	Megan Treadwell	1963942, 1963953
	02/02/2018			02/02/2018 15:47	Megan Treadwell	1963954, 1963955
	02/02/2018			02/02/2018 15:48	Megan Treadwell	1963956
	02/02/2018			02/02/2018 15:49	Megan Treadwell	1963957
SM 2120 B	02/02/2018			02/02/2018 16:02	Tanya Welborn	1963940, 1963943
	02/02/2018			02/02/2018 16:03	Tanya Welborn	1963944
	02/02/2018			02/02/2018 16:04	Tanya Welborn	1963945
	02/02/2018			02/02/2018 16:59	Tanya Welborn	1963946
	02/02/2018			02/02/2018 17:00	Tanya Welborn	1963947
SM 2320 B-97	02/02/2018			02/08/2018	Lauren Bottorf	1963940, 1963943
	02/02/2018			02/09/2018	Lauren Bottorf	1963944, 1963945, 1963946, 1963947
SM 2540 C-97	02/02/2018			02/07/2018	Yijie Li	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 2540 D-97	02/02/2018			02/07/2018	Yijie Li	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 4500 F-C-97	02/02/2018			02/22/2018	Dale L. Simmons	1963940, 1963943, 1963944, 1963945, 1963946, 1963947
SM 5310 B-00	02/02/2018			02/14/2018	Megan Treadwell	1963941, 1963948, 1963949, 1963950
	02/02/2018			02/15/2018	Megan Treadwell	1963951, 1963952