

Chemical Analysis Report

CEN-DIST-2019-01-09-01

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

Event Description: **Downey X2 / Drawdy / Thresa / Charm**
Request ID: **RQ-2019-01-07-37**
Customer: **CEN-DIST**
Project ID: **SMP**

Send Reports to:
FL Dept. of Environmental Protection
FL Dept. of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, FL 32803-3767
Attn: Mike Linger

For additional information please contact
Colin Wright, Ph.D.
Liang-Tsair Lin, Ph.D.
Kerry Tate, Ph.D.
Dr. rer. nat. Bettina Steinbock
Thekkekalathil Chandrasekhar, Ph.D, QA Officer
Phone (850) 245-8085

Certified by: Dr. rer. nat. Bettina Steinbock, Environmental Administrator

Date Certified: 29-JAN-2019 12:26



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: LAKE DOWNEY @ 110M E OF CENTER

Collection Date/Time: 01/08/2019 10:26

Field ID: G2CE0196

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2052768	EPA 180.1 Rev. 2.0	Turbidity	0.90		NTU	P357058	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P357204	
		Sulfate	4.6		mg SO4/L	P357206	
	SM 2120 B	Color (true)	34		PCU	P357036	
	SM 2320 B-97	Total Alkalinity	11		mg CaCO3/L	P357389	
	SM 2540 C-97	TDS	61		mg/L	P357443	
	SM 2540 D-97	TSS	2	U	mg/L	P357571	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P357523	
2052770	EPA 350.1 Rev. 2.0	Ammonia-N	0.028		mg N/L	P357246	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.62		mg N/L	P357220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.016		mg N/L	P357133	
	EPA 365.1 Rev. 2.0	Total-P	0.010		mg P/L	P357218	
	SM 5310 B-00	Organic Carbon	9.7		mg C/L	P357196	
2052772	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P357034	
2052800	EPA 200.7 Rev. 4.4	Barium	6.8		ug/L	P357021	
		Calcium	5.53		mg/L	P357021	
		Iron	31	I	ug/L	P357021	
		Magnesium	1.39		mg/L	P357021	
		Potassium	1.3		mg/L	P357021	
		Sodium	15.6		mg/L	P357021	
		Zinc	5.0	U	ug/L	P357021	
	EPA 200.8 Rev. 5.4	Aluminum	32		ug/L	P357021	
		Antimony	0.079	I	ug/L	P357021	
		Arsenic	2.66		ug/L	P357021	
		Boron**	33.5		ug/L	P357021	
		Cadmium	0.020	U	ug/L	P357021	
		Chromium	0.42	I	ug/L	P357021	
		Copper	0.74	I	ug/L	P357021	
		Lead	0.20	U	ug/L	P357021	
		Nickel	0.50	U	ug/L	P357021	
		Selenium	0.20	U	ug/L	P357021	
		Silver	0.010	U	ug/L	P357021	
		Thallium	0.10	U	ug/L	P357021	

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: LAKE DOWNEY @ 110M W OF CENTER

Collection Date/Time: 01/08/2019 10:36

Field ID: G2CE0197

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2052769	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P357058	
	EPA 300.0 Rev. 2.1	Chloride	23		mg Cl/L	P357204	
		Sulfate	4.6		mg SO4/L	P357206	
	SM 2120 B	Color (true)	34		PCU	P357037	
	SM 2320 B-97	Total Alkalinity	11		mg CaCO3/L	P357389	
	SM 2540 C-97	TDS	74		mg/L	P357443	
	SM 2540 D-97	TSS	2	I	mg/L	P357571	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P357523	
2052771	EPA 350.1 Rev. 2.0	Ammonia-N	0.027		mg N/L	P357246	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.59		mg N/L	P357220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.018		mg N/L	P357133	
	EPA 365.1 Rev. 2.0	Total-P	0.011		mg P/L	P357218	
	SM 5310 B-00	Organic Carbon	9.8		mg C/L	P357196	
2052773	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P357034	
2052801	EPA 200.7 Rev. 4.4	Barium	6.9		ug/L	P357021	
		Calcium	5.60		mg/L	P357021	
		Iron	30	I	ug/L	P357021	
		Magnesium	1.42		mg/L	P357021	
		Potassium	1.3		mg/L	P357021	
		Sodium	15.7		mg/L	P357021	
		Zinc	5.0	U	ug/L	P357021	
	EPA 200.8 Rev. 5.4	Aluminum	32		ug/L	P357021	
		Antimony	0.082	I	ug/L	P357021	
		Arsenic	2.75		ug/L	P357021	
		Boron**	34.3		ug/L	P357021	
		Cadmium	0.020	U	ug/L	P357021	
		Chromium	0.40	U	ug/L	P357021	
		Copper	0.75	I	ug/L	P357021	
		Lead	0.20	U	ug/L	P357021	
		Nickel	0.50	U	ug/L	P357021	
		Selenium	0.20	U	ug/L	P357021	
		Silver	0.010	U	ug/L	P357021	
		Thallium	0.10	U	ug/L	P357021	

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: LAKE DRAWDY @ 150M NNE OF CENTER

Collection Date/Time: 01/08/2019 11:45

Field ID: G2CE0079

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2052774	EPA 180.1 Rev. 2.0	Turbidity	1.1		NTU	P357058	
	EPA 300.0 Rev. 2.1	Chloride	22		mg Cl/L	P357204	
		Sulfate	8.3		mg SO4/L	P357206	
	SM 2120 B	Color (true)	220		PCU	P357037	
	SM 2320 B-97	Total Alkalinity	5.1		mg CaCO3/L	P357389	
	SM 2540 C-97	TDS	92		mg/L	P357443	
	SM 2540 D-97	TSS	2	I	mg/L	P357571	
	SM 4500 F-C-97	Fluoride	0.035	U	mg F/L	P357523	
2052777	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P357246	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.68		mg N/L	P357220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.21		mg N/L	P357133	
	EPA 365.1 Rev. 2.0	Total-P	0.016		mg P/L	P357218	
	SM 5310 B-00	Organic Carbon	20		mg C/L	P357196	
2052780	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P357034	

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: LAKE CHARM @ CENTER

Collection Date/Time: 01/08/2019 12:24

Field ID: G2CE0080

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2052775	EPA 180.1 Rev. 2.0	Turbidity	6.6		NTU	P357058	
	EPA 300.0 Rev. 2.1	Chloride	41		mg Cl/L	P357204	
		Sulfate	13		mg SO4/L	P357206	
	SM 2120 B	Color (true)	22		PCU	P357037	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P357389	
	SM 2540 C-97	TDS	152		mg/L	P357443	
	SM 2540 D-97	TSS	3	I	mg/L	P357571	
	SM 4500 F-C-97	Fluoride	0.21		mg F/L	P357523	
2052778	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P357246	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P357220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P357133	
	EPA 365.1 Rev. 2.0	Total-P	0.040		mg P/L	P357218	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P357196	
2052781	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P357034	

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: LAKE THERESA @ CENTER

Collection Date/Time: 01/08/2019 13:18

Field ID: G4CE0151

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2052776	EPA 180.1 Rev. 2.0	Turbidity	3.5		NTU	P357058	
	EPA 300.0 Rev. 2.1	Chloride	10		mg Cl/L	P357204	
		Sulfate	2.1		mg SO4/L	P357206	
	SM 2120 B	Color (true)	24		PCU	P357037	
	SM 2320 B-97	Total Alkalinity	83		mg CaCO3/L	P357389	
	SM 2540 C-97	TDS	113	A	mg/L	P357443	
	SM 2540 D-97	TSS	2	IA	mg/L	P357571	
	SM 4500 F-C-97	Fluoride	0.10		mg F/L	P357523	
2052779	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P357246	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P357220	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P357133	
	EPA 365.1 Rev. 2.0	Total-P	0.064		mg P/L	P357218	
	SM 5310 B-00	Organic Carbon	8.4		mg C/L	P357196	
2052782	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P357034	

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

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P357058

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357021

Component	Result	Code	Units
Barium	1.0	U	ug/L
Calcium	0.075	U	mg/L
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Potassium	0.30	U	mg/L
Sodium	0.50	U	mg/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Boron	2.0	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357204

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357206

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357246

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357220

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357133

Component	Result	Code	Units
NO ₂ NO ₃ -N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357218

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357034

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

Reference Method: SM 2120 B
Batch ID: P357036

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P357037

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P357389

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

Reference Method: SM 2540 C-97
Batch ID: P357443

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P357571

Component	Result	Code	Units
TSS	2	U	mg/L

Quality Assurance Report

Method Blank Results

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P357196

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: P357021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Barium	102		P	85 - 115
Calcium	102		P	85 - 115
Iron	106		P	85 - 115
Magnesium	109		P	85 - 115
Potassium	103		P	85 - 115
Sodium	102		P	85 - 115
Zinc	99.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	99.7		P	85 - 115
Antimony	98.6		P	85 - 115
Arsenic	103		P	85 - 115
Boron	96.7		P	85 - 115
Cadmium	98.1		P	85 - 115
Chromium	96.8		P	85 - 115
Copper	100		P	85 - 115
Lead	96.5		P	85 - 115
Nickel	100		P	85 - 115
Selenium	102		P	85 - 115
Silver	102		P	85 - 115
Thallium	97.8		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357204

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	98.2		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357206

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	95.5		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357246

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357220

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	106		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357133

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357218

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357034

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	100		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P357036

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2120 B
Batch ID: P357037

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	104		P	85 - 115

Reference Method: SM 2320 B-97
Batch ID: P357389

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	101		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.2		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P357196

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.4		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052801	Barium	101	100	P/P	80 - 120
2052801	Calcium	100		P	80 - 120
2052801	Iron	104	104	P/P	80 - 120
2052801	Magnesium	104	104	P/P	80 - 120
2052801	Potassium	100	99.9	P/P	80 - 120
2052801	Sodium	102		P	80 - 120
2052801	Zinc	103	103	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052801	Aluminum	98.4	97.4	P/P	80 - 120
2052801	Antimony	99.0	99.8	P/P	80 - 120
2052801	Arsenic	101	101	P/P	80 - 120
2052801	Boron	98.9	97.0	P/P	80 - 120
2052801	Cadmium	101	102	P/P	80 - 120
2052801	Chromium	99.3	98.8	P/P	80 - 120
2052801	Copper	101	99.7	P/P	80 - 120
2052801	Lead	98.5	97.6	P/P	80 - 120
2052801	Nickel	100	99.9	P/P	80 - 120
2052801	Selenium	98.0	99.7	P/P	80 - 120
2052801	Silver	103	104	P/P	80 - 120
2052801	Thallium	106	105	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357204

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052768	Chloride	93.0		P	90 - 110
2052878	Chloride	97.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357206

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052768	Sulfate	95.2		P	90 - 110
2052878	Sulfate	96.3		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357246

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052770	Ammonia-N	103	99.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357220

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052778	Kjeldahl Nitrogen	99.0	99.0	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357133

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052770	NO2NO3-N	103	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357218

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052813	Total-P	101	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357034

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052772	O-Phosphate-P	95.3	96.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052880	Fluoride	101	103	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P357196

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2052770	Organic Carbon	99.9	99.3	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P357058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052757	Turbidity	6.33	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P357021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052801	Barium	0.179	Spike	P	0 - 20
2052801	Calcium	0.139	Spike	P	0 - 20
2052801	Iron	0.0709	Spike	P	0 - 20
2052801	Magnesium	0.318	Spike	P	0 - 20
2052801	Potassium	0.0308	Spike	P	0 - 20
2052801	Sodium	0.226	Spike	P	0 - 20
2052801	Zinc	0.0547	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P357021

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052801	Aluminum	1.01	Spike	P	0 - 20
2052801	Antimony	0.765	Spike	P	0 - 20
2052801	Arsenic	0.671	Spike	P	0 - 20
2052801	Boron	1.46	Spike	P	0 - 20
2052801	Cadmium	1.12	Spike	P	0 - 20
2052801	Chromium	0.533	Spike	P	0 - 20
2052801	Copper	1.32	Spike	P	0 - 20
2052801	Lead	0.873	Spike	P	0 - 20
2052801	Nickel	0.385	Spike	P	0 - 20
2052801	Selenium	1.71	Spike	P	0 - 20
2052801	Silver	1.18	Spike	P	0 - 20
2052801	Thallium	0.593	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357204

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052878	Chloride	0.758	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P357206

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052878	Sulfate	0.156	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P357246

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052770	Ammonia-N	2.34	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P357220

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052778	Kjeldahl Nitrogen	0.0352	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P357133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052770	NO2NO3-N	0.449	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P357218

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052813	Total-P	1.75	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P357034

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052772	O-Phosphate-P	1.46	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P357036

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052755	Color (true)	2.80	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P357037

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052816	Color (true)	0.294	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P357389

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052880	Total Alkalinity	0.752	Sample	P	0 - 1.6

Quality Assurance Report Precision

Reference Method: SM 2540 C-97
Batch ID: P357443

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052776	TDS	3.54	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P357523

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052880	Fluoride	1.01	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P357196

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2052770	Organic Carbon	0.406	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: EPA 365.1 Rev. 2.0 dissolved

Run ID: A88720

Included Lab Sample IDs: 2052772, 2052773, 2052780, 2052781, 2052782

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.9	98.1	P/P	90 - 110
O-Phosphate-P	99.8	99.0	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A88721

Included Lab Sample IDs: 2052768, 2052769, 2052774, 2052775, 2052776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	104	P/P	90 - 115
Color (true)	104	106	P/P	90 - 115
Color (true)	104	104	P/P	90 - 115

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A88736

Included Lab Sample IDs: 2052768, 2052769, 2052774, 2052775, 2052776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	100	P/P	95 - 105

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A88750

Included Lab Sample IDs: 2052800, 2052801

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Barium	102	103	P/P	90 - 110
Barium	103	103	P/P	90 - 110
Calcium	100	101	P/P	90 - 110
Calcium	100	100	P/P	90 - 110
Iron	100	100	P/P	90 - 110
Iron	101	100	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Magnesium	101	101	P/P	90 - 110
Potassium	99.2	99.7	P/P	90 - 110
Potassium	99.3	99.2	P/P	90 - 110
Sodium	100	101	P/P	90 - 110
Sodium	101	101	P/P	90 - 110
Zinc	102	103	P/P	90 - 110
Zinc	103	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A88763

Included Lab Sample IDs: 2052770, 2052771, 2052777, 2052778, 2052779

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

Reference Method: SM 5310 B-00

Run ID: A88786

Included Lab Sample IDs: 2052770, 2052771, 2052777, 2052778, 2052779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
-----------	---------	---------	------------	----------------

Quality Assurance Report Calibration Verification

Reference Method: SM 5310 B-00

Run ID: A88786

Included Lab Sample IDs: 2052770, 2052771, 2052777, 2052778, 2052779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.2	99.6	P/P	90 - 110
Organic Carbon	99.6	99.8	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A88788

Included Lab Sample IDs: 2052768, 2052769, 2052774, 2052775, 2052776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	100	101	P/P	90 - 110
Chloride	99.3	100	P/P	90 - 110
Sulfate	99.4	100	P/P	90 - 110
Sulfate	100	99.4	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A88802

Included Lab Sample IDs: 2052770, 2052771, 2052777, 2052778, 2052779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	101	P/P	90 - 110
Ammonia-N	99.9	101	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A88815

Included Lab Sample IDs: 2052770, 2052771, 2052777, 2052778, 2052779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88828

Included Lab Sample IDs: 2052779

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	102	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A88845

Included Lab Sample IDs: 2052770, 2052771, 2052777, 2052778

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

Reference Method: SM 2320 B-97

Run ID: A88858

Included Lab Sample IDs: 2052768, 2052769, 2052774, 2052775, 2052776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	100	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 4500 F-C-97

Run ID: A88903

Included Lab Sample IDs: 2052768, 2052769, 2052774, 2052775, 2052776

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	101	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88929

Included Lab Sample IDs: 2052800, 2052801

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Antimony	101	100	P/P	90 - 110
Arsenic	104	101	P/P	90 - 110
Boron	93.1	101	P/P	90 - 110
Cadmium	100	101	P/P	90 - 110
Chromium	99.7	101	P/P	90 - 110
Copper	102	104	P/P	90 - 110
Lead	100	100	P/P	90 - 110
Nickel	101	103	P/P	90 - 110
Selenium	103	101	P/P	90 - 110
Silver	103	103	P/P	90 - 110
Thallium	96.5	98.0	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A88979

Included Lab Sample IDs: 2052800, 2052801

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	102	102	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					6.33
EPA 200.7 Rev. 4.4	Barium	102	101	100		0.179
	Calcium	102	100			0.139
	Iron	106	104	104		0.0709
	Magnesium	109	104	104		0.318
	Potassium	103	100	99.9		0.0308
	Sodium	102	102			0.226
	Zinc	99.3	103	103		0.0547
EPA 200.8 Rev. 5.4	Aluminum	99.7	98.4	97.4		1.01
	Antimony	98.6	99.0	99.8		0.765
	Arsenic	103	101	101		0.671
	Boron	96.7	98.9	97.0		1.46
	Cadmium	98.1	101	102		1.12
	Chromium	96.8	99.3	98.8		0.533
	Copper	100	101	99.7		1.32
	Lead	96.5	98.5	97.6		0.873
	Nickel	100	100	99.9		0.385
	Selenium	102	98.0	99.7		1.71
	Silver	102	103	104		1.18
	Thallium	97.8	106	105		0.593
EPA 300.0 Rev. 2.1	Chloride	98.2	97.3	93.0		0.758
	Sulfate	95.5	96.3	95.2		0.156
EPA 350.1 Rev. 2.0	Ammonia-N	100	103	99.8		2.34
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	106	99.0	99.0		0.0352
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	102	103	103		0.449
EPA 365.1 Rev. 2.0	Total-P	104	101	99.5		1.75
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	95.3	96.7		1.46
SM 2120 B	Color (true)	104				2.80
	Color (true)	104				0.294
SM 2320 B-97	Total Alkalinity	101				0.752
SM 2540 C-97	TDS					3.54
SM 4500 F-C-97	Fluoride	98.2	101	103		1.01
SM 5310 B-00	Organic Carbon	98.4	99.9	99.3		0.406

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2052768, 2052769, 2052774, 2052775, 2052776
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2052800, 2052801
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2052800, 2052801
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2052768, 2052769, 2052774, 2052775, 2052776
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2052768, 2052769, 2052774, 2052775, 2052776
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2052770, 2052771, 2052777, 2052778, 2052779
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2052770, 2052771, 2052777, 2052778, 2052779
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2052770, 2052771, 2052777, 2052778, 2052779
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2052770, 2052771, 2052777, 2052778, 2052779

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780 SM 2120 B / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L True Color measured at 450 nm	2052772, 2052773, 2052780, 2052781, 2052782 2052768, 2052769, 2052774, 2052775, 2052776
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2052768, 2052769, 2052774, 2052775, 2052776
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2052768, 2052769, 2052774, 2052775, 2052776
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2052768, 2052769, 2052774, 2052775, 2052776
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2052768, 2052769, 2052774, 2052775, 2052776
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2052770, 2052771, 2052777, 2052778, 2052779

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	01/09/2019			01/09/2019 14:47	Megan Treadwell	2052768, 2052769, 2052774, 2052775, 2052776
EPA 200.7 Rev. 4.4	01/09/2019	01/09/2019 15:30	Elliott D. Healy	01/10/2019 14:23	Betina Topolski	2052800
	01/09/2019	01/09/2019 15:30	Elliott D. Healy	01/10/2019 14:54	Betina Topolski	2052801
EPA 200.8 Rev. 5.4	01/09/2019	01/09/2019 15:30	Elliott D. Healy	01/19/2019 11:30	Robert K Palmer	2052800
	01/09/2019	01/09/2019 15:30	Elliott D. Healy	01/19/2019 11:40	Robert K Palmer	2052801
	01/09/2019	01/19/2019 15:30	Elliott D. Healy	01/23/2019 15:00	Robert K Palmer	2052800
	01/09/2019	01/19/2019 15:30	Elliott D. Healy	01/23/2019 15:09	Robert K Palmer	2052801
EPA 300.0 Rev. 2.1	01/09/2019			01/11/2019 15:29	Lipi Saha	2052768
	01/09/2019			01/11/2019 16:17	Lipi Saha	2052769
	01/09/2019			01/11/2019 16:29	Lipi Saha	2052774
	01/09/2019			01/11/2019 17:05	Lipi Saha	2052775
	01/09/2019			01/11/2019 17:17	Lipi Saha	2052776
EPA 350.1 Rev. 2.0	01/09/2019			01/14/2019 12:35	Ping Hua	2052770
	01/09/2019			01/14/2019 12:40	Ping Hua	2052771
	01/09/2019			01/14/2019 12:41	Ping Hua	2052777
	01/09/2019			01/14/2019 12:49	Ping Hua	2052778
	01/09/2019			01/14/2019 12:50	Ping Hua	2052779
EPA 351.2 Rev. 2.0	01/09/2019	01/14/2019 11:25	Adrian Shelby	01/15/2019 11:58	Joseph Suarez	2052770
	01/09/2019	01/14/2019 11:25	Adrian Shelby	01/15/2019 11:59	Joseph Suarez	2052771
	01/09/2019	01/14/2019 11:25	Adrian Shelby	01/15/2019 12:01	Joseph Suarez	2052777
	01/09/2019	01/14/2019 11:25	Adrian Shelby	01/15/2019 12:02	Joseph Suarez	2052778
	01/09/2019	01/14/2019 11:25	Adrian Shelby	01/15/2019 12:07	Joseph Suarez	2052779
EPA 353.2 Rev. 2.0	01/09/2019			01/11/2019 09:32	Beverly Y. Sanders	2052770
	01/09/2019			01/11/2019 09:39	Beverly Y. Sanders	2052771
	01/09/2019			01/11/2019 09:40	Beverly Y. Sanders	2052777
	01/09/2019			01/11/2019 09:41	Beverly Y. Sanders	2052778
	01/09/2019			01/11/2019 09:43	Beverly Y. Sanders	2052779
EPA 365.1 Rev. 2.0	01/09/2019	01/14/2019 12:30	Sima Feizi	01/15/2019 13:31	Rosalyn Ballman	2052779
	01/09/2019	01/14/2019 12:30	Sima Feizi	01/15/2019 17:55	Rosalyn Ballman	2052770
	01/09/2019	01/14/2019 12:30	Sima Feizi	01/15/2019 17:56	Rosalyn Ballman	2052771
	01/09/2019	01/14/2019 12:30	Sima Feizi	01/15/2019 17:57	Rosalyn Ballman	2052777
	01/09/2019	01/14/2019 12:30	Sima Feizi	01/15/2019 17:58	Rosalyn Ballman	2052778
EPA 365.1 Rev. 2.0 dissolved	01/09/2019			01/09/2019 15:15	Jhamieka S. Greenwood	2052772
	01/09/2019			01/09/2019 15:50	Jhamieka S. Greenwood	2052773
	01/09/2019			01/09/2019 15:51	Jhamieka S. Greenwood	2052780
	01/09/2019			01/09/2019 15:52	Jhamieka S. Greenwood	2052781
	01/09/2019			01/09/2019 15:53	Jhamieka S. Greenwood	2052782
SM 2120 B	01/09/2019			01/09/2019 15:38	Chelsea Hernandez	2052768
	01/09/2019			01/09/2019 15:42	Chelsea Hernandez	2052769

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2120 B	01/09/2019			01/09/2019 15:43	Chelsea Hernandez	2052775
	01/09/2019			01/09/2019 15:44	Chelsea Hernandez	2052776
	01/09/2019			01/09/2019 16:19	Chelsea Hernandez	2052774
SM 2320 B-97	01/09/2019			01/16/2019 11:07	Dale L. Simmons	2052768
	01/09/2019			01/16/2019 11:22	Dale L. Simmons	2052769
	01/09/2019			01/16/2019 11:37	Dale L. Simmons	2052774
	01/09/2019			01/16/2019 11:54	Dale L. Simmons	2052775
	01/09/2019			01/16/2019 12:10	Dale L. Simmons	2052776
SM 2540 C-97	01/09/2019			01/10/2019 14:35	Yijie Li	2052768, 2052769, 2052774, 2052775, 2052776
SM 2540 D-97	01/09/2019			01/10/2019 14:35	Yijie Li	2052768, 2052769, 2052774, 2052775, 2052776
SM 4500 F-C-97	01/09/2019			01/18/2019 03:59	Dale L. Simmons	2052768
	01/09/2019			01/18/2019 04:06	Dale L. Simmons	2052769
	01/09/2019			01/18/2019 04:15	Dale L. Simmons	2052774
	01/09/2019			01/18/2019 04:22	Dale L. Simmons	2052775
	01/09/2019			01/18/2019 04:30	Dale L. Simmons	2052776
SM 5310 B-00	01/09/2019			01/11/2019 20:40	Megan Treadwell	2052770
	01/09/2019			01/11/2019 21:54	Megan Treadwell	2052771
	01/09/2019			01/11/2019 22:06	Megan Treadwell	2052777
	01/09/2019			01/11/2019 22:18	Megan Treadwell	2052778
	01/09/2019			01/11/2019 22:30	Megan Treadwell	2052779