

Chemical Analysis Report

CEN-DIST-2016-01-21-01

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

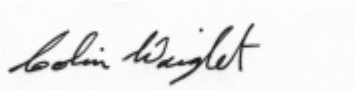
Event Description: **Clear Lk Outlet+HA/Lk Hart**
Request ID: **RQ-2016-01-18-31**
Customer: **CEN-DIST**
Project ID: **SMP**

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

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Certified by: Colin Wright, Environmental Administrator

Date Certified: 17-FEB-2016 09:46

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: CLEAR LAKE OUTLET @ CHANDLER ST.

Collection Date/Time: 01/20/2016 11:10

Field ID: G4CE0080

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1764364	EPA 180.1 Rev. 2.0	Turbidity	2.4		NTU	P297387	
	EPA 300.0 Rev. 2.1	Chloride	13		mg Cl/L	P297815	
		Sulfate	13	A	mg SO4/L	P297775	
	SM 2120 B	Color (true)	12	A	PCU	P297380	
	SM 2320 B-97	Total Alkalinity	62		mg CaCO3/L	P297521	
	SM 2540 C-97	TDS	118	A	mg/L	P298059	
	SM 2540 D-97	TSS	4	I	mg/L	P297893	
	SM 4500 F-C-97	Fluoride	0.074	I	mg F/L	P297515	
1764365	EPA 350.1 Rev. 2.0	Ammonia-N	0.025		mg N/L	P297793	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.92		mg N/L	P297577	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.015		mg N/L	P297724	
	EPA 365.1 Rev. 2.0	Total-P	0.053		mg P/L	P297532	
	SM 5310 B-00	Organic Carbon	6.0		mg C/L	P297729	
1764366	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P297390	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Sample Location: LAKE HART MIDRADIAL NORTH

Collection Date/Time: 01/20/2016 11:54

Field ID: G4CE0081

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1764355	EPA 180.1 Rev. 2.0	Turbidity	4.1		NTU	P297386	
	EPA 300.0 Rev. 2.1	Chloride	18		mg Cl/L	P297683	
		Sulfate	6.4		mg SO4/L	P297681	
	SM 2120 B	Color (true)	310		PCU	P297380	
	SM 2320 B-97	Total Alkalinity	4.5		mg CaCO3/L	P297521	
	SM 2540 C-97	TDS	97		mg/L	P298058	
	SM 2540 D-97	TSS	2	U	mg/L	P297892	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P297515	
1764358	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P297793	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.85		mg N/L	P297536	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.099		mg N/L	P297724	
	EPA 365.1 Rev. 2.0	Total-P	0.031		mg P/L	P297529	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P297475	
1764361	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P297390	
1764375	EPA 200.7 Rev. 4.4	Calcium	5.96		mg/L	P297558	
		Iron	930		ug/L	P297558	
		Magnesium	1.87		mg/L	P297558	
		Potassium	1.6		mg/L	P297558	
		Sodium	10.9		mg/L	P297558	
		Zinc	5.0	U	ug/L	P297558	
	EPA 200.8 Rev. 5.4	Arsenic	0.68		ug/L	P297558	
		Cadmium	0.020	U	ug/L	P297558	

Field ID: G4CE0081

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1764375	EPA 200.8 Rev. 5.4	Chromium	0.66		ug/L	P297558	
		Copper	0.80		ug/L	P297558	
		Lead	0.60		ug/L	P297558	
		Nickel	0.43		ug/L	P297558	
		Silver	0.0050	U	ug/L	P297558	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 02/16/2016.

Sample Location: LAKE HART CENTER OF LAKE

Collection Date/Time: 01/20/2016 12:01

Field ID: G4CE0082

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1764356	EPA 180.1 Rev. 2.0	Turbidity	4.6		NTU	P297386	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P297815	
		Sulfate	6.1		mg SO4/L	P297775	
	SM 2120 B	Color (true)	310		PCU	P297380	
	SM 2320 B-97	Total Alkalinity	4.5		mg CaCO3/L	P297521	
	SM 2540 C-97	TDS	99		mg/L	P298058	
	SM 2540 D-97	TSS	2	I	mg/L	P297892	
	SM 4500 F-C-97	Fluoride	0.043	I	mg F/L	P297515	
1764359	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P297793	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.86		mg N/L	P297536	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P297724	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P297532	
	SM 5310 B-00	Organic Carbon	21		mg C/L	P297475	
1764362	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.006	I	mg P/L	P297390	
1764376	EPA 200.7 Rev. 4.4	Calcium	5.80		mg/L	P297558	
		Iron	980		ug/L	P297558	
		Magnesium	1.89		mg/L	P297558	
		Potassium	1.5		mg/L	P297558	
		Sodium	10.8		mg/L	P297558	
		Zinc	5.0	U	ug/L	P297558	
	EPA 200.8 Rev. 5.4	Arsenic	0.71		ug/L	P297558	
		Cadmium	0.020	U	ug/L	P297558	
		Chromium	0.63		ug/L	P297558	
		Copper	0.74		ug/L	P297558	
		Lead	0.62		ug/L	P297558	
		Nickel	0.41		ug/L	P297558	
		Silver	0.0050	U	ug/L	P297558	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 02/16/2016.

Sample Location: LAKE HART MIDRADIAL SOUTH

Collection Date/Time: 01/20/2016 12:15

Field ID: G4CE0083

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1764357	EPA 180.1 Rev. 2.0	Turbidity	4.6	A	NTU	P297387	
	EPA 300.0 Rev. 2.1	Chloride	17		mg Cl/L	P297815	
		Sulfate	6.0		mg SO4/L	P297775	
	SM 2120 B	Color (true)	310		PCU	P297380	
	SM 2320 B-97	Total Alkalinity	4.3		mg CaCO3/L	P297521	
	SM 2540 C-97	TDS	99		mg/L	P298059	
	SM 2540 D-97	TSS	2	U	mg/L	P297893	
	SM 4500 F-C-97	Fluoride	0.044	I	mg F/L	P297515	
1764360	EPA 350.1 Rev. 2.0	Ammonia-N	0.011		mg N/L	P297793	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.95		mg N/L	P297536	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.10		mg N/L	P297724	
	EPA 365.1 Rev. 2.0	Total-P	0.032		mg P/L	P297532	
	SM 5310 B-00	Organic Carbon	24		mg C/L	P297729	
1764363	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.007	I	mg P/L	P297390	
1764377	EPA 200.7 Rev. 4.4	Calcium	5.79		mg/L	P297558	
		Iron	990		ug/L	P297558	
		Magnesium	1.89		mg/L	P297558	
		Potassium	1.5		mg/L	P297558	
		Sodium	10.8		mg/L	P297558	
		Zinc	5.0	U	ug/L	P297558	
	EPA 200.8 Rev. 5.4	Arsenic	0.70		ug/L	P297558	
		Cadmium	0.020	U	ug/L	P297558	
		Chromium	0.62		ug/L	P297558	
		Copper	0.75		ug/L	P297558	
		Lead	0.62		ug/L	P297558	
		Nickel	0.41		ug/L	P297558	
		Silver	0.0050	U	ug/L	P297558	

Ref. Method and Comment:

SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.

EPA 351.2 Rev. 2.0: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 02/16/2016.

Quality Assurance Report

Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P297386

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 180.1 Rev. 2.0

Batch ID: P297387

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Quality Assurance Report Method Blank Results

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P297558

Component	Result	Code	Units
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: P297558

Component	Result	Code	Units
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.050	U	ug/L
Copper	0.10	U	ug/L
Lead	0.050	U	ug/L
Nickel	0.050	U	ug/L
Silver	0.0050	U	ug/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297681

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297683

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297775

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297793

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: P297536

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297577

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297724

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297532

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297390

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

Reference Method: SM 2120 B
Batch ID: P297380

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P297521

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

Reference Method: SM 2540 C-97
Batch ID: P298058

Component	Result	Code	Units
TDS	15	U	mg/L

Quality Assurance Report Method Blank Results

Reference Method: SM 2540 C-97
Batch ID: P298059

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P297892

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P297893

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P297515

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P297475

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

Reference Method: SM 5310 B-00
Batch ID: P297729

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: P297558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	106		P	85 - 115
Iron	103		P	85 - 115
Magnesium	111		P	85 - 115
Potassium	108		P	85 - 115
Sodium	106		P	85 - 115
Zinc	97.6		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P297558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	99.4		P	85 - 115

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P297558

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Cadmium	95.9		P	85 - 115
Chromium	97.7		P	85 - 115
Copper	96.4		P	85 - 115
Lead	90.4		P	85 - 115
Nickel	97.8		P	85 - 115
Silver	98.3		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297681

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	93.9		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297683

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297775

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	109		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297793

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: P297536

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297577

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: P297724

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: P297529

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297532

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	99.1		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297390

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

Reference Method: SM 2320 B-97
Batch ID: P297521

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 105

Reference Method: SM 4500 F-C-97
Batch ID: P297515

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.5		P	94 - 108

Reference Method: SM 5310 B-00
Batch ID: P297475

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.6		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P297729

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	92.5		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P297558

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

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P297558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764126	Calcium	105	105	P/P	80 - 120
1764126	Iron	103	103	P/P	80 - 120
1764126	Magnesium	108	108	P/P	80 - 120
1764126	Potassium	107	106	P/P	80 - 120
1764126	Sodium	101	102	P/P	80 - 120
1764126	Zinc	97.3	97.5	P/P	80 - 120
1764176	Calcium	99.8		P	80 - 120
1764176	Iron	100		P	80 - 120
1764176	Magnesium	99.7		P	80 - 120
1764176	Potassium	105		P	80 - 120
1764176	Sodium	104		P	80 - 120
1764176	Zinc	97.7		P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P297558

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764126	Arsenic	98.2	99.1	P/P	80 - 120
1764126	Cadmium	96.0	98.0	P/P	80 - 120
1764126	Chromium	96.3	97.8	P/P	80 - 120
1764126	Copper	96.0	95.7	P/P	80 - 120
1764126	Lead	90.6	90.7	P/P	80 - 120
1764126	Nickel	96.6	97.7	P/P	80 - 120
1764126	Silver	97.7	97.9	P/P	80 - 120
1764176	Arsenic	102		P	80 - 120
1764176	Cadmium	98.4		P	80 - 120
1764176	Chromium	96.6		P	80 - 120
1764176	Copper	94.4		P	80 - 120
1764176	Lead	92.1		P	80 - 120
1764176	Nickel	96.2		P	80 - 120
1764176	Silver	97.4		P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297681

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764067	Sulfate	101		P	90 - 110
1764068	Sulfate	95.5		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297683

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764067	Chloride	104		P	90 - 110
1764068	Chloride	104		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297775

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764364	Sulfate	104		P	90 - 110
1764425	Sulfate	105		P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1765664	Chloride	99.8		P	90 - 110
1765665	Chloride	99.1		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297793

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764358	Ammonia-N	108	109	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297724

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764385	NO2NO3-N	99.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297529

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764136	Total-P	101	103	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297532

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764359	Total-P	98.0	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297390

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764152	O-Phosphate-P	99.1	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P297515

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764135	Fluoride	95.6	97.7	P/P	94 - 107

Reference Method: SM 5310 B-00
Batch ID: P297475

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764137	Organic Carbon	90.2	90.4	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P297729

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1764360	Organic Carbon	95.3		P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P297386

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764144	Turbidity	8.97	Sample	P	0 - 20

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P297387

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764357	Turbidity	1.75	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P297558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764126	Calcium	0.152	Spike	P	0 - 20
1764126	Iron	0.655	Spike	P	0 - 20
1764126	Magnesium	0.375	Spike	P	0 - 20
1764126	Potassium	0.881	Spike	P	0 - 20
1764126	Sodium	0.323	Spike	P	0 - 20
1764126	Zinc	0.225	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P297558

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764126	Arsenic	0.939	Spike	P	0 - 20
1764126	Cadmium	2.11	Spike	P	0 - 20
1764126	Chromium	1.54	Spike	P	0 - 20
1764126	Copper	0.359	Spike	P	0 - 20
1764126	Lead	0.165	Spike	P	0 - 20
1764126	Nickel	1.10	Spike	P	0 - 20
1764126	Silver	0.241	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297681

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764067	Sulfate	4.84	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297683

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764067	Chloride	0.0907	Sample	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297775

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764364	Sulfate	0.255	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P297815

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1765664	Chloride	0.0691	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P297793

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764358	Ammonia-N	0.767	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297536

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764151	Kjeldahl Nitrogen	5.61	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P297577

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1763831	Kjeldahl Nitrogen	0.0809	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P297724

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764385	NO2NO3-N	0.625	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297529

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764136	Total-P	1.71	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P297532

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764359	Total-P	0.141	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P297390

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764152	O-Phosphate-P	1.90	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P297380

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764364	Color (true)	5.74	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P297521

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764135	Total Alkalinity	0.838	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P298058

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764140	TDS	0.957	Sample	P	0 - 10

Reference Method: SM 2540 C-97
Batch ID: P298059

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764364	TDS	0.851	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P297515

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764135	Fluoride	2.00	Spike	P	0 - 3.7

Reference Method: SM 5310 B-00
Batch ID: P297475

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764137	Organic Carbon	0.268	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P297729

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1764360	Organic Carbon	0.671	Spike	P	0 - 20

Quality Assurance Report Precision

* 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: A67199

Included Lab Sample IDs: 1764355, 1764356, 1764357, 1764364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	103	P/P	90 - 115
Color (true)	102	102	P/P	90 - 115

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A67200

Included Lab Sample IDs: 1764361, 1764362, 1764363, 1764366

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	98.6	P/P	90 - 110
O-Phosphate-P	98.9	98.1	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A67201

Included Lab Sample IDs: 1764355, 1764356, 1764357, 1764364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	100	99.5	P/P	95 - 105
Turbidity	99.5	99.5	P/P	95 - 105

Reference Method: SM 5310 B-00

Run ID: A67237

Included Lab Sample IDs: 1764358, 1764359

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	92.8	94.4	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A67252

Included Lab Sample IDs: 1764355, 1764356, 1764357, 1764364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.0	99.0	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A67254

Included Lab Sample IDs: 1764355, 1764356, 1764357, 1764364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	99.5	98.4	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A67286

Included Lab Sample IDs: 1764355, 1764356, 1764357, 1764364

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	101	102	P/P	90 - 110
Chloride	102	101	P/P	90 - 110
Chloride	104	106	P/P	90 - 110
Sulfate	101	102	P/P	90 - 110
Sulfate	102	99.4	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A67300

Included Lab Sample IDs: 1764358, 1764359, 1764360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	97.9	97.8	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A67307

Included Lab Sample IDs: 1764365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	104	102	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A67319

Included Lab Sample IDs: 1764365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	105	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A67329

Included Lab Sample IDs: 1764358, 1764359, 1764360, 1764365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	100	100	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A67330

Included Lab Sample IDs: 1764360, 1764365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	93.3	94.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A67332

Included Lab Sample IDs: 1764358, 1764359, 1764360

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.2	98.8	P/P	90 - 110
Total-P	97.5	96.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A67333

Included Lab Sample IDs: 1764375, 1764376, 1764377

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	98.0	102	P/P	90 - 110
Iron	98.7	101	P/P	90 - 110
Magnesium	99.0	103	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	101	103	P/P	90 - 110
Zinc	98.4	105	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A67344

Included Lab Sample IDs: 1764375, 1764376, 1764377

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	103	102	P/P	90 - 110
Cadmium	101	101	P/P	90 - 110
Chromium	100	100	P/P	90 - 110
Copper	101	99.1	P/P	90 - 110
Lead	96.6	96.5	P/P	90 - 110
Nickel	99.6	98.1	P/P	90 - 110
Silver	99.3	99.7	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A67351

Included Lab Sample IDs: 1764358, 1764359, 1764360, 1764365

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	103	P/P	90 - 110
Ammonia-N	103	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		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity						8.97	
	Turbidity						1.75	
EPA 200.7 Rev. 4.4	Calcium	106		105	105	99.8		0.152
	Iron	103		103	103	100		0.655
	Magnesium	111		108	108	99.7		0.375
	Potassium	108		107	106	105		0.881
	Sodium	106		101	102	104		0.323
	Zinc	97.6		97.3	97.5	97.7		0.225
EPA 200.8 Rev. 5.4	Arsenic	99.4		98.2	99.1	102		0.939
	Cadmium	95.9		96.0	98.0	98.4		2.11
	Chromium	97.7		96.3	97.8	96.6		1.54
	Copper	96.4		96.0	95.7	94.4		0.359
	Lead	90.4		90.6	90.7	92.1		0.165

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery			Precision SMP	MS
			LCS				
EPA 200.8 Rev. 5.4	Nickel	97.8	96.6	97.7	96.2		1.10
	Silver	98.3	97.7	97.9	97.4		0.241
EPA 300.0 Rev. 2.1	Chloride	103	104	104		0.0907	
	Chloride	101	99.8	99.1		0.0691	
	Sulfate	93.9	101	95.5		4.84	
	Sulfate	109	104	105		0.255	
EPA 350.1 Rev. 2.0	Ammonia-N	100	108	109			0.767
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	99.0					5.61
	Kjeldahl Nitrogen	106					0.0809
EPA 353.2 Rev. 2.0	NO2NO3-N	102	99.0	100			0.625
EPA 365.1 Rev. 2.0	Total-P	97.8	101	103			1.71
	Total-P	99.1	98.0	98.2			0.141
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	99.1	101			1.90
SM 2120 B	Color (true)					5.74	
SM 2320 B-97	Total Alkalinity	102				0.838	
SM 2540 C-97	TDS					0.957	
	TDS					0.851	
SM 4500 F-C-97	Fluoride	96.5	95.6	97.7			2.00
SM 5310 B-00	Organic Carbon	92.6	90.2	90.4			0.268
	Organic Carbon	92.5	95.3				0.671

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1764355, 1764356, 1764357, 1764364
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	1764375, 1764376, 1764377
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	1764375, 1764376, 1764377
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1764355, 1764356, 1764357, 1764364
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1764355, 1764356, 1764357, 1764364
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1764358, 1764359, 1764360, 1764365
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1764358, 1764359, 1764360, 1764365
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1764358, 1764359, 1764360, 1764365
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1764358, 1764359, 1764360, 1764365
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1764361, 1764362, 1764363, 1764366
SM 2120 B / E31780	True Color measured at 450 nm	1764355, 1764356, 1764357, 1764364
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1764355, 1764356, 1764357, 1764364
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1764355, 1764356, 1764357, 1764364
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1764355, 1764356, 1764357, 1764364
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1764355, 1764356, 1764357, 1764364
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1764358, 1764359, 1764360, 1764365

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	01/21/2016			01/21/2016 13:04	Sima Feizi	1764355, 1764356, 1764357, 1764364
EPA 200.7 Rev. 4.4	01/21/2016	01/26/2016	Elliott D. Healy	01/28/2016	Joshua Ayres	1764375, 1764376, 1764377
EPA 200.8 Rev. 5.4	01/21/2016	01/26/2016	Elliott D. Healy	01/28/2016	Charles J. Peterson	1764375, 1764376, 1764377
EPA 300.0 Rev. 2.1	01/21/2016			01/28/2016	Ping Hua	1764355, 1764356, 1764357, 1764364
	01/21/2016			01/29/2016	Ping Hua	1764356, 1764357, 1764364
EPA 350.1 Rev. 2.0	01/21/2016			01/28/2016	Diana M. Turner	1764358, 1764359, 1764360, 1764365
EPA 351.2 Rev. 2.0	01/21/2016	01/26/2016	Christopher Armour	01/27/2016	Bryan A. Werth	1764358, 1764359, 1764360
	01/21/2016	01/27/2016	Christopher Armour	01/28/2016	Bryan A. Werth	1764365
EPA 353.2 Rev. 2.0	01/21/2016			01/28/2016	Peter D. Kaus	1764358, 1764359, 1764360, 1764365
EPA 365.1 Rev. 2.0	01/21/2016	01/26/2016	Christopher Armour	01/27/2016	Lipi Saha	1764365
	01/21/2016	01/26/2016	Christopher Armour	01/28/2016	Lipi Saha	1764358, 1764359, 1764360
EPA 365.1 Rev. 2.0 dissolved	01/21/2016			01/21/2016 15:26	Julia Storbeck	1764361, 1764362
	01/21/2016			01/21/2016 15:32	Julia Storbeck	1764363, 1764366
SM 2120 B	01/21/2016			01/21/2016 14:59	Rochelle Y Jackson	1764364
	01/21/2016			01/21/2016 15:39	Rochelle Y Jackson	1764355
	01/21/2016			01/21/2016 15:40	Rochelle Y Jackson	1764356
	01/21/2016			01/21/2016 15:41	Rochelle Y Jackson	1764357
SM 2320 B-97	01/21/2016			01/26/2016	Dale L. Simmons	1764355, 1764356, 1764357, 1764364
SM 2540 C-97	01/21/2016			01/26/2016	Sima Feizi	1764355, 1764356, 1764357, 1764364
SM 2540 D-97	01/21/2016			01/26/2016	Sima Feizi	1764355, 1764356, 1764357, 1764364
SM 4500 F-C-97	01/21/2016			01/25/2016	Dale L. Simmons	1764355, 1764356, 1764357, 1764364
SM 5310 B-00	01/21/2016			01/23/2016	Sofia Elnemr	1764358, 1764359
	01/21/2016			01/27/2016	Sofia Elnemr	1764360, 1764365