

Chemical Analysis Report

SW-DIST-2018-11-15-01

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

Event Description: **Scott & Bonnet**
Request ID: **RQ-2018-11-12-64**
Customer: **SW-DIST**
Project ID: **SMP**

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Certified by: Colin Wright, Program Administrator

Date Certified: 10-DEC-2018 11:44

A handwritten signature in black ink, appearing to read "Colin Wright", is displayed on a light gray 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: LAKE BONNET NORTH

Collection Date/Time: 11/14/2018 09:45

Field ID: G2SW0057

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041866	EPA 180.1 Rev. 2.0	Turbidity	26		NTU	P354769	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P355286	
		Sulfate	4.8		mg SO4/L	P355289	
		Color (true)	19		PCU	P354778	
	SM 2320 B-97	Total Alkalinity	45		mg CaCO3/L	P355202	RPD
	SM 2540 C-97	TDS	88		mg/L	P355135	
	SM 2540 D-97	TSS	50		mg/L	P354860	
	SM 4500 F-C-97	Fluoride	0.18		mg F/L	P355279	
2041869	EPA 350.1 Rev. 2.0	Ammonia-N	0.007		mg N/L	P355067	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.4		mg N/L	P354908	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P355089	
	EPA 365.1 Rev. 2.0	Total-P	0.23		mg P/L	P354986	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P354964	
2041872	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P354780	
2041915	EPA 200.7 Rev. 4.4	Calcium	17.0		mg/L	P355002	
		Iron	130		ug/L	P355002	
		Magnesium	2.40		mg/L	P355002	
		Potassium	2.7		mg/L	P355002	
		Sodium	8.9		mg/L	P355002	
		Zinc	5.8	I	ug/L	P355002	
	EPA 200.8 Rev. 5.4	Arsenic	0.61		ug/L	P355002	
		Cadmium	0.020	U	ug/L	P355002	
		Chromium	0.57	I	ug/L	P355002	
		Copper	0.88		ug/L	P355002	
		Lead	1.80		ug/L	P355002	
		Nickel	0.31	I	ug/L	P355002	
		Silver	0.010	U	ug/L	P355002	

Ref. Method and Comment:

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

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 11/29/2018.

Sample Location: LAKE BONNET SW

Collection Date/Time: 11/14/2018 10:10

Field ID: G2SW0058

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041867	EPA 180.1 Rev. 2.0	Turbidity	22		NTU	P354769	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P355286	
		Sulfate	4.8		mg SO4/L	P355289	
		Color (true)	19		PCU	P354778	
	SM 2320 B-97	Total Alkalinity	45		mg CaCO3/L	P355202	RPD
	SM 2540 C-97	TDS	104		mg/L	P355135	
	SM 2540 D-97	TSS	46	I	mg/L	P354860	
	SM 4500 F-C-97	Fluoride	0.18		mg F/L	P355279	
2041870	EPA 350.1 Rev. 2.0	Ammonia-N	0.006		mg N/L	P355068	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.5		mg N/L	P354908	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P355089	
	EPA 365.1 Rev. 2.0	Total-P	0.20		mg P/L	P354986	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P354964	
2041873	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P354780	
2041916	EPA 200.7 Rev. 4.4	Calcium	16.6		mg/L	P355002	
		Iron	110	I	ug/L	P355002	
		Magnesium	2.37		mg/L	P355002	
		Potassium	2.6		mg/L	P355002	
		Sodium	8.8		mg/L	P355002	
		Zinc	5.6	I	ug/L	P355002	
	EPA 200.8 Rev. 5.4	Arsenic	0.61		ug/L	P355002	
		Cadmium	0.020	U	ug/L	P355002	
		Chromium	0.55	I	ug/L	P355002	
		Copper	0.79	I	ug/L	P355002	
		Lead	1.56		ug/L	P355002	
		Nickel	0.30	I	ug/L	P355002	
		Silver	0.013	I	ug/L	P355002	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated due to sample matrix interference.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 11/29/2018.

Sample Location: LAKE BONNET SE

Collection Date/Time: 11/14/2018 10:00

Field ID: G2SW0059

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041868	EPA 180.1 Rev. 2.0	Turbidity	26		NTU	P354769	
	EPA 300.0 Rev. 2.1	Chloride	12		mg Cl/L	P355286	
		Sulfate	4.8		mg SO4/L	P355289	
		Color (true)	19	A	PCU	P354779	
	SM 2320 B-97	Total Alkalinity	44		mg CaCO3/L	P355202	RPD
	SM 2540 C-97	TDS	110		mg/L	P355135	
	SM 2540 D-97	TSS	48	I	mg/L	P354860	
	SM 4500 F-C-97	Fluoride	0.18		mg F/L	P355279	
2041871	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P355073	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	3.4		mg N/L	P355100	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P355089	
	EPA 365.1 Rev. 2.0	Total-P	0.23		mg P/L	P354986	
	SM 5310 B-00	Organic Carbon	11		mg C/L	P354964	
2041874	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	I	mg P/L	P354780	
2041917	EPA 200.7 Rev. 4.4	Calcium	17.3		mg/L	P355002	
		Iron	140		ug/L	P355002	
		Magnesium	2.53		mg/L	P355002	
		Potassium	2.8		mg/L	P355002	
		Sodium	9.1		mg/L	P355002	
		Zinc	5.8	I	ug/L	P355002	
	EPA 200.8 Rev. 5.4	Arsenic	0.59		ug/L	P355002	
		Cadmium	0.020	U	ug/L	P355002	
		Chromium	0.63	I	ug/L	P355002	
		Copper	0.88		ug/L	P355002	
		Lead	1.92		ug/L	P355002	
		Nickel	0.27	I	ug/L	P355002	
		Silver	0.010	U	ug/L	P355002	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated due to sample matrix interference.

EPA 200.8 Rev. 5.4: The lead result was confirmed in the undigested sample on 11/29/2018.

Sample Location: SCOTT LAKE @ SOUTH CENTRAL

Collection Date/Time: 11/14/2018 11:35

Field ID: G2SW0060

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2041863	EPA 180.1 Rev. 2.0	Turbidity	7.2	A	NTU	P354769	
	EPA 300.0 Rev. 2.1	Chloride	25		mg Cl/L	P355286	
		Sulfate	7.6		mg SO4/L	P355289	
	SM 2120 B	Color (true)	12		PCU	P354776	
	SM 2320 B-97	Total Alkalinity	46		mg CaCO3/L	P355202	RPD
	SM 2540 C-97	TDS	123		mg/L	P355135	
	SM 2540 D-97	TSS	13	I	mg/L	P354860	
	SM 4500 F-C-97	Fluoride	0.29		mg F/L	P355279	
2041864	EPA 350.1 Rev. 2.0	Ammonia-N	0.004	I	mg N/L	P355067	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.3		mg N/L	P354908	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.024		mg N/L	P355088	
	EPA 365.1 Rev. 2.0	Total-P	0.072		mg P/L	P354986	
	SM 5310 B-00	Organic Carbon	7.7		mg C/L	P354964	
2041865	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P354780	

Ref. Method and Comment:

SM 2540 D-97: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample. The PQL was elevated due to sample matrix interference.

EPA 351.2 Rev. 2.0: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354769

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355002

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: P355002

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: P355286

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355289

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355067

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355068

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355073

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354908

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355100

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355088

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355089

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: P354986

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354780

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

Reference Method: SM 2120 B
Batch ID: P354776

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2120 B
Batch ID: P354778

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Quality Assurance Report

Method Blank Results

Reference Method: SM 2120 B
Batch ID: P354779

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P355202

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

Reference Method: SM 2540 C-97
Batch ID: P355135

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P354860

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P354964

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: P355002

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Calcium	102		P	85 - 115
Iron	104		P	85 - 115
Magnesium	100		P	85 - 115
Potassium	102		P	85 - 115
Sodium	102		P	85 - 115
Zinc	96.3		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355002

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Arsenic	106		P	85 - 115
Cadmium	99.7		P	85 - 115
Chromium	99.8		P	85 - 115
Copper	103		P	85 - 115
Lead	94.5		P	85 - 115
Nickel	102		P	85 - 115
Silver	105		P	85 - 115

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355286

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.8		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355289

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Sulfate	98.8		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355067

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355068

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.9		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355073

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	98.4		P	90 - 110

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354908

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355100

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355088

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355089

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354986

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354780

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

Reference Method: SM 2120 B
Batch ID: P354776

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	99.1		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P354778

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	100		P	90 - 110

Reference Method: SM 2120 B
Batch ID: P354779

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Color (true)	101		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: SM 2320 B-97
Batch ID: P355202

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	100		P	98 - 107

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	98.4		P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354964

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	93.2		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355002

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2042008	Calcium	102		P	80 - 120
2042008	Iron	99.7		P	80 - 120
2042008	Magnesium	102		P	80 - 120
2042008	Potassium	98.8		P	80 - 120
2042008	Sodium	100		P	80 - 120
2042008	Zinc	97.3		P	80 - 120
2042120	Calcium	96.2		P	80 - 120
2042120	Iron	92.5	101	P/P	80 - 120
2042120	Magnesium	95.4		P	80 - 120
2042120	Potassium	94.2	102	P/P	80 - 120
2042120	Sodium	97.3		P	80 - 120
2042120	Zinc	94.0	94.7	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355002

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2042008	Arsenic	101		P	80 - 120
2042008	Cadmium	98.1		P	80 - 120
2042008	Chromium	97.8		P	80 - 120
2042008	Copper	97.1		P	80 - 120
2042008	Lead	93.9		P	80 - 120
2042008	Nickel	97.3		P	80 - 120
2042008	Silver	102		P	80 - 120
2042120	Arsenic	105	106	P/P	80 - 120
2042120	Cadmium	102	99.9	P/P	80 - 120
2042120	Chromium	96.9	97.2	P/P	80 - 120
2042120	Copper	98.0	98.3	P/P	80 - 120
2042120	Lead	95.3	95.6	P/P	80 - 120
2042120	Nickel	97.4	98.0	P/P	80 - 120
2042120	Silver	100	101	P/P	80 - 120

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355286

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041732	Chloride	95.0		P	90 - 110
2041998	Chloride	102		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355289

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041732	Sulfate	99.6		P	90 - 110
2041998	Sulfate	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355067

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041775	Ammonia-N	100	98.8	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355068

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2042330	Ammonia-N	93.6	101	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355073

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041902	Ammonia-N	97.5	98.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355100

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2042508	Kjeldahl Nitrogen	99.4	97.9	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355088

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041792	NO2NO3-N	99.6	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355089

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041869	NO2NO3-N	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354986

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041683	Total-P	100	101	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354780

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041874	O-Phosphate-P	94.5	98.2	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041712	Fluoride	104	104	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P354964

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2041793	Organic Carbon	97.0	92.2	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P354769

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041863	Turbidity	5.67	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P355002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2042120	Calcium	6.39	Spike	P	0 - 20
2042120	Iron	8.78	Spike	P	0 - 20
2042120	Magnesium	10.1	Spike	P	0 - 20
2042120	Potassium	4.61	Spike	P	0 - 20
2042120	Sodium	5.69	Spike	P	0 - 20
2042120	Zinc	0.739	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P355002

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2042120	Arsenic	0.372	Spike	P	0 - 20
2042120	Cadmium	1.88	Spike	P	0 - 20
2042120	Chromium	0.253	Spike	P	0 - 20
2042120	Copper	0.379	Spike	P	0 - 20
2042120	Lead	0.289	Spike	P	0 - 20
2042120	Nickel	0.555	Spike	P	0 - 20
2042120	Silver	1.41	Spike	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355286

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041732	Chloride	0.484	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P355289

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041732	Sulfate	0.689	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355067

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041775	Ammonia-N	1.16	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355068

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2042330	Ammonia-N	4.49	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P355073

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041902	Ammonia-N	0.906	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P354908

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041864	Kjeldahl Nitrogen	0.129	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P355100

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2042508	Kjeldahl Nitrogen	1.21	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355088

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041792	NO2NO3-N	1.77	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P355089

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041869	NO2NO3-N	0.995	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P354986

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041683	Total-P	0.737	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P354780

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041874	O-Phosphate-P	3.67	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: SM 2120 B
Batch ID: P354776

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041732	Color (true)	0.816	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P354778

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041677	Color (true)	2.39	Sample	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P354779

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041868	Color (true)	1.99	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P355202

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041712	Total Alkalinity	2.84	Sample	F	0 - 1.6

Reference Method: SM 2540 C-97
Batch ID: P355135

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041971	TDS	2.17	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P355279

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041712	Fluoride	0.490	Spike	P	0 - 3.5

Reference Method: SM 5310 B-00
Batch ID: P354964

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2041793	Organic Carbon	2.82	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 180.1 Rev. 2.0

Run ID: A87801

Included Lab Sample IDs: 2041863, 2041866, 2041867, 2041868

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A87803

Included Lab Sample IDs: 2041865, 2041872, 2041873, 2041874

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	100	100	P/P	90 - 110
O-Phosphate-P	101	99.2	P/P	90 - 110

Reference Method: SM 2120 B

Run ID: A87804

Included Lab Sample IDs: 2041863, 2041866, 2041867, 2041868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	101	101	P/P	85 - 115
Color (true)	102	102	P/P	85 - 115
Color (true)	102	102	P/P	85 - 115

Reference Method: SM 5310 B-00

Run ID: A87888

Included Lab Sample IDs: 2041864, 2041869, 2041870, 2041871

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	94.0	94.2	P/P	90 - 110
Organic Carbon	94.2	93.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87899

Included Lab Sample IDs: 2041864, 2041869, 2041870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.6	99.3	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A87913

Included Lab Sample IDs: 2041864, 2041869, 2041870, 2041871

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

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87941

Included Lab Sample IDs: 2041864, 2041869, 2041870

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	102	95.2	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A87946

Included Lab Sample IDs: 2041871

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	101	99.6	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A87948

Included Lab Sample IDs: 2041864, 2041869, 2041870, 2041871

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.5	100	P/P	90 - 110
NO2NO3-N	99.5	99.5	P/P	90 - 110

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A87958

Included Lab Sample IDs: 2041915, 2041916, 2041917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Arsenic	101	98.9	P/P	90 - 110
Cadmium	96.3	95.4	P/P	90 - 110
Chromium	97.0	96.9	P/P	90 - 110
Copper	101	97.6	P/P	90 - 110
Lead	94.4	93.7	P/P	90 - 110
Nickel	100	98.3	P/P	90 - 110
Silver	99.1	97.9	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A87965

Included Lab Sample IDs: 2041871

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	98.1	93.8	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A87982

Included Lab Sample IDs: 2041915, 2041916, 2041917

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Calcium	104	102	P/P	90 - 110
Iron	103	101	P/P	90 - 110
Magnesium	103	101	P/P	90 - 110
Potassium	102	101	P/P	90 - 110
Sodium	105	102	P/P	90 - 110
Zinc	96.5	95.3	P/P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A87993

Included Lab Sample IDs: 2041863, 2041866, 2041867, 2041868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	102	102	P/P	90 - 110
Chloride	102	103	P/P	90 - 110
Sulfate	101	101	P/P	90 - 110
Sulfate	101	103	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: SM 2320 B-97

Run ID: A87999

Included Lab Sample IDs: 2041863, 2041866, 2041867, 2041868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	98.2	99.7	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A88028

Included Lab Sample IDs: 2041863, 2041866, 2041867, 2041868

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	99.5	100	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 SMP	MS
			LCS				
EPA 180.1 Rev. 2.0	Turbidity					5.67	
EPA 200.7 Rev. 4.4	Calcium	102	102	96.2			6.39
	Iron	104	99.7	92.5	101		8.78
	Magnesium	100	102	95.4			10.1
	Potassium	102	98.8	94.2	102		4.61
	Sodium	102	100	97.3			5.69
	Zinc	96.3	97.3	94.0	94.7		0.739
EPA 200.8 Rev. 5.4	Arsenic	106	101	105	106		0.372
	Cadmium	99.7	98.1	102	99.9		1.88
	Chromium	99.8	97.8	96.9	97.2		0.253
	Copper	103	97.1	98.0	98.3		0.379
	Lead	94.5	93.9	95.3	95.6		0.289
	Nickel	102	97.3	97.4	98.0		0.555
	Silver	105	102	100	101		1.41
EPA 300.0 Rev. 2.1	Chloride	99.8	95.0	102		0.484	
	Sulfate	98.8	99.6	101		0.689	
EPA 350.1 Rev. 2.0	Ammonia-N	101	100	98.8			1.16
	Ammonia-N	96.9	93.6	101			4.49
	Ammonia-N	98.4	97.5	98.9			0.906
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	105					0.129
	Kjeldahl Nitrogen	102	99.4	97.9			1.21
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	99.6	102			1.77
	NO2NO3-N	99.5	100	101			0.995
EPA 365.1 Rev. 2.0	Total-P	105	100	101			0.737
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	102	94.5	98.2			3.67
SM 2120 B	Color (true)	99.1				0.816	
	Color (true)	100				2.39	
	Color (true)	101				1.99	
SM 2320 B-97	Total Alkalinity	100				2.84	
SM 2540 C-97	TDS					2.17	
SM 4500 F-C-97	Fluoride	98.4	104	104			0.490
SM 5310 B-00	Organic Carbon	93.2	97.0	92.2			2.82

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2041863, 2041866, 2041867, 2041868
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2041915, 2041916, 2041917
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2041915, 2041916, 2041917
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	2041863, 2041866, 2041867, 2041868
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	2041863, 2041866, 2041867, 2041868
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2041864, 2041869, 2041870, 2041871
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2041864, 2041869, 2041870, 2041871
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2041864, 2041869, 2041870, 2041871
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2041864, 2041869, 2041870, 2041871

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2041865, 2041872, 2041873, 2041874
SM 2120 B / E31780	True Color measured at 450 nm	2041863, 2041866, 2041867, 2041868
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	2041863, 2041866, 2041867, 2041868
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	2041863, 2041866, 2041867, 2041868
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2041863, 2041866, 2041867, 2041868
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2041863, 2041866, 2041867, 2041868
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2041864, 2041869, 2041870, 2041871

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	11/15/2018			11/15/2018 16:42	Megan Treadwell	2041863, 2041866, 2041867, 2041868
EPA 200.7 Rev. 4.4	11/15/2018	11/20/2018 17:25	Elliott D. Healy	11/27/2018 15:17	Betina Topolski	2041915
	11/15/2018	11/20/2018 17:25	Elliott D. Healy	11/27/2018 15:25	Betina Topolski	2041916
	11/15/2018	11/20/2018 17:25	Elliott D. Healy	11/27/2018 15:32	Betina Topolski	2041917
EPA 200.8 Rev. 5.4	11/15/2018	11/20/2018 17:25	Elliott D. Healy	11/27/2018 04:37	Robert K Palmer	2041915
	11/15/2018	11/20/2018 17:25	Elliott D. Healy	11/27/2018 04:47	Robert K Palmer	2041916
	11/15/2018	11/20/2018 17:25	Elliott D. Healy	11/27/2018 04:57	Robert K Palmer	2041917
EPA 300.0 Rev. 2.1	11/15/2018			11/29/2018 00:14	Lipi Saha	2041863
	11/15/2018			11/29/2018 00:26	Lipi Saha	2041866
	11/15/2018			11/29/2018 00:38	Lipi Saha	2041867
	11/15/2018			11/29/2018 01:14	Lipi Saha	2041868
EPA 350.1 Rev. 2.0	11/15/2018			11/19/2018 15:10	Ping Hua	2041871
	11/15/2018			11/21/2018 14:51	Adrian Shelby	2041864
	11/15/2018			11/21/2018 14:52	Adrian Shelby	2041869
	11/15/2018			11/21/2018 14:57	Adrian Shelby	2041870
EPA 351.2 Rev. 2.0	11/15/2018	11/19/2018 15:45	Adrian Shelby	11/20/2018 15:14	Joseph Suarez	2041864
	11/15/2018	11/19/2018 15:45	Adrian Shelby	11/20/2018 15:18	Joseph Suarez	2041869
	11/15/2018	11/19/2018 15:45	Adrian Shelby	11/20/2018 15:20	Joseph Suarez	2041870
	11/15/2018	11/26/2018 16:00	Adrian Shelby	11/27/2018 10:16	Joseph Suarez	2041871
EPA 353.2 Rev. 2.0	11/15/2018			11/26/2018 11:45	Lauren Bottorf	2041864
	11/15/2018			11/26/2018 11:53	Lauren Bottorf	2041869
	11/15/2018			11/26/2018 11:59	Lauren Bottorf	2041870
	11/15/2018			11/26/2018 12:00	Lauren Bottorf	2041871
EPA 365.1 Rev. 2.0	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 11:25	Beverly Y. Sanders	2041864
	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 11:26	Beverly Y. Sanders	2041869
	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 11:29	Beverly Y. Sanders	2041870
	11/15/2018	11/20/2018 12:35	Sima Feizi	11/21/2018 11:31	Beverly Y. Sanders	2041871
EPA 365.1 Rev. 2.0 dissolved	11/15/2018			11/15/2018 16:50	Jhamieka S. Greenwood	2041874
	11/15/2018			11/15/2018 17:12	Jhamieka S. Greenwood	2041865
	11/15/2018			11/15/2018 17:14	Jhamieka S. Greenwood	2041872
	11/15/2018			11/15/2018 17:15	Jhamieka S. Greenwood	2041873
SM 2120 B	11/15/2018			11/15/2018 17:25	Chelsea Hernandez	2041863
	11/15/2018			11/15/2018 17:43	Chelsea Hernandez	2041866
	11/15/2018			11/15/2018 17:44	Chelsea Hernandez	2041867
	11/15/2018			11/15/2018 17:48	Chelsea Hernandez	2041868
SM 2320 B-97	11/15/2018			11/21/2018 10:49	Dale L. Simmons	2041863
	11/15/2018			11/21/2018 11:04	Dale L. Simmons	2041866
	11/15/2018			11/21/2018 11:19	Dale L. Simmons	2041867
	11/15/2018			11/21/2018 11:34	Dale L. Simmons	2041868
SM 2540 C-97	11/15/2018			11/16/2018 17:06	Yijie Li	2041863, 2041866, 2041867, 2041868

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
SM 2540 D-97	11/15/2018			11/16/2018 17:06	Yijie Li	2041863, 2041866, 2041867, 2041868
SM 4500 F-C-97	11/15/2018			11/29/2018 05:34	Dale L. Simmons	2041863
	11/15/2018			11/29/2018 05:38	Dale L. Simmons	2041866
	11/15/2018			11/29/2018 05:42	Dale L. Simmons	2041867
	11/15/2018			11/29/2018 05:46	Dale L. Simmons	2041868
SM 5310 B-00	11/15/2018			11/19/2018 19:30	Megan Treadwell	2041864
	11/15/2018			11/19/2018 20:10	Megan Treadwell	2041869
	11/15/2018			11/19/2018 20:23	Megan Treadwell	2041870
	11/15/2018			11/19/2018 20:36	Megan Treadwell	2041871