

Chemical Analysis Report

SO-DIST-2016-08-30-01

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

Event Description: **Sanibel Dune Lakes**

Request ID: **RQ-2016-04-11-07**

Customer: **SO-DIST**

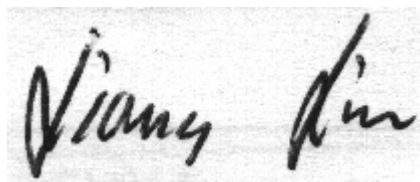
Project ID: **SMP**

Send Reports to:
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2295 Victoria Ave. Suite 364
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Attn: Ben Paswater

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Certified by: Liang Lin, Environmental Administrator

Date Certified: 21-SEP-2016 09:50

A handwritten signature in black ink, appearing to read "Liang Lin", is written on a light-colored, textured 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 group are included in this report: 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: DUNES WEIR DS

Collection Date/Time: 08/29/2016 10:00

Field ID: DUNES WEIR DS

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1827937	EPA 180.1 Rev. 2.0	Turbidity	5.7		NTU	P310588	
	EPA 300.0 Rev. 2.1	Chloride	3.1E+03		mg Cl/L	P311211	
		Sulfate	500		mg SO4/L	P311215	
	SM 2120 B	Color (true)	41	A	PCU	P310551	
	SM 2320 B-97	Total Alkalinity	148		mg CaCO3/L	P310715	
	SM 2540 C-97	TDS	5.84E+03		mg/L	P311043	
	SM 2540 D-97	TSS	7	I	mg/L	P310856	
	SM 4500 F-C-97	Fluoride	0.72		mg F/L	P310718	
1827938	EPA 350.1 Rev. 2.0	Ammonia-N	0.018		mg N/L	P310565	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	2.3		mg N/L	P310703	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P311330	
	EPA 365.1 Rev. 2.0	Total-P	0.10		mg P/L	P310730	MS
	SM 5310 B-00	Organic Carbon	19		mg C/L	P311046	
1827939	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.009	I	mg P/L	P310569	

Ref. Method and Comment:

EPA 300.0 Rev. 2.1: Sulfate: Batch relative percent difference is unavailable because of low analyte concentration in the QC sample.

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: P310588

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P311211

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1

Batch ID: P311215

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0

Batch ID: P310565

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

Reference Method: EPA 351.2 Rev. 2.0

Batch ID: P310703

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

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310730

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310569

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

Reference Method: SM 2120 B
Batch ID: P310551

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P310715

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

Reference Method: SM 2540 C-97
Batch ID: P311043

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P310856

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P310718

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P311046

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

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311211

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

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311215

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310565

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310703

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

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

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: P310730

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310569

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

Reference Method: SM 2320 B-97
Batch ID: P310715

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	102		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P310718

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	97.2		P	92 - 103

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P311046

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	98.6		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311211

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828219	Chloride	101		P	90 - 110
1828220	Chloride	101		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311215

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1828219	Sulfate	101		P	90 - 110
1828220	Sulfate	100		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310565

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827826	Ammonia-N	107	106	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310703

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827392	Kjeldahl Nitrogen	102	95.3	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827938	NO2NO3-N	101	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310730

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1826894	Total-P	90.5	87.7	P/F	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310569

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827939	O-Phosphate-P	99.4	101	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: SM 4500 F-C-97
Batch ID: P310718

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827836	Fluoride	97.3	98.5	P/P	91 - 105

Reference Method: SM 5310 B-00
Batch ID: P311046

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1827894	Organic Carbon	99.9	99.9	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P310588

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827890	Turbidity	1.71	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P311211

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1828219	Chloride	0.0765	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P310565

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827826	Ammonia-N	0.542	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P310703

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827392	Kjeldahl Nitrogen	4.45	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P311330

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827938	NO2NO3-N	0.991	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
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Quality Assurance Report Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P310730

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1826894	Total-P	3.05	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P310569

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827939	O-Phosphate-P	1.10	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P310551

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827937	Color (true)	3.23	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P310715

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827836	Total Alkalinity	0.220	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P311043

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827955	TDS	5.62	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P310718

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827836	Fluoride	0.969	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P311046

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1827894	Organic Carbon	0.0	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

Quality Assurance Report Calibration Verification

Reference Method: SM 2120 B
Run ID: A71404
Included Lab Sample IDs: 1827937

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	93.6	94.9	P/P	85 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A71409
Included Lab Sample IDs: 1827938

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A71410
Included Lab Sample IDs: 1827939

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

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A71417
Included Lab Sample IDs: 1827937

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

Reference Method: SM 2320 B-97
Run ID: A71460
Included Lab Sample IDs: 1827937

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

Reference Method: SM 4500 F-C-97
Run ID: A71460
Included Lab Sample IDs: 1827937

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

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A71488
Included Lab Sample IDs: 1827938

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

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A71520
Included Lab Sample IDs: 1827938

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	101	104	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 300.0 Rev. 2.1

Run ID: A71576

Included Lab Sample IDs: 1827937

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

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A71577

Included Lab Sample IDs: 1827938

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: A71583

Included Lab Sample IDs: 1827938

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	100	101	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				1.71	
EPA 300.0 Rev. 2.1	Chloride	102	101 101		0.0765	
	Sulfate	101	101 100			
EPA 350.1 Rev. 2.0	Ammonia-N	106	106 107			0.542
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	103	102 95.3			4.45
EPA 353.2 Rev. 2.0	NO2NO3-N	102	101 100			0.991
EPA 365.1 Rev. 2.0	Total-P	99.8	90.5 87.7			3.05
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	100	99.4 101			1.10
SM 2120 B	Color (true)				3.23	
SM 2320 B-97	Total Alkalinity	102			0.220	
SM 2540 C-97	TDS				5.62	
SM 4500 F-C-97	Fluoride	97.2	97.3 98.5			0.969
SM 5310 B-00	Organic Carbon	98.6	99.9 99.9			0.0

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1827937
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1827937
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1827937

Reference Method Descriptions

Method / DoH Cert #	Description	<u>Associated Samples</u>
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1827938
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1827938
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1827938
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1827938
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1827939
SM 2120 B / E31780	True Color measured at 450 nm	1827937
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	1827937
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1827937
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1827937
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1827937
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1827938

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	08/30/2016			08/30/2016 14:54	Sima Feizi	1827937
EPA 300.0 Rev. 2.1	08/30/2016			09/14/2016	Ping Hua	1827937
EPA 350.1 Rev. 2.0	08/30/2016			08/30/2016	Joseph Suarez	1827938
EPA 351.2 Rev. 2.0	08/30/2016	09/07/2016	Adrian Shelby	09/09/2016	Virginia P. Brown	1827938
EPA 353.2 Rev. 2.0	08/30/2016			09/13/2016	Beverly Y. Sanders	1827938
EPA 365.1 Rev. 2.0	08/30/2016	09/07/2016	Vijayalakshmi Reddy	09/08/2016	Lipi Saha	1827938
EPA 365.1 Rev. 2.0 dissolved	08/30/2016			08/30/2016 15:49	Julia Storbeck	1827939
SM 2120 B	08/30/2016			08/30/2016 14:59	Blanca Fach	1827937
SM 2320 B-97	08/30/2016			08/31/2016	Dale L. Simmons	1827937
SM 2540 C-97	08/30/2016			08/31/2016	Yijie Li	1827937
SM 2540 D-97	08/30/2016			08/31/2016	Yijie Li	1827937
SM 4500 F-C-97	08/30/2016			08/31/2016	Dale L. Simmons	1827937
SM 5310 B-00	08/30/2016			09/13/2016	Sofia Elnemr	1827938