Chemical Analysis Report

CEN-DIST-2016-06-23-01

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

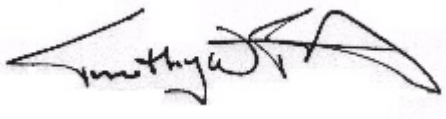
Event Description: **Lake Olive+LVI**
Request ID: **RQ-2016-06-06-67**
Customer: **CEN-DIST**
Project ID: **SMP**

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

For additional information please contact
Timothy W. Fitzpatrick
Liang-Tsair Lin, Ph.D.
Colin Wright, Ph.D.
Thekkekalathil Chandrasekhar, PhD, QA Officer
Phone (850) 245-8085

Certified by: Timothy Fitzpatrick, Program Administrator

Date Certified: 18-JUL-2016 13:48



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: LAKE OLIVE @ CENTER **Collection Date/Time: 06/22/2016 13:15**

Field ID: G4CE0128 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
1810599	EPA 180.1 Rev. 2.0	Turbidity	8.1		NTU	P306765	
	EPA 300.0 Rev. 2.1	Chloride	16		mg Cl/L	P307237	
		Sulfate	16		mg SO4/L	P307642	
	SM 2120 B	Color (true)	23	A	PCU	P306771	
	SM 2320 B-97	Total Alkalinity	56	A	mg CaCO3/L	P307282	
	SM 2540 C-97	TDS	124	A	mg/L	P307590	
	SM 2540 D-97	TSS	8	I	mg/L	P307451	
	SM 4500 F-C-97	Fluoride	0.057	I	mg F/L	P307287	
1810600	EPA 350.1 Rev. 2.0	Ammonia-N	0.005		mg N/L	P306933	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	1.1		mg N/L	P306857	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P307128	
	EPA 365.1 Rev. 2.0	Total-P	0.065		mg P/L	P306805	
	SM 5310 B-00	Organic Carbon	6.8		mg C/L	P307219	
1810601	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.005	I	mg P/L	P306757	

Ref. Method and Comment:
SM 2540 D-97: The precision data is unavailable due to the low analyte concentration in the QC sample.
EPA 365.1 Rev. 2.0: Total-P: Matrix spike recovery data is unavailable due to high analyte concentration in the QC sample.

Quality Assurance Report
Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P306765

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307237

Component	Result	Code	Units
Chloride	0.20	U	mg Cl/L

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307642

Component	Result	Code	Units
Sulfate	0.20	U	mg SO4/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306933

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

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306857

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: P307128

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306805

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306757

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

Reference Method: SM 2120 B
Batch ID: P306771

Component	Result	Code	Units
Color (true)	2.5	U	PCU

Reference Method: SM 2320 B-97
Batch ID: P307282

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

Reference Method: SM 2540 C-97
Batch ID: P307590

Component	Result	Code	Units
TDS	15	U	mg/L

Reference Method: SM 2540 D-97
Batch ID: P307451

Component	Result	Code	Units
TSS	2	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P307287

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P307219

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: P307237

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Chloride	99.3		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307642

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

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306933

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	96.7		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306857

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: P307128

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

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306805

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

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306757

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

Reference Method: SM 2320 B-97
Batch ID: P307282

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	95 - 108

Reference Method: SM 4500 F-C-97
Batch ID: P307287

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	99.4		P	92 - 103

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: SM 5310 B-00
Batch ID: P307219

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	99.5		P	85 - 115

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307237

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810202	Chloride	99.8		P	90 - 110
1810671	Chloride	96.0		P	90 - 110

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307642

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1811608	Sulfate	103		P	90 - 110
1811609	Sulfate	104		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306933

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810600	Ammonia-N	98.7	98.6	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306857

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810562	Kjeldahl Nitrogen	93.6	95.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307128

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810144	NO2NO3-N	98.0	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306757

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810601	O-Phosphate-P	98.4	99.1	P/P	90 - 110

Reference Method: SM 4500 F-C-97
Batch ID: P307287

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810599	Fluoride	98.5	98.5	P/P	91 - 105

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: SM 5310 B-00
Batch ID: P307219

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
1810615	Organic Carbon	105	104	P/P	85 - 115

Quality Assurance Report
Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P306765

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810363	Turbidity	2.43	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307237

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810202	Chloride	0.542	Sample	P	0 - 20

Reference Method: EPA 300.0 Rev. 2.1
Batch ID: P307642

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1811608	Sulfate	2.09	Sample	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P306933

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810600	Ammonia-N	0.141	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P306857

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810562	Kjeldahl Nitrogen	1.23	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P307128

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810144	NO2NO3-N	2.52	Spike	P	0 - 20

Quality Assurance Report
Precision

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P306805

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810337	Total-P	0.335	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P306757

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810601	O-Phosphate-P	0.674	Spike	P	0 - 20

Reference Method: SM 2120 B
Batch ID: P306771

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810599	Color (true)	0.469	Sample	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P307282

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810599	Total Alkalinity	0.608	Sample	P	0 - 4.8

Reference Method: SM 2540 C-97
Batch ID: P307590

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810599	TDS	1.61	Sample	P	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P307287

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810599	Fluoride	0.0	Spike	P	0 - 3.0

Reference Method: SM 5310 B-00
Batch ID: P307219

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
1810615	Organic Carbon	0.453	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: EPA 365.1 Rev. 2.0 dissolved
Run ID: A70196
Included Lab Sample IDs: 1810601

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.8	101	P/P	90 - 110

Reference Method: EPA 180.1 Rev. 2.0
Run ID: A70197
Included Lab Sample IDs: 1810599

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

Reference Method: SM 2120 B
Run ID: A70198
Included Lab Sample IDs: 1810599

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Color (true)	100	101	P/P	90 - 115

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A70250
Included Lab Sample IDs: 1810600

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	99.1	99.5	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A70257
Included Lab Sample IDs: 1810600

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	98.0	97.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A70266
Included Lab Sample IDs: 1810600

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	104	96.0	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A70307
Included Lab Sample IDs: 1810600

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A70313
Included Lab Sample IDs: 1810599

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chloride	99.9	102	P/P	90 - 110

Quality Assurance Report
Calibration Verification

Reference Method: SM 5310 B-00
Run ID: A70359
Included Lab Sample IDs: 1810600

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	98.1	97.8	P/P	90 - 110

Reference Method: SM 2320 B-97
Run ID: A70372
Included Lab Sample IDs: 1810599

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

Reference Method: SM 4500 F-C-97
Run ID: A70372
Included Lab Sample IDs: 1810599

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

Reference Method: EPA 300.0 Rev. 2.1
Run ID: A70443
Included Lab Sample IDs: 1810599

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Sulfate	103	107	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					2.43	
EPA 300.0 Rev. 2.1	Chloride	99.3	99.8	96.0		0.542	
	Sulfate	103	103	104		2.09	
EPA 350.1 Rev. 2.0	Ammonia-N	96.7	98.7	98.6			0.141
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	102	93.6	95.8			1.23
EPA 353.2 Rev. 2.0	NO2NO3-N	99.0	98.0	100			2.52
EPA 365.1 Rev. 2.0	Total-P	98.4					0.335
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	105	98.4	99.1			0.674
SM 2120 B	Color (true)					0.469	
SM 2320 B-97	Total Alkalinity	103				0.608	
SM 2540 C-97	TDS					1.61	
SM 4500 F-C-97	Fluoride	99.4	98.5	98.5			0.0
SM 5310 B-00	Organic Carbon	99.5	105	104			0.453

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	1810599
EPA 300.0 Rev. 2.1 / E31780	Chloride in aqueous matrices	1810599
EPA 300.0 Rev. 2.1 / E31780	Sulfate in aqueous matrices	1810599
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	1810600
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	1810600
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	1810600
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	1810600
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	1810601
SM 2120 B / E31780	True Color measured at 450 nm	1810599
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO3/L	1810599
SM 2540 C-97 / E31780	Total Dissolved Solids in aqueous matrices	1810599
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices	1810599
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	1810599
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	1810600

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	06/23/2016			06/23/2016 15:44	Sima Feizi	1810599
EPA 300.0 Rev. 2.1	06/23/2016			07/01/2016	Ping Hua	1810599
	06/23/2016			07/08/2016	Ping Hua	1810599
EPA 350.1 Rev. 2.0	06/23/2016			06/27/2016	Diana M. Turner	1810600
EPA 351.2 Rev. 2.0	06/23/2016	06/27/2016	Sofia Elnemr	06/28/2016	Christopher Armour	1810600
EPA 353.2 Rev. 2.0	06/23/2016			06/29/2016	Beverly Y. Sanders	1810600
EPA 365.1 Rev. 2.0	06/23/2016	06/24/2016	Vijayalakshmi Reddy	06/28/2016	Lipi Saha	1810600
EPA 365.1 Rev. 2.0 dissolved	06/23/2016			06/23/2016 14:04	Julia Storbeck	1810601
SM 2120 B	06/23/2016			06/23/2016 16:29	Rochelle Y Jackson	1810599
SM 2320 B-97	06/23/2016			07/02/2016	Dale L. Simmons	1810599
SM 2540 C-97	06/23/2016			06/27/2016	Sima Feizi	1810599
SM 2540 D-97	06/23/2016			06/27/2016	Sima Feizi	1810599
SM 4500 F-C-97	06/23/2016			07/02/2016	Dale L. Simmons	1810599
SM 5310 B-00	06/23/2016			06/30/2016	Sofia Elnemr	1810600