JonesEdmunds
Integrity • Knowledge • Service

July 25, 2019

Renée J. Kwiat, CHMM, Environmental Consultant, Air and Waste
Florida Department of Environmental Protection - South District
PO Box 2549
2295 Victoria Ave.
Fort Myers, Florida 33902-2549

RE: Lee County Resource Recovery Facility, PA90-30H
Construction & Demolition Debris Recycling Facility
First Semiannual 2019 Water Quality Monitoring Report
FDEP Permit No. 0130719-018-SO-01
WACS Facility ID: 93715
Jones Edmunds Project No. 12345-014-01

Dear Ms. Kwiat:

During the First Semiannual 2019 sampling event at the Lee County Resource Recovery Facility (RRF) and the Construction & Demolition Debris Recycling Facility (CDDRF), Sulfate in MW-2S was reported at 256 mg/L; above the SDWS of 250 mg/L. MW-2S was resampled for Sulfate on May 29, 2019. The table below provides the result of the resample event compared to the original result.

Sample	Parameter	First Semiannual 2019 Result	May 29, 2019 Resample Result
MW-2S	Sulfate	**256 mg/L**	191 mg/L

Bold = Concentrations above groundwater standard.

The Sulfate concentration reported in MW-2S for the resample event is less than that reported during the First Semiannual 2019 sampling event and is below the SDWS of 250 mg/L. Trend analysis indicates that Sulfate has been generally increasing in MW-2S.

A table of groundwater results for the First Semiannual 2019 sampling event and the resampling event compared to groundwater standards is provided in Attachment 1. Parameter Monitoring Report forms (PMRs) are provided in Attachment 2. Laboratory data and Chain of Custody forms are presented in Attachment 3. Field Data forms are included in Attachment 4 and a trend graph of historical Sulfate concentrations in MW-2S is included in Attachment 5.

If you have any questions regarding this report, please contact me at (352) 377-5821 or ekennelley@jonesedmunds.com.

Sincerely,

Elizabeth D Kennelley
Project Manager / Project Scientist
730 NE Waldo Road
Gainesville, FL 32641

M:\EnvDocs\Lee County_Resource Recovery Facility\2019\19M5 Resample\19M5_Lee RRF_Letter.docx

xc: Rebecca Rodriguez, Lee County
Linda Monroy, Lee County
Laura Gray, Lee County

Attachments

ATTACHMENT 1

ANALYSIS RESULTS COMPARED TO GROUNDWATER STANDARDS

PARAMETERS AT OR ABOVE THE LABORATORY DETECTION LIMIT
LEE COUNTY RESOURCE RECOVERY FACILITY
FEBRUARY 2019 THROUGH MAY 2019

PARAMETER		CONDUC-TIVITY (FIELD)	DEPTH TO WATER FROM MEASURE PT	DISSOLVED OXYGEN (FIELD)	GROUND-WATER ELEVATION	pH (FIELD)	TEMPER-ATURE (FIELD)	TURBIDITY (FIELD)	SULFATE
STANDARD UNITS		(1) uS/cm	(1) ft	(1) ppm	(1) ft, NGVD	6.5-8.5 S.U.** S.U.	(1) deg C	(1) NTU	250 mg/L** mg/L
DETECTION									
MW-2S	02/25/2019	860	5.81	2.57	18.37	6.89	22.0	4.40	256
MW-2S	05/29/2019	968	7.16	0.71	17.02	6.80	23.8	0.37	191

LEGEND

*	=Primary Drinking Water Standard	I	= Value is between the Method Detection Level (MDL) and the Reporting Detection Level (RDL)
**	=Secondary Drinking Water Standard	J	= Estimated value
***	=Chapter 62-777 - Groundwater Cleanup Target Level (GCTL)	V	= Analyte found in associated method blank
(1)	=No Standard	Q	= Estimated value; analyte analyzed after acceptable holding time
-	=Not Analyzed		

ATTACHMENT 2

PARAMETER MONITORING REPORT FORMS

Lee County Resource Recovery Facility
Parameter Monitoring Report

PART III Analytical Results

Facility WACS #: **00093715**

Test Site ID #: **23404**

Well Name: **MW-2S**

Classification of Ground Water: **G II**

Ground Water Elevation (NGVD): **17.02**

Sampling Date/Time: **5/29/2019 4:40:00 PM**

Report Period: **MAY 2019**

Well Purged: **Y**

Well Type:
[ ] Background [ ] Intermediate
[ ] Compliance [ ] Water Supply
[X] Detection [ ] Piezometer
[ ] Assessment [ ] Leachate
[ ] Other [ ] Surface Water

STORET CODE	PARAMETER MONITORED	SAMPLING METHOD	FIELD FILTERED	ANALYSIS METHOD	ANALYSIS DATE/TIME	ANALYSIS RESULT *	UNITS	DETECTION LIMIT/UNITS
082545	GROUNDWATER ELEVATION	PP	No	DEP-SOP	5/29/2019 4:40:00 PM	17.02	ft, NGVD	-10 ft, NGVD
000094	CONDUCTIVITY (FIELD)	PP	No	EPA 120.1	5/29/2019 4:40:00 PM	968	umhos/cm	umhos/cm
000406	pH (FIELD)	PP	No	EPA 150.1	5/29/2019 4:40:00 PM	6.80	Std. Units	Std. Units
000010	TEMPERATURE (FIELD)	PP	No	EPA 170.1	5/29/2019 4:40:00 PM	23.8	deg C	deg C
082078	TURBIDITY (FIELD)	PP	No	EPA 180.1	5/29/2019 4:40:00 PM	0.37	NTU	NTU
000945	SULFATE	PP	No	EPA 300.0	6/14/2019 2:52:00 AM	191	mg/L	5.0 mg/L
000299	DISSOLVED OXYGEN (FIELD)	PP	No	EPA 360.1	5/29/2019 4:40:00 PM	0.71	mg/L	mg/L
082546	DEPTH TO WATER FROM MEASURE PT	PP	No	FT1000	5/29/2019 4:40:00 PM	7.16	ft	-10 ft
046480	REDOX POTENTIAL (FIELD)	PP	No	SM2580B	5/29/2019 4:40:00 PM	-54.8	mV	mV

* Attach Laboratory Reports

Lee County Resource Recovery Facility
Parameter Monitoring Report

PART III Analytical Results

Facility WACS #: 00093715

Test Site ID #:

Well Name: EQUBLK (19M5LCRFF-E2B1)

Classification of Ground Water:

Ground Water Elevation (NGVD):

Sampling Date/Time: 5/29/2019 2:13:00 PM

Report Period: MAY 2019

Well Purged:

Well Type:

[ ]	Background	[ ]	Intermediate
[ ]	Compliance	[ ]	Water Supply
[ ]	Detection	[ ]	Piezometer
[ ]	Assessment	[ ]	Leachate
[X]	Other	[ ]	Surface Water

STORET CODE	PARAMETER MONITORED	SAMPLING METHOD	FIELD FILTERED	ANALYSIS METHOD	ANALYSIS DATE/TIME	ANALYSIS RESULT *	UNITS	DETECTION LIMIT/UNITS
000945	SULFATE	PP	No	EPA 300.0	6/14/2019 3:15:00 AM	< 2.5	mg/L	2.5 mg/L

ATTACHMENT 3

ORIGINAL LABORATORY DATA INCLUDING CHAIN-OF-CUSTODY FORMS

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

June 14, 2019

Lab Data
Jones Edmunds & Associates
730 NE Waldo Road
Gainesville, FL 32641

RE: Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

Dear Lab Data:
Enclosed are the analytical results for sample(s) received by the laboratory on May 31, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeff Baylor

Jeff Baylor
jeff.baylor@pacelabs.com
(386)672-5668
Project Manager

Enclosures

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

CERTIFICATIONS

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174
Alaska DEC- CS/UST/LUST
Alabama Certification #: 41320
Arizona Certification# AZ0819
Colorado Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Kentucky Certification #: 90050
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maryland Certification: #346
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14
New Hampshire Certification #: 2958
New Jersey Certification #: FL022
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
North Dakota Certification #: R-216
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

SAMPLE SUMMARY

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35471878001	**MW-2S**	Water	05/29/19 16:40	05/31/19 11:25
35471878002	**EQ BLANK #1**	Water	05/29/19 14:13	05/31/19 11:25

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

SAMPLE ANALYTE COUNT

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35471878001	**MW-2S**	EPA 300.0	JDM	1	PASI-O
35471878002	**EQ BLANK #1**	EPA 300.0	JDM	1	PASI-O

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

ANALYTICAL RESULTS

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

Sample: MW-2S **Lab ID: 35471878001** Collected: 05/29/19 16:40 Received: 05/31/19 11:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Field pH	**6.80**	Std. Units			1		05/29/19 16:40		
Field Temperature	**23.8**	deg C			1		05/29/19 16:40		
Field Specific Conductance	**968**	umhos/cm			1		05/29/19 16:40		
REDOX	**-54.8**	mV			1		05/29/19 16:40		
Turbidity	**0.37**	NTU			1		05/29/19 16:40		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**191**	mg/L	10.0	5.0	2		06/14/19 02:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

ANALYTICAL RESULTS

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

Sample: EQ BLANK #1 **Lab ID: 35471878002** Collected: 05/29/19 14:13 Received: 05/31/19 11:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**2.5 U**	mg/L	5.0	2.5	1		06/14/19 03:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

QUALITY CONTROL DATA

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

QC Batch: 545917 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 35471878001, 35471878002

METHOD BLANK: 2957876 Matrix: Water
Associated Lab Samples: 35471878001, 35471878002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	2.5 U	5.0	2.5	06/13/19 17:09	

LABORATORY CONTROL SAMPLE: 2957877

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	50	50.4	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2960966 2960967

Parameter	Units	35470274002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	5.7	50	50	56.7	55.7	102	100	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2960968 2960969

Parameter	Units	20105701001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	7.7	50	50	57.9	58.7	100	102	90-110	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

QUALIFIERS

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-O	Pace Analytical Services - Ormond Beach

ANALYTE QUALIFIERS

U	Compound was analyzed for but not detected.

Pace Analytical Services, LLC
8 East Tower Circle
Ormond Beach, FL 32174
(386)672-5668

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 0520219-EDK4 May 2019 resample
Pace Project No.: 35471878

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35471878001	**MW-2S**				
35471878001	**MW-2S**	EPA 300.0	545917		
35471878002	**EQ BLANK #1**	EPA 300.0	545917		

WO#: 35471878

35471878

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Jones, Edmunds & Associates	Report To:	Ms. Elizabeth Kennelley	Attention:	
Address:	730 N.E. Waldo Road Bldg. A	Copy To:		Company Name:	
	Gainesville, FL 32641-5699			Address:	
Email:	smessick@jonesedmunds.com	Purchase Order #:		Pace Quote:	
Phone:	(352) 377-5821 Fax: 377-3166	Project Name:	0520219-EDK4 May 2019 resample	Pace Project Manager:	jeff.baylor@pacelabs.com,
Requested Due Date:		Project #:	12345-014-01-6402	Pace Profile #:	11934, line 6

Regulatory Agency	
State / Location	FL

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Requested Analysis Filtered (Y/N) Y/N	Analyses Test: Sulfate	Residual Chlorine (Y/N)	
1	~~MW-26~~ WTE-25 (19M5LCRRF-25)	WT	G	—		5/29/19	1640		1	1									X		Resample
2	EQ Blank #1 (19M5LCRRF-EQB1)	WT		—		↓	1413		1	1									X		
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

S. Messick

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
~~Samples hand delivered by~~	Kourtney Talbert	5/28/19	1600	Steve Messick	5/28/19	1100				
~~Steve to Pace Analytical~~	Steve Messick	5/30/19	1500	Susan Rodriguez / PACE	5.30.19	1125	0.2	Y	Y	Y
~~in Oldsmar FL.~~ Samples										
shipped by FedX Std Overnight										

Fed Ex Gainesville FL. to Oldsmar FL.

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Steve Messick		
SIGNATURE of SAMPLER:	Steve Messick	DATE Signed:	5/30/19

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Pace Analytical Florida Laboratory	Document Name: Sample Condition Upon Receipt Form	Document Revised: May 30, 2018
	Document No.: F-FL-C-007 rev. 13	Issuing Authority: Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

WO#: 35471878

Project #
Project Manager: PM: JSB **Due Date:** 06/14/19
Client: CLIENT: JONEDM

Date and Initials of person:
Examining contents: I.R.T
Label:
Deliver:
pH:

Thermometer Used: T353 Date: 5/31/19 Time: 1152 Initials: JRA

State of Origin: ☐ For WV projects, all containers verified to ≤6 °C

Cooler #1 Temp.°C	0.1 (Visual)	+0.1 (Correction Factor)	.2 (Actual)	☐ Samples on ice, cooling process has begun
Cooler #2 Temp.°C	(Visual)	(Correction Factor)	(Actual)	☐ Samples on ice, cooling process has begun
Cooler #3 Temp.°C	(Visual)	(Correction Factor)	(Actual)	☐ Samples on ice, cooling process has begun
Cooler #4 Temp.°C	(Visual)	(Correction Factor)	(Actual)	☐ Samples on ice, cooling process has begun
Cooler #5 Temp.°C	(Visual)	(Correction Factor)	(Actual)	☐ Samples on ice, cooling process has begun
Cooler #6 Temp.°C	(Visual)	(Correction Factor)	(Actual)	☐ Samples on ice, cooling process has begun

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other

Shipping Method: ☐ First Overnight ☐ Priority Overnight ☑ Standard Overnight ☐ Ground ☐ International Priority ☐ Other

Billing: ☐ Recipient ☑ Sender ☐ Third Party ☐ Credit Card ☐ Unknown

Tracking # 8137 8977 3949

Custody Seal on Cooler/Box Present: ☑ Yes ☐ No **Seals intact:** ☐ Yes ☐ No **Ice:** (Wet) Blue Dry None

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other

Samples shorted to lab (If Yes, complete) Shorted Date: Shorted Time: Qty: 1x BPIU (BOD)

Comments:

Chain of Custody Present	☑ Yes ☐ No ☐ N/A	
Chain of Custody Filled Out	☑ Yes ☐ No ☐ N/A	
Relinquished Signature & Sampler Name COC	☑ Yes ☐ No ☐ N/A	
Samples Arrived within Hold Time	☑ Yes ☐ No ☐ N/A	
Rush TAT requested on COC	☐ Yes ☑ No ☐ N/A	
Sufficient Volume	☑ Yes ☐ No ☐ N/A	
Correct Containers Used	☑ Yes ☐ No ☐ N/A	
Containers Intact	☑ Yes ☐ No ☐ N/A	
Sample Labels match COC (sample IDs & date/time of collection)	☑ Yes ☐ No ☐ N/A	
All containers needing acid/base preservation have been checked.	☑ Yes ☐ No ☐ N/A	Preservation Information:
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	☑ Yes ☐ No ☐ N/A	Preservative: Lot #/Trace #: Date: Time: Initials:
Headspace in VOA Vials? (>6mm):	☐ Yes ☐ No ☑ N/A	
Trip Blank Present:	☐ Yes ☐ No ☑ N/A	

Client Notification/ Resolution:
Person Contacted: Date/Time:

Comments/ Resolution (use back for additional comments):

Project Manager Review: Date:

ATTACHMENT 4

FIELD DATA FORMS

GROUNDWATER SAMPLING LOG

SITE NAME Lee County Resource Recovery Facility		SITE LOCATION: Felda, Florida	
WELL NO: EQUBLK-1	WELL WACS NO:	SAMPLE ID: 19M5LC-EQB1 19M5LCRR5-EQB1	DATE: 5/29/19

PURGING DATA

WELL DIAMETER (in): PVC 2"	TUBING DIAMETER (in): 1/4"	WELL SCREEN LENGTH: ___ From ___ ft to ___ ft **	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE: Peristaltic Pump (PP)

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY

1 WELL VOLUME = (feet – feet) X 0.16 gallons/foot = gallons Water Level Measured with: MPM-GNV-01

PURGE METHOD: 2.3 2.4 2.5 FS2222 Private

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ODOR	ORP (mVolts)

S. Messick

SAMPLING DATA

SAMPLED BY (Print) / AFFILIATION: Steve Messick / Jones, Edmunds & Associates Inc.	SAMPLER(S) SIGNATURES: Steve Messick	SAMPLING INITIATED AT: 1413	SAMPLING ENDED AT: 1414

PUMP OR TUBING DEPTH IN WELL (feet): N/A	SAMPLE PUMP VOC Sampling Rate <400 ml/min ☐ FLOW RATE Other Samples Rate (mL / min): +/- 250	TUBING MATERIAL CODE: PE & S	SAMPLING EQUIPMENT CODE: APP
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) FILTER SIZE: ___ µm Filtration Equipment Type:		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOL	PRES. USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL PH*	INTENDED ANALYSIS
19M5LCRRF EQB1	1	PE	250 mL	None	None	X	Sulfate

REMARKS: WTE-25

- Verified Sample pH as <2 or >12 (as applicable) at ~~MW-25~~ Rm
- ** Screened interval referenced is depth below Top of Casing

Sky Conditions: Scattered Ambient Air Temperature: 34°C
Approx. Wind Speed and Direction: 0-5mph S

Grundfos Settings: ___HZ Peristaltic Setting: #2
Bladder Pump: CPM ___ Refill/Discharge ___sec Pressure ___PSI
Total Tubing Length: 20 feet (New Tubing)

Comments:

New 1/4" tubing flush with Zeph. Dist. Water Lot# 021119042WF233
#24 Silicone head tubing Lot# H033J4T000 1/4" tubing Lot# BU1K2139
Tubing then used to purge and sample well WTE-25

GROUNDWATER SAMPLING LOG

SITE NAME: Lee County Resource Recovery Facility		SITE LOCATION: Felda, Florida	
WELL NO: ~~MW-2S~~ WTE-2S (Resample)	WELL WACS NO:	SAMPLE ID: 19M%LCRRF-2S	DATE: 5/29/19

PURGING DATA

WELL DIAMETER (in): PVC 2"	TUBING DIAMETER (in): ¼"	WELL SCREEN LENGTH: ___ Unknown ft **	STATIC DEPTH TO WATER (feet): 7.16	PURGE PUMP TYPE: Peristaltic Pump (PP)

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY

1 WELL VOLUME = (12.00 feet – 7.16 feet) X 0.16 gallons/foot = 0.8 gallons Water Level Measured with: MPM-GNV-01

PURGE METHOD: (2.3) 2.4 2.5 FS2222 Private

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable)

N/A = gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGING INITIATED AT: 1623	PURGING ENDED AT: 1639	TOTAL VOLUME PURGED (gallons): 1.6

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	COLOR (describe)	ODOR	ORP (mVolts)
1631	0.8	0.8	0.10	7.16	6.82	23.9	970	0.93	0.46	None Clear	None	-43.5
1635	0.4	1.2	↓	7.16	6.80	23.8	969	0.74	0.33	↓	↓	-45.5
1639	0.4	1.6	↓	7.16	6.80	23.8	968	0.71	0.37	↓	↓	-54.8

SAMPLING DATA

SAMPLED BY (Print) / AFFILIATION: Steve Messick / Jones, Edmunds & Associates Inc.	SAMPLER(S) SIGNATURES: Steve Messick	SAMPLING INITIATED AT: 1640	SAMPLING ENDED AT: 1641

PUMP OR TUBING DEPTH IN WELL (feet): 8	SAMPLE PUMP VOC Sampling Rate <400 ml/min ☐ FLOW RATE Other Samples Rate (mL / min): ~378	TUBING MATERIAL CODE: **PE&S**	SAMPLING EQUIPMENT CODE: **APP**
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOL	PRES. USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL PH*	INTENDED ANALYSIS
19M5LCRRF -2S	1	PE	250 mL	None	None	N/A	Sulfate

REMARKS: Location – At waste to energy facility

- Verified Sample pH as <2 or >12 (as applicable) at WTE-2S
- ** Screened interval referenced is depth below Top of Casing

Sky Conditions: scattered Ambient Air Temperature: 34°C

Approx. Wind Speed and Direction: 0-5mph S

Grundfos Settings: ___HZ Peristaltic Setting: #2

Bladder Pump: CPM ___ Refill/Discharge ___sec Pressure ___PSI

Total Tubing Length: 20 feet (New Tubing)

Comments:

This is a resample for sulfate only
I measured total well depth after collecting the sample, equals 17.23

FT 1500 Field Measurement of Dissolved Oxygen (D.O.)

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Lee/Hendry RSWF **DATE** 5/29/19

INSTRUMENT (MAKE/MODEL#) YSI 556 MPS **INSTRUMENT #** YSI - GNV - 03

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL Cl X DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A Moist Air Chamber

Zero D.O. Calibration Check Date 04/03/19 Reference Meter Book Steve- 01

(Zero D. O. checked quarterly) Zero Oxygen Solution Stnd Lot# UV1 Exp. Date: 06/2019

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE (mg/L)	Temperature (Deg C)	INSTRUMENT RESPONSE (mg/L)	(+/- 0.3 mg/L) DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
19/05/29	0835	A	7.94	~~27.2~~ ~~26.4~~	7.70/7.94	0.00	Yes	Init.	jmm
↓	1656	A	7.48	30.6	7.60	0.12	Yes	Cont.	jmm
19/05/30	0805	A	8.54	23.2	8.43/8.54	Ø	Yes	Init.	jmm
↓	1055	A	7.85	27.8	7.88	0.3	Yes	Cont.	jmm

FT 1100 Field Measurement of Hydrogen Ion Activity (pH)

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Lee/Hendry RSWF **DATE** 5/29/19

INSTRUMENT (MAKE/MODEL#) YSI 556 MPS **INSTRUMENT #** YSI - GNV - 03

Instrument Gain -5.227 **Date Determined** 5/29/19 (Acceptable Gain = Acceptable Slope)

(Range -5.597 to -4.579 acceptable) (Check Instrument Gain at the beginning of each week)

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY X pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A **7.00 SU Lot #** CC559745 **Expiration Date** 05/14/20

Standard B **4.01 SU Lot #** WW1 **Expiration Date** 04/2020

Standard C **10.00 SU Lot #** CC552792 **Expiration Date** 04/05/20

Standard D 6.86 **SU Lot #** VQ1 **Expiration Date** 10/2019

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE (SU)	INSTRUMENT RESPONSE (SU)	(+/- 0.2 SU) DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
19/05/29	0844	A	7.00	6.99/7.00	Ø	Yes	Init.	sm
	0846	B	4.01	4.01	Ø	Yes	Init.	sm
	0847	C	10.00	10.06/10.01	Ø	Yes	Init.	sm
	0850	D	6.86	6.83	0.03	Yes	Init.	sm
	1658	A	7.00	6.98	0.02	Yes	Cont.	sm
	1659	B	4.01	4.00	0.01	Yes	Cont.	sm
↓	1701	C	10.00	10.03	0.03	Yes	Cont.	sm
19/05/30	0807	A	7.00	7.04	0.04	Yes	Init.	sm
	0808	B	4.01	4.07	0.06	Yes	Init.	sm
	0809	C	10.00	10.01	0.01	Yes	Init.	sm
	1057	A	7.00	7.05	0.05	Yes	Cont.	sm
	1058	B	4.01	4.05	0.04	Yes	Cont.	sm
↓	1100	C	10.00	9.98	0.02	Yes	Cont.	sm

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Lee/Hendry RSWF **DATE** 5/29/19

INSTRUMENT (MAKE/MODEL#) YSI 556 MPS **INSTRUMENT #** YSI - GNV - 03

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH **X** ORP
☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A Zobell's Solution Mixed Standard **Expiration Date** 07/05/19
Stock Solution Lot # 18L100623 **Expiration Date** 12/05/2023

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE (mV)	Temperature (Deg C)	INSTRUMENT RESPONSE (mV)	(+/- 10 mV) DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
19/05/29	0852	A	226.4	26.2	225.6/226.4	Ø	Yes	Init.	SM
↓	1703	A	224.9	27.4	224.3	0.6	Yes	Cont.	SM
19/05/30	0810	A	224.1	28.0	222.6/224.1	Ø	Yes	Init.	SM
↓	1102	A	224.4	27.8	223.9	0.5	Yes	Cont.	SM

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Lee/Hendry RSWF **DATE** 5/29/19

INSTRUMENT (MAKE/MODEL#) YSI 556 MPS **INSTRUMENT #** YSI - GNV - 03

PARAMETER: *[check only one]*

☐ TEMPERATURE X CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1413 uS/cm Lot # CC17803 Expiration Date 10/30/19

Standard B 447 uS/cm Lot # CC17346 Expiration Date 06/22/19

Standard C 84 uS/cm Lot # CC17607 Expiration Date 08/24/19

Standard D 8974 uS/cm Lot # VU1 Expiration Date 06/2019

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE (uS/cm)	INSTRUMENT RESPONSE (uS/cm)	(+/- 5%) DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
19/05/29	0855	A	1413	1406/1413	Ø	Yes	Init.	sm
	0857	B	447	438	<2	Yes	Init.	sm
	0859	C	84	84	Ø	Yes	Init.	sm
	0900	D	8,974	8941	<1	Yes	Init.	sm
	0902	E	80,000	79900	<1	Yes	Init.	sm
	1705	C	84	85	<2	Yes	Cont.	sm
	1706	B	447	439	<2	Yes	Cont.	sm
↓	1708	A	1413	1411	<1	Yes	Cont.	sm
19/05/30	0813	A	1413	1417	<1	Yes	Init.	sm
	0814	B	447	439	<2	Yes	Init.	sm
	0815	C	84	84	Ø	Yes	Init.	sm
	0816	D	8,974	8945	<1	Yes	Init.	sm
	0817	E	80,000	79668	<1	Yes	Init.	sm
	1103	C	84	84	Ø	Yes	Cont.	sm
	1104	B	447	439	<2	Yes	Cont.	sm
	1105	A	1413	1410	<1	Yes	Cont.	sm
	1107	D	8974	8940	<1	Yes	Cont.	sm
↓	1109	E	80,000	79720	<1	Yes	Cont.	sm

Standard E 80,000 uS/cm Lot # VU1 Exp. Date: 06/2019

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Lee/Hendry RSWF **DATE** 5/29/19

INSTRUMENT (MAKE/MODEL#) Hach 2100P **INSTRUMENT #** TB-GNV- 01

Instrument Calibration Date: 04/03/19 **Reference Meter Book:** Steve - 01

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

X TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A **Gel Standard** *3.61* **NTU**

Standard B **Gel Standard** *41.5* **NTU**

Standard C **Gel Standard** *435* **NTU**

Standard D **Measurement Cell + Distilled Water <0.25NTU**

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE (NTU)	INSTRUMENT RESPONSE (NTU)	(+/- 6.5%) DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
19/05/29	0905	A	3.61	3.65	<2	Yes	Init.	sm
	0906	B	41.5	41.1	<1	Yes	Init.	sm
	0906	C	435	430	<2	Yes	Init.	sm
	0907	D	≤0.25	0.19	—	—	Init.	sm
	1710	A	3.61	3.63	<1	Yes	Cont.	sm
	1710	B	41.5	41.4	<1	Yes	Cont.	sm
	1711	D	≤0.25	0.20	—	—	Cont.	sm
19/05/30	0818	A	3.61	3.59	<1	Yes	Init.	sm
	0819	B	41.5	41.1	<1	Yes	Init.	sm
	0820	D	≤0.25	0.19	—	—	Init.	sm
	0820	C	435	434	<1	Yes	Init.	sm
	1111	A	3.61	3.63	<1	Yes	Cont.	sm
	1111	B	41.5	41.3	<1	Yes	Cont.	sm
	1112	C	435	432	<1	Yes	Cont.	sm
	1112	D	≤0.25	0.22	—	—	Cont	sm

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME In House Comparison **DATE** 04/03/19

INSTRUMENT (MAKE/MODEL#) YSI 556 MPS **INSTRUMENT #** YSI - GNV - 03

PARAMETER: *[check only one]*

X TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER _____

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A **NIST Thermometer 10.0 °C** **#94748 Cal Date: 10/22/18**

Standard B **NIST Thermometer 25.0 °C** **#94748 Exp. Date: 10/22/19**

Standard C **NIST Thermometer 40.0 °C**

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE (°C)	INSTRUMENT RESPONSE (°C)	(+/- 0.5°C) DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	CALIBRATOR INITIALS
19/04/03	1510	A	10.0	9.95	<0.1	Yes	Init	SMM
19/04/03	1525	B	25.0	24.8	0.2	Yes	Init	SMM
19/04/03	1540	C	40.0	40.1	<0.1	Yes	Init	SMM

REFERENCE FACTORS FOR FIELD SAMPLING DATA SHEETS

WELL CAPACITY (Gallons / Foot):

0.75" = 0.02
1" = 0.04
1.25" = 0.06
2" = 0.16
3" = 0.37
4" = 0.65
5" = 1.02
6" = 1.47
12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gallons / Foot): 1/8" = **0.0006**
3/16" = **0.0014**
1/4" = **0.0026**
5/16" = **0.004**
3/8" = **0.006**
1/2" = **0.010**
5/8" = **0.016**

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other

PURGING EQUIPMENT CODES **B** = Bailer **BP** = Bladder Pump **ESP** = Electric Submersible Pump **PP** = Peristaltic Pump

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltid Pump **RFPP** = Reverse Flow Peristaltic Pump **O** = Other (Specify) **SM** = Straw Method (Tubing Gravity Drain) **VT** = Vacuum Trap

STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: **± 0.2 units**

Temperature: **± 0.2 °C**

Specific Conductance: **± 5%**

Dissolved Oxygen: **all readings ≤ 20% saturation (see Table FS 2200-2)**
optionally, ± 0.2 mg/L or ± 10% (whichever is greater)

Turbidity: **all readings ≤ 20 NTU**
optionally ± 5 NTU or ± 10% (whichever is greater)

gal/min	=	ml/min	gal/min	=	ml/min	gal/min	=	ml/min
0.026		100	0.211		800	0.396		1500
0.053		200	0.238		900	0.423		1600
0.079		300	0.264		1000	0.449		1700
0.106		400	0.291		1100	0.476		1800
0.132		500	0.317		1200	0.502		1900
0.159		600	0.343		1300	0.528		2000
0.185		700	0.370		1400			

GENERAL SAMPLING NOTES AND CONVENTIONS

1. All sampling was performed according to the FDEP Standard Operating Procedures as listed in DEP-SOP-001/01 (Field Procedures) dated March 31, 2008 (Effective 12/3/08).

2. Field cleaning and decontamination has been done in accordance with DEP-SOP-001/01 (Field Procedures), FC-1000.

3. Tubing and filter cartridge lot numbers for all sampling points and wells are the same as those listed for that tubing type on the Equipment Blank data form(s) covering that equipment system.

4. Tubing suppliers/manufacturers are named in the following list:

• HDPE disposable tubing	US Plastics
• Tygon tubing	Cole Parmer
• Norprene tubing	Cole Parmer
• Silicon tubing	Cole Parmer

5. Field instrument calibrations were conducted in accordance with DEP-SOP-001/01 (Field Procedures), FT1000.

6. Calibration solution and gas suppliers are named in the following list:

• pH calibration solutions	Cole Parmer/Oakton
• Conductivity calibration solutions	Cole Parmer/Oakton
• Dissolved Oxygen probe membranes	YSI
• ORP calibration solutions	YSI
• Turbidity calibration solutions/gel standards	Hach
• TVA calibration gas cylinders	Airgas
• Eagle RKI calibration gas cylinders	Airgas

7. All samples collected were grab samples.

8. All sample containers requiring added preservative were supplied pre-preserved from the laboratory. No additional preservative was added in the field.

9. A combination of a front-bumper-mounted gasoline generator and an electric air compressor or compressed nitrogen is used to power the Grundfos electric submersible pump and bladder pump systems, as appropriate.

10. Screened intervals are assumed to be at the bottom of all monitoring wells sampled unless otherwise noted.

11. Well purge method indications on the field data sheets correspond to DEP-SOP-001/01 (Field Procedures), FS2000 sections as indicated below:

Data Sheet Designation	SOP Designation
2.3	FS 2212.2.3
2.4	FS 2212.2.4
2.5	FS 2212.2.5
2222 or 3.7.1	FS 2222 or 2212.3.7.1
Private	FS 2215.1 & 2215.2 (Jones Edmunds SOP for private well sampling)

Comments or Exceptions

ATTACHMENT 5

SULFATE TREND GRAPH

Lee County Resource Recovery Facility
Historic Sulfate in MW-2S