Morris, John R.

From: Troy Hays <thayes@jonesedmunds.com>
Sent: Monday, October 31, 2016 9:41 AM
To: Morris, John R.
Cc: Roff, Nick; Henry C. Norris (Henry.Norris@citrusbocc.com); Brandy J. Yunko (Brandy.Yunko@citrusbocc.com)
Subject: Citrus County Central Landfill, Contamination Assessment Plan-Phase 1
Attachments: 2016.10.26_Citrus_Contamination Assessment Plan.pdf

Good Morning John,

The Citrus County Central Landfill, Contamination Assessment Plan-Phase 1 is attached for your review. A hard copy was shipped to you last week also. Please do not hesitate to call me with any questions or comments at 352-258-9520.

Thanks,

Troy D. Hays, PG
Senior Manager / Vice President

JONES EDMUNDS
INTEGRITY | KNOWLEDGE | SERVICE

Jones Edmunds & Associates, Inc.
730 NE Waldo Road | Gainesville, FL 32641
352.377.5821 ext. 1480 | Cell: 352.258.9520
www.jonesedmunds.com

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JONES EDMUNDS

October 21, 2016

Mr. John Morris, PG
Florida Department of Environmental Protection – Southwest District
13051 North Telecom Parkway
Temple Terrace, FL 33637-0926

RE: Citrus County Central Landfill
Contamination Assessment Plan-Phase 1
WACS Facility ID: 39859
Jones Edmunds Project No.: 03860-056-01

Dear Mr. Morris,

This report details the proposed Contamination Assessment Plan – Phase 1 to address the groundwater and landfill gas migration concerns at the Citrus County Central Landfill. This plan addresses the following issues at the site:

- Delineating VOC exceedances observed in MW-19 and MW-21.
- Remediating VOC exceedances observed in background well MW-7.
- Investigating the adequacy of the current landfill gas monitoring network.

BACKGROUND

On September 20, 2005, Citrus County Board of County Commissioners (BOCC) executed a Consent Agreement with the Florida Department of Environmental Protection (FDEP) to address issues of reported groundwater exceedances in downgradient groundwater monitoring wells since 2002 and exceedances of the lower explosive limit (LEL) for combustible gases (calibrated to methane) at the landfill gas (LFG) monitoring probes since November 2003. The BOCC implemented the approved Groundwater Investigation Plan and the Landfill Gas Compliance Action Plan, in the Consent Agreement. SCS Engineers implemented the Landfill Gas Compliance Action Plan. Jones Edmunds prepared a Groundwater Investigation Report (GWIR) dated January 3, 2006 which addressed paragraphs 6, 8, 11a, 11b, and Exhibit A of the Consent Agreement. Jones Edmunds submitted a Response to FDEP's Request for Additional Information (RAI) entitled Groundwater Investigation Report Response to FDEP RAI in September 2006.

The Consent Agreement required the BOCC to obtain a lease expansion agreement from the Division of Forestry/State Lands and provide a copy to the FDEP. On October 5, 2005, the Department of Agriculture and Consumer Services Division of Forestry issued a Special Arrangement of Accommodations to grant Citrus County Solid Waste Management Division permission to access the Withlacoochee State Forest for the purpose of installing and monitoring 18 gas probes (GP-1 through GP-18) and groundwater monitoring wells (MW-10 through MW-17) next to the Citrus County Central Landfill (Landfill). A copy of the Citrus County Central Landfill Special Use permit was submitted to FDEP as Attachment B of the GWIR.

Monitoring wells (MW-10 through MW-15 and MW-17) were installed in October and November 2005. One water-level monitoring well (MW-16) was installed between the lined and unlined cells to provide additional groundwater flow information. The well logs and completion reports were submitted to the FDEP in the September 2006 GWIR RAI. Groundwater samples were collected from MW-10 through MW-15 and MW-17 in July 2006. The samples were analyzed for the parameters listed in 40 CFR Part 258, Appendix II. Analytical results for the July 2006 sampling event were provided in Appendix H of the GWIR.

A permit modification requesting changes to (1) the Landfill property boundary, (2) the zone of discharge, (3) the groundwater monitoring network, and (4) the LFG monitoring network was submitted to and approved by FDEP (Modification 21375-011 to existing Permit #21375-008-SO/01). The modified Landfill property boundary extends approximately 300 feet from the previous west, south, and east property boundaries. The new zone of discharge extends approximately 100 feet from the edge of waste along the western, northern, and southern closed Landfill boundaries.

On July 18, 2006, Jones Edmunds conducted groundwater sampling for the Second Semiannual 2006 permit-required compliance monitoring. Groundwater results from MW-10 reported concentrations of Benzene, Methylene Chloride, and Vinyl Chloride above the FDEP drinking water standards. Jones Edmunds re-sampled MW-10 on August 31, 2006. Concentrations of Benzene and Methylene Chloride were at the Primary Drinking Water Standard (PDWS) and Vinyl Chloride exceeded the PDWS.

The confirmed exceedance of Vinyl Chloride in MW-10 initiated implementation of a Site Assessment Report (SAR) in accordance with Rule 62-780, FAC as required by the Consent Agreement 05-1078. The site assessment was conducted to delineate the horizontal and vertical extent of contamination as well as any potential environmental or public health threats.

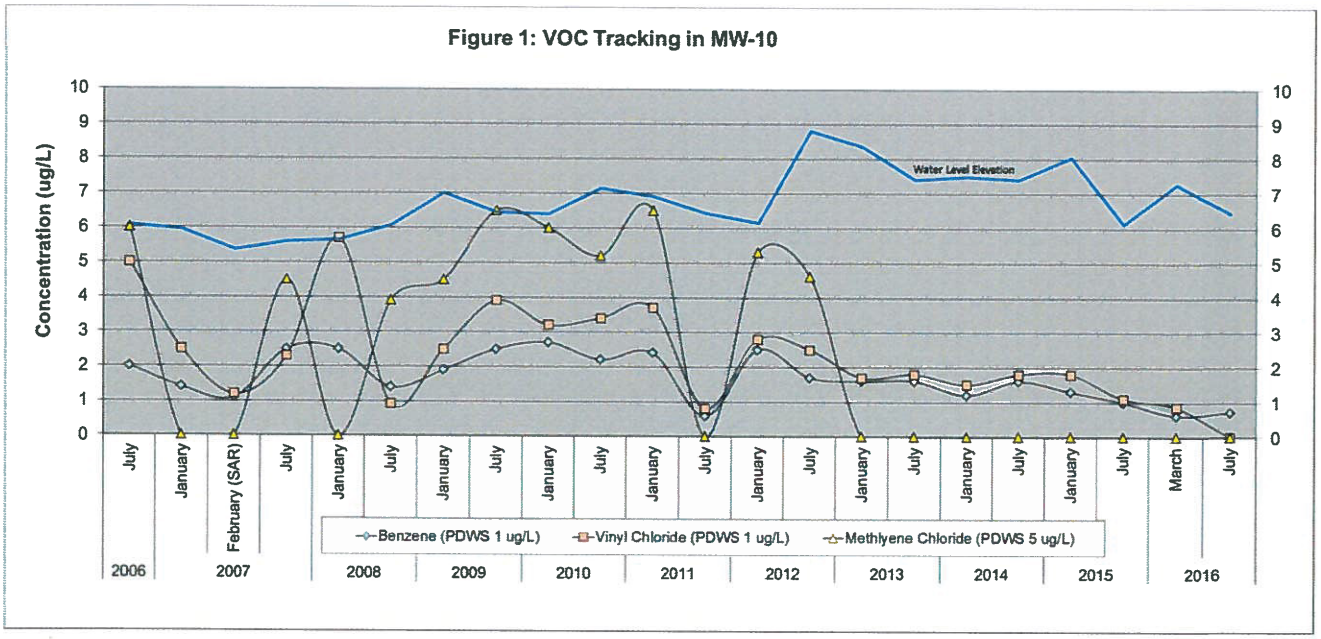
Site assessment activities included installing two assessment wells for vertical and horizontal delineation of contaminant migration. Vertical assessment well MW-19 was installed clustered with MW-10 and screened at a deeper interval. Horizontal assessment well MW-18 was installed approximately 150 feet northwest of MW-10 and screened to intersect the water table.

FDEP requested that the apparent groundwater mounding in the vicinity of MW-10 be investigated as part of this site assessment. Two piezometers, PZ-1 and PZ-2, were installed west and east of MW-10 to collect water level measurements. Both piezometers were screened to intersect the water table. Pressure transducers were installed in MW-10, MW-18, PZ-1, and PZ-2 to continuously record water level data. Single well aquifer performance tests (slug tests) were conducted on the wells to obtain hydrologic information in the vicinity of MW-10. In addition, during April and May 2007, four biweekly continuous-round groundwater level measurements were collected from on-site wells to augment the pressure transducer data. The SAR was submitted to FDEP on October 10, 2007 identifying migrating landfill gas as the cause of the groundwater contamination. Attachment 1 is the July 2016 potentiometric surface map. Attachment 1 shows the current groundwater monitoring network.

FDEP met with the County and Jones Edmunds and requested additional information to verify that migrating landfill gas was the source of the contamination. Jones Edmunds conducted landfill gas speciation sampling on gas samples collected from MW-10 and MW-17. The sampling showed that gas in the well risers contained the parameter of concern VOCs at sufficient concentrations to cause the observed groundwater exceedances. The results of the gas sampling are documented in the Site Assessment Report Response to FDEP's RAI dated January 2009.

Based on the information presented in the SARs, FDEP requested that active remediation be implemented to remediate the groundwater around MW-10. Jones Edmunds installed the solar powered soil vapor extraction system near MW-10 and the assessment wells. Since the system installation in October of 2010, the VOCs observed in the groundwater have decreased and have been at concentrations below the drinking water standards for the past two sampling events. Figure 1 shows the parameters of concern concentration trends in MW-10.

Figure 1: VOC Tracking in MW-10



CURRENT SITE GOUNDWATER CONDITIONS

The solar powered soil vapor extraction system has remediated the shallow groundwater around MW-10. However, three additional groundwater contamination issues have been recently observed at the site. The three issues are:

1. Observed exceedances of Benzene, Vinyl Chloride, and Methylene Chloride in MW-19.
2. Observed exceedances of Benzene in MW-21.
3. Observed exceedances of Benzene in Background well MW-7.

VOCs in MW-19

Assessment well MW-19 is clustered with MW-10 but screened deeper in the aquifer to monitor for vertical migration of contaminants. Assessment well MW-18 is downgradient of MW-10 and has never had any exceedances of groundwater protection standards. Recently, Benzene, Vinyl Chloride, and Methylene Chloride have all been observed in MW-19 at concentrations above their respective groundwater protection standards. Figure 2 shows the parameter concentration trends in MW-19.

There have been low level hits of both Benzene and Vinyl Chloride in MW-19 in the past; however, just recently the well has had detections of all 3 parameters at elevated concentrations. Of the parameters of concern, Methylene Chloride is the most soluble in water; therefore it will dissolve into water at the highest concentrations. Methylene Chloride also has the highest Vapor Pressure; therefore, Methylene Chloride will volatilize out of water first due to changes in pressure. As shown in Figure 1, which shows the VOC tracking in MW-10, Methylene Chloride had the greatest concentration and was the first to fall out after implementation of the gas extraction remediation. Methylene Chloride remains below the detection limit in MW-10, indicating that the gas extraction system is still effecting the VOC concentrations in the groundwater.

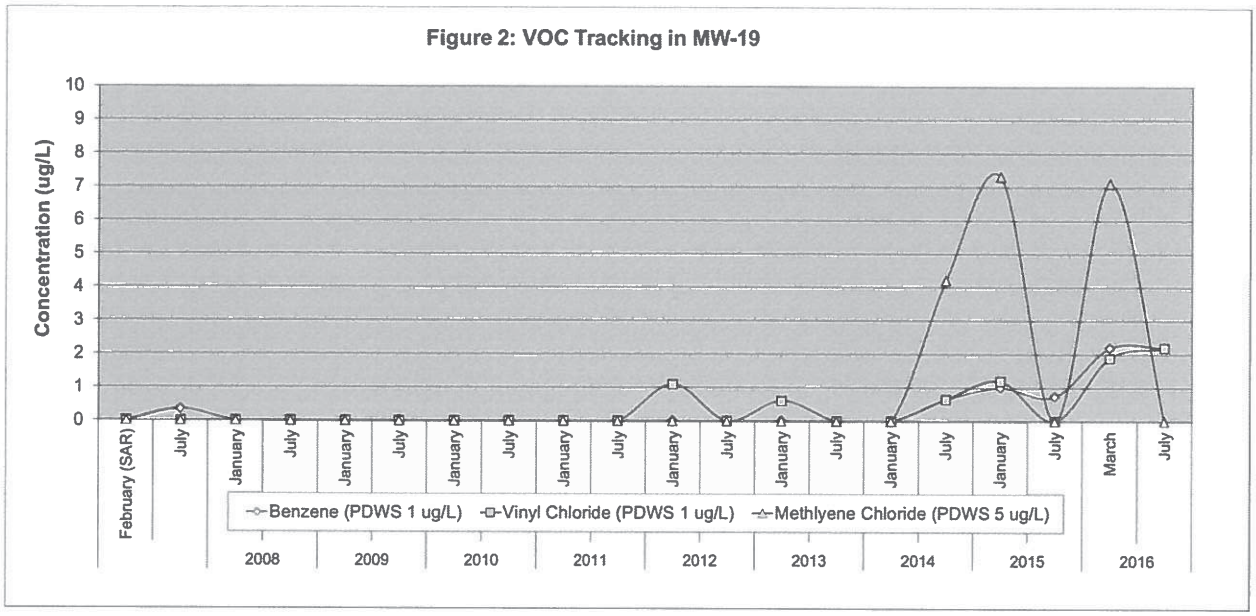


Figure 2 shows a spike in Methylene Chloride in MW-19 associated with smaller spikes of both Benzene and Vinyl Chloride. All of the parameters in MW-19 decreased during the July 2015 sampling event; however, they spiked back up during the March 2016 sampling event. During the July 2016 event the concentrations of Benzene and Vinyl Chloride both stayed level but the concentration of Methylene Chloride dropped back down below the laboratory detection limit.

MW-19 is an assessment well and only sampled for the VOC parameters of concern so in September of 2016, Citrus County had Jones Edmunds sample MW-19 for leachate indicator parameters. The sampling was conducted to determine if the observed VOC exceedances in MW-19 were sourced from landfill gas, as they are the same contaminants as those observed in MW-10, or if exceedances could be sourced from a leachate plume. Table 1 compares the results of the sampling event with background concentrations observed during the July 2016 compliance sampling. The laboratory report and field data are provided as Attachment 2.

The results of the September 2016 sampling event show that the exceedances in MW-19 do not appear to be originating from a different source such as a leachate plume. The leachate indicator parameters are at similar concentrations to background concentrations and the concentrations observed in MW-10. The only difference is the detection of Ammonia in MW-19 which was not observed in the background wells or compliance well MW-10. Since 2014, the Ammonia concentrations observed at the site have ranged from below the laboratory detection limit up to around 2.5 mg/L. Although there is elevated Ammonia in this well the lack of additional Chloride still points to a non-leachate source. The County plans to add Ammonia and Chloride to the routing semiannual sampling of MW-19.

Table 1: September Sampling Results Summary

Well Designation	Well ID	Chloride (mg/L)	Ammonia (mg/L)	Iron (ug/L)	Sampling Event
Assessment Well	MW-19	5.5	6.6	1100	Sep-16
Background Wells	MW-3	8	BDL	BDL	Jul-16
	MW-7	6.7	BDL	2500	
Compliance Well	MW-10	5.9	BDL	5900	

Note: BDL is Below Laboratory Detection Limit

Additionally, during the September 2016 sampling of MW-19, landfill gas was measured in the well. To measure the landfill gas, tubing was attached to the gas meter and lowered into the well 100 ft below land surface to measure the gas. The reported concentrations of gas in MW-19 were:

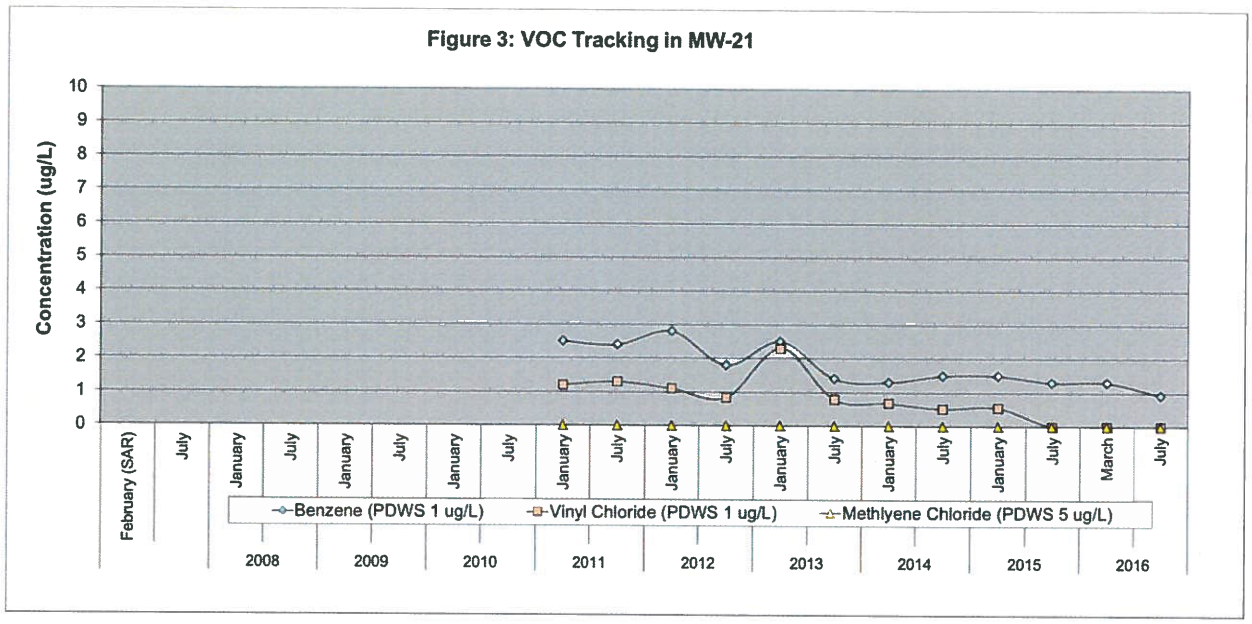
- Oxygen: 17.2 % Volume
- Carbon Dioxide: 2.0 % Volume
- Methane: peak concentration of 51.5 % Volume

The results of the additional groundwater sampling and the measuring of landfill gas in the riser of MW-19 indicate that the contamination is sourced from landfill gas. The contamination character is the same as what is observed and has been remediated in MW-10. In response to the increases of VOCs in MW-19, the County shut down GEW-1 and GEW-5 on the soil vapor extraction system near MW-10 and MW-19. This focuses the suction on the middle of the gas system where the exceedances are observed. This modification to the system was implemented in March 2016 and, as shown in figure 2, the Methylene Chloride exceedance went back down below the laboratory detection limit and the concentrations of Benzene and Vinyl Chloride both leveled off in the July 2016 sampling event. One set of data is too soon to make a definitive conclusion if whether or not the increased suction has started to remediate the exceedances in MW-19 but the immediate reductions are promising.

VOCs in MW-21

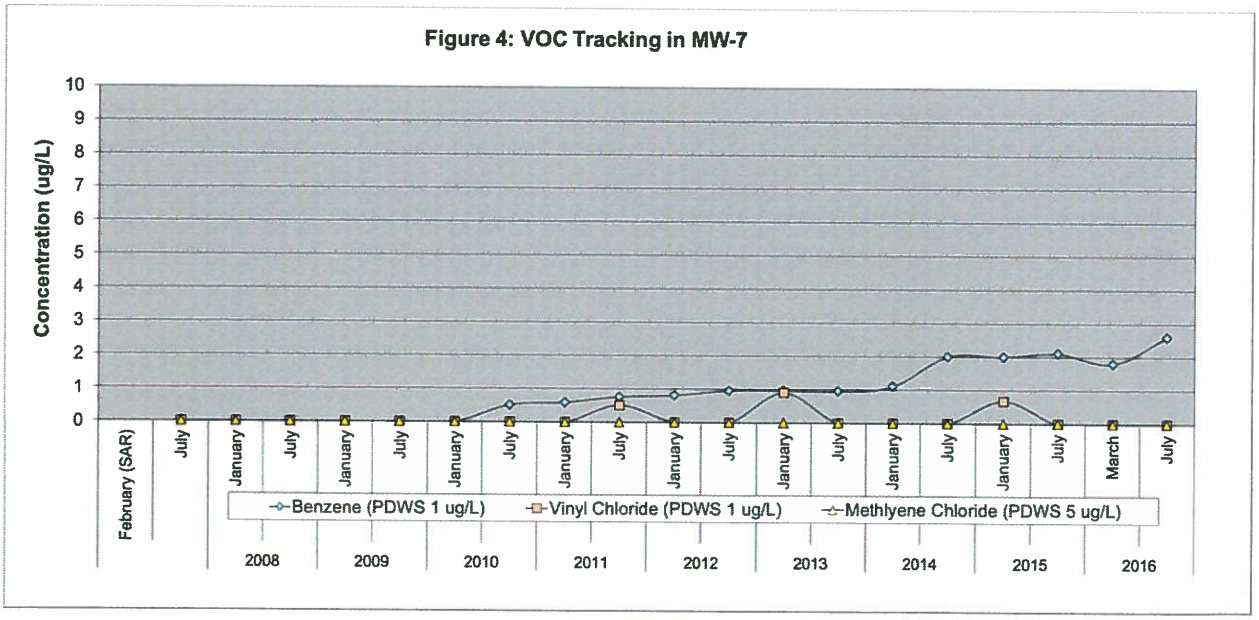
Analytical data collected in MW-21 since 2011 show slowly declining exceedances of Benzene and Vinyl Chloride. This well has not had any detections of Methylene Chloride since 2011. Figure 3 shows the VOC parameter trends in MW-21.

Both Benzene and Vinyl Chloride have been slowly decreasing in this well since 2011. Both parameters were below the groundwater protection standards during the July 2016 sampling event. The parameters observed in MW-21are the same as those observed in MW-10 and the concentrations of Chloride and Ammonia in this well are low level at similar concentrations to the reported background concentration ranges. The source of the groundwater contamination in MW-21 appears to be from migrating landfill gas the same as MW-10.



VOCs in MW-7

Low Level concentrations of Benzene were first observed in Background Well MW-7 during the July 2010 sampling event. Since then, Benzene has been slowly increasing in this well. Figure 4 shows the VOC parameter trends in MW-7. Vinyl Chloride is detected sporadically, below or at the primary drinking water standard, and there have been no detections of Methylene Chloride.



As MW-7 is a background well it is included in the routing semiannual compliance sampling events and is sampled for Chloride and Ammonia every event. Both parameters are low level and do not indicate leachate impacts.

During the September 2016 sampling event, landfill gas was also measured in MW-7. The gas was measured the same way as in MW-19. Tubing was attached to the gas meter and lowered into the well 100 ft below land surface to measure the gas. The reported concentrations of gas in MW-7 were:

- Oxygen: 4.2 % Volume
- Carbon Dioxide: 38.2 % Volume
- Methane: peak concentration of 52.5 % Volume

Based on the groundwater analytical results and the observed landfill gas in the riser of MW-7, the most likely source of the Benzene observed in the groundwater at MW-7 is landfill gas. Hydraulically, MW-7 is on the up gradient boundary of the landfill and is appropriately positioned for a background well. The parameters observed in this well are expected to be from migrating landfill gas and not from off-site contamination or a leachate release.

CURRENT LANDFILL GAS MONITORING NETWORK

In 2005, the County implemented the Landfill Gas Compliance Action Plan that was included in the consent order. The plan required the installation of 18 new landfill gas monitoring probes screened at depths varying from 35 ft to 75 ft below landfill surface. Additionally, GP-19 was installed in November 2010 as part of the landfill expansion. Figure 5 shows the current landfill gas monitoring network. Table 2 provides the construction details for the gas probes.

The most recent landfill gas compliance monitoring report was submitted on September 30, 2016 and no methane was detected in any of the 19 gas monitoring probes or the on-site structures. Since the installation of the Landfill Gas Compliance Action Plan migration of landfill gas at the site has not been considered a compliance issue. However, the observation of landfill gas in groundwater monitoring wells which are screened much deeper than the gas compliance probes has raised questions about the adequacy of the landfill gas monitoring network.

Landfill gas will migrate in the unsaturated pore space following the path of least resistance. Landfill gas is denser then air so it will not float. It would need sufficient back pressure to overcome the downward pull of gravity and rise. It is suspected that landfill gas is being pulled down through the unsaturated pore spaces until it hits the water table. It then spreads out across the water table and is entering the groundwater monitoring wells either through the screens intersecting the water table or breaches in the well casings. If this is occurring, the landfill gas may be migrating beneath the current gas monitoring network undetected.

Figure 5: Citrus County Central Landfill, Landfill Gas Monitoring Network.

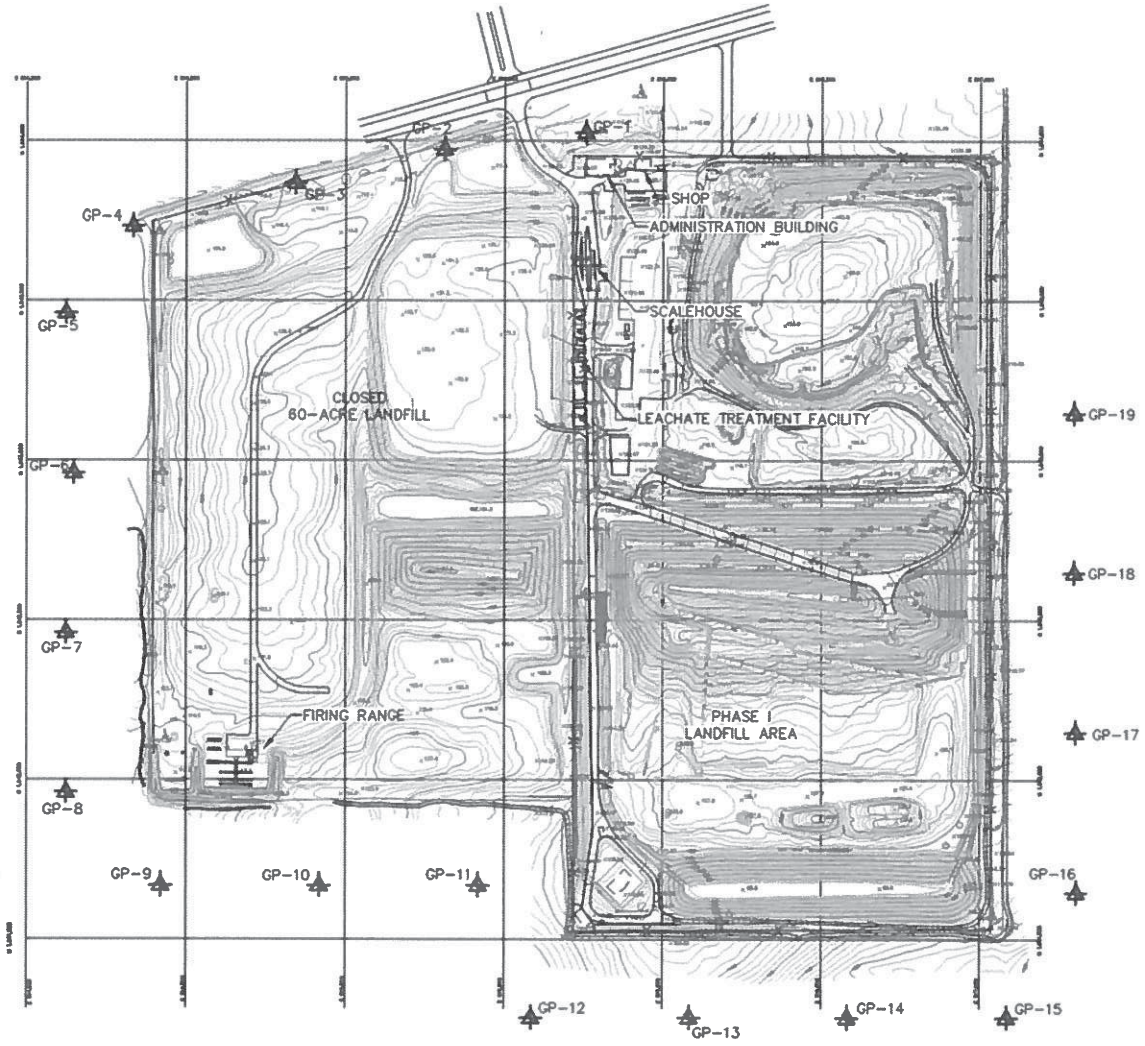


Table 2: Gas Monitoring Probe Construction Details

Gas Probe ID	Probe Depth (ft)	Length of Slotted Pipe (ft)	Solid Pipe Length Below Grade (ft)	Solid Pipe Length Above Grade (ft)
GP-1	40	35	5	3
GP-2	40	35	5	3
GP-3	40	35	5	3
GP-4	40	35	5	3
GP-5	40	35	5	3
GP-6	40	35	5	3
GP-7	40	35	5	3
GP-8	40	35	5	3
GP-9	40	35	5	3
GP-10	40	35	5	3
GP-11	40	35	5	3
GP-12	80	75	5	3
GP-13	80	75	5	3
GP-14	80	75	5	3
GP-15	80	75	5	3
GP-16	80	75	5	3
GP-17	80	75	5	3
GP-18	80	75	5	3
GP-19*	40	35	5	3

Notes: Data in this table collected from the approved Landfill Gas Compliance Action Plan.
GP-19 was not part of the original plan, dimensions need to be field verified.

CONTAMINATION ASSESSMENT PLAN

As detailed above, Citrus County has implemented a substantial effort to get the site into compliance and to remediate the groundwater exceedances. We are proposing a phased plan with the first phase being additional investigation into the remaining areas of concern at the site. The second phase will most likely consist of active remediation, which will be proposed after we evaluate the data collected in Phase 1. The County is moving forward with Phase 1, the Contamination Assessment Plan. Phase 1 will address the following items:

1. Delineation of the groundwater exceedances around MW-19.
2. Delineation of the groundwater exceedances around MW-21.
3. Remediating the groundwater and landfill gas migration issues that have been observed at MW-7.
4. Conduct further investigation into the adequacy of the current landfill gas monitoring network.

Each of the contamination assessment plan items are discussed in detail below.

1. Delineation of the groundwater exceedances around MW-19

As discussed above, MW-19 is clustered with MW-10 and screened deeper in the aquifer. The downgradient well MW-18 has never had any exceedances reported in it; however, vertical migration at MW-19 is a concern. The County will install one additional well (MW-19D) clustered with MW-10 and MW-19 screened deeper than MW-19 to monitor a deeper portion of the aquifer. The proposed construction details for MW-19D are in Table 3.

Table 3: Well Construction Details for MW-10 and MW-19 with Proposed Details for MW-19D

Well	Designation	Total Depth (ft)	Screen Interval (ft BLS)	Diameter (inch)	Well Material
MW-10	Compliance	120.5	100.5 to 120.5	2	PVC
MW-19	Assessment	140 ft	130 to140	2	PVC
MW-19D	Assessment	160 ft	150 to 160	2	PVC

MW-19D is scheduled to be installed using a sonic rig with continuous sampling to the total depth of the boring. No standard penetration sampling will be performed; however, samples will be collected from the recovered core. MW-19D will be developed using surge-and-purge methods until the purge water has turbidity under 20 NTU. The County Surveyor will survey the well for location and elevation.

An initial sampling event will be conducted on MW-19D. The well will be sampled for Benzene, Vinyl Chloride, Methylene Chloride, and field parameters.

2. Delineation of the groundwater exceedances around MW-21.

The exceedances of Benzene and Vinyl Chloride in MW-21 are currently below FDEP's standards but there is concern that there may be deeper contamination in this area similar to what is observed at MW-10 and MW-19. To delineate the observed contamination around MW-21, the County proposes to install two assessment wells in this area. MW-21D will be installed clustered with MW-21 but screened deeper in the aquifer to monitor for vertical migration and MW-22 will be installed north of MW-21 to monitor for horizontal migration.

Table 4: Well Construction Details for MW-21 with Proposed Details for MW-21D and MW-22

Well	Designation	Total Depth (ft)	Screen Interval (ft BLS)	Diameter (inch)	Well Material
MW-21	Detection	125.4	105 to 125	2	PVC
MW-21D	Assessment	145 ft	135 to 145	2	PVC
MW-22	Assessment	125 ft	105 to 125	2	PVC

MW-21D and MW-22 are scheduled to be installed using a sonic rig with continuous sampling to the total depth of the boring. No standard penetration sampling will be performed; however, lithologic samples will be collected from the recovered core. The wells will be developed using surge-and-purge methods until the purge water has turbidity under 20 NTU. The County Surveyor will survey the wells for location and elevation.

An initial sampling event will be conducted on MW-21D and MW-22. The wells will be sampled for Benzene, Vinyl Chloride and field parameters.

3. Remediate the groundwater and landfill gas migration issues that have been observed at MW-7.

The observed exceedances in Background well MW-7 are sourced from landfill gas and landfill gas has been measured in this well. As MW-7 is one of the site background wells, this well is up-gradient of the site and the downgradient flow is under the landfill. Therefore, no additional groundwater delineation is proposed around this well and the County is proposing moving forward with active remediation at this location.

MW-7 is located adjacent to the new cell and within a reasonable distance of the active landfill gas extraction system installed in Phase 1. The County proposes to install two landfill gas extraction wells between MW-7 and the active cell liner. The County will hook those two wells up to the landfill gas extraction system. This will remove the gas that is in contact with the groundwater and create a barrier prohibiting landfill gas migration along the eastern property boundary.

Both extraction wells will be 2 inch diameter PVC and installed with 40 foot screened intervals just above the water table. They will be connected to the landfill gas extraction system to remove the observed landfill gas in this area. The removal of the landfill gas is expected to also remediate the exceedances of Benzene in the groundwater in this well.

4. Conduct further investigation into the adequacy of the current landfill gas monitoring network.

The current landfill gas monitoring network that was installed as required in the consent order has not detected any migrating landfill gas at the site. However, there is an issue with landfill gas being measured in the groundwater monitoring wells that are screened deeper than the landfill gas monitoring probes. The County is moving forward with installing three additional landfill gas monitoring probes that will be screened just above the water table. The gas probes will be constructed of 1 inch PVC with a 10 foot screen at the bottom of the well.

The exact locations for the three additional gas probes have not been finalized and the final construction details for the probes will be adjusted to ensure that the screen is just above the water table but not in water. GP-20 and GP-21 will be installed in the vicinity of MW-7 and MW-10/MW-21 area, respectively, as these areas have confirmed gas issues. The list below outlines the details for each of the three proposed gas probes (GP-20, GP-21, and GP-22).

- GP-20 will be positioned near GP-18 east of the landfill on the property in the easement around the facility. The closest groundwater well to GP-20 is MW-7. During the July 2016 groundwater sampling event the depth to water in MW-7 was recorded as 121.67 ft below land surface. Based on this depth to groundwater, GP-20 will be installed to 115 ft below land surface.

- GP-21 will be positioned on the north boundary of the landfill between GP-2 and GP-3. The depth to water measurement in MW-18 (the closest well to the property boundary in that area) was 109.16 ft below land surface. Based on this measurement, GP-21 will be installed to 105 ft below land surface.

- The location for GP-22 will be determined in the field. The known areas of landfill gas migration are in the vicinity of MW-7 and MW-10/MW-21. Both of these locations will be monitored by the other two proposed gas probes. Due to the depth where we are measuring landfill gas, there is no expected hazard to human health or the environment. Additionally, the only landfill boundary that has any infrastructure along it is the north property boundary and we are installing GP-21 along this boundary.

    - To determine the best location for GP-22, Jones Edmunds will measure the landfill gas concentrations in all of the groundwater monitoring wells spanning the water table. We will determine the best location for GP-22 based on these readings and the depth to water measurements collected from the nearest well.

After installation of the gas probes, they will be monitored for landfill gas concentrations for two consecutive months and then incorporated into the quarterly compliance gas monitoring.

REPORTING

Upon receipt of all groundwater analytical data and the completion of the two consecutive months of landfill gas measurements, the County and Jones Edmunds will prepare a report detailing the Phase 1 contamination assessment plan activities. The report will include at a minimum the following:

- Groundwater Monitoring Well completion reports including boring logs, WMD permits, and survey information.
- Construction diagrams of the gas monitoring probes and extraction wells.
- Updated monitoring well construction tables for the groundwater wells and the gas monitoring probes.
- Sampling results including laboratory reports and field sheets.
- ADaPT reporting.
- Gas monitoring results and calibration logs.
- Discussion of the analytical results.
- Recommendations for further action if necessary
- Discussion of the status of the consent order.

SCHEDULE

The County has approved funds to move forward with the Phase 1 contamination assessment plan proposed. Within one week of FDEP approval of the Phase 1 plan, we will schedule the

drillers to construct the groundwater well, gas extraction well, and gas probe installations. The schedule is dependent upon driller availability and the schedule assumes that the drillers will have all work completed within 3 months of approval of the Phase 1 Plan.

Table 5: Proposed Schedule for Phase 1

Task	Weeks from FDEP Approval of the Phase 1 Plan
Groundwater Wells Installed	12 weeks
Gas Extraction Wells Installed	
Gas Monitoring Probes Installed	
Develop and Survey Wells	14 weeks
Sample Groundwater Wells	16 weeks
Conduct 1st Gas Monitoring of New Probes	
Receive Groundwater Analytical Results	20 weeks
Conduct 2nd Gas Monitoring of New Probes	
Submit Report to FDEP	24 weeks

The County greatly appreciates FDEP's assistance through this process and help getting the site in compliance and closing out the consent order. If you have any questions about this plan or any of the information submitted herein, please do not hesitate to call me at 352-258-9520.

Sincerely,

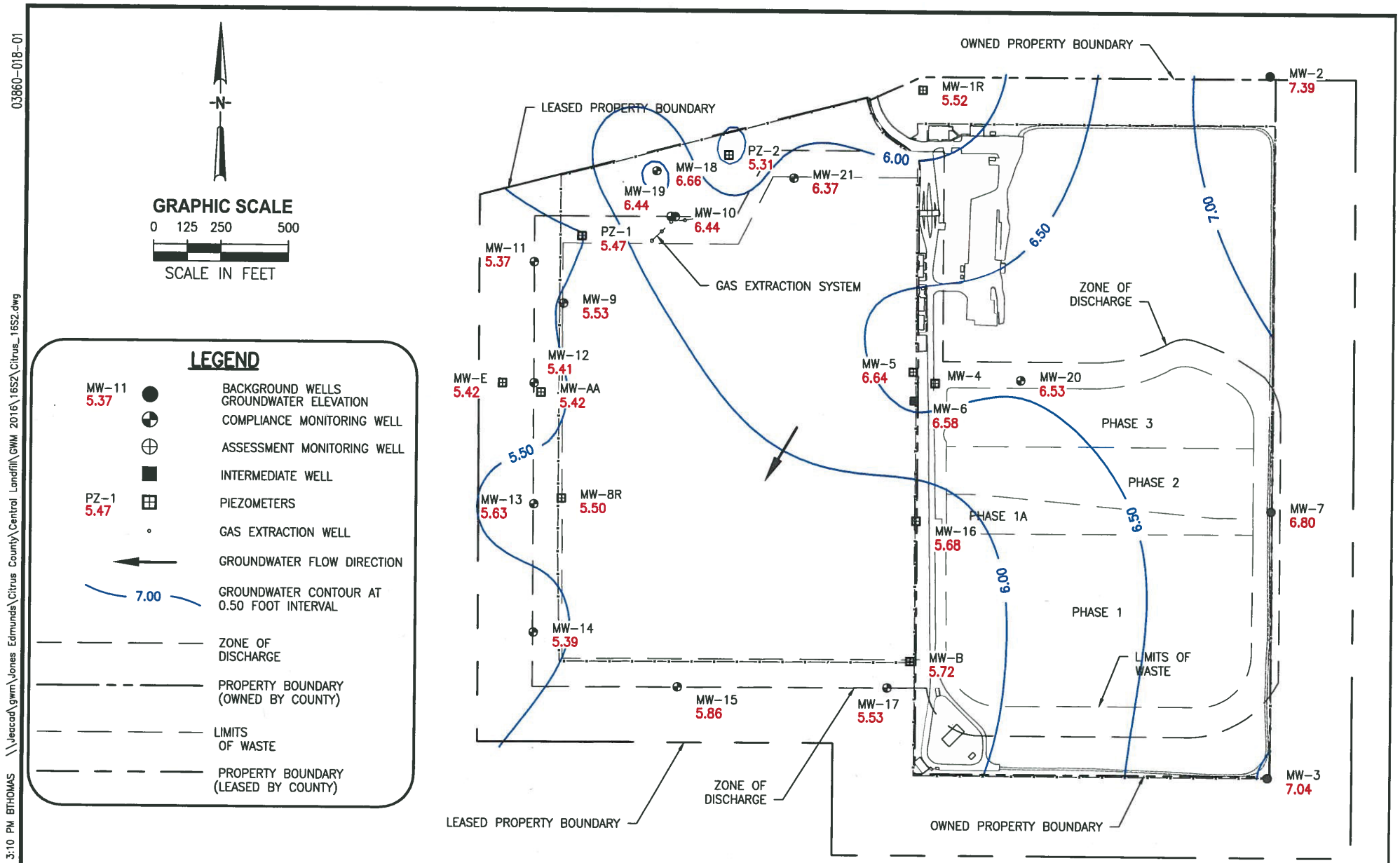
Troy D. Hays, PG
Sr. Manager/Vice President

\\Gnv-projects\projects\03860-CitrusCounty\056-01-GW Monitoring 2017\CAP\2016.10.26_Citrus_Contamination Assessment Plan.docx

xc: Henry Norris, Citrus County
Brady Yunko, Citrus County

Attachment 1: Site Map
Attachment 2: Laboratory Report for the September 2016 Groundwater Sampling Event

ATTACHMENT 1



CITRUS COUNTY CENTRAL LANDFILL
GROUNDWATER CONTOUR MAP
JULY 21, 2016

JONES EDMUNDS

03860-018-01

LAST SAVED: 9/22/2016 3:10 PM BTHOMAS \\Jeccad\gwm\Jones Edmunds\Citrus County\Central Landfill\GWM 2016\1652\Citrus_1652.dwg

Plotted: 9/22/16 3:11pm BThomas

ATTACHMENT 2

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Tampa
6712 Benjamin Road
Suite 100
Tampa, FL 33634
Tel: (813)885-7427

TestAmerica Job ID: 660-75605-1
Client Project/Site: Citrus County LF - MW19

For:
Jones Edmunds & Associates, Inc
730 NE Waldo Road
Gainesville, Florida 32641-5699

Attn: Ms. Elizabeth Kennelley

Jess Hornsby

Authorized for release by:
8/29/2016 4:12:15 PM

Jess Hornsby, Project Manager I
(813)885-7427
jess.hornsby@testamericainc.com

Table of Contents

Sample Summary

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-75605-1	MW-19 (16M8CL-19)	Water	08/17/16 10:43	08/18/16 09:05

Case Narrative

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Job ID: 660-75605-1

Laboratory: TestAmerica Tampa

Narrative

Receipt
The sample was received on 8/18/2016 9:05 AM; the sample arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 2.4°C.

HPLC/IC
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Client Sample ID: MW-19 (16M8CL-19)

Lab Sample ID: 660-75605-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	5.5		0.50	0.20	mg/L	1		300.0	Total/NA
Iron	1100		100	25	ug/L	1		6020	Total Recoverable
Sodium	3.4		0.50	0.17	mg/L	1		6020	Total Recoverable
Ammonia	6.6		1.3	0.50	mg/L	5		350.1	Total/NA
Total Dissolved Solids	40		5.0	5.0	mg/L	1		SM 2540C	Total/NA
Field pH	5.27				SU	1		Field Sampling	Total/NA
Field Temperature	24.3				Degrees C	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.15				mg/L	1		Field Sampling	Total/NA
Specific Conductance	104				umhos/cm	1		Field Sampling	Total/NA
Turbidity	3.80				NTU	1		Field Sampling	Total/NA
Depth to Water (ft from MP)	106.86				ft	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Client Sample ID: MW-19 (16M8CL-19)

Date Collected: 08/17/16 10:43
Date Received: 08/18/16 09:05

Lab Sample ID: 660-75605-1
Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.5		0.50	0.20	mg/L			08/26/16 19:11	1

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1100		100	25	ug/L		08/24/16 10:46	08/25/16 00:27	1
Sodium	3.4		0.50	0.17	mg/L		08/24/16 10:46	08/25/16 00:27	1

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	6.6		1.3	0.50	mg/L			08/24/16 13:09	5
Total Dissolved Solids	40		5.0	5.0	mg/L			08/19/16 13:34	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	5.27				SU			08/17/16 10:43	1
Field Temperature	24.3				Degrees C			08/17/16 10:43	1
Oxygen, Dissolved	0.15				mg/L			08/17/16 10:43	1
Specific Conductance	104				umhos/cm			08/17/16 10:43	1
Turbidity	3.80				NTU			08/17/16 10:43	1
Depth to Water (ft from MP)	106.86				ft			08/17/16 10:43	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 680-447371/2
Matrix: Water
Analysis Batch: 447371

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.20	U	0.50	0.20	mg/L			08/26/16 09:26	1

Lab Sample ID: LCS 680-447371/3
Matrix: Water
Analysis Batch: 447371

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.67		mg/L		97	90 - 110

Lab Sample ID: LCSD 680-447371/4
Matrix: Water
Analysis Batch: 447371

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.69		mg/L		97	90 - 110	0	15

Lab Sample ID: 660-75589-I-3 MS
Matrix: Water
Analysis Batch: 447371

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	13		10.0	22.4		mg/L		99	80 - 120

Lab Sample ID: 660-75589-I-3 MSD
Matrix: Water
Analysis Batch: 447371

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	13		10.0	22.6		mg/L		101	80 - 120	1	15

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 680-447014/1-A
Matrix: Water
Analysis Batch: 447180

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 447014

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	25	U	100	25	ug/L		08/24/16 10:46	08/25/16 00:16	1
Sodium	0.17	U	0.50	0.17	mg/L		08/24/16 10:46	08/25/16 00:16	1

Lab Sample ID: LCS 680-447014/2-A
Matrix: Water
Analysis Batch: 447180

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 447014

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	5000	5150		ug/L		103	75 - 125
Sodium	5.00	4.69		mg/L		94	75 - 125

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: 660-75605-1 MS
Matrix: Water
Analysis Batch: 447180

Client Sample ID: MW-19 (16M8CL-19)
Prep Type: Total Recoverable
Prep Batch: 447014

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	1100		5000	6550		ug/L		109	75 - 125
Sodium	3.4		5.00	8.34		mg/L		99	75 - 125

Lab Sample ID: 660-75605-1 MSD
Matrix: Water
Analysis Batch: 447180

Client Sample ID: MW-19 (16M8CL-19)
Prep Type: Total Recoverable
Prep Batch: 447014

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	1100		5000	6220		ug/L		103	75 - 125	5	20
Sodium	3.4		5.00	7.89		mg/L		90	75 - 125	5	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 680-447092/1
Matrix: Water
Analysis Batch: 447092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	0.10	U	0.25	0.10	mg/L			08/24/16 11:46	1

Lab Sample ID: LCS 680-447092/2
Matrix: Water
Analysis Batch: 447092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	1.00	1.07		mg/L		107	90 - 110

Lab Sample ID: LCSD 680-447092/12
Matrix: Water
Analysis Batch: 447092

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	1.00	1.07		mg/L		107	90 - 110	1	30

Lab Sample ID: 660-75589-G-9 MS
Matrix: Water
Analysis Batch: 447092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia	0.10	U J3	1.00	1.21	J3	mg/L		121	90 - 110

Lab Sample ID: 660-75589-G-9 MSD
Matrix: Water
Analysis Batch: 447092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ammonia	0.10	U J3	1.00	1.20	J3	mg/L		120	90 - 110	1	30

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 660-173037/1
Matrix: Water
Analysis Batch: 173037

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	5.0	U	5.0	5.0	mg/L			08/19/16 13:34	1

Lab Sample ID: LCS 660-173037/2
Matrix: Water
Analysis Batch: 173037

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	10000	9360		mg/L		94	80 - 120

Lab Sample ID: 660-75571-C-1 DU
Matrix: Water
Analysis Batch: 173037

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	950		944		mg/L		1	20

QC Association Summary

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

HPLC/IC

Analysis Batch: 447371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75605-1	MW-19 (16M8CL-19)	Total/NA	Water	300.0	
MB 680-447371/2	Method Blank	Total/NA	Water	300.0	
LCS 680-447371/3	Lab Control Sample	Total/NA	Water	300.0	
LCSD 680-447371/4	Lab Control Sample Dup	Total/NA	Water	300.0	
660-75589-I-3 MS	Matrix Spike	Total/NA	Water	300.0	
660-75589-I-3 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Metals

Prep Batch: 447014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75605-1	MW-19 (16M8CL-19)	Total Recoverable	Water	3005A	
MB 680-447014/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 680-447014/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
660-75605-1 MS	MW-19 (16M8CL-19)	Total Recoverable	Water	3005A	
660-75605-1 MSD	MW-19 (16M8CL-19)	Total Recoverable	Water	3005A	

Analysis Batch: 447180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75605-1	MW-19 (16M8CL-19)	Total Recoverable	Water	6020	447014
MB 680-447014/1-A	Method Blank	Total Recoverable	Water	6020	447014
LCS 680-447014/2-A	Lab Control Sample	Total Recoverable	Water	6020	447014
660-75605-1 MS	MW-19 (16M8CL-19)	Total Recoverable	Water	6020	447014
660-75605-1 MSD	MW-19 (16M8CL-19)	Total Recoverable	Water	6020	447014

General Chemistry

Analysis Batch: 173037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75605-1	MW-19 (16M8CL-19)	Total/NA	Water	SM 2540C	
MB 660-173037/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 660-173037/2	Lab Control Sample	Total/NA	Water	SM 2540C	
660-75571-C-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 447092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75605-1	MW-19 (16M8CL-19)	Total/NA	Water	350.1	
MB 680-447092/1	Method Blank	Total/NA	Water	350.1	
LCS 680-447092/2	Lab Control Sample	Total/NA	Water	350.1	
LCSD 680-447092/12	Lab Control Sample Dup	Total/NA	Water	350.1	
660-75589-G-9 MS	Matrix Spike	Total/NA	Water	350.1	
660-75589-G-9 MSD	Matrix Spike Duplicate	Total/NA	Water	350.1	

Field Service / Mobile Lab

Analysis Batch: 173118

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75605-1	MW-19 (16M8CL-19)	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Client Sample ID: MW-19 (16M8CL-19)

Date Collected: 08/17/16 10:43
Date Received: 08/18/16 09:05

Lab Sample ID: 660-75605-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL	5 mL	447371	08/26/16 19:11	JRJ	TAL SAV
Total Recoverable	Prep	3005A			50 mL	250 mL	447014	08/24/16 10:46	AJR	TAL SAV
Total Recoverable	Analysis	6020		1			447180	08/25/16 00:27	BJB	TAL SAV
Total/NA	Analysis	350.1		5	2 mL	2 mL	447092	08/24/16 13:09	ALS	TAL SAV
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	173037	08/19/16 13:34	GH1	TAL TAM
Total/NA	Analysis	Field Sampling		1			173118	08/17/16 10:43	FS	TAL TAM

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858
TAL TAM = TestAmerica Tampa, 6712 Benjamin Road, Suite 100, Tampa, FL 33634, TEL (813)885-7427

Method Summary

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL SAV
6020	Metals (ICP/MS)	SW846	TAL SAV
350.1	Nitrogen, Ammonia	MCAWW	TAL SAV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL TAM
Field Sampling	Field Sampling	EPA	TAL TAM

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAV = TestAmerica Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

TAL TAM = TestAmerica Tampa, 6712 Benjamin Road, Suite 100, Tampa, FL 33634, TEL (813)885-7427

Certification Summary

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Laboratory: TestAmerica Tampa

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E84282	06-30-17

Laboratory: TestAmerica Savannah

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
	AFCEE		SAVLAB	
A2LA	DoD ELAP		399.01	02-28-17
A2LA	ISO/IEC 17025		399.01	02-28-17
Alabama	State Program	4	41450	06-30-17
Alaska (UST)	State Program	10	UST-104	11-05-16
Arkansas DEQ	State Program	6	88-0692	01-31-17
California	State Program	9	2939	07-31-16 *
Colorado	State Program	8	N/A	12-31-16
Connecticut	State Program	1	PH-0161	03-31-17
Florida	NELAP	4	E87052	06-30-17
GA Dept. of Agriculture	State Program	4	N/A	06-12-17
Georgia	State Program	4	N/A	06-30-17
Georgia	State Program	4	803	06-30-17
Guam	State Program	9	15-005r	04-16-17
Hawaii	State Program	9	N/A	06-30-17
Illinois	NELAP	5	200022	11-30-16
Indiana	State Program	5	N/A	06-30-17
Iowa	State Program	7	353	06-30-17
Kentucky (DW)	State Program	4	90084	12-31-16
Kentucky (UST)	State Program	4	18	06-30-17
Kentucky (WW)	State Program	4	90084	12-31-16
Louisiana	NELAP	6	30690	06-30-17
Louisiana (DW)	NELAP	6	LA160019	12-31-16
Maine	State Program	1	GA00006	09-24-16 *
Maryland	State Program	3	250	12-31-16
Massachusetts	State Program	1	M-GA006	06-30-17
Michigan	State Program	5	9925	06-30-17
Mississippi	State Program	4	N/A	06-30-16 *
Nebraska	State Program	7	TestAmerica-Savannah	06-30-17
New Jersey	NELAP	2	GA769	06-30-17
New Mexico	State Program	6	N/A	06-30-17
New York	NELAP	2	10842	03-31-17
North Carolina (DW)	State Program	4	13701	07-31-17
North Carolina (WW/SW)	State Program	4	269	12-31-16
Oklahoma	State Program	6	9984	08-31-16
Pennsylvania	NELAP	3	68-00474	06-30-17
Puerto Rico	State Program	2	GA00006	12-31-16
South Carolina	State Program	4	98001	06-30-16 *
Tennessee	State Program	4	TN02961	06-30-16 *
Texas	NELAP	6	T104704185-14-7	11-30-16
USDA	Federal		SAV 3-04	06-11-17
Virginia	NELAP	3	460161	06-14-17
Washington	State Program	10	C805	06-10-16 *
West Virginia (DW)	State Program	3	9950C	12-31-16

* Certification renewal pending - certification considered valid.

Certification Summary

Client: Jones Edmunds & Associates, Inc
Project/Site: Citrus County LF - MW19

TestAmerica Job ID: 660-75605-1

Laboratory: TestAmerica Savannah (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
West Virginia DEP	State Program	3	094	08-31-16
Wisconsin	State Program	5	999819810	08-31-16 *
Wyoming	State Program	8	8TMS-L	06-30-16 *

* Certification renewal pending - certification considered valid.

TestAmerica Tampa
6712 Benjamin Road Suite 100
Tampa, FL 33634
Phone (813) 885-7427 Fax (813) 885-7049

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Steve Messick	Lab PM: Hornsby, Jess	Carrier Tracking No(s): 8345 9203 7059	COC No: 660-70516-22460.1
Client Contact: Ms. Elizabeth Kennelley	Phone: (352) 538-6605	E-Mail: jess.hornsby@testamericainc.com		Page: Page 1 of 1
Company: Jones Edmunds & Associates, Inc				Job #:
Address: 730 NE Waldo Road	Due Date Requested: Standard			
City: Gainesville	TAT Requested (days):			
State, Zip: FL, 32641-5699				
Phone: (352) 377-5821	PO #: 77178			
Email: ekennelley@jonesedmunds.com	WO #: 95503-133-15			
Project Name: Citrus County LF	Project #: 66009982			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids	350.1 - Ammonia	300_ORGFM_28D - Chloride	6020 - Iron, Sodium	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	N	N		
MW-19 (16MSCC-19)	8/17/16	1043	G	Water	N	N	✓	✓	✓	✓		

S. Messick

660-75605 Chain of Custody

Loc: 660
75605

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify): samples shipped by Fed-Ex Next day saved from Gainesville to Tampa

Special Instructions/QC Requirements:

Empty Kit Relinquished by: [signature] Date: 08-11-16 Time: 1615 Method of Shipment: FXG

Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company
			Steve Messick	8/15/16 @ 1730	Jones Edmunds
Relinquished by: Steve Messick	Date/Time: 8/17/16 @ 1350	Company: Jones Edmunds	Received by: [signature]	Date/Time: 8/18/16 0905	Company: TA TPA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.2/2.4 CW-09

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8/29/2016

TestAmerica Tampa
6712 Benjamin Road Suite 100
Tampa, FL 33634
Phone (813) 885-7427 Fax (813) 885-7049

Chain of Custody Record

TestAmerica

Client Information (Sub Contract Lab)	Sampler	Lab PM: Hornsby, Jess	Carrier Tracking No(s):	COC No: 660-89793.1
Client Contact: Shipping/Receiving	Phone	E-Mail: jess.hornsby@testamericainc.com		Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc				Job #: 660-75605-1
Address: 5102 LaRoche Avenue,	Due Date Requested: 8/30/2016			
City: Savannah	TAT Requested (days):			
State, Zip: GA, 31404				
Phone: 912-354-7858(Tel) 912-352-0165(Fax)	PO #:			
Email:	WO #:			
Project Name: Citrus County Landfill	Project #: 66009982			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300_ORGFM_28D/ Chloride	350.1/ Ammonia	6020/3005A Appendix 1 Metals + Iron & Na	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-19 (16M8CL-19) (660-75605-1)	8/17/16	10:43 Eastern		Water			X	X	X	3	

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements: T.A

Empty Kit Relinquished by:	Date:	Time	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	8/18/16 1100	TA TPA	[signature]	8-19-16 7:00	
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by:	Date/Time	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.4 / 3.0 / 3.1 2.3 / 3.4 / 3.5

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8/29/2016

Jones, Edmunds, and Associates, Inc.
Environmental Consultants
730 NE Waldo Road
Gainesville, Florida 32641
(352) 377-5821 Fax (352) 377-3166

Please return a copy of this form with original lab report.

Collection Method:	Description:
BA	BAILER
BP	BLADDER PUMP
CP	CENTRIFUGAL PUMP
E	GRAB
M	METER READING
PP	PERISTALTIC PUMP
SP	SUBMERSIBLE OR IN-PLACE DEDICATED PUMP
Z	UNKNOWN

* Initial Depth to Water at Time of Sampling

Field Data Information Form

Project Name: Citrus County Central Landfill
Project Number: 03860-053-01
Date: 8/17/16
Sampler: Steve Messick
Laboratory: Test America - Tampa, Florida

Sampling Station	Date	Time	pH (S. U.)	Temp (Deg C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV)	Static Depth to Water *	Collection Method
MW-19	8/17/16	1043	5.27	24.3	104	0.15	3.80	52.7	106.86	SP

660-75605 Field Sheet

660-75605 Field

TO BE SUBMITTED TO LABORATORY WITH CHAIN-OF-CUSTODY

Login Sample Receipt Checklist

Client: Jones Edmunds & Associates, Inc

Job Number: 660-75605-1

Login Number: 75605
List Number: 1
Creator: Southers, Kristin B

List Source: TestAmerica Tampa

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Jones Edmunds & Associates, Inc

Job Number: 660-75605-1

Login Number: 75605
List Number: 2
Creator: Johnson, Jessica R

List Source: TestAmerica Savannah
List Creation: 08/19/16 03:18 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

GROUNDWATER SAMPLING LOG

SITE NAME: Citrus County Landfill		SITE LOCATION: Lecanto, Florida
WELL NO: MW-19 (flush mount well)	SAMPLE ID: 16M8CC-19	WACS# 22710 / DATE: 8/17/2016

PURGING DATA

WELL DIAMETER (in): 2" PVC	TUBING DIAMETER (in): 1/4" ~~3/8"~~	WELL SCREEN LENGTH: 10 ft From 130.00 to 140.00 BTOC	STATIC DEPTH TO WATER (feet): 106.86	PURGE PUMP TYPE: Dedicated Bladder Pump (DBP)

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

1 WELL VOLUME = (140.00 feet – 106.86 feet) X 0.16 gallons/foot = 5.3 gallons Water Level Measured with: MPM-GNV-01

PURGE METHOD: (2.3) 2.4 2.5 N/A FS2222 Full volumes

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) + 0.123 gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 117	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 117	PURGING INITIATED AT: 0915	PURGING ENDED AT: 1041	TOTAL VOLUME PURGED (gallons): 8.0

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)
1011	5.3	5.3	0.09	107.68	5.35	24.3	108	0.17	4.54	None Clear	None	63.7
1026	1.3	6.6	↓	107.68	5.31	24.2	106	0.16	3.91	↓	↓	57.1
1041	1.4	8.0	↓	107.68	5.27	24.3	104	0.15	3.80	↓	↓	52.7

SAMPLING DATA

SAMPLED BY (Print) / AFFILIATION: Steve Messick / Jones, Edmunds & Assoc. Inc.	SAMPLER(S) SIGNATURES: Steve Messick	SAMPLING INITIATED AT: 1043	SAMPLING ENDED AT: 1048

PUMP OR TUBING DEPTH IN WELL (feet): 117	SAMPLE PUMP FLOW RATE VOC Sampling Rate 100-400 ml/min (N/A) Other Samples Rate (mL / min):+/- 360	TUBING MATERIAL CODE: PE	SAMPLING EQUIPMENT CODE: DBP
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: ____ FILTER SIZE: ____ µm		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
16M8CC-19	1	PE	125 mL	None	None	N/A	6020 – Iron, Sodium
16M8CC-19	1	PE	125 mL	H2SO4	None	<2	6020 – Iron, Sodium
16M8CC-19	1	PE	125 mL	None	None	N/A	300 ORGFM 28D - Chloride
16M8CC-19	1	PE	250 mL	H2SO4	None	<2	350.1 Ammonia
16M8CC-19	1	PE	250 mL	HNO3	None	<2	Metals
16M8CC-19	1	PE	500 mL	None	None	N/A	2540C - TDS

REMARKS: Well screen length is from below top of casing (BTOC). Flush mount well vented >10 minutes before reading water level.

* Verified Sample pH as <2 or >12 (as applicable) at MW-19
Sky Conditions: Cloudy Ambient Air Temperature: 32°C
Approx. Wind Speed and Direction: 0-5 SW

Bladder Pump: CPM 2, Refill/Discharge 20/10 sec, Pressure 70 PSI
Total Tubing Length: — ft.

Comments:

Purge slowly, well gets turbid easy.

TestAmerica Tampa
6712 Benjamin Road Suite 100
Tampa, FL 33634
Phone (813) 885-7427 Fax (813) 885-7049

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Steve Messick	Lab PM: Hornsby, Jess	Carrier Tracking No(s): 8545 9205 7059	COC No: 660-70516-22460.1
Client Contact: Ms. Elizabeth Kennelley	Phone: (352) 538-6605	E-Mail: jess.hornsby@testamericainc.com		Page: Page 1 of 1
Company: Jones Edmunds & Associates, Inc				Job #:
Address: 730 NE Waldo Road	Due Date Requested: Standard			
City: Gainesville	TAT Requested (days):			
State, Zip: FL, 32641-5699				
Phone: (352) 377-5821	PO #: 77178			
Email: ekennelley@jonesedmunds.com	WO #: 95503-133-15			
Project Name: Citrus County LF	Project #: 66009982			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids	350.1 - Ammonia	300_ORGFM_28D - Chloride	6020 - Iron, Sodium	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	S	N	N		
MW-19 (16MBCC-19)	8/17/16	1043	G	Water	N	N	✓	✓	✓	✓		

S. Messick

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify): samples shipped by Fed-X Next day saver from Gainesville to Tampa	Special Instructions/QC Requirements:
Empty Kit Relinquished by:	Date: 08-11-16 Time: 1615 Method of Shipment: FXG

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			Steve Messick	8/15/16 @ 1730	Jones Edmunds
Relinquished by: Steve Messick	Date/Time: 8/17/16 @ 1350	Company Jones Edmunds	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Bottle Order: Citrus Co. MW-19
Bottle Order #: 22460
Request From Client: 8/11/2016
Date Order Posted: 8/11/2016 10:24:14AM
Order Status: Ready To Process
Prepared By: Jess Hornsby
Deliver By Date: 8/12/2016 11:59:00PM
Lab Project Number: 66009982

Order Completion Information

Creator: Jess Hornsby
Filled by:
Sent Date: 08-11-16
Sent Via:
Tracking #:

Sets	Bottles/Set	Qty	Bottle Type Description	Preservative	Method	Matrix	Sample Type	Comments	Lot #
1	1	1	Plastic 500ml - Wide -unpreserved	None	2540C - Total Dissolved Solids	Water	Normal		
1	1	1	Plastic 250ml - with Nitric Acid	Nitric Acid		Water	Normal		
1	1	1	Plastic 250ml - with Sulfuric Acid	Sulfuric Acid	350.1 - Ammonia	Water	Normal		
1	1	1	Plastic 125 mL oblong - unpreserved	None	300_ORGFM_28D - Chloride	Water	Normal		
1	1	1	Plastic 125mL - unpreserved	None	6020 - Iron, Sodium	Water	Normal		
1	1	1	Plastic 125mL - with Sulfuric Acid	Sulfuric Acid	6020 - Iron, Sodium	Water	Normal		

Notes to Field Staff:

Health and Safety Notes:

Preservative	Comment
Nitric Acid	CAUTION! STRONG OXIDIZER! CONTAINS 1:1 NITRIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Sulfuric Acid	CAUTION! CONTAINS 1:1 SULFURIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.

Relinquished By	Company	Date	Time	Received By	Company	Seal #:
Relinquished By	Company	Date	Time	Received By	Company	Seal #:

Please notify us immediately if an error is found in shipment

Jones, Edmunds, and Associates, Inc.
Environmental Consultants
730 NE Waldo Road
Gainesville, Florida 32641
(352) 377-5821 Fax (352) 377-3166

Please return a copy of this form with original lab report.

Field Data Information Form

Project Name: Citrus County Central Landfill
Project Number: 03860-053-01
Date: 8/17/16
Sampler: Steve Messick
Laboratory: Test America - Tampa, Florida

Sampling Station	Date	Time	pH (S. U.)	Temp (Deg C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP (mV)	Static Depth to Water *	Collection Method
MW-19	8/17/16	1043	5.27	24.3	104	0.15	3.80	52.7	106.86	SP

TO BE SUBMITTED TO LABORATORY WITH CHAIN-OF-CUSTODY

Collection Method:	Description:
BA	BAILER
BP	BLADDER PUMP
CP	CENTRIFUGAL PUMP
E	GRAB
M	METER READING
PP	PERISTALTIC PUMP
SP	SUBMERSIBLE OR IN-PLACE DEDICATED PUMP
Z	UNKNOWN

* Initial Depth to Water at Time of Sampling

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

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Citrus County Landfill **DATE** 8/17/16

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 07/07/16 Reference Meter Book Steve - 01

(Zero D. O. checked with standard quarterly)

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE (mg/L)	Temper-ature (Deg C)	INSTRUMENT RESPONSE (mg/L)	(+/- 0.3 mg/L) DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
16/08/17	0833	A	7.81	28.1	7.85	0.04	Yes	Init.	jmm
〃	1403	A	7.55	30.0	7.60	0.05	Yes	Cont.	jmm

FT 1100 Field Measurement of Hydrogen Ion Activity (pH)

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Citrus County Landfill **DATE** 8/17/16

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

Instrument Gain -5.294 **Date Determined** 8/17/16 (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 #** TQ1 **Expiration Date** 10/2017

Standard B **4.01 SU Lot #** TR5 **Expiration Date** 09/2017

Standard C **10.00 SU Lot #** TS1 **Expiration Date** 08/2017

Standard D 9.18 **SU Lot #** TZ1 **Expiration Date** 01/2017

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
16/08/17	0834	A	7.00	7.00	Ø	Yes	Init.	JMM
↓	0838	B	4.01	4.01	Ø	Yes	Init.	JMM
	0839	C	10.00	9.94/9.99	0.01	Yes	Init.	JMM
	0841	D	9.18	9.05	0.13	Yes	Init.	JMM
	1405	A	7.00	7.03	0.03	Yes	Cont.	JMM
	1406	B	4.01	4.00	0.01	Yes	Cont.	JMM
	1408	C	10.00	9.96	0.04	Yes	Cont.	JMM

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Citrus County Landfill **DATE** 8/17/16

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** **1/07/17**

Stock Solution Lot # 16A100497 **Expiration Date 2018-01-25**

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
16/08/17	0843	A	226.3	26.3	224.2/226.3	Ø	yes	Init	Am
↓	1409	A	225.2	27.1	224.6	0.6	yes	Cont.	Am

FT 1200 Field Measurement of Specific Conductance

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Citrus County Landfill **DATE** 8/17/16

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 # TR1 Expiration Date 09/2017

Standard B 447 uS/cm Lot # T01 Expiration Date ~~05/2017~~ mm 12/2017

Standard C 84 uS/cm Lot # TP1 Expiration Date 11/2017

Standard D 8974 uS/cm Lot # T51 Expiration Date 08/2017

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
16/08/17	0846	A	1413	1423/1413	Ø	Yes	Init.	mm
	0848	B	447	446	<1	Yes	Init.	mm
	0850	C	84	88	<5	Yes	Init.	mm
	1411	D	8974	8823	<2	yes	Cont.	mm
	1414	A	1413	1415	<1	Yes	Cont.	mm
	1415	B	447	445	<1	yes	Cont.	mm
↓	1416	C	84	88	<5	Yes	Cont.	mm

FT 1600 Field Measurement of Turbidity

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME Citrus County Landfill **DATE** 8/17/16

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

Instrument Calibration Date: 07/07/16 **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** *3.83* **NTU**

Standard B **Gel Standard** *40.9* **NTU**

Standard C **Gel Standard** *432* **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
16/08/17	0853	A	3.83	3.79	<2	Yes	Init.	km
	0854	B	40.9	41.1	<1	Yes	Init.	km
	0854	C	432	426	<2	Yes	Init.	km
	0855	D	≤0.25	0.19	—	—	Init.	km
	1418	A	3.83	3.81	<1	Yes	Cont.	km
	1418	B	40.9	41.6	<2	Yes	Cont.	km
↓	1419	D	≤0.25	0.22	—	—	Cont.	km

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

SITE NAME In House Comparison **DATE** 1/05/16

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 5.0 °C #2E4826 #94748 Cal Date: 9/21/15**

Standard B **NIST Thermometer 25.0 °C #2E4826 #94748 Exp. Date: 9/21/16**

Standard C **NIST Thermometer 40.0 °C #2E4826**

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
16/01/05	1441	C	40.0	40.1	0.1	yes	Init	SMM
16/01/05	1445	B	25.0	25.1	0.1	yes	Init	SMM
16/01/05	1452	A	5.0	5.1	0.1	yes	Init	SMM

REFERENCE FACTORS FOR FIELD SAMPLING DATA SHEETS

WELL CAPACITY (Gallons Per 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 (Gal./Ft.):

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

SAMPLING/PURGING **APP** = After Peristaltic Pump **B** = Bailer **BP** = Bladder Pump **ESP** = Electric Submersible Pump **PP** = Peristaltic Pump

EQUIPMENT CODES: **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	Praxair
• Eagle RKI calibration gas cylinders	Praxair

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 are 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.

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

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