

January 12, 2018

Mr. Steve Tafuni  
Southwest District Office  
Florida Department of Environmental Protection  
13051 N. Telecom Parkway  
Temple Terrace, FL 33637-0926

Re: **Review of Semi-Annual Sampling Results**  
**Second Half 2017 Sampling Event**  
**Hardee County Landfill**  
**WACS Facility ID No. SWD/25/40612**  
**Permit No. 38414-016-SO/01**

Dear Mr. Tafuni:

On behalf of the Hardee County Solid Waste Department, Atkins presents this review of the results of the second half of 2017 sampling event for the facility referenced above. This document is designed to comply with the requirements of Appendix 3-Water Quality Monitoring Plan, included with the facility's operation permit, and was compiled in general accordance with the guidelines promulgated in Chapter 62-701.510(9)(a) of the Florida Administrative Code (FAC).

## **BACKGROUND**

The Hardee County Solid Waste Disposal Facility is an active Class I landfill, which encompasses approximately 100 acres of land at 685 Airport Road in Hardee County, Florida. In November 2013, the County received a construction permit (38414-015-SC/01) for Phase II Section II Construction. Phase II Section II is located along the west side of the current waste placement area. Also in November 2013, the County received an operation permit associated with the Phase II Sections I & II operation. In 2014, the County completed construction of the waste cell for Phase II Section II. This required abandonment of two existing monitoring wells, abandonment of multiple piezometers, and installation of two new monitoring wells. According to the facility's operating permit (38414-016-SO/01), the water quality monitoring network is designed to monitor the groundwater in the surficial aquifer and the surface water.

The groundwater monitoring network includes eight monitoring wells, which are designated MW-1, MW-2, MW-4, MW-10R, MW-11, MW-12R, MW-13, and MW-14. The facility's permit designates MW-1 and MW-4 as background wells and the other wells as detection wells. Item 3 of Appendix 3-Water Quality Monitoring Plan lists the monitoring wells and piezometers applicable to the facility's current operation permit.

There are two other monitoring wells, MW-6 and MW-7, which are designated by the permit as piezometers, along with 12 other piezometers. Please note that the following former piezometers have been abandoned and are no longer included in the operating permit: PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-9, PZ-10, PZ-15, and PZ-16. The layout of the site is presented in **Figure 1**.

Item 4 of Appendix 3-Water Quality Monitoring Plan of the facility's operation permit specifies that groundwater samples shall be collected from the monitoring wells on a semi-annual basis. The groundwater samples are analyzed for the analytes listed on the 40 Code of Federal Regulations (CFR) Part 258, Appendix I, as well as for total ammonia, iron, chlorides, mercury, nitrate, sodium, and total dissolved solids (TDS). These analytes are also listed in Item 4 of Appendix 3 of the facility's operation permit.

Item 8 of Appendix 3-Water Quality Monitoring Plan of the facility's operation permit calls for the collection of a surface water sample from one location, which is designated SW-2. The surface water samples are normally collected during both semi-annual sampling events during the year if sufficient water is present.

The groundwater and surface water sampling points are illustrated in **Figure 1**.

#### **SECOND HALF 2017 SAMPLING EVENT**

The second half of 2017 sampling event was conducted on December 19 and 20, 2017. Groundwater samples and one surface water sample were collected during this event. The groundwater and surface water samples were collected in general accordance with the Florida Department of Environmental Protection (FDEP) Standard Operating Procedure for Field Activities (SOP 001/01). Sample collection was performed by Atkins personnel, and analysis was performed by Flowers Chemical Laboratories, Inc. (FCL). FCL is a NELAC-certified laboratory. A FDEP Water Quality Monitoring Certification form for the sampling event is provided in **Attachment A**.

#### **Sample Collection Methodology**

Prior to sampling the monitoring wells, each well was purged with a peristaltic pump using the "low-flow" method. A minimum equivalent of one to three well volumes was purged from each well prior to sample collection. Temperature, pH, conductivity, dissolved oxygen (DO), and turbidity measurements were monitored and recorded throughout the purging process to ensure that representative water samples were collected. The groundwater samples were given identifiers which corresponded to the well of origin. Depth-to-groundwater measurements were made from the top-of-casing (TOC) at each monitoring well prior to initiating the purging process. Water level readings were also made at the piezometers listed in the permit. The water level measurements were subtracted from the TOC elevations to determine the elevation of the water table at each well and piezometer. The TOC elevations are referenced in feet above the National Geodetic Vertical Datum (NGVD). The groundwater sampling logs and field equipment calibration logs are provided in **Attachment B**.

All of the samples were placed in laboratory-prepared containers, placed on ice, and transferred to FCL for analysis of the analytes listed in the applicable sections of the facility's operation permit.

## **SECOND HALF 2017 SAMPLING EVENT RESULTS**

### **Groundwater Flow Pattern**

Depth to groundwater measurements were collected at the eight monitoring wells and at 14 piezometers during this sampling event. The groundwater level elevation data from this event are presented in **Table 1**. The groundwater elevation data were plotted and contoured to generate the groundwater elevation contour map presented in **Figure 2**. Piezometer P-18 was dry, and it appeared to be blocked or clogged at the bottom. The data indicated that the groundwater in the surficial aquifer beneath the landfill was flowing in a southerly direction at the time of this sampling event. The groundwater also appeared to be flowing to the southeast, toward a wetland area east of the landfill. The water table gradient measured approximately 0.0016 feet per foot beneath the site (as measured between well MW-1 and well MW-10R). Water level elevation measurements were also performed at two staff gauges located in ponds on the site (SG-1 and SG-2).

### **Sampling Results**

A description of the detections in the groundwater and surface water is presented below.

#### Groundwater Analytical Results

There were numerous inorganic analytes detected in the groundwater samples collected and analyzed during this sampling event. The only organic analyte detected in the groundwater was toluene in MW-2. The toluene concentration in the sample from MW-2 did not exceed its FDEP criteria. The inorganic analyte detections included all of those which are typically part of the analytical program except antimony, beryllium, cadmium, cobalt, mercury, silver, and thallium. At least one inorganic analyte was detected at every well in the monitoring network.

The concentrations of all of the analytes that were detected in the groundwater were compared to their respective Maximum Contaminant Level (MCL) or Secondary Drinking Water Standard (SDWS) in accordance with the Florida statutes. The MCLs and SDWSs for Drinking Water Standards, Monitoring, and Reporting are promulgated by Chapter 62-550 of the Florida Administrative Code (FAC). Not every parameter has an MCL or SDWS. There were three analytes detected at concentrations that did not comply with their standards – pH, iron, and arsenic. Iron and pH have SDWS criteria, while the criteria for arsenic is provided as an MCL in Chapter 62-550 FAC. A description of the detection patterns with these three analytes is described below.

- pH - The standard for pH is any value within the range of 6.5 to 8.5 Standard Units (SU). The pH values at six of the eight wells were less than 6.5 SU, and the pH measured as low as 4.95 SU at well MW-1. The pH values at wells MW-2 and MW-12R were within the

standard range. The pH values at both of the background wells, MW-1 (with a pH of 4.95 SU) and MW-4 (with a pH of 6.43 SU), were lower than the standard range.

- Iron - The standard for iron is 0.3 milligrams per liter (mg/L). The iron concentrations in the samples collected at all wells except MW-12R and MW-14 exceeded the standard. The iron concentrations at both of the background wells (MW-1 and MW-4) were well above the standard. The highest iron concentration detected during December 2017 was 26.8 mg/L (at MW-10R).
- Arsenic – Monitoring at this site has been closely tracking arsenic concentrations in MW-4. The standard for arsenic is 0.01 mg/L. For the past multiple sampling events, the arsenic concentration in MW-4 has slightly exceeded that standard, and that trend continued during this sampling event. The arsenic concentration in MW-4 during December 2017 was 0.0111 mg/L, which compares closely with the May 2017 arsenic concentration (0.0150 mg/L) and with the January 2017 arsenic concentration (0.0142 mg/L). MW-4 is designated as a background well.

A summary of the groundwater analytical results is presented in **Table 2**, and the laboratory analytical reports are provided in **Attachment C**.

#### Surface Water Analytical Results

There were several inorganic analytes detected in the surface water sample (SW-2). No volatile organic analytes were detected. The concentration of every analyte that was detected in the surface water sample was compared to the State surface water quality standards (if a standard existed for that analyte). The surface water standards are promulgated by Chapter 62-302, FAC. A summary of the surface water analytical results is presented in **Table 3**, and the laboratory analytical report is provided in **Attachment C**.

None of the laboratory parameters were out of compliance with their surface water criteria. The Dissolved Oxygen field measurement was not in compliance with the surface water criteria. Dissolved Oxygen was measured at a concentration of 1.84 mg/L, which is less than the criteria of greater than 5 mg/L.

### **SUMMARY AND CONCLUSIONS**

The results of the second half of 2017 sampling event at the Hardee County Solid Waste Disposal Facility were consistent with those of the recent sampling events, with numerous inorganic analyte detections in the groundwater and surface water.

There were three analytes detected in the groundwater that did not comply with their regulatory standards: arsenic, pH, and iron were detected in the groundwater at concentrations in excess of their regulatory criteria. It should be noted that the primary parameters that were not in compliance with their standards in the groundwater (pH and iron) were also not in compliance with their

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standards in both of the background monitoring wells. The arsenic exceedance occurred only in one of the background monitoring wells (MW-4).

Based on these findings, the facility does not appear to be having a significant effect on groundwater and surface water quality. Atkins recommends that the analytical results in future sampling events be evaluated closely for any developing trends. If you have any questions regarding the information presented in this report, please call me at (813) 281-8377.

Sincerely,

A handwritten signature in blue ink that reads "Bradley J. Bayne".

Bradley J. Bayne, PG  
Senior Scientist  
Florida PG No. 1733

CC: Ken Wheeler, Project Manager, Hardee County Solid Waste Management Department, 685 Airport Road, Wauchula, FL 33873 (2 copies)  
File 100058586

## TABLES

**Table 1**  
**Groundwater Elevation Data**  
**Hardee County Landfill**  
**Second Half 2017**

<b>Well Identifier</b>	<b>Top-of-Casing Elevation (Ft-NGVD)</b>	<b>Ground Surface Elevation (Ft-NGVD)</b>	<b>Total Depth (Ft-TOC)</b>	<b>Well Diameter (Inches)</b>	<b>Depth to Groundwater (Ft below TOC)</b>	<b>Groundwater Elevation (Ft-NGVD)</b>
<b>Monitoring Wells</b>						
MW-1	87.97	86.24	11.00	4	5.97	82.00
MW-2	85.86	83.75	10.50	4	6.01	79.85
MW-4	87.16	84.09	18.90	2	6.38	80.78
MW-10R	88.56	85.49	15.12	2	8.68	79.88
MW-11	88.11	85.17	13.90	2	9.58	78.53
MW-12R	89.00	85.71	23.25	2	9.63	79.37
MW-13	88.88	NM	23.00	2	7.45	81.43
MW-14	88.16	NM	23.00	2	6.76	81.40
<b>Piezometers</b>						
MW-6	88.25	85.06	NA	2	9.20	79.05
MW-7	87.88	84.98	NA	2	8.39	79.49
P-7	84.47	82.41	NA	2	5.71*	78.76
P-8	85.32	83.25	NA	2	6.92	78.40
P-11	88.69	86.16	NA	2	8.29	80.40
P-13	87.96	87.98	NA	2	8.34	79.62
P-14	87.31	84.05	NA	2	7.55	79.76
P-17	88.82	85.88	NA	2	6.47	82.35
P-18	88.74	84.37	NA	2	DRY**	ND
P-19	86.73	84.14	NA	2	5.58	81.15
P-20	87.6	84.68	NA	2	6.46	81.14
P-21	86.63	83.57	NA	2	6.53	80.10
P-22	87.04	84.09	NA	2	7.02	80.02
P-23	86.45	83.71	NA	2	7.31	79.14
<b>Staff Gauges</b>						
SG-1	80.51#	NA	NA	NA	+1.4***	81.91
SG-2	78.57#	NA	NA	NA	+3.5***	82.07

NM = Not measured    NA = Not applicable or available

\* = casing cut off    # = lag bolt/zero elevation    \*\* = dry or plugged, no data (ND)

\*\*\* = bottom of gauge obscured by vegetation, elevation estimated

**Table 2**  
**Groundwater Analytical Summary**  
**Hardee County Landfill**  
**Second Half 2017**

Analyte	Monitoring Well:		MW-1	MW-2	MW-4	MW-10R	MW-11	MW-12R	MW-13	MW-14
	Sample Date:		12/19/2017	12/19/2017	12/19/2017	12/20/2017	12/20/2017	12/19/2017	12/19/2017	12/19/2017
	Standard <sup>(1)</sup>	Units								
<b>Field Measurements</b>										
Groundwater Elevation		ft	82.00	79.85	80.78	79.88	78.53	79.37	81.43	81.40
Temperature		deg. C	22.20	21.41	21.21	23.83	22.13	22.97	22.29	22.28
pH	6.5-8.5	STD	<b>4.95</b>	6.92	<b>6.43</b>	<b>6.33</b>	<b>5.59</b>	6.52	<b>6.13</b>	<b>6.07</b>
Conductivity		uS/cm	212	614	546	605	93	360	344	507
Dissolved Oxygen (DO)		mg/l	1.87	1.90	0.49	0.53	1.06	1.04	1.81	0.56
Turbidity		NTU	15.0	0.29	8.94	9.40	19.7	4.91	3.73	3.70
<b>Inorganics (Appendix 1 parameters only)</b>										
Nitrate (as N)	10	mg/l	0.0813	0.0526	0.0252	0.594	0.0113 I	0.0638	2.37	0.0492
TDS	500	mg/l	224	336	380	292	102	216	204	306
Chloride	250	mg/l	22.2	21.1	25.2	24.1	6.37 I	6.29 I	5.33 I	5.59 I
Antimony	0.006	mg/l	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U
Arsenic	0.01	mg/l	0.0022	0.00100 U	<b>0.0111</b>	0.0047	0.00100 U	0.0026	0.00100 U	0.0051
Barium	2	mg/l	0.0132	0.0202	0.0142	0.0198	0.0176	0.00370 I	0.00360 I	0.00380 I
Beryllium	0.004	mg/l	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Cadmium	0.005	mg/l	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Chromium	0.1	mg/l	0.0219	0.0037	0.00690	0.0039	0.006	0.0039	0.0037	0.004
Cobalt	0.14	mg/l	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Copper	1	mg/l	0.0026	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00170 I	0.00100 U
Lead	0.015	mg/l	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00140 I	0.00100 U	0.00100 U	0.00100 U
Mercury	0.002	mg/l	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U	0.0000200 U
Nickel	0.1	mg/l	0.0039	0.002	0.003	0.00170 I	0.00120 I	0.00130 I	0.00120 I	0.00110 I
Selenium	0.05	mg/l	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.00200 U	0.0057	0.00200 U
Silver	0.1	mg/l	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U	0.000500 U
Thallium	0.002	mg/l	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U	0.00100 U
Vanadium	0.049	mg/l	0.0122	0.0057	0.0118	0.0023	0.0064	0.0101	0.0026	0.00220
Zinc	5	mg/l	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0197 I	0.0434	0.0100 U	0.0100 U
Ammonia (as N)	2.8	mg/l	0.0705	0.0100 U	0.161	0.557	0.0100 U	0.0133 I	0.0100 U	0.234
Iron	0.3	mg/l	<b>3.69</b>	<b>0.656</b>	<b>7.28</b>	<b>26.8</b>	<b>0.408</b>	0.0100 U	<b>0.331</b>	0.141
Sodium	160	mg/l	11.5	18.4	12.6	17.5	5.79	5.61	4.66	4.74
<b>Organics</b>										
1,1,1,2-Tetrachloroethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1,1-Trichloroethane	200	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1,2,2-Tetrachloroethane		ug/l	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
1,1,2-Trichloroethane	5	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1-Dichloroethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1-Dichloroethene	7	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,2-Dichloroethane	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,2-Dichloropropane	5	ug/l	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
2-Butanone (MEK)		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
2-Hexanone		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Acetone	6300	ug/l	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U	5.00 U
Acrylonitrile		ug/l	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U
Benzene	1	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Bromochloromethane		ug/l	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Bromodichloromethane		ug/l	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Bromoform		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Bromomethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Carbon Disulfide		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Carbon Tetrachloride	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chlorobenzene		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chloroethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chloroform		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Chloromethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Dibromochloromethane		ug/l	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U
Dibromomethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Ethylbenzene	700	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Methyl iodide		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Methyl isobutyl ketone		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Methylene chloride		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Para-dichlorobenzene	75	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Styrene	100	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Tetrachloroethene	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Toluene	1000	ug/l	0.500 U	2.73	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Trichloroethene	3	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Trichlorofluoromethane		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Vinyl Acetate		ug/l	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Vinyl chloride	1	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Xylenes	10000	ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
cis-1,2-Dichloroethene	70	ug/l	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
cis-1,3-Dichloropropene		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
o-Dichlorobenzene	600	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
trans-1,2-Dichloroethene	100	ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
trans-1,3-Dichloropropene		ug/l	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
trans-1,4-Dichloro-2-butene		ug/l	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
1,2,3 - Trichloropropane		ug/l	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U
1,2 - Dibromomethane (EDB)		ug/l	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U	0.0100 U
1,2 - dibromo-3-chloropropane		ug/l	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U

<sup>(1)</sup> - Maximum Contaminant Level (MCL) or Secondary Drinking Water Standard (SDWS), as established in Chapter 62-550. Analyte concentrations shown with shading represent an exceedance of the MCL or SDWS.

U = Compound was analyzed but not detected; I = Reported value is between the laboratory method detection limit and the laboratory practical quantitation limit



**Table 3**  
**Surface Water Analytical Summary**  
**Hardee County Landfill**  
**Second Half 2017**

Analyte	Location:		SW-2
	Sample Identifier:		SW-2
	Date of Test:		12/20/2017
	Standard(1)	Units	
<b>Field Measurements</b>			
Temperature		deg. C	17.57
pH	6-8.5	STD	6.76
Conductivity	1275	uS/cm	345
Dissolved Oxygen (DO)	>5	mg/l	1.84
Turbidity	29+	NTU	3.00
<b>Inorganics</b>			
Nitrate (as N)		mg/l	0.0100 U
Nitrite (as N)		mg/l	0.0200 U
Total Dissolved Solids (TDS)		mg/l	234
Aluminum	1.5	mg/l	0.0100 U
Ammonia (as N)		mg/l	0.0100 U
Antimony	4.3	mg/l	0.00200 U
Arsenic	0.05	mg/l	0.00100 U
Barium		mg/l	0.00330 I
Beryllium	0.00013	mg/l	0.000500 U
Cadmium	Note 2	mg/l	0.000200 U
Chromium	Note 3	mg/l	0.0037
Cobalt		mg/l	0.00100 U
Copper	Note 4	mg/l	0.00100 U
Iron	1	mg/l	0.751
Lead	Note 5	mg/l	0.00100 U
Mercury	0.000012	mg/l	0.0000200 U
Nickel	Note 6	mg/l	0.00100 U
Selenium	5	mg/l	0.00200 U
Silver	0.00007	mg/l	0.000500 U
Thallium	0.0063	mg/l	0.00100 U
Vanadium	0.049	mg/l	0.00100 U
Zinc	Note 7	mg/l	0.0100 U
Fecal coliform	800	mpn/100ml	14.7
Total Hardness (as CaCO3)		mg/l	134
Total Organic Carbon (TOC)		mg/l	20.8
Total Nitrogen		mg/l	0.850
Total Phosphorus		mg/l	1.13
Total Suspended Solids (TSS)		mg/l	2.25
Un-ionized Ammonia	0.02	mg/l	0.000100 U
Biological Oxygen Demand (BOD)		mg/l	2.29
Chemical Oxygen Demand (COD)		mg/l	45.6
Chlorophyll A		ug/l	0.0200 U
Total Kheldahl Nitrogen (TKN) (as N)		mg/l	0.850
<b>Organics</b>			
1,1,1,2-Tetrachloroethane		ug/l	0.500 U
1,1,1-Trichloroethane	270	ug/l	0.500 U
1,1,2,2-Tetrachloroethane	10.8	ug/l	0.100 U
1,1,2-Trichloroethane	16	ug/l	0.500 U
1,1-Dichloroethane		ug/l	0.500 U
1,1-Dichloroethene	3.2	ug/l	0.500 U
1,2-Dichloroethane	37	ug/l	0.500 U
1,2-Dichloropropane	14	ug/l	0.200 U

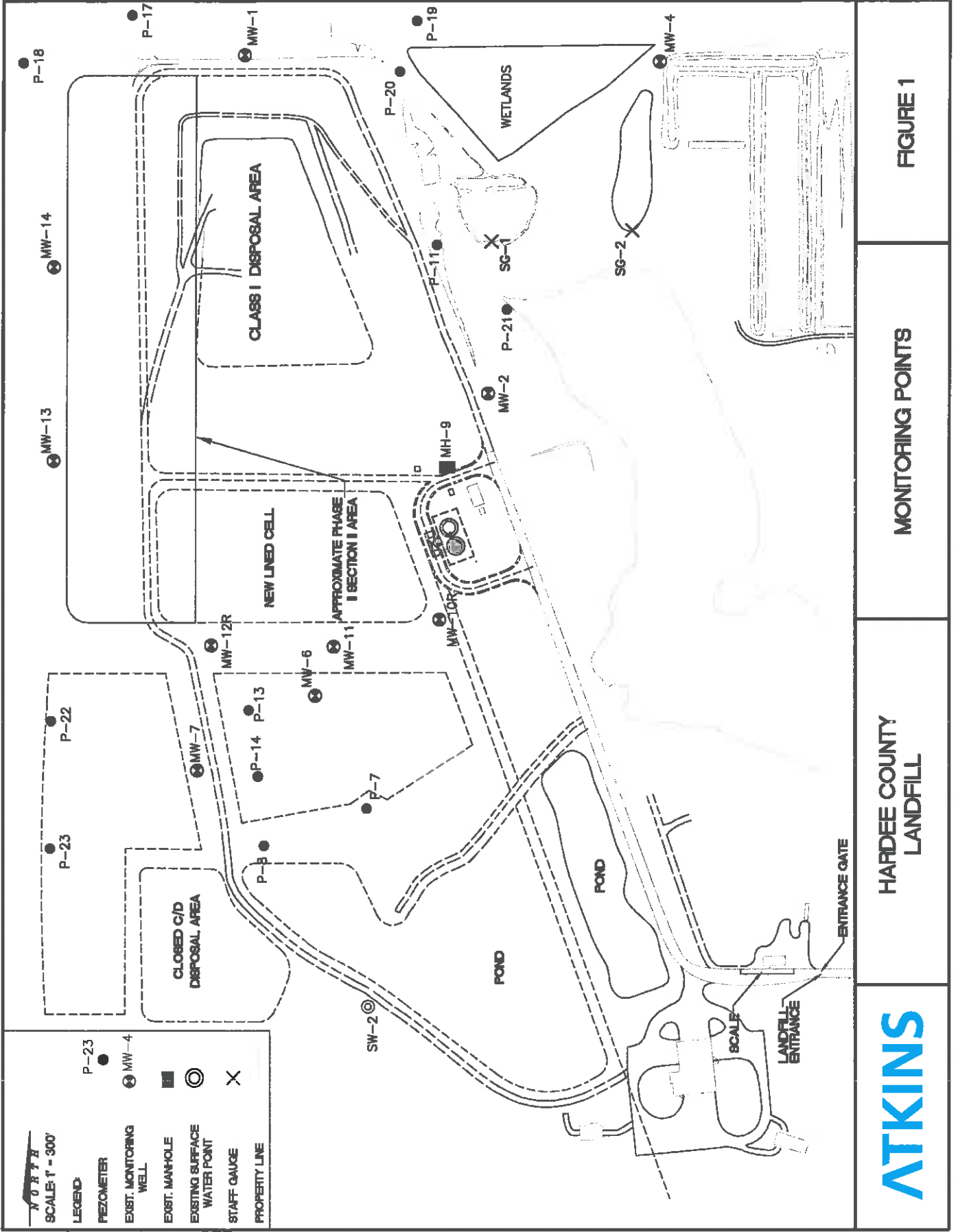
Analyte	Location:		SW-2
	Sample Identifier:		SW-2
	Date of Test:		12/20/2017
	Standard(1)	Units	
1,2,3-Trichloropropane	0.2	ug/l	0.0200 U
1,2-Dibromoethane (EDB)	13	ug/l	0.0100 U
1,2-Dibromo-3-chloropropane		ug/l	0.0200 U
2-Butanone (MEK)	120000	ug/l	0.500 U
2-Hexanone		ug/l	0.500 U
Acetone	1700	ug/l	5.00 U
Acrylonitrile	0.2	ug/l	0.300 U
Benzene	71.28	ug/l	0.500 U
Bromochloromethane		ug/l	0.100 U
Bromodichloromethane	49.7	ug/l	0.100 U
Bromoform		ug/l	0.500 U
Bromomethane	35	ug/l	0.500 U
Carbon disulfide	110	ug/l	1.00 U
Carbon tetrachloride	4.42	ug/l	0.500 U
Chlorobenzene	17	ug/l	0.500 U
Chloroethane		ug/l	0.500 U
Chloroform		ug/l	0.500 U
Chloromethane	470.8	ug/l	0.500 U
Dibromochloromethane		ug/l	0.400 U
Dibromomethane	1580	ug/l	0.500 U
Ethylbenzene	610	ug/l	0.500 U
Methyl iodide		ug/l	1.00 U
Methyl isobutyl ketone		ug/l	1.00 U
Methylene chloride		ug/l	1.00 U
Para-dichlorobenzene		ug/l	0.500 U
Styrene	460	ug/l	0.500 U
Tetrachloroethene	8.85	ug/l	0.500 U
Toluene	480	ug/l	0.500 U
Trichloroethene	80.7	ug/l	0.500 U
Trichlorofluoromethane		ug/l	0.500 U
Vinyl Acetate	700	ug/l	10.0 U
Vinyl chloride	2.4	ug/l	0.500 U
Xylenes	370	ug/l	1.00 U
cis-1,2-Dichloroethene	3.2	ug/l	0.200 U
cis-1,3-Dichloropropene	12	ug/l	0.500 U
o-Dichlorobenzene		ug/l	0.500 U
trans-1,2-Dichloroethene	11000	ug/l	0.500 U
trans-1,3,-Dichloropropene	12	ug/l	0.500 U
trans-1,4-Dichloro-2-butene		ug/l	1.00 U

Abbreviations: mg/l = milligrams per liter; ug/l = micrograms per liter; NTU = nephelometric turbidity units; mpn/100ml = most probable number (of bacteria colonies) per 100 ml. U = less than method detection limit (MDL) I = between MDL and practical quantitation limit

(1) Surface water standards presented in Chapter 62-302, FAC. Analyte concentrations shown with shading represent an exceedance of the regulatory level. Value of hardness is used to determine calculated standards below.

- (2) Cd less than or equal to  $e(0.7852(\ln H)-3.49)$
- (3) Cr less than or equal to  $e(0.819(\ln H)+0.6848)$
- (4) Cu less than or equal to  $e(0.845(\ln H)-1.702)$
- (5) Pb less than or equal to  $e(1.273(\ln H)-4.705)$
- (6) Ni less than or equal to  $e(0.846(\ln H)+0.0584)$
- (7) Zn less than or equal to  $e(0.8473(\ln H)+0.884)$

## FIGURES

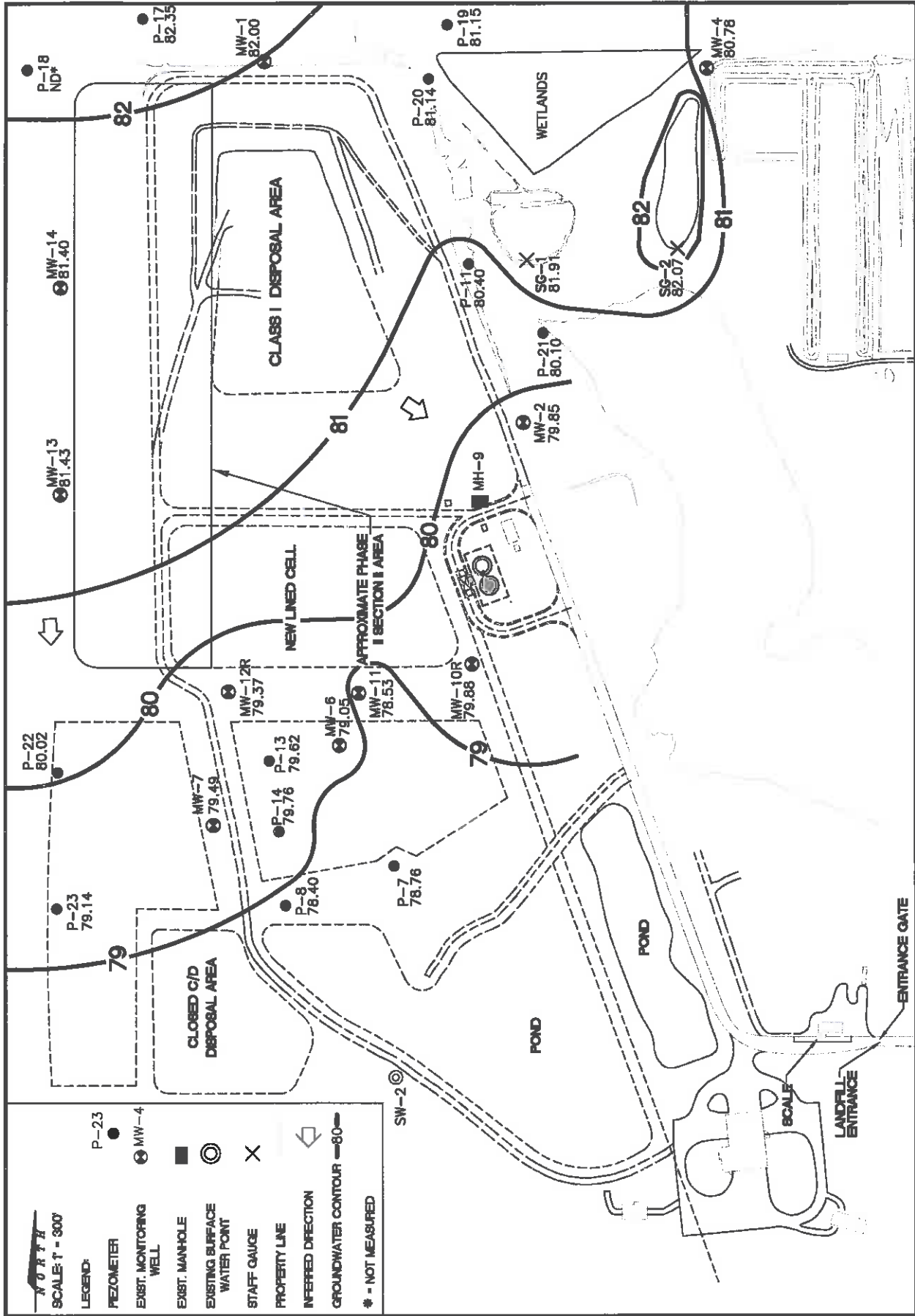


**ATKINS**

HARDEE COUNTY  
LANDFILL

MONITORING POINTS

FIGURE 1



**ATKINS**

**HARDEE COUNTY LANDFILL**

**WATER TABLE ELEVATION CONTOUR MAP SECOND HALF 2017**

**FIGURE 2**

**ATTACHMENT A**

**Ground Water Monitoring Report Form**



# Florida Department of Environmental Protection

Bob Martinez Center  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

DEP Form #: 62-701.900(31), F.A.C.

Form Title: Water Quality Monitoring Certification

Effective Date: January 6, 2010

Incorporated in Rule 62-701.510(9), F.A.C.

## WATER QUALITY MONITORING CERTIFICATION

### PART I GENERAL INFORMATION

- (1) Facility Name Hardee County Solid Waste Disposal Facility  
Address 685 Airport Road  
City Wauchula, FL Zip 33873 County Hardee  
Telephone Number (863) 773-5089
- (2) WACS Facility ID SWD-25-40612
- (3) DEP Permit Number 38414-016-SO-01
- (4) Authorized Representative's Name Bradley J. Bayne, P.G. Title Senior Geologist  
Address Atkins North America, 4030 West Boy Scout Boulevard, Suite 700  
City Tampa, FL Zip 33607 County Hillsborough  
Telephone Number (813) 281-8377  
Email address (if available) bradley.bayne@atkinsglobal.com

### CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submission of false information including the possibility of fine and imprisonment.

January 12, 2018  
(Date)

Bradley J. Bayne  
(Owner or Authorized Representative's Signature)

### PART II QUALITY ASSURANCE REQUIREMENTS

- Sampling Organization Atkins North America (see above information)
- Analytical Lab NELAC / HRS Certification # NELAC # E83018
- Lab Name Flowers Chemical Laboratories, Inc.
- Address 481 Newburyport Avenue, Altamonte Springs, FL 32715
- Phone Number (407) 339-5984
- Email address (if available) june@flowerslabs.com (June Flowers)

Northwest District  
160 Government Center  
Pensacola, FL 32501-5794  
850-595-8360

Northeast District  
7825 Baymeadows Way, Ste. 200 B  
Jacksonville, FL 32256-7590  
904-807-3300

Central District  
3319 Maguire Blvd., Ste. 232  
Orlando, FL 32803-3767  
407-894-7555

Southwest District  
13051 N. Telecom Pky.  
Tempe Terrace, FL  
813-632-7600

South District  
2285 Victoria Ave., Ste. 364  
Fort Myers, FL 33902-2549  
239-332-8975

Southeast District  
400 North Congress Ave.  
West Palm Beach, FL 33401  
561-681-8800

## **ATTACHMENT B**

### **Groundwater Sampling Logs and Field Equipment Calibration Logs**



# DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: <u>Hardee County Landfill</u>		SITE LOCATION: <u>685 Airport Rd., Wauchope</u>	
WELL NO: <u>MW-1</u>	SAMPLE ID: <u>MW-1</u>	DATE: <u>12/19/17</u>	

## PURGING DATA

WELL DIAMETER (inches): <u>4</u>	TUBING DIAMETER (inches): <u>1/4</u>	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): <u>5.97</u>	PURGE PUMP TYPE OR BAILER: <u>Peristaltic</u>							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = ( <u>12.70</u> feet - <u>5.97</u> feet) X <u>0.65</u> gallons/foot = <u>4.37</u> gallons											
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): <u>9</u>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <u>9</u>	PURGING INITIATED AT: <u>10:40</u>	PURGING ENDED AT: <u>11:35</u>	TOTAL VOLUME PURGED (gallons): <u>5.5</u>							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) <u>µmhos/cm</u> or <u>µS/cm</u>	DISSOLVED OXYGEN (circle units) <u>mg/L</u> or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
<u>11:15</u>	<u>3.5</u>	<u>3.5</u>	<u>0.1</u>	<u>6.98</u>	<u>5.42</u>	<u>22.18</u>	<u>210</u>	<u>3.10</u>	<u>24.2</u>	<u>Brown</u>	<u>None</u>
<u>11:20</u>	<u>0.5</u>	<u>4.0</u>	<u>0.1</u>	<u>7.00</u>	<u>5.11</u>	<u>22.23</u>	<u>211</u>	<u>2.78</u>	<u>16.7</u>	<u>↓</u>	<u>↓</u>
<u>11:25</u>	<u>0.5</u>	<u>4.5</u>	<u>0.1</u>	<u>7.00</u>	<u>4.99</u>	<u>22.25</u>	<u>211</u>	<u>2.73</u>	<u>15.9</u>	<u>↓</u>	<u>↓</u>
<u>11:30</u>	<u>0.5</u>	<u>5.0</u>	<u>0.1</u>	<u>7.01</u>	<u>4.95</u>	<u>22.17</u>	<u>212</u>	<u>1.98</u>	<u>14.5</u>	<u>clear</u>	<u>↓</u>
<u>11:35</u>	<u>0.5</u>	<u>5.5</u>	<u>0.1</u>	<u>7.00</u>	<u>4.95</u>	<u>22.20</u>	<u>212</u>	<u>1.87</u>	<u>15.0</u>	<u>↓</u>	<u>↓</u>
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											
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

## SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: <u>Brad Bayne / Atkins</u>				SAMPLER(S) SIGNATURE(S): <u>Bradley D. Bayne</u>				SAMPLING INITIATED AT: <u>11:35</u>		SAMPLING ENDED AT: <u>11:45</u>	
PUMP OR TUBING DEPTH IN WELL (feet): <u>9</u>				TUBING MATERIAL CODE: <u>S+HDPE</u>		FIELD-FILTERED: Y <u>(N)</u> Filtration Equipment Type:				FILTER SIZE: _____ µm	
FIELD DECONTAMINATION: PUMP Y <u>(N)</u>				TUBING Y <u>(N)</u> (replaced)				DUPLICATE: Y <u>(N)</u>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH					
<u>See Chain of Custody</u>											
REMARKS:											
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)											
SAMPLING EQUIPMENT CODES: APP = After (Through) Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)											

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. 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)

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Rd., Wauchula	
WELL NO: MW-2	SAMPLE ID: MW-2	DATE: 12/19/17	

[illegible]

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins				SAMPLER(S) SIGNATURE(S): Bradley D. Bayne			SAMPLING INITIATED AT: 10:20		SAMPLING ENDED AT: 10:30	
PUMP OR TUBING DEPTH IN WELL (feet): 9				TUBING MATERIAL CODE: S + HDPE			FIELD-FILTERED: Y (N) Filtration Equipment Type:		FILTER SIZE: _____ µm	
FIELD DECONTAMINATION: PUMP Y (N)				TUBING Y (N) (replaced)			DUPLICATE: Y (N)			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH				
REMARKS:										
<b>MATERIAL CODES:</b> AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)										
<b>SAMPLING EQUIPMENT CODES:</b> APP = After (Through) Peristaltic Pump; RFP = Reverse Flow Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)										

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $\pm 0.2$  mg/L or  $\pm 10\%$  (whichever is greater) **Turbidity:** all readings  $\leq 20$  NTU; optionally  $\pm 5$  NTU or  $\pm 10\%$  (whichever is greater)

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Rd., Wavahula	
WELL NO: MW-4	SAMPLE ID: MW-4	DATE: 12/19/17	

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 6.38	PURGE PUMP TYPE OR BAILER: Peristaltic
<b>WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> (only fill out if applicable) $= (21.60 \text{ feet} - 6.38 \text{ feet}) \times 0.16 \text{ gallons/foot} = 2.43 \text{ gallons}$				
<b>EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> (only fill out if applicable) $= \text{gallons} + (\text{gallons/foot} \times \text{feet}) + \text{gallons} = \text{gallons}$				
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 10	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 10	PURGING INITIATED AT: 8:30	PURGING ENDED AT: 9:05	TOTAL VOLUME PURGED (gallons): 3.5

[illegible]

**PURGING EQUIPMENT CODES:** B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLED BY (PRINT) / AFFILIATION: Brad Bayne / Atkins		SAMPLER(S) SIGNATURE(S): Bradley D. Bayne		SAMPLING INITIATED AT: 9:05	SAMPLING ENDED AT: 9:15
PUMP OR TUBING DEPTH IN WELL (feet): 10		TUBING MATERIAL CODE: S + HDPE		FIELD-FILTERED: Y (N)	FILTER SIZE: _____ µm
FIELD DECONTAMINATION: PUMP Y (N)		TUBING Y (N) (replaced)		DUPLICATE: Y (N)	

[illegible]

REMARKS:

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

**SAMPLING EQUIPMENT CODES:** APP = After (Through) Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump;  
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

**NOTES:** 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

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

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $\pm 0.2$  mg/L or  $\pm 10\%$  (whichever is greater) **Turbidity:** all readings  $< 20$  NTU; optionally  $\pm 5$  NTU or  $\pm 10\%$  (whichever is greater)

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Rd., Waycross	
WELL NO: MW-10R	SAMPLE ID: MW-10R	DATE: 12/20/17	

WELL DIAMETER (inches):		TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH:		STATIC DEPTH TO WATER (feet):		PURGE PUMP TYPE OR BAILER:				
2		1/4			8.68		Peristaltic				
<b>WELL VOLUME PURGE:</b> 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)											
		= (	23.08	feet -	8.68	feet) X	0.16 gallons/foot = 2.3 gallons				
<b>EQUIPMENT VOLUME PURGE:</b> 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				
<b>INITIAL PUMP OR TUBING DEPTH IN WELL (feet):</b>		<b>FINAL PUMP OR TUBING DEPTH IN WELL (feet):</b>		<b>PURGING INITIATED AT:</b>		<b>PURGING ENDED AT:</b>		<b>TOTAL VOLUME PURGED (gallons):</b>			
12		12		9:20		10:00		4.0			
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) <small>µmhos/cm or µS/cm</small>	DISSOLVED OXYGEN (circle units) <small>mg/L or % saturation</small>	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:40	2.0	2.0	0.1	9.12	6.23	23.67	595	1.15	15.4	Clear	None
9:45	0.5	2.5	0.1	9.12	6.28	23.73	604	0.71	12.7		
9:50	0.5	3.0	0.1	9.11	6.32	23.73	608	0.59	12.4		
9:55	0.5	3.5	0.1	9.10	6.32	23.80	605	0.57	9.27		
10:00	0.5	4.0	0.1	9.10	6.33	23.83	605	0.53	9.40	↓	↓
<b>WELL CAPACITY (Gallons Per Foot):</b> 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											
<b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 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											
<b>PURGING EQUIPMENT CODES:</b> B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

SAMPLED BY (PRINT) / AFFILIATION: <b>Brad Bayne / Atkins</b>				SAMPLER(S) SIGNATURE(S): <b>Bradley J. Bayne</b>			PUMPING INITIATED AT: <b>10:00</b>		SAMPLING ENDED AT: <b>10:10</b>			
PUMP OR TUBING DEPTH IN WELL (feet): <b>12</b>				TUBING MATERIAL CODE: <b>5+ HDPE</b>			FIELD-FILTERED: Y <b>(N)</b> Filtration Equipment Type:		FILTER SIZE: _____ µm			
FIELD DECONTAMINATION: PUMP Y <b>(N)</b> TUBING Y <b>(N)</b> (replaced)							DUPLICATE: Y <b>(N)</b>					
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		SAMPLE PUMP FLOW RATE (mL per minute)	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH						
<b>See Chain of Custody</b>												
REMARKS:												
<b>MATERIAL CODES:</b> <b>AG</b> = Amber Glass; <b>CG</b> = Clear Glass; <b>HDPE</b> = High Density Polyethylene; <b>LDPE</b> = Low Density Polyethylene; <b>PP</b> = Polypropylene; <b>S</b> = Silicone; <b>T</b> = Teflon; <b>O</b> = Other (Specify)												
<b>SAMPLING EQUIPMENT CODES:</b> <b>APP</b> = After (Through) Peristaltic Pump; <b>B</b> = Bailor; <b>BP</b> = Bladder Pump; <b>ESP</b> = Electric Submersible Pump; <b>RFPP</b> = Reverse Flow Peristaltic Pump; <b>SM</b> = Straw Method (Tubing Gravity Drain); <b>O</b> = Other (Specify)												

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  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)

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Rd., Wavhola	
WELL NO: MW-11	SAMPLE ID: MW-11	DATE: 12/20/17	

WELL DIAMETER (inches): <u>2</u>	TUBING DIAMETER (inches): <u>1/4</u>	WELL SCREEN INTERVAL DEPTH:      feet to      feet	STATIC DEPTH TO WATER (feet): <u>9.58</u>	PURGE PUMP TYPE OR BAILER: <u>Peristaltic</u>
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable)				
= ( <u>13.90</u> feet - <u>9.58</u> feet ) X <u>0.16</u> gallons/foot = <u>0.69</u> gallons				
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				

**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**  
**PURGING EQUIPMENT CODES:** **B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)**

[illegible]

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $+0.2$  mg/L or  $+10\%$  (whichever is greater) **Turbidity:** all readings  $\leq 20$  NTU; optionally  $+5$  NTU or  $+10\%$  (whichever is greater)



SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Rd., Wauchula	
WELL NO: MW-12B	SAMPLE ID: MW-12B	DATE: 12/19/17	

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 1 1/4	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 9.63	PURGE PUMP TYPE OR BAILER: Peristaltic
<b>WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> (only fill out if applicable) = ( 23.04 feet - 9.63 feet ) X 0.16 gallons/foot = 2.15 gallons				
<b>EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> (only fill out if applicable) = gallons + ( gallons/foot X feet ) + gallons = gallons				

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  
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

## REMARKS:

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; Q = Other (Specify)

**SAMPLING EQUIPMENT CODES:** APP = After (Through) Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump;  
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

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

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $\pm 0.2$  mg/L or  $\pm 10\%$  (whichever is greater) **Turbidity:** all readings  $< 20$  NTU; optionally  $\pm 5$  NTU or  $\pm 10\%$  (whichever is greater)

SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Rd., Wavchula	
WELL NO: MW-13	SAMPLE ID: MW-13	DATE: 12/19/17	

[illegible]

SAMPLED BY (PRINT) / AFFILIATION: <b>Brad Bayne / Atkins</b>				SAMPLER(S) SIGNATURE(S): <i>Brad Bayne</i>				SAMPLING INITIATED AT: <b>13:30</b>		SAMPLING ENDED AT: <b>13:40</b>			
PUMP OR TUBING DEPTH IN WELL (feet): <b>10</b>				TUBING MATERIAL CODE: <b>S+HDPE</b>		FIELD-FILTERED: Y <input checked="" type="checkbox"/> N			FILTER SIZE: _____ µm				
FIELD DECONTAMINATION: PUMP Y <input checked="" type="checkbox"/> N TUBING Y <input checked="" type="checkbox"/> N (replaced)						DUPLICATE: Y <input checked="" type="checkbox"/> N							
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		SAMPLE PUMP FLOW RATE (mL per minute)	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)		FINAL pH						
<b>See Chain of Custody</b>													
REMARKS:													
<b>MATERIAL CODES:</b> AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)													
<b>SAMPLING EQUIPMENT CODES:</b> APP = After (Through) Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)													

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $\pm 0.2$  mg/L or  $\pm 10\%$  (whichever is greater) **Turbidity:** all readings  $< 20$  NTU; optionally  $\pm 5$  NTU or  $\pm 10\%$  (whichever is greater)

# DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: <u>Hardee County Landfill</u>		SITE LOCATION: <u>685 Airport Rd., Wauchope</u>	
WELL NO: <u>MW-14</u>	SAMPLE ID: <u>MW-14</u>	DATE: <u>12/19/17</u>	

## PURGING DATA

WELL DIAMETER (Inches): <u>2</u>	TUBING DIAMETER (Inches): <u>1.14</u>	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): <u>6.76</u>	PURGE PUMP TYPE OR BAILER: <u>Peristaltic</u>
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = ( <u>20.35</u> feet - <u>6.76</u> feet) X <u>0.16</u> gallons/foot = <u>2.17</u> gallons				
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): <u>9</u>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <u>9</u>	PURGING INITIATED AT: <u>12:05</u>	PURGING ENDED AT: <u>12:40</u>	TOTAL VOLUME PURGED (gallons): <u>3.5</u>

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) $\mu\text{mhos/cm}$ or $\mu\text{S/cm}$	DISSOLVED OXYGEN (circle units) $\text{mg/L}$ or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:25	2.0	2.0	0.1	7.14	6.11	22.26	507	0.79	6.01	Clear	None
12:30	0.5	2.5	0.1	7.15	6.08	22.42	507	0.71	5.40	↓	↓
12:35	0.5	3.0	0.1	7.13	6.08	22.31	507	0.58	3.92	↓	↓
12:40	0.5	3.5	0.1	7.12	6.07	22.28	507	0.56	3.70	↓	↓

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

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

## SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: <u>Brad Bayne/Atkins</u>				SAMPLER(S) SIGNATURE(S): <u>Bradley J. Bayne</u>				SAMPLING INITIATED AT: <u>12:40</u>		SAMPLING ENDED AT: <u>12:50</u>	
PUMP OR TUBING DEPTH IN WELL (feet): <u>9</u>				TUBING MATERIAL CODE: <u>S + HDPE</u>				FIELD-FILTERED: Y <u>(N)</u>		FILTER SIZE: _____ $\mu\text{m}$	
FIELD DECONTAMINATION: PUMP Y <u>(N)</u>				TUBING Y <u>(N)</u> (replaced)				DUPLICATE: Y <u>(N)</u>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH					
<u>See Chain of Custody</u>											

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After (Through) Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

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

pH:  $\pm 0.2$  units Temperature:  $\pm 0.2$  °C Specific Conductance:  $\pm 5\%$  Dissolved Oxygen: all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $\pm 0.2$  mg/L or  $\pm 10\%$  (whichever is greater) Turbidity: all readings  $\leq 20$  NTU; optionally  $\pm 5$  NTU or  $\pm 10\%$  (whichever is greater)



SITE NAME: Hardee County Landfill		SITE LOCATION: 685 Airport Rd., Wauchoiga	
WELL NO: SW-2	SAMPLE ID: SW-2	DATE: 12/20/17	

[illegible]

SAMPLED BY (PRINT) / AFFILIATION: <b>Brad Bayne / Atkins</b>				SAMPLER(S) SIGNATURE(S): <i>Bradley J. Bayne</i>			SAMPLING INITIATED AT: <b>11:00</b>		SAMPLING ENDED AT: <b>11:40</b>	
PUMP OR TUBING DEPTH IN WELL (feet):				TUBING MATERIAL CODE: <b>5+HDPE</b>			FIELD-FILTERED: Y <input checked="" type="radio"/> N		FILTER SIZE: _____ µm	
FIELD DECONTAMINATION: PUMP Y <input checked="" type="radio"/> N				TUBING Y <input checked="" type="radio"/> N (replaced)			DUPLICATE: Y <input checked="" type="radio"/> N			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH				
REMARKS:										
<b>MATERIAL CODES:</b> AG = Amber Glass; CG = Clear Glass; HDPE = High Density Polyethylene; LDPE = Low Density Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)										
<b>SAMPLING EQUIPMENT CODES:</b> APP = After (Through) Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)										

**pH:**  $\pm 0.2$  units **Temperature:**  $\pm 0.2$  °C **Specific Conductance:**  $\pm 5\%$  **Dissolved Oxygen:** all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $\pm 0.2$  mg/L or  $\pm 10\%$  (whichever is greater) **Turbidity:** all readings  $\leq 20$  NTU; optionally  $\pm 5$  NTU or  $\pm 10\%$  (whichever is greater)

## INSTRUMENT (MAKE/MODEL#)

451 556

**INSTRUMENT #**

14A100127

**PARAMETER:** *[check only one]*

Rented from Peterson Environmental

☐ TEMPERATURE

☐ CONDUCTIVITY

## ☐ SALINITY

☒ pH

☐ ORP

☐ TURBIDITY

☐ RESIDUAL CL

**DO**

☐ OTHER

Standard A 4.01 Provided by Peterson Environmental

Standard B 7.00

### Standard C

[illegible]





