



Florida Department of Environmental Protection

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June 22, 2017

Mr. Himanshu Mehta, P.E.
Indian River County Solid Waste Disposal District
1325 74th Avenue SW
Vero Beach, FL, 32968
hmehta@ircgov.com

**Re: Indian River County Landfill
WACS Facility Identification Number 19134
First Semiannual 2017 Water Quality Monitoring Report
Department Review Letter
Indian River County – Solid Waste**

Dear Mr. Mehta:

The Florida Department of Environmental Protection (DEP) has reviewed the Semi-Annual Water Quality Monitoring Report for January 2017 (Report) for Indian River County Landfill. The Report, prepared by CDM Smith Inc. for the above-referenced site pursuant to Department Permit No. 0128769-024-SOMM, was dated and received March 30, 2017 respectively. The Department has reviewed the C&D landfill portion of the report and have following comments and recommendation in the attached document.

Therefore, in accordance with subsection 62-701.510(6)(a), F.A.C. you are hereby notified to initiate evaluation monitoring in a manner and within the time frames provided for by Department Rule 62-701.510(6), F.A.C. Department staff look forward to receiving the results of the quarterly ground water monitoring required by this section including the data from any newly installed piezometers.

Should you have any questions concerning this matter, please direct all correspondence to me at the letterhead address or via email at ben.fisch@dep.state.fl.us or contact me by telephone at (561) 681-6617.

Sincerely,

A handwritten signature in cursive script that reads "Ben Fisch".

Ben Fisch
Environmental Specialist
Compliance Assurance Program
JS/ja/gk/bf

TO: Ben Fisch, FDEP Southeast District Office

DATE: June 21, 2017

THROUGH: Cory Dilmore, P.E.
Environmental Administrator, Solid Waste Section

FROM: James Jarmolowski, P.G.
Professional Geologist II, Solid Waste Section

FACILITY: Indian River County Construction and Demolition (C&D)
Debris Disposal Facility
WACS ID #19134

SUBJECT: Review of Groundwater Quality Information for a Permit Renewal Application for
C&D Disposal and Recycling Facility Submitted by Indian River County
on May 17, 2017

1. Facility Information: The Indian River County Landfill property covers about 276 acres and includes a Class I disposal area and a 19-acre C&D disposal facility in the southeast corner of the property. The C&D disposal facility is permitted under a separate permit from the Class I landfill, and is the subject of this review. Other operations and facilities located on the Indian River County Landfill property include a recovered materials transfer facility, a household hazardous waste transfer facility, a yard trash processing operation, and a waste tire site.

2. C&D Disposal Facility Information: C&D operations have been conducted for Cell 1 since between 1993 and 1998. C&D permit No. SO31-0128769-021 was issued by the Central District on September 11, 2012. A renewal application was submitted on May 17, 2017, for the continued operation of Cell 1 of the C&D facility, which indicated that no proposed changes to the operation were proposed, except for the addition of general procedures for closure by mining. A Request for Additional Information was sent by the Department on June 7, 2017, concerning the renewal application submitted on May 17, 2017. In accordance with 62-701.730(6)(a), the C&D disposal facility is an existing facility that was in operation prior to July 1, 2010, and is authorized to continue operation without a liner and leachate collection system.

3. Groundwater Monitoring Network: The groundwater monitoring network consists of five well clusters, with each having shallow and intermediate depth monitoring wells, and have the designations of S for shallow, and I for intermediate. The monitoring wells include MW-17S, MW-17I, MW-18S, MW-18I, MW-19S, MW-19I, MW-20S, MW-20I, MW-21S, and MW-21I. The locations are shown in Figure 1, and the following information is provided for each monitoring well:

MW-17S: This is a detection monitoring well, installed adjacent to the west of the C&D disposal facility, and is 22.91 feet deep.

MW-17I: This detection monitoring well is located adjacent to MW-17S, and is 44.51 feet deep.

MW-18S: This is a detection monitoring well, installed on the southwest of the C&D disposal facility, and is 21.34 feet deep.

- MW-18I: This detection monitoring well is located adjacent to MW-18S, and is 36.01 feet deep.
- MW-19S: This is a compliance monitoring well, installed adjacent to the east of the C&D disposal facility, and is 23.75 feet deep.
- MW-19I: This compliance monitoring well is located adjacent to MW-19S, and is 42.95 feet deep.
- MW-20S: This is a compliance monitoring well, installed adjacent to the southeast of the C&D disposal facility, and is 21.04 feet deep.
- MW-20I: This compliance monitoring well is located adjacent to MW-19S, and is 43.13 feet deep.
- MW-21S: This is a compliance monitoring well, installed adjacent to the northeast of the C&D disposal facility, and is 32.22 feet deep.
- MW-21I: This compliance monitoring well is located adjacent to MW-21S, and is 52.24 feet deep.

4. Groundwater Monitoring Requirements: Groundwater monitoring is required to be conducted semi-annually for MW-17S, MW-17I, MW-18S, MW-18I, MW-19S, MW-19I, MW-20I, MW-21S, and MW-21I, for parameters for C&D disposal facilities specified in 62-730(8)(c). The sampling and reporting activities are included with the results for the Class I landfill. The samples are collected in January and July of each year, for the required parameters associated with C&D disposal facilities. In addition to the semi-annual monitoring activities, the C&D monitoring wells were also sampled on April 7, 2017, for the parameters for C&D disposal facilities.

5. Site Specific Information: Based on the information contained in multiple reports submitted by the facility, the direction of groundwater flow in the shallow and intermediate zones is generally from the west to the east. The hydraulic gradient between MW-17S and MW-19S is 0.0010.

With respect to nearby surface water features, the southwest portion of the facility contains a large stormwater pond. A canal identified as the C-6 canal is located approximately 100 feet to the south and extends in an east-west direction, and a canal identified as the Lateral canal is located approximately 200 feet to the east, and extends in a north-south direction. Based on the well survey completed for the 2015 renewal application for the Class I landfill, there are multiple water supply wells located off-site to the west within a 1 mile radius.

With respect to groundwater flow velocity, the Technical Report completed by CDM Smith on May 28, 2015, it was indicated that the “horizontal seepage velocity in the shallow zone of the surficial aquifer in the immediate vicinities of the canals is 0.51 foot/day or approximately 15.3 feet per month. It was indicated that the horizontal seepage rate for the “intermediate zone of the surficial aquifer in the immediate vicinities of the canals is 0.11 foot/day or approximately 3.4 feet/month.

6. Review of Benzene Levels Detected in MW-21S Since January 2016: Benzene has been detected in MW-21S in low concentrations slightly above the Groundwater Cleanup Target Level (GCTL) of 1.0 microgram per liter (ug/L) in concentrations ranging from 1.1 ug/L in January 2016 to 1.5 ug/L detected in January 2017, and is indicative of an increasing trend. Benzene was

not detected in MW-21S above the applicable laboratory detection limit prior to January 2016. The results for MW-21S and MW-21I are summarized in the following table:

<i>Sampling Date</i>	<i>Benzene, ug/L MW-21S</i>	<i>Benzene, ug/L MW-21I</i>
1/2014	0.71U	0.71U
7/2014	0.71U	0.71U
1/2015	0.71U	0.71U
7/2015	0.71U	0.71U
1/2016	1.1	0.71U
7/2016	1.2	0.71U
1/2017	1.5	0.71U
4/2017	1.4	0.71U
Notes:		
1) ug/L = Micrograms per liter, U = Not detected above applicable laboratory detection limit.		
2) The Groundwater cleanup target level (GCTL) for benzene is 1.0 ug/L		

7. Iron and TDS Monitoring Results for January 2007, January 2010, January 2015 and January 2017: While reviewing the semi-annual monitoring reports and the additional groundwater sampling results completed in April 2017 for the C&D permit renewal application, elevated iron and TDS levels have been reported for the C&D disposal facility and the Class I landfill. These elevated levels have been reported as being historically elevated due to background conditions. However, review of multiple reports indicates that background conditions for landfill with respect to off-site properties have never been established. Summary tables for iron and TDS results obtained in January 2007, January 2010, January 2015 and January 2017 are provided below to illustrate the levels detected and identification of increasing trends for these parameters.

Well Number	Sampling Date	Iron, ug/L	TDS, mg/L
17S	1/2007	220	1,800
	1/2010	1310	2,200
	1/2015	2440	780
	1/2017	7340	690
17I	1/2007	80	930
	1/2010	20,200	970
	1/2015	29,700	1,100
	1/2017	37,100	1,100
Notes:			
1) ug/L = Micrograms per liter, mg/L = milligrams per liter.			
2) The Groundwater Cleanup Target level (GCTL) for iron is 300 ug/L, and is 500 mg/L for TDS.			

<i>Well Number</i>	<i>Sampling Date</i>	<i>Iron, ug/L</i>	<i>TDS, mg/L</i>
18S	1/2007	41,000	630
	1/2010	819	860
	1/2015	4,600	690
	1/2017	2,960	680
18I	1/2007	180	1,100
	1/2010	31,600	950
	1/2015	38,000	1,100
	1/2017	51,200	1,000
19S	1/2007	26,000	1,100
	1/2010	16,300	1,100
	1/2015	7,720	1,200
	1/2017	8,930	1,100
19I	1/2007	79	780
	1/2010	9,980	760
	1/2015	11,100	670
	1/2017	11,400	680
20S	1/2007	920	1,100
	1/2010	266	1,200
	1/2015	47.7	1,100
	1/2017	38U	1,000
20I	1/2007	17U	760
	1/2010	6,390	940
	1/2015	5,680	760
	1/2017	5,560	710
21S	1/2007	160	600
	1/2010	9,830	710
	1/2015	14,900	1,200
	1/2017	16,120	2,100
21I	1/2007	78	560
	1/2010	5,120	510
	1/2015	5,380	470
	1/2017	5,810	490

Notes:
1) ug/L = Micrograms per liter. mg/L = milligrams per liter.
2) U= not detected above the applicable laboratory detection limit.
3) The Groundwater cleanup target level (GCTL) for iron is 300 ug/L, and is 500 mg/L for TDS.

- 8. *Review of Iron Monitoring Results for January 2007, January 2010, January 2015 and January 2017:*** Based on review of monitoring results for iron for January 2007, January 2010, January 2015 and January 2017, the following items are provided:
- a. Iron was consistently detected above the GCTL of 300 micrograms per liter (ug/L) in almost every monitoring well at the C&D disposal facility. The only monitoring well where iron was not detected consistently above 300 ug/L was MW-20S.
 - b. For the monitoring event in January 2017, the concentrations of iron ranged from less than 38 ug/L in MW-20S to 51,200 ug/L in MW-18I.
 - c. Increasing trends of iron are present in MW-17S, MW-17I, MW-18I, MW-19I, MW-21S, and MW-21I. Higher concentrations were also observed in intermediate wells MW-17I, MW-18I, and MW-20I than in the adjacent shallow wells.
 - d. The Technical Report dated May 28, 2015 indicated the elevated concentrations of iron for the C&D disposal facility “vary considerable with time and location” and that “there is little correlation between parameters.”
- 9. *Review of TDS Monitoring Results for January 2007, January 2010, January 2015 and January 2017:*** Based on review of monitoring results for TDS for January 2007, January 2010, January 2015 and January 2017, the following items are provided:
- a. TDS was consistently detected above the GCTL of 500 milligrams per liter (mg/L) in almost every monitoring well at the C&D disposal facility. The only monitoring well where TDS was not detected consistently above 500 mg/L was MW-21I.
 - b. For the monitoring event in January 2017, the concentrations of TDS ranged from 490 mg/L in MW-21I to 2,100 mg/L detected in MW-21S.
 - c. A decreasing trend is present in MW-17S, and no other trends were identified for any other monitoring wells. Higher concentrations were also observed in shallow wells MW-19S, 20S, and 21S, than in the adjacent intermediate wells.
 - d. The Technical Report dated May 28, 2015 indicated the elevated concentrations of TDS for the C&D disposal facility “there is little if any correlation between parameters.” It was also indicated that “other parameters such as TDS are generally consistent with respect to time and location.
- 10. *Sodium and Ammonia Monitoring Results for MW-19S, MW-19I, MW-21S, and MW-21I for January 2007, January 2010, January 2015 and January 2017:*** While reviewing the semi-annual monitoring reports and the additional groundwater sampling results completed in April 2017 for the C&D permit renewal application, elevated ammonia and sodium levels were reported for MW-21S at C&D disposal facility. The Technical Report completed in May 2015 indicated that “groundwater in the vicinity of the C&D debris landfill is generally stable or perhaps improving with respect to most parameters at most locations with the exception of well MW-21S.” The following summary table is provided for sodium and ammonia for MW-19S, MW-19I, MW-21S, and MW-21I, to illustrate any increasing trends for these parameters:

<i>Well Number</i>	<i>Sampling Date</i>	<i>Sodium, mg/L</i>	<i>Ammonia, mg/L</i>
19S	1/2007	160	3.5
	1/2010	134	8.0
	1/2015	164	17.0
	1/2017	148	13.0
19I	1/2007	98	2.5
	1/2010	91.7	1.6
	1/2015	74	0.66
	1/2017	86	0.56
21S	1/2007	42	0.72
	1/2010	89.2	8.3
	1/2015	174	12
	1/2017	349	21
21I	1/2007	62	0.56
	1/2010	62.4	0.63
	1/2015	118	0.63
	1/2017	55.6	0.64
Notes: 1) mg/L = milligrams per liter. 2) The Groundwater cleanup target level for sodium is 160 mg/L and is 2.8 mg/L for ammonia.			

11. Review of Sodium and Ammonia Monitoring Results for January 2007, January 2010, January 2015 and January 2017 for MW-19S, MW-19I, MW-21S, and MW-21I: Based on review of monitoring results for sodium and ammonia for January 2007, January 2010, January 2015 and January 2017, the following items are provided:

- a. An increasing trend for sodium was identified in MW-21S, which increased from 42 mg/L in January 2007, to 349 mg/L in January 2017. The GCTL for sodium is 160 mg/L.
- b. Increasing trends for ammonia were identified in MW-19S and MW-21S for the interval from January 2007 through January 2017. MW-19S detected ammonia at 3.5 mg/L in January 2007, and 13.0 mg/l in January 2017. MW-21S detected ammonia at 0.72 mg/L in January 2007, and 21 mg/l in January 2017. The GCTL for sodium is 160 mg/L.

12. Recommendations: Based on the above paragraphs, the following recommendations are provided:

- a. **Detection of Benzene in MW-21S:** Based on the detection of benzene in MW-21S from January 2016 to April 2017, it is recommended that evaluation monitoring be initiated pursuant to 62-701.510(6). The evaluation monitoring should provide (but not be limited to) if the benzene exceedance is related to the C&D disposal facility; and a determination if elevated benzene concentrations are present beyond the zone of discharge.

- b. ***Recommendation for Evaluation Monitoring for Iron:*** Based on the increasing trends of iron observed in detection and compliance wells and the elevated levels of iron observed in the intermediate detection and compliance monitoring wells, evaluation monitoring is recommended pursuant to 62-701.510(6) for iron at the C&D disposal facility. The evaluation monitoring should provide (but not be limited to) a determination of background levels for iron for the C&D disposal facility; if the iron exceedances in the compliance and detection monitoring wells are related to the C&D disposal facility; and a determination if elevated iron concentrations are present beyond the zone of discharge.
- c. ***Recommendation for Evaluation Monitoring for TDS:*** Based on the elevated levels of TDS observed in detection and compliance wells, evaluation monitoring is recommended pursuant to 62-701.510(6) for TDS at the C&D disposal facility. The evaluation monitoring should provide (but not be limited to) a determination of background levels for TDS for the C&D disposal facility; if the TDS exceedances in the compliance and detection monitoring wells are related to the C&D disposal facility; and a determination if elevated TDS concentrations are present beyond the zone of discharge.
- d. ***Recommendation for Evaluation Monitoring for Sodium and Ammonia in MW-19S and MW-21S:*** Based on the elevated levels of sodium and ammonia in MW-21S and ammonia in MW-19S, evaluation monitoring is recommended pursuant to 62-701.510(6). The evaluation monitoring should provide (but not be limited to) a determination of background levels for sodium and ammonia for the MW-19S and MW-21S; if the ammonia and sodium exceedances in MW-19S and MW-21S as applicable are related to the C&D disposal facility; and a determination if elevated sodium and ammonia concentrations are present beyond the zone of discharge.

FIGURES

Figure 1 – Site Plan and Monitoring Well Locations

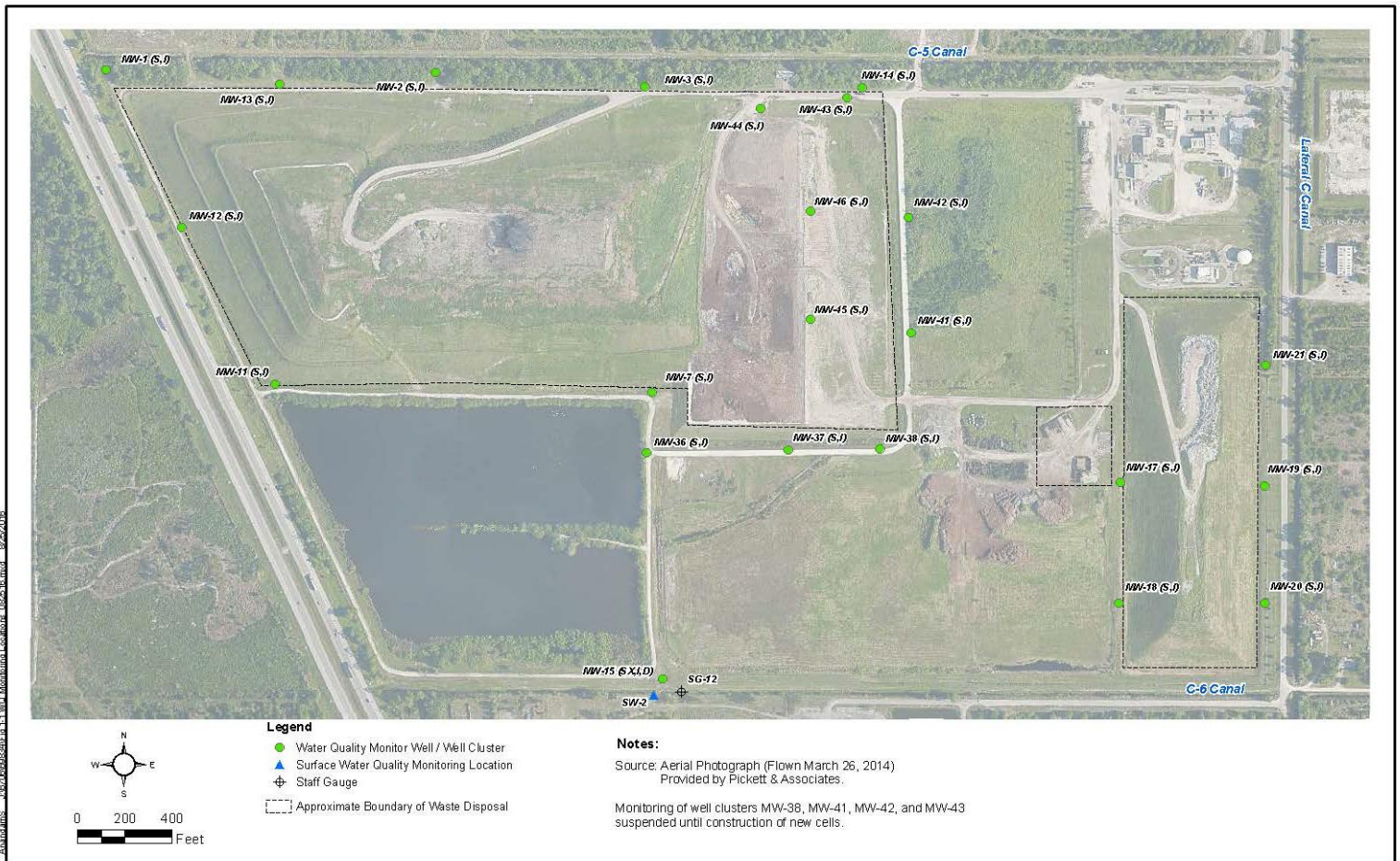
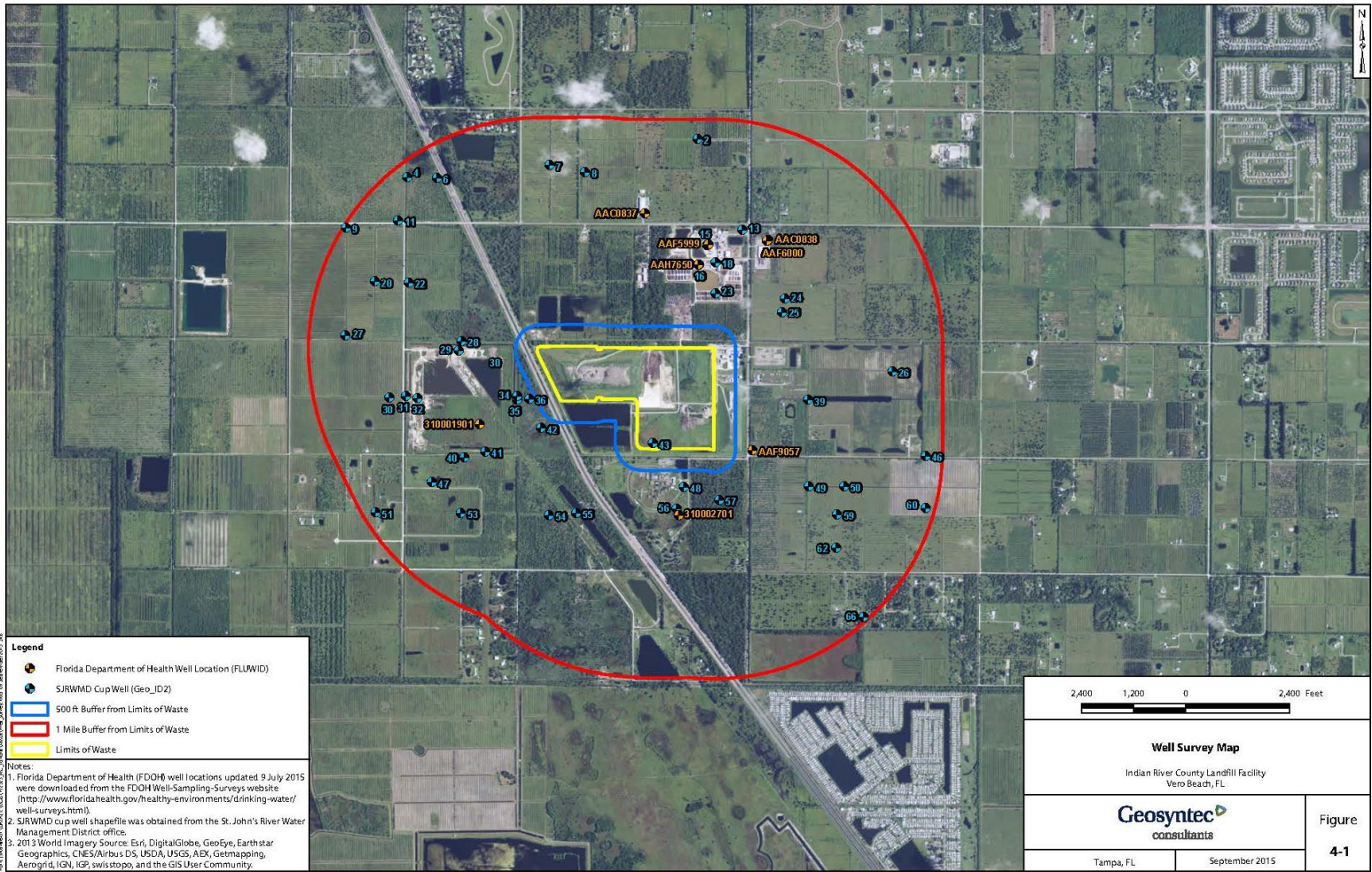


Figure 1-1
 Indian River County Landfill Water Quality Monitoring Locations
 Indian River County

Source: Water Quality Monitoring Event, January 2017 Monitoring Event, prepared by CDM Smith, March 30, 2017

Figure 2 – Well Survey Map



Source: Class I Landfill Permit Renewal Landfill Application for Indian River County, prepared by Geosyntec Consultants, September 28, 2015