



ONE COMPANY | *Many Solutions™*

May 21, 2013

David S. Adams, P.G.
Environmental Manager
Public Utilities Department - BSOC
334 N. Falkenburg Rd.
Tampa, FL 33619

Dept. of Environmental Protection

JUN 04 2013

Southwest District

**RE: Well Completion Documents
Monitoring/Assessment Wells TH-76 and TH-77
SE County Landfill
Hillsborough County, Florida**

Dear Mr. Adams:

HDR Engineering is pleased to submit the attached documents for your review and submittal to the FDEP. We have completed the required FDEP form 62-701.900(30), a lithological log, and a well construction diagram for each well – TH-76 and TH-77.

We appreciate the opportunity to be of service to Hillsborough County. If you have any questions, please call me at (904) 598-8968.

Sincerely,

John Catches, P.G.
Senior Project Manager
HDR Engineering, Inc.

Attachments

c.c.: Richard Siemering, HDR
Robert Curtis, HDR



STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT,
REPAIR, MODIFY, OR ABANDON A WELL

- ☒ Southwest
☐ Northwest
☐ St. Johns River
☐ South Florida
☐ Suwannee River
☐ DEP
☐ Delegated Authority (If Applicable)

PLEASE FILL OUT ALL APPLICABLE FIELDS
(* Denotes Required Fields Where Applicable)

The water well contractor is responsible for completing
this form and forwarding the permit application to the
appropriate delegated authority where applicable.

Permit No. 827899
Florida Unique ID _____
Permit Stipulations Required (See Attached)
23.38
62-524 Quad No. Q3118 Definition No. _____
CUP/WUP Application No. _____
APPROVED FOR FILING AND RECORD USE ONLY

1. Hillsborough County Post Office Box 1110 Tampa FL 33601-1110
*Owner, Legal Name if Corporation *Address *City *State *ZIP *Telephone Number
2. 0
*Well Location - Address, Road Name or Number, City Lithia
3. IL-22-31-21-777-000004-46530.0
*Parcel ID No. (PIN) or Alternate Key (Circle One) Lot Block Unit
4. 22 31c 21 HILLSBOROUGH Subdivision Check if 62-524: Yes ☒ No
*Section or Land Grant *Township *Range *County
5. Michael Rice 7091 (352) 237-1995 michael.rice@boardlongyear.com
*Water Well Contractor *License Number *Telephone Number E-mail Address
6. 6785 8W 6TH PLACE APT 101A OCALA FL 34474
*Water Well Contractor's Address *City *State *ZIP
7. *Type of Work: ☒ Construction ☐ Repair ☐ Modification ☐ Abandonment
8. *Number of Proposed Wells 2
9. *Specify Intended Use(s) of Well(s):
Domestic Landscape Irrigation Agricultural Irrigation Site Investigation
Bottled Water Supply Recreation Area Irrigation Livestock ☒ Monitoring
Public Water Supply (Limited Use/DOH) Nursery Irrigation Test
Public Water Supply (Community or Non-Community/DEP) Commercial/Industrial Earth-Coupled Geothermal
Class I Injection Golf Course Irrigation HVAC Supply
Class V Injection: Recharge Commercial/Industrial Disposal Aquifer Storage and Recovery HVAC Return
Remediation: Recovery Air Sparge Other (Describe) Drainage
Other (Describe) (Note: Not all types of wells are permitted by a given permitting authority)
10. *Distance from Septic System if ≤ 200 ft. 11. Facility Description Landfill 12. Estimated Start Date 03/22/2013
13. *Estimated Well Depth 180 ft. *Estimated Casing Depth ft. *Primary Casing Diameter 2 in. Open Hole: From To ft.
14. Estimated Screen Interval: From 160.0 To 180.0 ft.
15. *Primary Casing Material: Black Steel Galvanized ☒ PVC Stainless Steel
Not Cased Other
16. Secondary Casing: Telescope Casing Liner Surface Casing Diameter in.
17. Secondary Casing Material: Black Steel Galvanized PVC Stainless Steel Other
18. *Method of Construction, Repair, or Abandonment: Auger Cable Tool Jetted Rotary ☒ Sonic
Combination (Two or More Methods) Hand Driven (Well Point, Sand Point) Hydraulic Point (Direct Push)
Horizontal Drilling Plugged by Approved Method Other (Describe)
19. Proposed Grouting Interval for the Primary, Secondary, and Additional Casing:
From To Seal Material (Bentonite Neat Cement Other)
From To Seal Material (Bentonite Neat Cement Other)
From To Seal Material (Bentonite Neat Cement Other)
From To Seal Material (Bentonite Neat Cement Other)
20. Indicate total number of existing wells on site 20 List number of existing unused wells on site 0
21. *Is this well or any existing well or water withdrawal on the owner's contiguous property covered under a Consumptive Water Use Permit (CUP/WUP)
or CUP/WUP Application? Yes ☒ No If yes, complete the following: CUP/WUP No District Well ID No.
22. Latitude 27 48 23.60 Longitude 82 11 29.52
23. Data Obtained From: GPS ☒ Map Survey Datum: NAD 27 ☒ NAD 83 WGS 84
I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water
use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well
construction. I further certify that all information provided in this application is accurate and that I will obtain
necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well
completion report in the District within 30 days after completion of the construction, repair, modification, or
abandonment authorized by this permit, or the permit stipulations, whichever occurs first.
I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my
responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon the well, or, I certify that I am
the agent for the owner, that the information provided is accurate, and that I have informed the owner of his
responsibilities as stated above. Owner consents to allowing personnel of this WUD or Delegated Authority access to
the well site during the construction, repair, modification, or abandonment authorized by this permit.
Digitally Signed _____ 7091 Digitally Signed _____ 3/25/2013
*Signature of Contractor *License No. *Signature of Owner or Agent *Date
DO NOT WRITE BELOW THIS LINE (FOR OFFICIAL USE ONLY)
Approval Granted By Joseph Haglin STATUS: ISSUED Issue Date 03/25/2013 Expiration Date 06/23/2013 Hydrologist Approval _____
Fee Received \$50.00 Receipt No. 10080269 Check No. _____
THIS PERMIT IS NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WUD OR DELEGATED AUTHORITY. THE
PERMIT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL CONSTRUCTION, REPAIR, MODIFICATION, OR ABANDONMENT ACTIVITIES.
FORM LEG-R 040.01 (8/10) Rule 40D-3.101 (1), F.A.C. EFFECTIVE DATE: 9/12/2010 This permit is valid for 90 days from the date of issue.



Florida Department of Environmental Protection

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

DEP Form # 62-701 900(30)

Form Title: Monitoring Well Completion Report

Effective Date: January 6, 2010

Incorporated in Rule 62-701 510(3), F.A.C.

MONITORING WELL COMPLETION REPORT

DATE: May 2, 2013

FACILITY NAME: Hillsborough County, Southeast County Landfill

DEP PERMIT NO.: 35435-020-SO-01

WACS FACILITY ID NO.: SWD/29/41193

WACS MONITORING SITE NUM.: _____

WACS WELL NO.: TH-76

WELL TYPE: BACKGROUND ☐

DETECTION ☐

COMPLIANCE ☒

LATITUDE: 27° 46' 32.34" LONGITUDE: -82° 11' 28.95"

(see back for LAT / LONG requirements):

Coordinate Accuracy 0.10' (vert. and horiz.) Datum NAD 83 w/1990 adj. Elevation Datum NGVD 1929

Collection Method RTK

Collection Date 4/23/2013

Collector Name Gregory A. Prather, P.S.M.

Collector Affiliation Pickett & Associates, Inc.

AQUIFER MONITORED: Floridan

DRILLING METHOD: Sonic

DATE INSTALLED: 3/27/2013

INSTALLED BY: Boart Longyear with oversight by HDR Engineering

BORE HOLE DIAMETER: 8 5/8" TOTAL DEPTH: 174.5 ft (BLS)

CASING TYPE: PVC CASING DIAMETER: 2 inch CASING LENGTH: 159.5 ft

SCREEN TYPE: PVC SCREEN SLOT SIZE: 0.010" SCREEN LENGTH: 15 ft

SCREEN DIAMETER: 2 inch SCREEN INTERVAL: 159.5 ft TO 174.5 ft (BLS)

FILTER PACK TYPE: silica sand

FILTER PACK GRAIN SIZE: 20/30

INTERVAL COVERED: 156.5 ft TO 174.5 ft (BLS)

SEALANT TYPE: Bentonite SEALANT INTERVAL: 154 ft TO 156.5 ft (BLS)

GROUT TYPE: Type I/II Portland GROUT INTERVAL: 0 TO 154 ft (BLS)

TOP OF CASING ELEVATION (NGVD): 111.21 ft GROUND SURFACE ELEVATION (NGVD): 108.41 ft

DESCRIBE WELL DEVELOPMENT: Pump and bail

POST DEVELOPMENT WATER LEVEL ELEVATION (NGVD): DTW 94.7 ft / elevation 16.51 ft

DATE AND TIME MEASURED: 4/5/2013 at 2:41 PM

REMARKS: Removed approximately 8 gal. water removed from well in 120 min

NAME OF PERSON PREPARING REPORT: John Catches, P.G., HDR Engineering, 904-598-8968,

john.catches@hdrinc.com

(Name, Organization, Phone No., E-mail)

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

Northeast District
7825 Baymeadows Way Ste 200B
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
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
239-332-6975

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600

HDR Engineering, Inc.

Borehole and Well Construction Log

Page 1 of 3

Site Name: Southeast County Landfill
 Boring ID: TH-76
 Date Begin: 3/25/2013
 Date End: 3/27/2013

HDR Project No.: 193806-001
 Contractor/Driller: Boart Longyear
 Rig Type: Sonic
 Method: Sonic, Continuous Sample

Site Location: Lithia, FL
 Total Depth Drilled: 174.5 feet
 Sample Method/Size: Continuous Sample 4"
 Cutting Disposal: Spread on site

Temporary Well Construction Log		Borehole Log		
		Sample Interval	Description	
Date & Time Begin Drilling: <u>3/25/2013</u> End Drilling: <u>3/27/2013</u> Construction Details Well Construction Intervals Riser: <u>0 to 159.5 ft bls</u> Screen: <u>159.5 to 174.5 ft bls</u> Silt Trap: <u>N/A</u> Surf. Seal: <u>0 to 154 ft bls</u> Seal: <u>154 ft to 156.5 ft</u> Filter Pack: <u>156.5 ft to 174.5 ft</u> Backfill: <u>N/A</u> Materials Riser: <u>2" Sch. 40 PVC</u> Screen: <u>2" Sch 40 PVC - 0.010" slot</u> Surf. Seal: <u>Neat Type II Portland (approx. 92 lb bag each), 19 bags</u> Seal: <u>Bentonite Chips (approx. 50 lb bag each), 2 bags</u> Filter Pack: <u>20/30 Quartz Sand (approx. 50 lb bag each), 9 bags</u> Backfill: <u>N/A</u> Surface Completion Protection: <u>6" dia Aluminum Protective Cover</u> Pad: <u>2'x2'x4" premix concrete</u> Lock: <u>Padlock on locking cover</u> HDR Personnel Field Work: <u>Karamjit Singh</u> Log Draft: <u>Catches/Singh</u> Symbols Concrete:  Grout:  Bentonite:  Sand:  Notes ' - feet " - inches BLS - below land surface ALS - above land surface bTOC - Below top of PVC casing NA - not applicable HSA - Hollow-stem auger  - water level		8" borehole 	Elevations (FT-NGVD 1929) PVC Top-of-Casing <u>111.21 ft</u> Concrete Pad <u>108.41 ft</u> Lat/Long (NAD 83/1990 adj) <u>27° 46' 32.34" N</u> <u>82° 11' 28.95" W</u> Notes:	SPT Data ASTM 1596 per 5" <u>N</u>
0	0 - 1	SAND, fine grain w/organics, gray-black, SM		
2	1 - 2	SAND, fine grain w/organics, dark brown, SM		
4	2 - 5	SAND, fine to medium grain, brown, SP		
6	5 - 9	SAND, fine grain with organics, brown-black, SM		
8	9 - 12	SAND, fine to medium grain, gray, SP		
10	12 - 14	SAND, fine, clayey, gray, SC		
12	14 - 15	SAND, fine to medium grain, gray, SP		
14	15 - 16	CLAY, very slightly sandy, gray, CL		
16	16 - 17	CLAY, gray-green w/light colored limestone fragments, plastic, damp, CL-CH		
18	17 - 27	CLAY, gray, fewer limestone fragments, damp, CL-CH		
20	27 - 30	LIMESTONE, weathered with small % clay, gray to cream, damp		
22	30 - 33	CLAY, w/limestone fragments, dry, cream color		
24	33 - 37	CLAY, w/limestone fragments, gray, plastic, damp, CL-CH		
26	37 - 42	CLAY, w/limestone fragments, dark gray to cream, damp, plastic, CL-CH		
28	42 - 45	LIMESTONE, fragmented, in sand/clay matrix, dry, cream color		
30	45 - 52	SAND, silty, w/limestone fragments, dry, gray, SP		
32	52 - 57	CLAY, damp plastic w/limestone fragments, gray, CL-CH		
34	57 - 60	Borehole diameter 0 - 58 ft = 8 inch, borehole diameter below 58 ft = 6 inch		

HDR Engineering, Inc.

Borehole and Well Construction Log

Page 2 of 3

Site Name: Southeast County Landfill
 Boring ID: TH-76
 Date Begin: 3/25/2013
 Date End: 3/27/2013

HDR Project No.: 193806-001
 Contractor/Driller: Boart Longyear
 Rig Type: Sonic
 Method: Sonic, Continuous Sample

Site Location: Lithia, FL
 Total Depth Drilled: 174.5 feet
 Sample Method/Size: Continuous Sample 4"
 Cutting Disposal: Spread on site

Temporary Well Construction Log		Lithology	Borehole Log	
		Sample Interval	Description	
Date & Time Begin Drilling: <u>3/25/2013</u> End Drilling: <u>3/27/2013</u> Construction Details Well Construction Intervals Riser: <u>0 to 159.5 ft bis</u> Screen: <u>159.5 to 174.5 ft bis</u> Silt Trap: <u>N/A</u> Surf. Seal: <u>0 to 154 ft bis</u> Seal: <u>154 ft to 156.5 ft</u> Filter Pack: <u>156.5 ft to 174.5 ft</u> Backfill: <u>N/A</u> Materials Riser: <u>2" Sch. 40 PVC</u> Screen: <u>2" Sch 40 PVC - 0.010" slot</u> Surf. Seal: <u>Neat Type II Portland (approx. 92 lb bag each), 19 bags</u> Seal: <u>Bentonite Chips (approx. 50 lb bag each), 2 bags</u> Filter Pack: <u>20/30 Quartz Sand (approx. 50 lb bag each), 9 bags</u> Backfill: <u>N/A</u> Surface Completion Protection: <u>6" dia Aluminum Protective Cover</u> Pad: <u>2'x2'x4" premix concrete</u> Lock: <u>Padlock on locking cover</u> HDR Personnel Field Work: <u>Karamjit Singh</u> Log Draft: <u>Catches/Singh</u> Symbols Concrete:  Grout:  Bentonite:  Sand:  Notes ' - feet " - inches BLS - below land surface ALS - above land surface bTOC - Below top of PVC casing NA - not applicable HSA - Hollow-stem auger ▼ - water level			Notes: DTW=89.54 below TOC, 86.74 below ground/Elevation=21.67 ft - May 2, 2013	SPT Data ASTM 1596 per 6" N
6" borehole		60 - 63	SAND, clayey w/limestone fragments, dry, gray, SC-SP	
		63 - 68	SAND, silty, w/limestone fragments, dry, gray, SP	
		68 - 74	SAND, silt and clay, low moisture, gray, SP	
		74 - 79	SAND, clayey, low moisture, packed and brittle, dark gray, SC	
		79 - 85	CLAY, very moist w/ small phosphate pebbles and limestone fragments, gray to pale green, CL-CH	
		85 - 88	LIMESTONE, weathered, with clayey sand matrix, low moisture, cream to gray	
		88 - 91	SAND, clayey w/limestone fragments, very low moisture, packed, pale green to dark gray, SC	
		91 - 100	LIMESTONE, weathered w/silty sand and phosphate pebbles, very low moisture, gray	
		100 - 103	CLAY, w/shell and limestone fragments, damp, plastic, gray, CL-CH	
		103 - 110	CLAY, sim to last w/ larger limestone fragments	
		110 - 116	SAND, silty/clayey w/ limestone fragments, low moisture, gray, SP	
		116 - 118	LIMESTONE, weathered w/silty sand, dry, cri	
		118 - 122	CLAY, w/phosphate grains and pebbles and limestone fragments, plastic, gray, CL-CH	

HDR Engineering, Inc.

Borehole and Well Construction Log

Page 3 of 3

Site Name: Southeast County Landfill
 Boring ID: TH-76
 Date Begin: 3/25/2013
 Date End: 3/27/2013

HDR Project No.: 193806-001
 Contractor/Driller: Boart Longyear
 Rig Type: Sonic
 Method: Sonic, Continuous Sample

Site Location: Lithia, FL
 Total Depth Drilled: 174.5 feet
 Sample Method/Size: Continuous Sample 4"
 Cutting Disposal: Spread on site

Temporary Well Construction Log		Lithology	Sample Interval	Borehole Log	
				Description	
Date & Time Begin Drilling: <u>3/25/2013</u> End Drilling: <u>3/27/2013</u> Construction Details Well Construction Intervals Riser: <u>0 to 159.5 ft bls</u> Screen: <u>159.5 to 174.5 ft bls</u> Silt Trap: <u>N/A</u> Surf. Seal: <u>0 to 154 ft bls</u> Seal: <u>154 ft to 156.5 ft</u> Filter Pack: <u>156.5 ft to 174.5 ft</u> Backfill: <u>N/A</u> Materials Riser: <u>2" Sch. 40 PVC</u> Screen: <u>2" Sch 40 PVC - 0.010" slot</u> Surf. Seal: <u>Neat Type II Portland (approx. 92 lb bag each), 19 bags</u> Seal: <u>Bentonite Chips (approx. 50 lb bag each), 2 bags</u> Filter Pack: <u>20/30 Quartz Sand (approx. 50 lb bag each), 9 bags</u> Backfill: <u>N/A</u> Surface Completion Protection: <u>6" dia Aluminum Protective Cover</u> Pad: <u>2'x2'x4" premix concrete</u> Lock: <u>Padlock on locking cover</u> HDR Personnel Field Work: <u>Karamjit Singh</u> Log Draft: <u>Catches/Singh</u> Symbols Concrete:  Grout:  Bentonite:  Sand:  Notes ' - feet " - inches BLS - below land surface ALS - above land surface bTOC - Below top of PVC casing NA - not applicable HSA - Hollow-stem auger ▼ - water level					Notes: SPT Data ASTM 1596 per 6" N
6" borehole					
120 122 124 126 128 130 132 134 136 138 140 142 144 146 148 150 152 154 156 158 160 162 164 166 168 170 172 174 176 178 180			122 - 125 125 - 128 128 - 133 133 - 136 136 - 138 138 - 158 158 - 164 164 - 169 169 - 172 172 - 180	SAND, clayey w/phosphate grains/pebbles and limestone fragments, gray, SP SAND, silty-clayey w/ decreasing % phosphate grains/pebbles and limestone fragments, dark gray, SP CLAY, w/ phosphate pebbles and limestone fragments, damp, plastic, gray, CL-CH CLAY, sim to last with lower % moisture, pale green, CL LIMESTONE, weathered w/silty sand, cream color CLAY, w/small limestone fragments, gray to dark gray, scattered phosphate pebbles, CL-CH Rod drop and no return indicates void space or very soft fill LIMESTONE, w/silty-clayey sand, gray CLAY, w/limestone fragments, gray LIMESTONE, cream color Limestone, w/small % clay CLAY, w/weathered limestone, cream color, limestone % decreased between 172 and 177 feet bls Bottom of screen set at 174.5 ft bls Well was overdrilled to 180 ft bls and backfilled to 177 ft bls with bentonite pellets.	

TH-76

ALUMINUM PROTECTIVE COVER LID (6-INCH)

PVC BELL CAP

ALUMINUM PROTECTIVE COVER (6-INCH)

CONCRETE PAD 2' X 2' X 4"

LAND SURFACE

3 FEET
PVC CASING (APPROX.)
(ABOVE GROUND)

8-INCH DIAMETER BOREHOLE

8-INCH TEMPORARY SURFACE
CASING (REMOVED DURING
GROUTING)
58 FT

2-INCH DIAMETER
SCHEDULE 40 PVC CASING

CEMENT GROUT SEAL

2.5 FOOT BENTONITE SEAL

15 FOOT, 2-INCH DIAMETER SCH-40
0.010" SLOTTED WELL SCREEN

SAND 3 FT ABOVE
SCREEN

20/30 SILICA SAND FILTER PACK

15 FEET PVC
WELL SCREEN
(159.5' TO 174.5')

2-INCH DIAMETER THREADED WELL POINT

1.5 FOOT SAND PACK (20/30)

6-INCH DIAMETER BOREHOLE (TYP)

4 FOOT BENTONITE SEAL

174.5 FEET

NOT TO SCALE

SOUTHEAST COUNTY LANDFILL

PUBLIC UTILITIES DEPARTMENT

ENVIRONMENTAL SERVICES

MONITOR WELL CONSTRUCTION DETAIL DIAGRAM

GROUNDWATER MONITORING WELL TH-76



Florida Department of Environmental Protection

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

DEP Form # 62-701.900(30)

Form Title: Monitoring Well Completion Report

Effective Date: January 6, 2010

Incorporated in Rule 62-701.510(3), F.A.C.

MONITORING WELL COMPLETION REPORT

DATE: May 2, 2013

FACILITY NAME: Hillsborough County, Southeast County Landfill

DEP PERMIT NO.: 35435-020-SO-01 WACS FACILITY ID NO.: SWD/29/41193

WACS MONITORING SITE NUM.: _____ WACS WELL NO.: TH-77

WELL TYPE: BACKGROUND ☐ DETECTION ☐ COMPLIANCE ☒

LATITUDE: 27° 46' 26.10" LONGITUDE: -82° 11' 28.33"

(see back for LAT / LONG requirements):

Coordinate Accuracy 0.10' (vert. and horiz.) Datum NAD 83 w/1990 adj. Elevation Datum NGVD 1929

Collection Method RTK Collection Date 4/23/2013

Collector Name Gregory A. Prather, P.S.M. Collector Affiliation Pickett & Associates, Inc.

AQUIFER MONITORED: Floridan

DRILLING METHOD: Sonic DATE INSTALLED: 3/29/2013

INSTALLED BY: Boart Longyear with oversight by HDR Engineering

BORE HOLE DIAMETER: 8"/6" TOTAL DEPTH: 166 ft (BLS)

CASING TYPE: PVC CASING DIAMETER: 2 inch CASING LENGTH: 151 ft

SCREEN TYPE: PVC SCREEN SLOT SIZE: 0.010" SCREEN LENGTH: 15 ft

SCREEN DIAMETER: 2 inch SCREEN INTERVAL: 151 ft TO 166 ft (BLS)

FILTER PACK TYPE: silica sand FILTER PACK GRAIN SIZE: 20/30

INTERVAL COVERED: 149 ft TO 166 ft (BLS)

SEALANT TYPE: Bentonite SEALANT INTERVAL: 146 ft TO 149 ft (BLS)

GROUT TYPE: Type I/II Portland GROUT INTERVAL: 0 TO 146 ft (BLS)

TOP OF CASING ELEVATION (NGVD): 119.88 ft GROUND SURFACE ELEVATION (NGVD): 117.08 ft

DESCRIBE WELL DEVELOPMENT: slow pumping

POST DEVELOPMENT WATER LEVEL ELEVATION (NGVD): DTW 98.6 ft / elevation 21.28 ft

DATE AND TIME MEASURED: 4/8/2013 at 4:25 PM

REMARKS: Removed approximately 10.7 gal. water removed from well in 48 min

NAME OF PERSON PREPARING REPORT: John Catches, P.G., HDR Engineering, 904-598-8968,

john.catches@hdrinc.com

(Name, Organization, Phone No., E-mail)

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

Northeast District
7825 Baymeadows Way Ste 200B
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.
Temple Terrace, FL
813-632-7600

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
239-332-6975

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600

HDR Engineering, Inc.

Borehole and Well Construction Log

Page 1 of 3

Site Name: Southeast County Landfill
Boring ID: TH-77
Date Begin: 3/27/2013
Date End: 3/29/2013

HDR Project No.: 193806-001
Contractor/Driller: Boart Longyear
Rig Type: Sonic
Method: Sonic, Continuous Sample

Site Location: Lithia, FL
Total Depth Drilled: 166 ft
Sample Method/Size: Continuous Sample 4"
Cutting Disposal: Spread on site

Temporary Well Construction Log		Lithology	Sample Interval	Description	Borehole Log	
Date & Time Begin Drilling: 3/27/2013 End Drilling: 3/29/2013 Construction Details Well Construction Intervals Riser: 0 to 151 ft bls Screen: 151 to 166 ft bls Silt Trap: N/A Surf. Seal: 0 to 146 ft bls Seal: 146 ft to 149 ft bls Filter Pack: 149 ft to 166 ft bls Backfill: N/A Materials Riser: 2" Sch. 40 PVC Screen: 2" Sch 40 PVC - 0.010" slot Surf. Seal: Neat Type II Portland (approx. 92 lb bag each), 18 bags Seal: Bentonite Chips (approx. 50 lb bag each), 2 bags Filter Pack: 20/30 Quartz Sand (approx. 50 lb bag each), 10 bags Backfill: N/A Surface Completion Protection: 6" dia Aluminum Protective Cover Pad: 2'x2'x4" premix concrete Lock: Padlock on locking cover HDR Personnel Field Work: Singh/Curtis Log Draft: Catches/Singh Symbols Concrete:  Grout:  Bentonite:  Sand:  Notes ' - feet " - inches BLS - below land surface ALS - above land surface bTOC - Below top of PVC casing NA - not applicable HSA - Hollow-stem auger ▼ - water level		8" borehole 		Elevations (FT-NGVD 1929) PVC Top-of-Casing 119.88 ft Concrete Pad 117.08 ft Lat/Long (NAD 83/1990 adj) 27° 46' 25.10" N 82° 11' 28.33" W Notes:	SPT Data ASTM 1596 per 6" N	
0	0 - 1	SAND, fine to medium grain gray-black, SM				
2	1 - 6					
4						
6	6 - 10	SAND, fine grain w/organics, black, SP				
8						
10	10 - 13	SAND, silty to clayey, brown, SP				
12						
14	13 - 15	SAND, clayey, pale green, SC				
16	15 - 17	SAND, silty, brown-gray, SM				
18	17 - 19	SAND, silty w/limestone fragments, gray to cream, SM				
20	19 - 20	SAND, sim to last whigher % limestone fragments, SM				
22	20 - 24	CLAY, slightly sandy, gray to cream color, CL				
24						
26	24 - 29	CLAY, damp, plastic, gray to cream CL-CH				
28						
30	29 - 38	CLAY, sim to last, but color transitioned to pale green				
32						
34						
36						
38	38 - 41	CLAY, sim to last, but color transitioned to grey to cream				
40						
42	41 - 43	LIMESTONE, weathered w/low % silty sand, gray to cream				
44	43 - 48	CLAY, slightly sandy, gray to pale green, CL-CH				
46						
48	48 - 51	Limestone, cream color				
50						
52	51 - 54	SAND, clayey w/limestone fragments, cream to dark gray, S				
54	54 - 55	LIMESTONE, weathered w/low % silty sand, gray to cream				
56	55 - 56	SAND, silty w/limestone fragments, gray, SP				
58	56 - 59	SAND, silty, gray, SM				
60	59 - 62	Borehole diameter 0 - 58 ft = 8 inch, borehole diameter below 58 ft = 6 inch CLAY, damp, plastic, pale green to cream, CL-CH				

HDR Engineering, Inc.

Borehole and Well Construction Log

Page 2 of 3

Site Name: Southeast County Landfill
 Boring ID: TH-77
 Date Begin: 3/27/2013
 Date End: 3/29/2013

HDR Project No.: 193806-001
 Contractor/Driller: Boart Longyear
 Rig Type: Sonic
 Method: Sonic, Continuous Sample

Site Location: Lithia, FL
 Total Depth Drilled: 166 ft
 Sample Method/Size: Continuous Sample 4"
 Cutting Disposal: Spread on site

Temporary Well Construction Log		Lithology	Sample Interval	Borehole Log	
				Description	
Data & Time Begin Drilling: <u>3/27/2013</u> End Drilling: <u>3/29/2013</u> Construction Details Well Construction Intervals Riser: <u>0 to 151 ft bis</u> Screen: <u>151 to 166 ft bis</u> Silt Trap: <u>N/A</u> Surf. Seal: <u>0 to 146 ft bis</u> Seal: <u>146 ft to 149 ft bis</u> Filter Pack: <u>149 ft to 166 ft bis</u> Backfill: <u>N/A</u> Materials Riser: <u>2" Sch. 40 PVC</u> Screen: <u>2" Sch 40 PVC - 0.010" slot</u> Surf. Seal: <u>Neat Type II Portland (approx. 92 lb bag each), 16 bags</u> Seal: <u>Bentonite Chips (approx. 50 lb bag each), 2 bags</u> Filter Pack: <u>20/30 Quartz Sand (approx. 50 lb bag each), 10 bags</u> Backfill: <u>N/A</u> Surface Completion Protection: <u>6" dia Aluminum Protective Cover</u> Pad: <u>2'x2'x4" premix concrete</u> Lock: <u>Padlock on locking cover</u> HDR Personnel Field Work: <u>Singh/Curtis</u> Log Draft: <u>Catches/Singh</u> Symbols Concrete:  Grout:  Bentonite:  Sand:  Notes '- feet "- inches BLS - below land surface ALS - above land surface bTOC - Below top of PVC casing NA - not applicable HSA - Hollow-stem auger ▼ - water level				Notes: DTW=98.54' below TOC, 95.72' below ground/Elevation=21.36', May 2, 2013	SPT Data ASTM 1596 per 6" N
6" borehole 				SAND, clayey, gray to pale green, SC SAND, silty to clayey, gray, SP SAND, clayey w/limestone fragments, gray, SP CLAY, w/limestone fragments, dry, gray, CL CLAY, moist, gray, CL-CH CLAY, w/phosphate grains and limestone fragments, cream - gray, moist, CL-CH CLAY, sim to last, but gray, CL-CH CLAY, packed, dry, pale green, CL CLAY, w/phosphate pebbles and limestone fragments, moist, plastic, gray, CL-CH Limestone, w/clay, dry, gray to cream CLAY, w/small limestone fragments, and few phosphate pebbles, moist, CL-CH SAND, silty, gray, SM CLAY, w/sand, small phosphate pebbles and limestone fragments, gray, CL LIMESTONE, cream	

HDR Engineering, Inc.

Borehole and Well Construction Log

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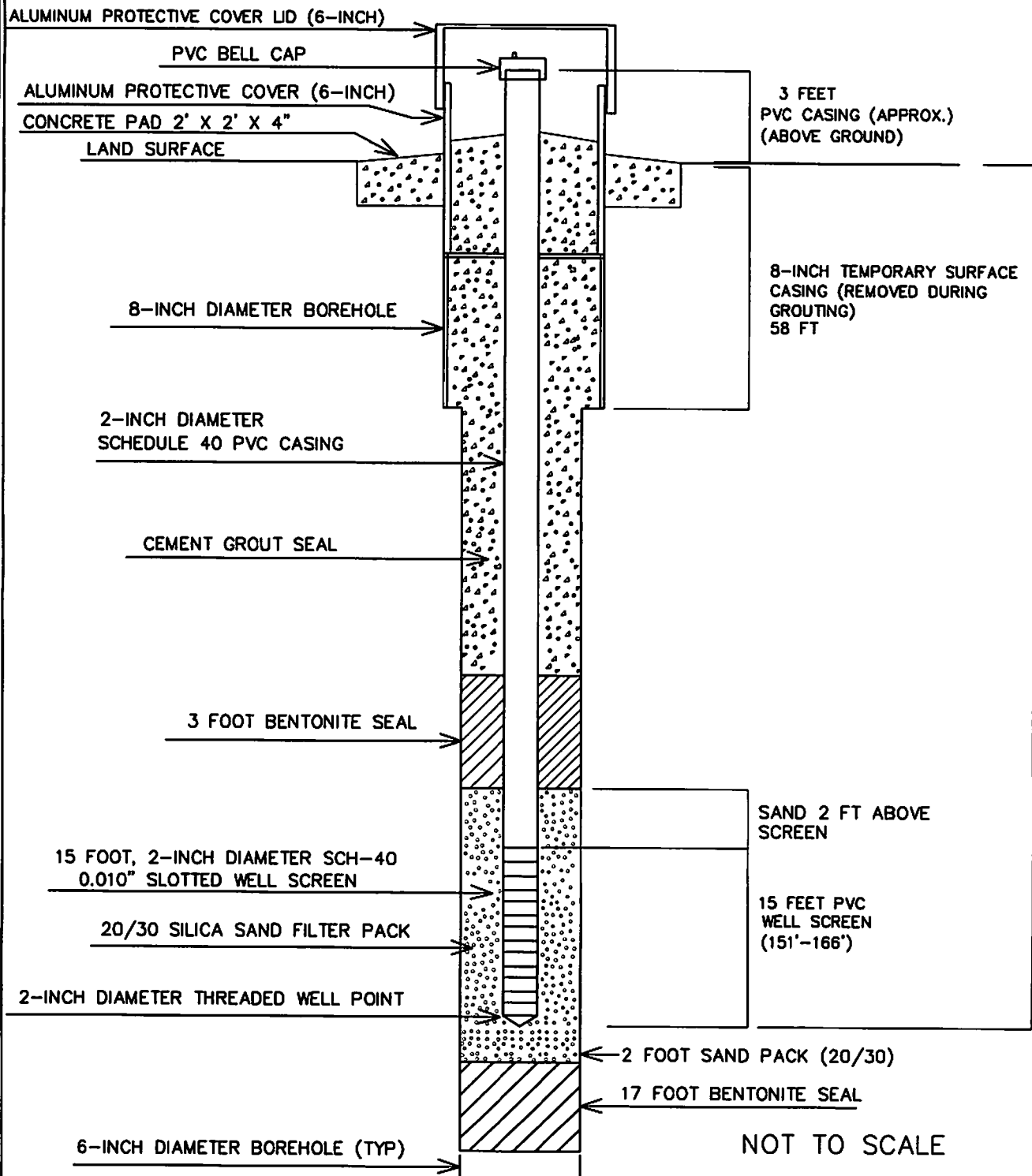
Site Name: Southeast County Landfill
 Boring ID: TH-77
 Date Begin: 3/27/2013
 Date End: 3/29/2013

HDR Project No.: 193806-001
 Contractor/Driller: Boart Longyear
 Rig Type: Sonic
 Method: Sonic, Continuous Sample

Site Location: Lithia, FL
 Total Depth Drilled: 166 ft.
 Sample Method/Size: Continuous Sample 4"
 Cutting Disposal: Spread on site

Temporary Well Construction Log		Borehole Log	
		Lithology	Description
Date & Time Begin Drilling: <u>3/27/2013</u> End Drilling: <u>3/29/2013</u> Construction Details Well Construction Intervals Riser: 0 to 151 ft bls Screen: 151 to 166 ft bls Silt Trap: N/A Surf. Seal: 0 to 146 ft bls Seal: 146 ft to 149 ft bls Filter Pack: 149 ft to 166 ft bls Backfill: N/A Materials Riser: 2" Sch. 40 PVC Screen: 2" Sch 40 PVC - 0.010" slot Surf. Seal: Neat Type II Portland (approx. 92 lb bag each), 18 bags Seal: Bentonite Chips (approx. 50 lb bag each), 2 bags Filter Pack: 20/30 Quartz Sand (approx. 50 lb bag each), 10 bags Backfill: N/A Surface Completion Protection: 6" dia Aluminum Protective Cover Pad: 2'x2'x4" premix concrete Lock: Padlock on locking cover HDR Personnel Field Work: <u>Singh/Curtis</u> Log Draft: <u>Catches/Singh</u> Symbols Concrete Grout Bentonite Sand Notes ' - feet " - inches BLS - below land surface ALS - above land surface bTOC - Below top of PVC casing NA - not applicable HSA - Hollow-stem auger ▼ - water level		6" borehole 	Notes: SPT Data ASTM 1596 per 6" N
120	120 - 124	SAND, silty clayey, w/phosphate pebbles, gray, SP	
122			
124	124 - 127	LIMESTONE, cream color	
126		SAND, silty/clayey, gray, SP	
128	127 - 128	LIMESTONE	
130	128 - 132	SAND, silty, brown, SM	
132			
134	132 - 137	SAND, fine, silty, brown, SM	
136			
138	137 - 144	SAND, fine, silty, gray, dry, SM	
140			
142			
144	144 - 145	CLAY, sandy, w/phosphate pebbles, SC	
146			
148	145 - 151	SAND, clayey, silty, SP	
150			
152	151 - 156	LIMESTONE, competent rock, cream color, dry	
154			
156	156 - 160	SAND, silty, clayey, gray, SP	
158			
160	160 - 170	SAND, silty, gray, dry, SM	
162			
164			
166			
168			
170			
172	170 - 185	SAND, clayey, gray, SC	
174			
176			
178			
180			
182			
184			
186			

TH-77



SOUTHEAST COUNTY LANDFILL

PUBLIC UTILITIES DEPARTMENT
ENVIRONMENTAL SERVICES

MONITOR WELL CONSTRUCTION DETAIL DIAGRAM
GROUNDWATER MONITORING WELL TH-77

NOT TO SCALE

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