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May 12, 2010

Tom Lubozynski, PE
Waste Management Administrator
Florida Department of Environmental Protection
3319 Maguire Blvd., Suite 232
Orlando, Florida 32803-3333

RECEIVED
MAY 17 2010
DEP Central Dist.

RE: VOLUSIA COUNTY - TOMOKA FARMS ROAD LANDFILL
LANDFILL GAS COLLECTION SYSTEM EXPANSION CERTIFICATION REPORT

Dear Mr. Lubozynski:

HDR Engineering, Inc. (HDR) on behalf of Volusia County (County), is submitting the Phase IIC Landfill Gas Collection System Certification of Construction report to the Florida Department of Environmental Protection (FDEP). The report details the recent expansion activities of the landfill gas collection system at the Tomoka Farms Road Landfill (Landfill). The report summarizes the gas collection system installation of six vertical landfill gas extraction wells (EW-10R, EW-12R, EW-13R, EW-14R, EW-15R, EW-16R, and EW-17R). Horizontal well piping on the southern side slope was extended to allow waste placement in the area.

Well logs, daily logs and a record drawing showing the updated layout of the vertical extraction wells including the lateral pipe extensions for the horizontal wells. If you should have any questions regarding this gas collection system expansion please do not hesitate to contact me at (904) 598-8928.

Sincerely,
HDR Engineering, Inc.

Carlo Lebron, PE
Project Engineer

Cc: Leonard Marion, Volusia County (w/o attachments)
Jennifer Stirk, Volusia County (w/o attachments)
Jeff Rustin, Florida Department of Environmental Protection (w/o attachments)
File (w/o attachments)

PHASE IIC LANDFILL GAS COLLECTION AND CONTROL SYSTEM RETROFIT TOMOKA FARMS ROAD LANDFILL

Report of Construction
February 22, 2010 through March 2, 2010

Presented to:



Volusia County Solid Waste Division
1990 Tomoka Farms Road
Daytona Beach, Florida 32124

Presented by:



HDR Engineering, Inc.
200 W Forsythe St., Suite 800
Jacksonville, Florida 32202

May, 2010

Report of Construction
February 22, 2010 through March 2, 2010

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AND CONTROL SYSTEM RETROFIT
TOMOKA FARMS ROAD LANDFILL

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Presented by:

HDR Engineering, Inc.
200 W Forsythe St., Suite 800
Jacksonville, Florida 32202

Florida Board of Professional Engineers
Certification No. 64078

 5/7/10

Carlo Lebron, P.E.
Florida Registration No. 60815

May, 2010

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Project Summary

This report provides certification of construction of the Phase IIC landfill gas collection and control system (GCCS) retrofit. This retrofit includes the re-drilling of 7 vertical landfill gas extraction wells and the retrofit of the southern wellheads for the horizontal collectors. The purpose of the re-drills was to increase the collection system efficiency by replacing damaged or flooded vertical wells. The retrofits to the horizontal collection system wellheads was performed in an effort to allow the County to continue waste placement along the south face of the North Cell. This retrofit will allow the monitoring and operation of all existing horizontal collection wellheads on the southern face of the North Cell while the former extraction points are buried under waste. The construction event described above was performed from February 22, 2010 through March 2, 2010 at the Tomoka Farms Road Landfill.

Site Background

Tomoka Farms Road Landfill (Landfill) is an active municipal solid waste landfill that is owned and operated by Volusia County. It is located at 1990 Tomoka Farms Road, Volusia County, Florida. This GCCS retrofit was originally designed by HDR Engineers, Inc. with Shaw Environmental and Infrastructure, Inc. (Shaw) as the primary construction contractor. HDR Engineering, Inc. (HDR) was retained to provide construction quality assurance for the project. The landfill also has a gas to energy plant onsite operated by Fortistar Methane Group which is the primary combustion device for the landfill gas. Sliger and Associates was used to perform all pre- and post-construction surveys.

Contract Documents

The original design for this retrofit was designed in the weeks leading up to the construction by HDR. This design was discussed during an on-site meeting February 19, 2010 in which representatives from the County, Shaw, HDR and Fortistar agreed upon the design and construction schedule.

Contact List

The parties involved in this project are listed below:

Owner:

Volusia County Solid Waste Division
1990 Tomoka Farms Road
Daytona Beach, Florida 32124
(386) 947-2952

Phase IIC Design Engineer:

HDR Engineering, Inc.
200 W. Forsyth Street, Suite 800
Jacksonville, Florida 32202
(904) 598-8900

Construction Contractor:

Shaw Environmental and Infrastructure, Inc.
9143 Phillips Highway, Suite 400
Jacksonville, Florida 32256
(904) 367-6025

Construction Quality Assurance and Record Documentation:

HDR Engineering, Inc.
200 W Forsyth St., Suite 800
Jacksonville, Florida 32202
(904) 598-8900

Surveyor:

Sliger & Associates, Inc.
3921 Nova Road
Port Orange, Florida 32127
(386) 761-5385

Gas to Energy Developer

Fortistar Methane Group
1990 Tomoka Farms Road
Daytona Beach, Florida 32124

Summary of Construction

Phase IIC GCCS Retrofit

The construction of the North Cell Class I Landfill Phase IIC GCCS Retrofit commenced on February 22, 2010 and was deemed substantially completed on March 1, 2010. The original design of the Phase IIC GCCS Retrofit consisted of the installation of seven vertical extraction well re-drills, retrofit of the southern horizontal wellheads to be away from the active face of the landfill and repair of the lateral lines for vertical wells being re-drilled. In total the Phase IIC GCCS Retrofit included the installation of the following estimated quantities:

- 1,580 feet of 6" diameter HDPE SDR 11 solid sub-header and lateral piping
- 467 feet of 6" diameter HDPE SDR 11 perforated vertical well piping
- 98 feet of 6" diameter HDPE SDR 11 solid vertical well piping
- 250 feet of 2" diameter HDPE SDR 11 solid air line piping
- 60 feet of 4" diameter HDPE SDR 17 solid lateral piping

Re-Drilled Wells

The 7 wells were found to be either damaged or producing less than sufficient quantities of landfill gas during an investigation conducted by HDR in January 2010. The wells were originally labeled as EW-10, EW-12, EW-13, EW-14, EW-15, EW-16, and EW-17 but were re-drilled and re-labeled with the letter "R" after their original designation. Included in Appendix B of this report are the drill logs as provided by Shaw. The below description does not match the current drill logs included in Appendix B as drill logs appear to have an error in their calculations. The discrepancy is being discussed and corrected by Shaw.

The borehole for EW-10R was extended to a final depth of 63 feet below grade. A total of 52 feet of perforated piping was used in this borehole; 32 feet of 6" HDPE SDR 11 with $\frac{3}{8}$ " perforations and 20 feet of 6" HDPE SDR 11 with $\frac{1}{4}$ " perforations. A total of 14 feet of solid piping was installed allowing the perforated pipe to be approximately 10 feet below grade while creating a 4 foot stub up above grade. A one foot thick bed of gravel was placed in the bottom of this borehole prior to the perforated pipe being installed. Gravel backfill was used around the borehole to a depth of 8 feet below grade, approximately 2 feet above the start of the perforations. A geotextile ring was then installed to prevent the intrusion of soil/bentonite into the gravel pack. Approximately 1 foot of soil was placed above this geotextile ring. To create a 2 foot plug of bentonite, 12 bags of pellet bentonite were then placed above the soil and hydrated according to the manufacturer recommendations. The remaining approximate 5 feet of borehole were completed with clean soil from an on-site stock pile.

The installation of EW-12R was originally a concern due to the potential for subsurface combustion in the previously existing extraction well. Carbon monoxide monitoring and temperature observation indicated that there was the potential for encountering smoldering waste during the excavation of the borehole. To ensure that the introduction of oxygen during the drilling process would not cause potential hazards the area was stockpiled with soil in case waste with elevated temperatures was encountered. Additionally the drill rig operator stated that if the waste exceeded 150°F at any time the drilling would be terminated and the well completed at that depth. The borehole for EW-12R was extended to a final depth of 44 feet below grade due to reaching this elevated temperature. A total of

45 feet of piping was used in this borehole; 31 feet of 6" HDPE SDR 11 with $\frac{3}{4}$ " perforations. A total of 14 feet of solid piping was installed with the perforated pipe at approximately 10 feet below grade while creating a 4 foot stub up above grade. A 3 foot thick bed of gravel was placed in the bottom of this borehole prior to the perforated pipe being installed. Gravel backfill was used around the borehole to a depth of 8 feet below grade, approximately 2 feet above the start of the perforations. A geotextile ring was then installed to prevent the intrusion of soil/bentonite into the gravel pack. Approximately 1 foot of soil was placed above this geotextile ring. To create a 2 foot plug of bentonite, 12 bags of pellet bentonite were then placed above the soil and hydrated according to the manufacturer recommendations. The remaining approximate 5 feet of the borehole was completed with clean soil from an on-site stock pile.

The borehole for EW-13R was extended to a final depth of 94 feet below grade. A total of 83 feet of perforated piping was used in this borehole; 53 feet of 6" HDPE SDR 11 with $\frac{3}{4}$ " perforations and 30 feet of 6" HDPE SDR 11 with $\frac{1}{4}$ " perforations. A total of 14 feet of solid piping was installed allowing the perforated pipe to be approximately 10 feet below grade while creating a 4 foot stub up above grade. A one foot thick bed of gravel was placed in the bottom of this borehole prior to the perforated pipe being installed. Gravel backfill was used around the borehole to a depth of 8 feet below grade, approximately 2 feet above the start of the perforations. A geotextile ring was then installed to prevent the intrusion of soil/bentonite into the gravel pack. Approximately 1 foot of soil was placed above this geotextile ring. To create a 2 foot plug of bentonite, 12 bags of pellet bentonite were then placed above the soil and hydrated according to the manufacturer recommendations. The remaining approximate 5 feet of borehole were completed with clean soil from an on-site stock pile.

The borehole for EW-14R was extended to a final depth of 66 feet below grade. A total of 55 feet of perforated piping was used in this borehole; 35 feet of 6" HDPE SDR 11 with $\frac{3}{4}$ " perforations and 20 feet of 6" HDPE SDR 11 with $\frac{1}{4}$ " perforations. A total of 14 feet of solid piping was installed allowing the perforated pipe to be approximately 10 feet below grade while creating a 4 foot stub up above grade. A one foot thick bed of gravel was placed in the bottom of this borehole prior to the perforated pipe being installed. Gravel backfill was used around the borehole to a depth of 8 feet below grade, approximately 2 feet above the start of the perforations. A geotextile ring was then installed to prevent the intrusion of soil/bentonite into the gravel pack. Approximately 1 foot of soil was placed above this geotextile ring. To create a 2 foot plug of bentonite, 12 bags of pellet bentonite were then placed above the soil and hydrated according to the manufacturer recommendations. The remaining approximate 5 feet of borehole were completed with clean soil from an on-site stock pile.

The borehole for EW-15R was extended to a final depth of 75 feet below grade. A total of 64 feet of perforated piping was used in this borehole; 44 feet of 6" HDPE SDR 11 with $\frac{3}{4}$ " perforations and 20 feet of 6" HDPE SDR 11 with $\frac{1}{4}$ " perforations. A total of 14 feet of solid piping was installed allowing the perforated pipe to be approximately 10 feet below grade while creating a 4 foot stub up above grade. A one foot thick bed of gravel was placed in the bottom of this borehole prior to the perforated pipe being installed. Gravel backfill was used around the borehole to a depth of 8 feet below grade, approximately 2 feet above the start of the perforations. A geotextile ring was then installed to prevent the intrusion of soil/bentonite into the gravel pack. Approximately 1 foot of soil was placed above this geotextile ring. To create a 2 foot plug of bentonite, 12 bags of pellet bentonite were then placed above the soil and hydrated according to the manufacturer recommendations. The remaining approximate 5 feet of borehole were completed with clean soil from an on-site stock pile.

The borehole for EW-16R was extended to a final depth of 92 feet below grade. A total of 81 feet of perforated piping was used in this borehole; 51 feet of 6" HDPE SDR 11 with $\frac{3}{4}$ " perforations and 30 feet of 6" HDPE SDR 11 with $\frac{1}{4}$ " perforations. A total of 14 feet of solid piping was installed allowing the perforated pipe to be approximately 10 feet below grade while creating a 4 foot stub up above grade. A one foot thick bed of gravel was placed in the bottom of this borehole prior to the perforated pipe being installed. Gravel backfill was used around the borehole to a depth of 8 feet below grade, approximately 2 feet above the start of the perforations. A geotextile ring was then installed to prevent the intrusion of soil/bentonite into the gravel pack. Approximately 1 foot of soil was placed above this geotextile ring. To create a 2 foot plug of bentonite, 12 bags of pellet bentonite were then placed above the soil and hydrated according to the manufacturer recommendations. The remaining approximate 5 feet of borehole were completed with clean soil from an on-site stock pile.

The borehole for EW-17R was extended to a final depth of 98 feet below grade. A total of 87 feet of perforated piping was used in this borehole; 57 feet of 6" HDPE SDR 11 with $\frac{3}{4}$ " perforations and 30 feet of 6" HDPE SDR 11 with $\frac{1}{4}$ " perforations. A total of 14 feet of solid piping was installed allowing the perforated pipe to be approximately 10 feet below grade while creating a 4 foot stub up above grade. A one foot thick bed of gravel was placed in the bottom of this borehole prior to the perforated pipe being installed. Gravel backfill was used around the borehole to a depth of 8 feet below grade, approximately 2 feet above the start of the perforations. A geotextile ring was then installed to prevent the intrusion of soil/bentonite into the gravel pack. Approximately 1 foot of soil was placed above this geotextile ring. To create a 2 foot plug of bentonite, 12 bags of pellet bentonite were then placed above the soil and hydrated according to the manufacturer recommendations. The remaining approximate 5 feet of borehole were completed with clean soil from an on-site stock pile.

Once the wells had been drilled and properly completed, Shaw repaired or retrofitted the lateral lines to allow for continued operation of the extraction points. The new wells EW-10R, EW-13R, EW-14R, EW-15R, EW-16R and EW-17R were retrofitted with minor additions piping, excavation and below grade tie-ins. The lateral line for EW-12R proved to be too deep to effectively use (as we had moved the location approximately 50' to the west from the previous extraction point). During the excavation for the lateral it was found that at the well the lateral line was greater than 8 feet in depth. The contractor then moved to the newly installed access road on the western face of the landfill. After excavating to determine a connection point to the existing collection system it was found that at the base of the slope the lateral line was still in excess of 6 feet below grade. In order to reduce the potential for damage to the newly installed access road and to allow shallower trenching the lateral line was run from EW-6 towards the southeast to EW-12R. This lateral was trenched with accompanying air line for future pumping accessibility.

Horizontal Well Monitoring Stations

In order to accommodate the filling operations for the County on the southern slope of the North Cell, the existing horizontal wellheads were re-designed to be moved down the slope, towards the limits of waste.

HDR designed two monitoring stations to be installed at the lowpoint of the header line. During the previous construction two stub-up access points were installed for these monitoring points to tie into the header system. These monitoring stations were designed to have four wellheads for HC-1B, HC-2B, HC-4B and HC-5B located on the western side of the lowpoint. The eastern monitoring station consisted

of two wellheads for HC-3B and HC-6B and a lateral line for the previously installed HC-7B. All of the interconnection points were constructed using 6" diameter HDPE SDR 11 piping and fittings. HC-7B was not retrofitted as the design the horizontal well allows both the riser from the well and the riser from the lateral line to be vertically extended when filling occurs.

Tying into the existing header line was accomplished using electrofusion couplings. These electrofusion couplings allowed the monitoring stations to have more slope than if a hard weld was performed. During the installation of the electrofusion connection points, a significant quantity of liquid accumulated from the stormwater channel along the access road. To provide a dry area for the electrofusion at the interconnection point, a large pit was excavated adjacent to the header line low point. This allowed the liquid to flow into the pit and away from the electrofusion coupling location. A trash pump was installed in this pit to remove the liquid and re-route it into the stormwater channel farther downstream from the header point.

During the connection of the new lateral lines to the existing header line, the existing lateral lines were decommissioned. To perform this decommissioning the existing lateral lines were excavated into the waste mass. If the lateral line was appropriately sloped away from the center of the waste mass, the lateral line was cut and capped approximately 5' below grade. The existing lateral was then connected to the newly installed lateral line. If the existing horizontal well was not slopped correctly, the line was excavated as far as feasibly possible (generally 15' into the waste mass), drained as best as possible, and connected to the new lateral line.

Closing

The Phase IIC Retrofit removed 7 previously existing wells (EW-10, EW-12, EW-13, EW-14, EW-15, EW-16 and EW-17) and replaced them with newly installed wells designated with an "R". Additionally the horizontal wellheads on the southern face of the north cell were retrofitted to allow continued monitoring while filling activities occur in the area.

Appendix A

Daily Field Reports



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DAILY SITE LOGS**Project Name:** Phase IIC GCCS Expansion**Date:** 2/22/2010**Project Site:** Tomoka Farms Road Landfill**Project Location:** Volusia County, Florida**Contractor:** Shaw Environmental**CQA Firm:** HDR Engineering, Inc.**CQA Associate:** Lee Daigle**Temp:** 62 °F Max54 °F Min**Weather:** Clear**Contractor Staff****Title****Equipment Used (Specific)**

<u>Evan Lightner</u>	<u>Superintendent</u>
<u>David Lightner</u>	<u>Welder/Loader</u>
<u>Rob Herrick</u>	<u>Welder/Loader</u>
<u>Ashley Cable</u>	<u>Laborer</u>
<u>Stacy Nutt</u>	<u>Driller</u>
<u>Wes Pickens</u>	<u>Drill Hand</u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>

<u>320DL Excavator</u>
<u>725 Articulated Truck</u>
<u>714 Truck</u>
<u>Front End Loader</u>
<u>320DL Excavator</u>
<u>Drill Rig</u>
<u> </u>
<u> </u>

Work Performed and Notes:

- Contractor arrived on site at 7:10 AM and began fusing pipe for the monitoring station east of the lowpoint. A minor design change was incorporated to move the monitoring station slightly up-slope and away from the drainage structure.
- Air test was performed on monitoring station, HZW-1B lateral, HZW-4B lateral, HZW-2B lateral, and HZW-5B lateral. All sections were connected prior to air testing. Air testing commenced at 12:01 PM at 10.1 PSI and was completed at 1:30 PM with 10.0 PSI. This air test successfully passed requirements.
- Contractor began the excavation of the lateral line for HZW-1B.
- EW-12 was investigated by HDR to determine potential for subsurface combustion. A gas sample was taken at the well, indicating gas concentrations of 5.8%CH₄, 48.7%CO₂, 0%O₂. Drager testing was also performed on the well indicating elevated levels of carbon monoxide with an average concentration of 250-300 PPM. Well was under significant positive pressure, various drager samples were pulled both when the well was under negative and positive pressure.



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DAILY SITE LOGS**Project Name:** Phase IIC GCCS Expansion**Date:** 2/23/2010**Project Site:** Tomoka Farms Road Landfill**Project Location:** Volusia County, Florida**Contractor:** Shaw Environmental**CQA Firm:** HDR Engineering, Inc.**CQA Associate:** Lee Daigle**Temp:** 70 °F Max55 °F Min**Weather:** Clear**Contractor Staff****Title****Equipment Used (Specific)**

<u>Evan Lightner</u>	<u>Superintendent</u>
<u>David Lightner</u>	<u>Welder/Loader</u>
<u>Rob Herrick</u>	<u>Welder/Loader</u>
<u>Ashley Cable</u>	<u>Laborer</u>
<u>Stacy Nutt</u>	<u>Driller</u>
<u>Wes Pickens</u>	<u>Drill Hand</u>
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<u>320DL Excavator</u>
<u>Drill Rig</u>
<u> </u>
<u> </u>

Work Performed and Notes:

- Contractor arrived on site at 7:00 AM. during installatiojn of the lateral line for HZW-1B it was found that the well was incorrectly sloping into the waste mass. This well was excavated 15-20 feet into the waste mass to correct the drainager. Once the liquid was removed from the lateral line a significant quantity of gas evacuated the extraction well. The pipe crew continued to excavate the lateral lines for HZW-2B and HZW-4B. These lateral lines will run in the same trench until splitting off with HZW-4B extending up the slope to the extraction point. HZW-2B was found to be at the incorrect slope and was attempted to be corrected. After excessive excavation of 15' in depth and 20' in length the pipe was not found to be properly sloped. As the horizontal well had significant quantities the well was installed with a highpoint in the middle of the lateral line where the wellhead had formerly been.
- Drillers started the day at EW-16R and hit the lateral line for the well at approximately 6' in depth. The pipe crew was brought to the location and repaired this lateral line once drilling was complete. Due to refusal the borehole was ceased at 91' in depth. After completing EW-16R the driller commenced on drilling EW-17R and succesfully drilled 65' in depth before properly covering the borehole and leaving the site.



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DAILY SITE LOGS

Project Name: Phase IIC GCCS Expansion

Date: 2/24/2010

Project Site: Tomoka Farms Road Landfill

Project Location: Volusia County, Florida

Contractor: Shaw Environmental

CQA Firm: HDR Engineering, Inc.

CQA Associate: Lee Daigle

Temp: 55 °F Max

42 °F Min

Weather: Light Rain

Contractor Staff

Title

Equipment Used (Specific)

<u>Evan Lightner</u>	<u>Superintendent</u>
<u>David Lightner</u>	<u>Welder/Loader</u>
<u>Rob Herrick</u>	<u>Welder/Loader</u>
<u>Ashley Cable</u>	<u>Laborer</u>
<u>Stacy Nutt</u>	<u>Driller</u>
<u>Wes Pickens</u>	<u>Drill Hand</u>
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<u>Front End Loader</u>
<u>320DL Excavator</u>
<u>Drill Rig</u>
<u> </u>
<u> </u>

Work Performed and Notes:

- Contractor arrived on site at 7:00 AM. Day commenced with the pipe crew repairing a damaged (bent) riser for EW-20 that the site personnel damaged. Pipe crew left after lunch due to rain.
- Drillers continued drilling EW-17R today and found that approximately 10' of the well was lost overnight. Drillers completed the well at the appropriate depth at approximately 12:45 PM and commenced on drilling EW-13R. Rain started at approximately 1:45 PM and drillers ceased operation at 4:15 PM reaching a depth of 55' below grade.
- Surveyors arrived on site today to mark out the location for EW-12R. While on site they also surveyed the asbuilt location for HZW-1B, 2B, and 4B laterals. Evan Lightner and Lee Daigle accompanied the surveyors during this as-built survey to verify the survey markers locations/features for accuracy with the existing collection system.



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DAILY SITE LOGS**Project Name:** Phase IIC GCCS Expansion**Date:** 2/25/2010**Project Site:** Tomoka Farms Road Landfill**Project Location:** Volusia County, Florida**Contractor:** Shaw Environmental**CQA Firm:** HDR Engineering, Inc.**CQA Associate:** Lee Daigle**Temp:** 65 °F Max40 °F Min**Weather:** Clear**Contractor Staff****Title****Equipment Used (Specific)**

<u>Evan Lightner</u>	<u>Superintendent</u>
<u>David Lightner</u>	<u>Welder/Loader</u>
<u>Rob Herrick</u>	<u>Welder/Loader</u>
<u>Ashley Cable</u>	<u>Laborer</u>
<u>Stacy Nutt</u>	<u>Driller</u>
<u>Wes Pickens</u>	<u>Drill Hand</u>
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<u>714 Truck</u>
<u>Front End Loader</u>
<u>320DL Excavator</u>
<u>Drill Rig</u>
<u> </u>
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Work Performed and Notes:

- Contractor arrived on site at 7:00 AM and began with the construction of the monitoring station for the eastern side of the low point. This monitoring station and lateral lines for HZW-3B, 6B and 7B were air tested from 10:10 AM through 11:35 AM at 10 PSI and passed the test. HZW-3B was watered out during installation of the lateral line. The horizontal well was excavated back, regraded and drained. After being drained the lateral produced significant quantities of gas. The lateral line and tie ins for HC-3B and 6B were completed and backfilled.
- The drillers continued to drill on EW-13R and found that approximately 5' had been lost overnight. EW-13R was completed to 96' in depth. During the installation of the well it was found that the borehole was smoking and smelled of burning wood. The carbon monoxide sensor on the 4 gas alarm went off and indicated a CO concentration of 500 ppm. This well was quickly completed in accordance with the detail and capped to prevent gas venting. The lateral line for this well will be installed by the pipe crew after the lateral lines for the horizontal wells are complete.
- After the completion of EW-13R the drillers commenced the drilling of EW-14R. This well was completed to a depth of 66' below grade at approximately 3:35 PM. The drill rig then restaged at EW-15R and commenced drilling. A 4" diameter HDPE, 2" diameter HDPE and 4" diameter PVC line were excavated during the drilling. These lines were found at a depth of 20' below grade. It appears that the HDPE is from the older gas collection system including air lines that had been previously abandoned. After discussion with Bill Wight of Fortistar this was verified. This well was extended to a depth of 50' before work ceased for the day.



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DAILY SITE LOGS

Project Name: Phase IIC GCCS Expansion
Project Site: Tomoka Farms Road Landfill
Project Location: Volusia County, Florida

Date: 2/26/2010

Contractor: Shaw Environmental
CQA Firm: HDR Engineering, Inc.
CQA Associate: Lee Daigle

Temp: 65 °F Max
43 °F Min

Weather: Clear

Contractor Staff	Title	Equipment Used (Specific)
<u>Evan Lightner</u>	<u>Superintendent</u>	<u>320DL Excavator</u>
<u>David Lightner</u>	<u>Welder/Loader</u>	<u>725 Articulated Truck</u>
<u>Rob Herrick</u>	<u>Welder/Loader</u>	<u>714 Truck</u>
<u>Ashley Cable</u>	<u>Laborer</u>	<u>Front End Loader</u>
<u>Stacy Nutt</u>	<u>Driller</u>	<u>320DL Excavator</u>
<u>Wes Pickens</u>	<u>Drill Hand</u>	<u>Drill Rig</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

Work Performed and Notes:

- Contractor arrived on-site at 7:00 AM and began excavation of the lateral line for HC-7B. During installation of the wellhead it was requested that the riser be extended approximately 2' vertically to account for additional waste placement. Once the lateral lines was complete the header line tie in points were exvacated. During connection of the monitoring stations significant quantities of stormwater extended into the trench. The installation of the monitoring station required significant pumping of the stormwater. Electrofusion couplings were used for the monitoring station connection points in an attempt to increase the grade on the monitoring station piping.
- Drillers continued to drill EW-15R commencing at 25' below grade. Overnight the drillers did not lose any depth within the borehole. During exvaction no waste was found through a depth of ~35' below grade. Excavation through this depth was found to be comprised of Enviro. The well was drilled to the final depth of 96' and properly set before the drillers left the site.



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DAILY SITE LOGS**Project Name:** Phase IIC GCCS Expansion**Date:** 2/27/2010**Project Site:** Tomoka Farms Road Landfill**Project Location:** Volusia County, Florida**Contractor:** Shaw Environmental**CQA Firm:** HDR Engineering, Inc.**CQA Associate:** Lee Daigle**Temp:** 65 °F Max44 °F Min**Weather:** Clear**Contractor Staff****Title****Equipment Used (Specific)**

<u>Evan Lightner</u>	<u>Superintendent</u>
<u>David Lightner</u>	<u>Welder/Loader</u>
<u>Rob Herrick</u>	<u>Welder/Loader</u>
<u>Ashley Cable</u>	<u>Laborer</u>
<u>Stacy Nutt</u>	<u>Driller</u>
<u>Wes Pickens</u>	<u>Drill Hand</u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>

<u>320DL Excavator</u>
<u>725 Articulated Truck</u>
<u>714 Truck</u>
<u>Front End Loader</u>
<u>320DL Excavator</u>
<u>Drill Rig</u>
<u> </u>
<u> </u>

Work Performed and Notes:

- Contractor's arrived on-site at 8:00 AM and began working on the installation of the lateral lines for EW-16R and EW-17R. After this installation was complete the pipe crew left the site at 11:30 AM because of rain.
-
- The drillers commenced the drilling of EW-12R. During this excavation additional temperature measurements were taken in an effort to reduce the potential for subsurface combustion. At approximately 44' below grade the waste was found to be in excess of 166 degrees. At this point the driller could not continue to drill the well due to elevated temperatures. This well was completed at 41' below grade, an additional 3' of soil was placed at the bottom of the borehole.
-



ONE COMPANY | Many Solutions™

DAILY SITE LOGSProject Name: Phase IIC GCCS ExpansionDate: 3/1/2010Project Site: Tomoka Farms Road LandfillProject Location: Volusia County, FloridaContractor: Shaw EnvironmentalCQA Firm: HDR Engineering, Inc.CQA Associate: Lee DaigleTemp: 71 °F Max52 °F MinWeather: Clear**Contractor Staff****Title****Equipment Used (Specific)**

<u>Evan Lightner</u>	<u>Superintendent</u>
<u>David Lightner</u>	<u>Welder/Loader</u>
<u>Rob Herrick</u>	<u>Welder/Loader</u>
<u>Ashley Cable</u>	<u>Laborer</u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>
<u> </u>	<u> </u>

<u>320DL Excavator</u>
<u>725 Articulated Truck</u>
<u>714 Truck</u>
<u>Front End Loader</u>
<u>320DL Excavator</u>
<u> </u>
<u> </u>
<u> </u>

Work Performed and Notes:

- Pipe crew arrived on site at 7:00 AM and continued the replacement of the lateral lines for the redrilled well. All wells were relatively easy to correct with the exception of EW-12R. During excavation of the previously utilized well it was found that the area smelled heavily of burning plastic. Once the borehole/well was properly sealed the area was backfilled. During the repair to the lateral line it was found that the existing lateral extended too deeply into the waste mass to be properly utilized again. After an attempt to locate the lateral at the base of the newly installed haul road was unsuccessful it was determined that the lateral line for EW-12R would be run from EW-6. Although this required an additional length of lateral the installation to the existing system was easier and could be completed faster.
- During the installation of the lateral line for EW-12R it was found that the existing riser for EW-5 was being buried beside the new access road. It was requested and competed that the well casing be raised using the materials from the abandoned EW-12.
- Survey crew was on-site at approximately 9:00 AM to perform additional surveying on the horizontal well retrofit areas. The surveyors were required to survey using a theodolite as the GPS system could not obtain a sufficient signal for transmission. These results will be transmitted to HDR once completed in the Sliger office.

Appendix B

Drill Logs

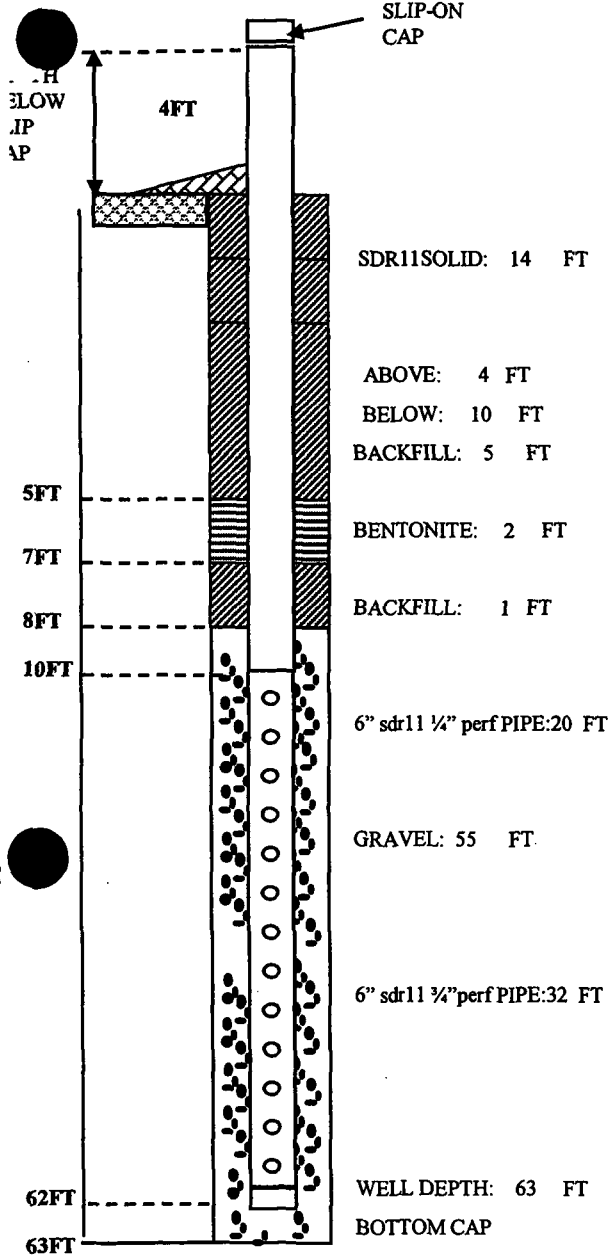
DRILLING & COMPLETION LOG

Project Name: Tomoka Farms landfill

Project No.: 132001

Date: 2-26-10

Well No. EW 10R



DRILL	63	WEATHER	
COMP.	63	START	
ABAN.		STOP	
SOLID	14	GRAVEL	55
PERF.	52		

DEPTH Temp	COMPOSITION	DEGREE OF DECOMPOSITION	AMOUNT OF MOISTURE
0-2	COVER		
2-10	MSW	LOW	LOW
10-20	MSW	LOW	LOW
20-30	MSW	LOW	LOW
30-40	MSW	LOW	LOW
40-50	MSW	MED	MED
50-60	MSW	HIGH	HIGH
60-63	MSW	HIGH	HIGH
70-80			
80-90			
90-100			
100-110			
110-120			
120-130			

TD: 63

COMMENTS:

NORTHING:

EASTING:

ELEVATION

CLIENT REPRESENTATIVE

DATE

EMCON/OWT SITE SUPERVISOR

DATE

NAME & TITLE

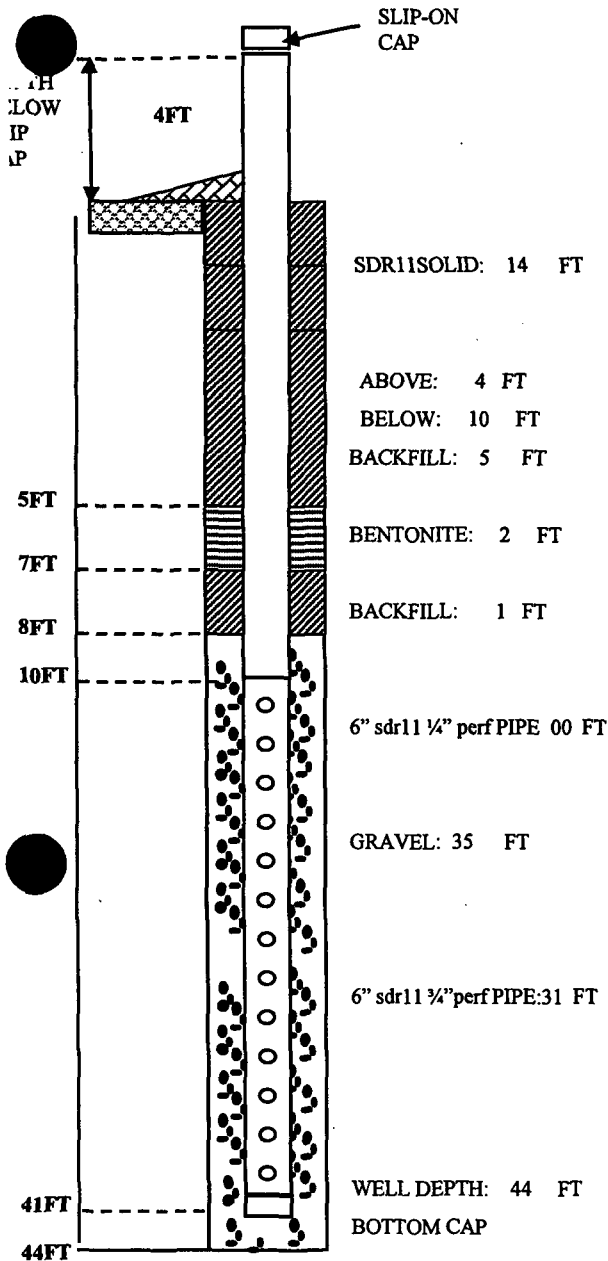
DRILLING & COMPLETION LOG

Project Name: Tomoka Farms landfill

Project No.: 132001

Date: 2-27-10

Well No. EW 12R



DRILL	44	WEATHER	
COMP.	41	START	
ABAN.		STOP	
SOLID	14	GRAVEL	34
PERF.	31		

DEPTH Temp	COMPOSITION	DEGREE OF DECOMPOSITION	AMOUNT OF MOISTURE
0-2	COVER		
2-10	MSW, 101	LOW	LOW
10-20	MSW, 127	LOW	LOW
20-30	MSW, 140	LOW	LOW
30-44	MSW, 147	LOW	LOW
40-50			
50-60			
60-70			
70-80			
80-90			
90-100			
100-110			
110-120			
120-130			

TD:44

BORING DIA:

COMMENTS:

NORTHING:

EASTING:

ELEVATION

DRILLED 44' OF 96'. STOPPED DUE EXCESSIVE HEAT IN BORING. SET WELL AT 41'.

CLIENT REPRESENTATIVE
NAME & TITLE

DATE

EMCON/OWT SITE SUPERVISOR

DATE

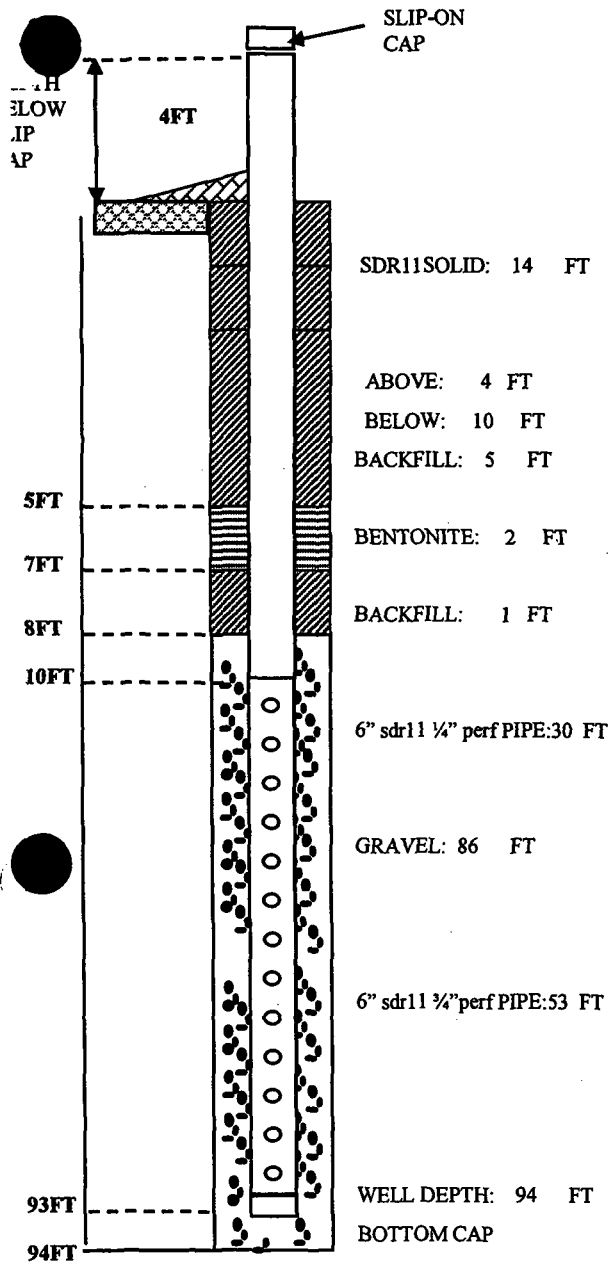
DRILLING & COMPLETION LOG

Project Name: Tomoka Farms landfill

Project No.: 132001

Date: 2-24-10

Well No. EW 13R



DRILL	94	WEATHER	
COMP.	94	START	
ABAN.		STOP	
SOLID	14	GRAVEL	86
PERF.	83		

DEPTH Temp	COMPOSITION	DEGREE OF DECOMPOSITION	AMOUNT OF MOISTURE
0-2	COVER		
2-10	MSW, 107	LOW	LOW
10-20	MSW, 119	LOW	LOW
20-30	MSW, 131	LOW	LOW
30-40	MSW, 136	LOW	LOW
40-50	MSW, 136	MED	MED
50-60	MSW, 138	HIGH	HIGH
60-70	MSW, 139	HIGH	HIGH
70-80	MSW, 142	HIGH	HIGH
80-94	MSW, 140	HIGH	HIGH
90-100			
100-110			
110-120			
120-130			

TD:94

COMMENTS:

NORTHING:

EASTING:

ELEVATION

CLIENT REPRESENTATIVE

DATE

EMCON/OWT SITE SUPERVISOR

DATE

NAME & TITLE

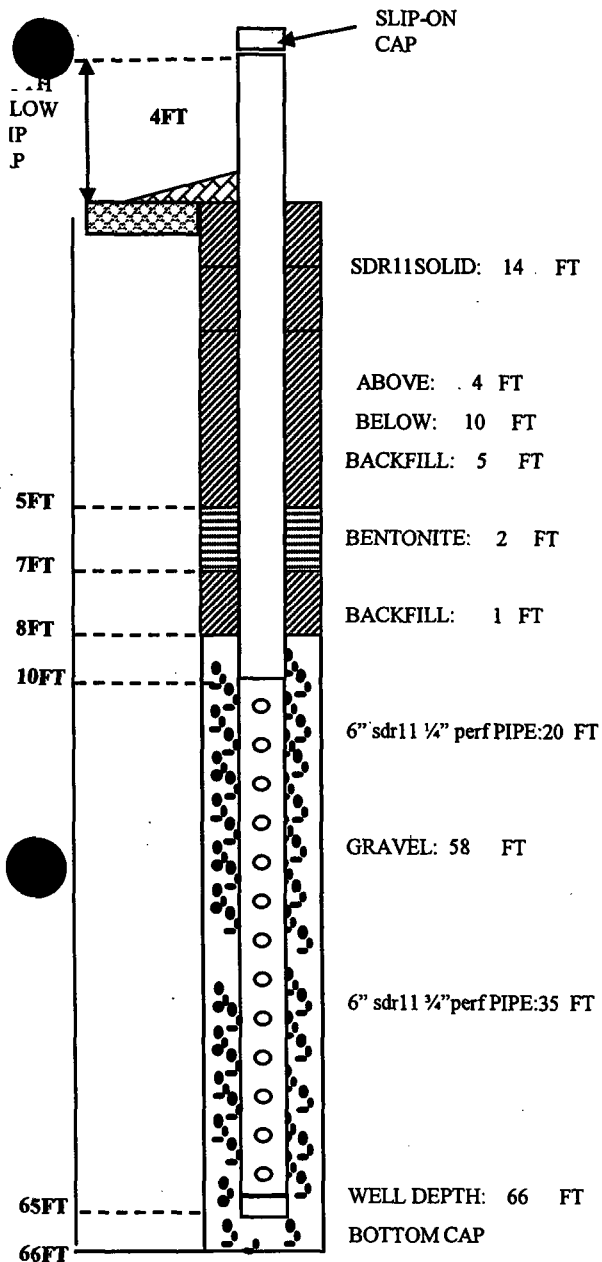
DRILLING & COMPLETION LOG

Project Name: Tomoka Farms landfill

Project No.: 132001

Date: 2-25-10

Well No. EW 14R



DRILL	66	WEATHER	
COMP.	66	START	
ABAN.		STOP	
SOLID	14	GRAVEL	58
PERF.	55		

DEPTH Temp	COMPOSITION	DEGREE OF DECOMPOSITION	AMOUNT OF MOISTURE
0-2	COVER		
2-10	MSW	LOW	LOW
10-20	MSW	LOW	LOW
20-30	MSW	LOW	LOW
30-40	MSW	LOW	LOW
40-50	MSW	MED	MED
50-60	MSW	HIGH	HIGH
60-66	MSW	HIGH	HIGH
70-80			
80-90			
90-100			
100-110			
110-120			
120-130			

TD:66

COMMENTS:

NORTHING:

EASTING:

ELEVATION

CLIENT REPRESENTATIVE
NAME & TITLE

DATE

EMCON/OWT SITE SUPERVISOR

DATE

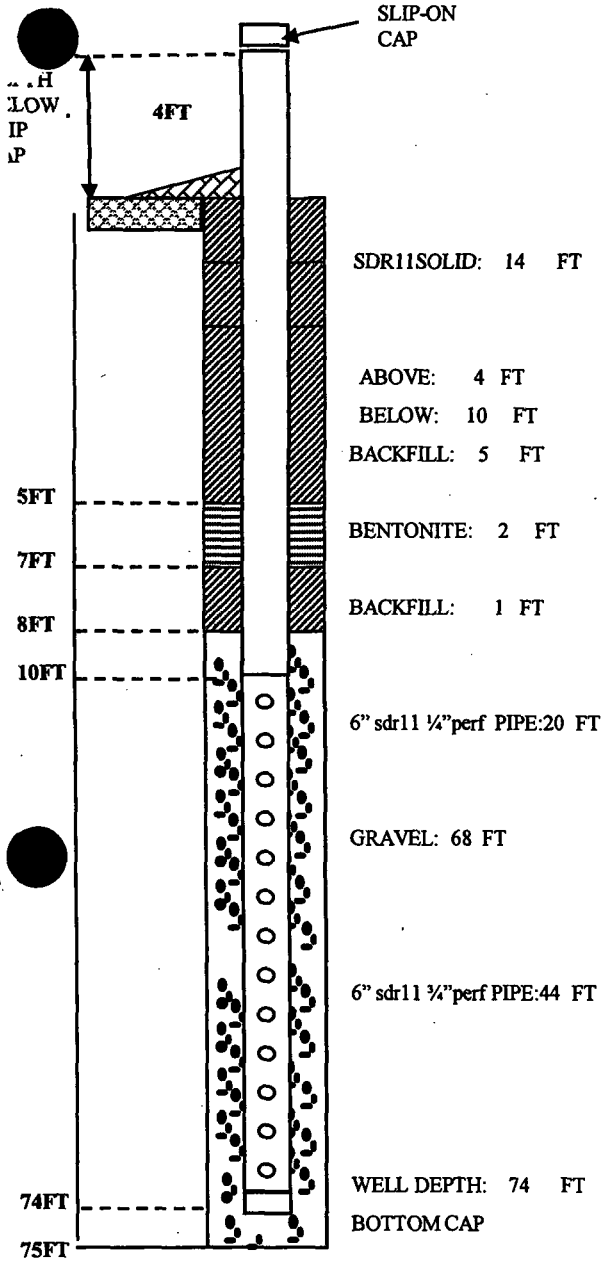
DRILLING & COMPLETION LOG

Project Name: Tomoka Farms landfill

Project No.: 132001

Date: 2-25-10

Well No. EW 15R



DRILL	75	WEATHER	
COMP.	75	START	
ABAN.		STOP	
SOLID	14	GRAVEL	66
PERF.	64		

DEPTH Temp	COMPOSITION	DEGREE OF DECOMPOSITION	AMOUNT OF MOISTURE
0-2	COVER		
2-10	MSW	LOW	LOW
10-20	MSW	LOW	LOW
20-30	MSW	LOW	LOW
30-40	MSW	LOW	LOW
40-50	MSW	MED	MED
50-60	MSW	HIGH	HIGH
60-75	MSW	HIGH	HIGH
70-80			
80-90			
90-100			
100-110			
110-120			
120-130			

TD: 75

BORING DIA:

COMMENTS:

NORTHING:

EASTING:

ELEVATION

CLIENT REPRESENTATIVE
NAME & TITLE

DATE

EMCON/OWT SITE SUPERVISOR

DATE

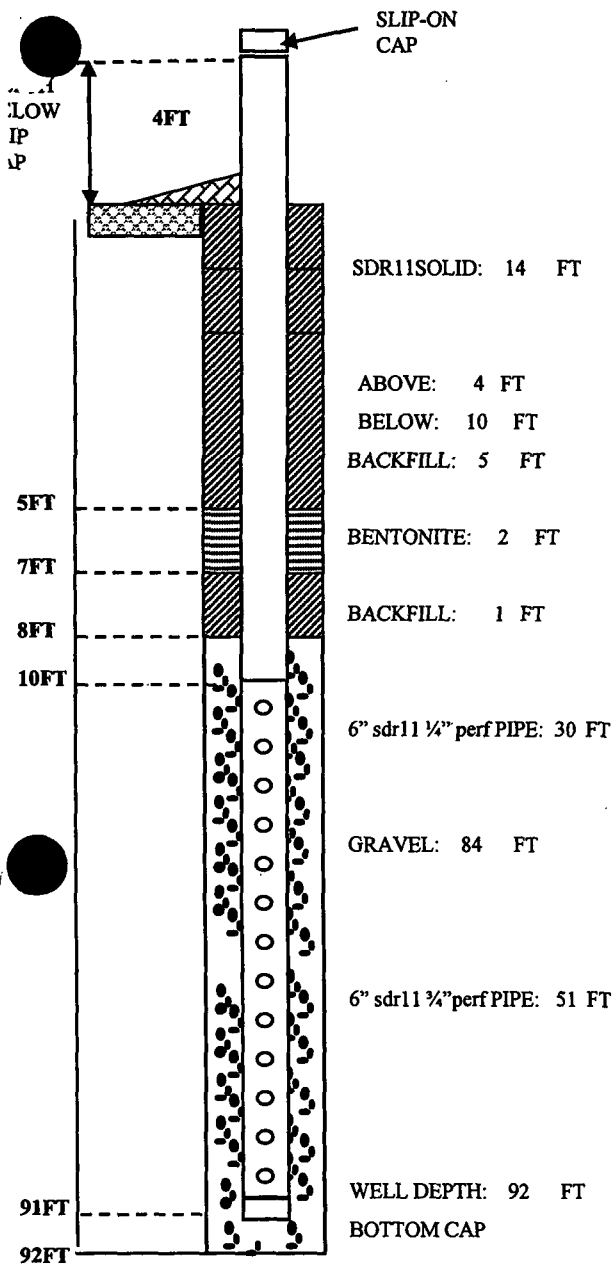
DRILLING & COMPLETION LOG

Project Name: Tomoka Farms landfill

Project No.: 132001

Date: 2-23-10

Well No. EW 16R



DRILL	92	WEATHER	
COMP.	92	START	
ABAN.		STOP	
SOLID	14	GRAVEL	84
PERF.	81		

DEPTH Temp	COMPOSITION	DEGREE OF DECOMPOSITION	AMOUNT OF MOISTURE
0-2	COVER		
2-10	MSW, 6" LAT	LOW	LOW
10-20	MSW, 98	LOW	LOW
20-30	MSW, 101	LOW	LOW
30-40	MSW, 103	LOW	LOW
40-50	MSW, 108	MED	MED
50-60	MSW, 121	HIGH	HIGH
60-70	MSW, 127	HIGH	HIGH
70-80	MSW, 136	HIGH	HIGH
80-90	MSW, 132	HIGH	HIGH
90-100			
100-110			
110-120			
120-130			

TD: 92

BORING DIA:

COMMENTS:

NORTHING:

EASTING:

ELEVATION

CLIENT REPRESENTATIVE
NAME & TITLE

DATE

EMCON/OWT SITE SUPERVISOR

DATE

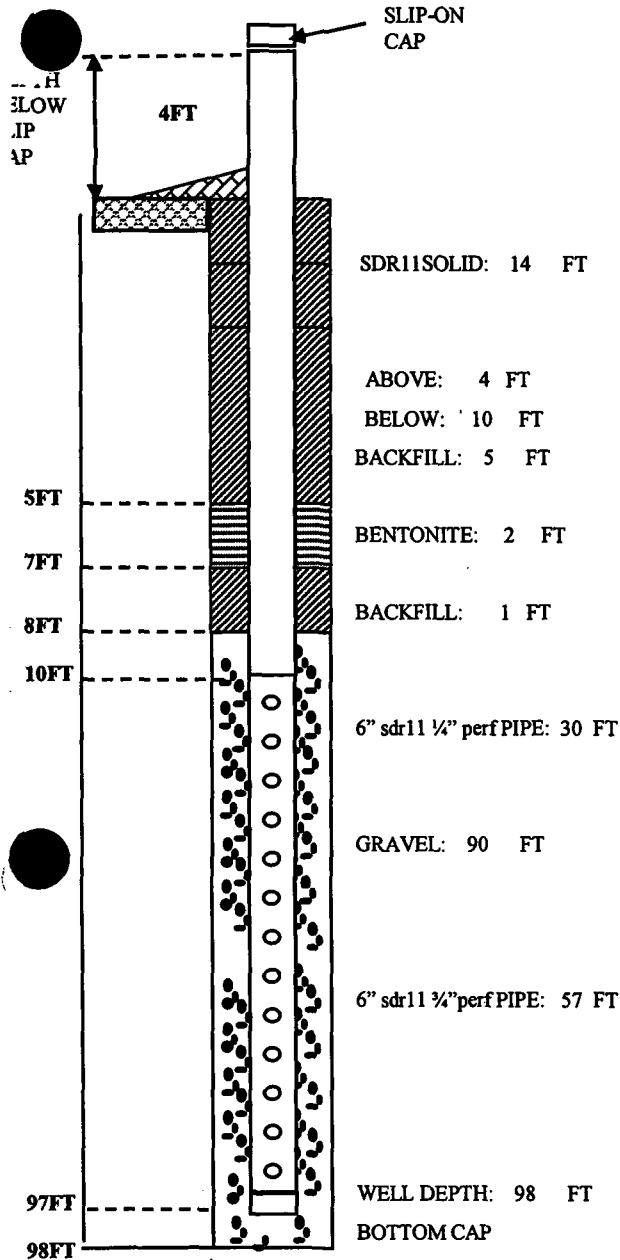
DRILLING & COMPLETION LOG

Project Name: Tomoka Farms landfill

Project No.: 132001

Date: 2-23-24-10

Well No. EW 17R



DRILL	98	WEATHER	
COMP.	98	START	
ABAN.		STOP	
SOLID	14	GRAVEL	90
PERF.	87		

DEPTH Temp	COMPOSITION	DEGREE OF DECOMPOSITION	AMOUNT OF MOISTURE
0-2	COVER		
2-10	MSW, 91	LOW	LOW
10-20	MSW, 99	LOW	LOW
20-30	MSW, 107	LOW	LOW
30-40	MSW, 118	LOW	LOW
40-50	MSW, 121	MED	MED
50-60	MSW, 121	HIGH	HIGH
60-70	MSW, 127	HIGH	HIGH
70-80	MSW, 126	HIGH	HIGH
80-98	MSW, 130	HIGH	HIGH
90-100			
100-110			
110-120			
120-130			

TD:98

COMMENTS:

NORTHING:

EASTING:

ELEVATION

CLIENT REPRESENTATIVE
NAME & TITLE

DATE

EMCON/OWT SITE SUPERVISOR

DATE

Appendix C

Construction Photographs

Project Name:	Volusia County Landfill Evaluation	Date:	2/22/10 – 3/2/10	Day:	
Project Owner:	Volusia County	Contractor:	Shaw E&I		
HDR Project No.		Subject:	Phase IIC Construction		



Monitoring Station Air Test



Monitoring Station Interconnection Area



E. Monitoring Station



Horizontal Well Laterals



Vertical Well Drilling



Vertical Well Installation



W. Monitoring Station Trenches



Lateral Connection to Horizontal Well



W. Monitoring Station Interconnection

Appendix D

Air Pressure Test Results

PIPE PRESSURE TEST REPORT FOR GAS PIPE

Project Name & NO: Tomoka Farms Land Fill 134665

Person Performing Test Rob Herrick Date 2/22/10

Description & Location of Pipe Tested 6" West Horizontal Extensions + manifold system.

Diameter & S.D.R. and Length of Pipes Being Tested All pipe is 6" SDR 17 And All Fittings Are SDR 11 / Total Length of 6" Pipe is 1,100'

Temperature if Required 65° at 10.0 P.S.I.

Time on 12:00 P.M. Time off 1:00 P.M.

Comments Passed Fine

Air Test Passed Signature: [Signature] / C. Herrick

PIPE PRESSURE TEST REPORT FOR GAS PIPE

Project Name & NO: Tomoka Farms Landfill # 134665

Person Performing Test Rob Herrick Date 2/25/10

Description & Location of Pipe Tested 6" East Horizontal Extensions +
manifold system.

Diameter & S.D.R. and Length of Pipes Being Tested All pipe is 6"
SDR 17 And All Fittings Are SDR 11 / Total Length of 6" pipe is 680'

Temperature if Required 46° At 100 P.S.F.

Time on 11:00 A.M. Time off 12:00 P.M.

Comments Passed Fine

Air Test Passed Signature: [Signature] / C. Lee

PIPE PRESSURE TEST REPORT FOR GAS PIPE

Project Name & NO: Tomoka Farms Landfill 134665

Person Performing Test Ashley Cable Date 3/1/10

Description & Location of Pipe Tested 6" Lateral From EW-6 to EW-12R.

Diameter & S.D.R. and Length of Pipes Being Tested The pipe is 6"
SDR 17 And All fittings are SDR 11. 250 Total length.

Temperature if Required 64° At 10.0 P.S.I.

Time on 3:30 P.m. Time off 4:30 P.m.

Comments Passed Fine

Air Test Passed Signature: *[Signature]* / *[Signature]*

PIPE PRESSURE TEST REPORT FOR GAS PIPE

Project Name & NO: Tomoka Farms Land Fill 134665

Person Performing Test Ashley Cable Date 3/1/10

Description & Location of Pipe Tested 2" Air Line From EW-6 to
EW-12R

Diameter & S.D.R. and Length of Pipes Being Tested All pipe And
Fittings Are SDR 9. 250' Total length

Temperature if Required 64° At 100 P.S.I

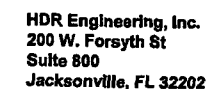
Time on 3:30 P.M. Time off 4:30 P.M.

Comments Passed Fine

Air Test Passed Signature: [Signature] / C. L. [Signature]

Appendix E

Record Drawings



A	04/10	SUBMITTED TO COUNTY
ISSUE	DATE	DESCRIPTION
PROJECT NUMBER	124386	
PROJECT MANAGER	C. KOENIG	
ENGINEERING STAFF	C. DAIGLE	
DRAWN BY	D. SOSA	
REVIEWED BY	C. LEBRON, P.E.	

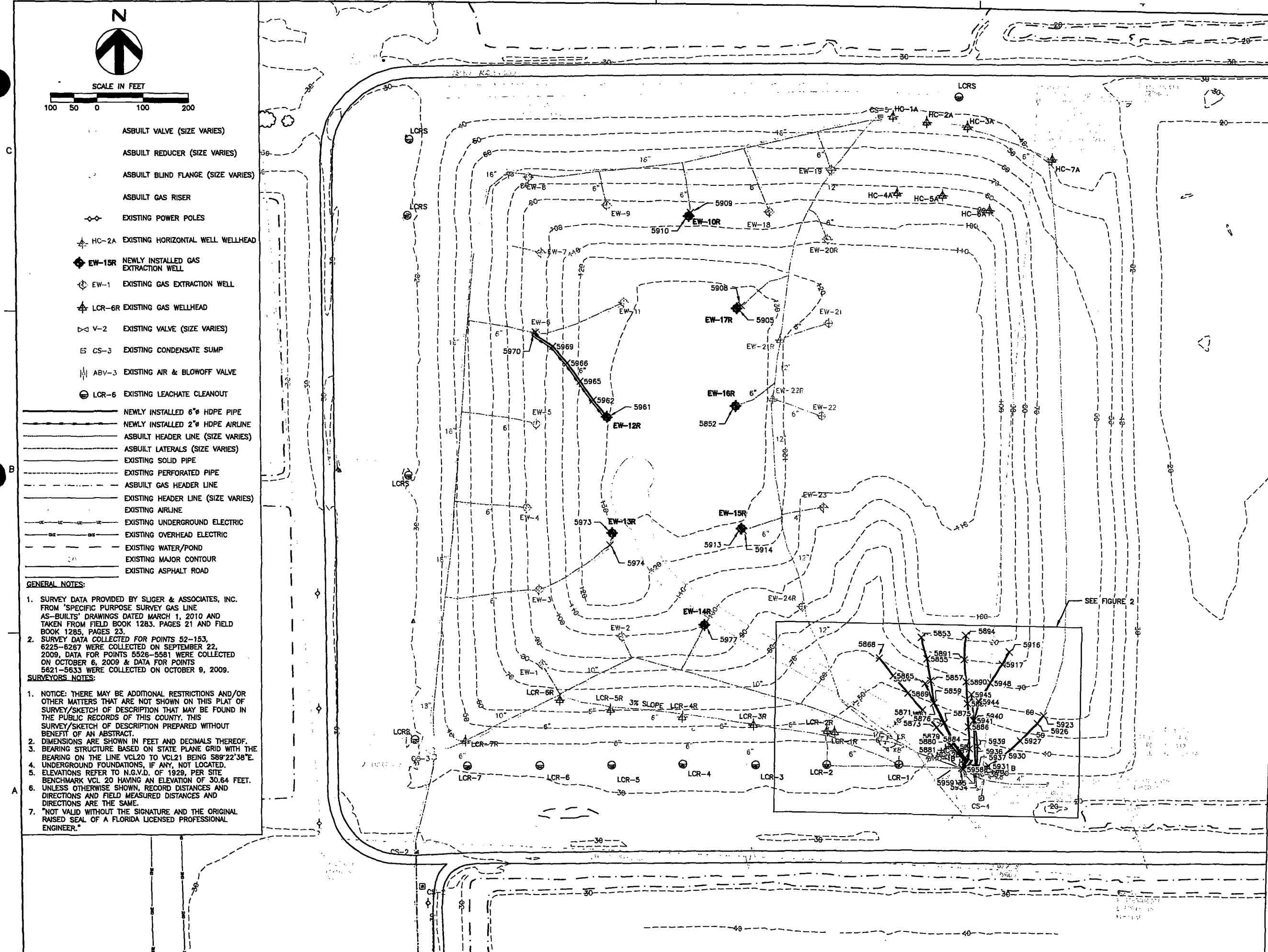
5/7/10

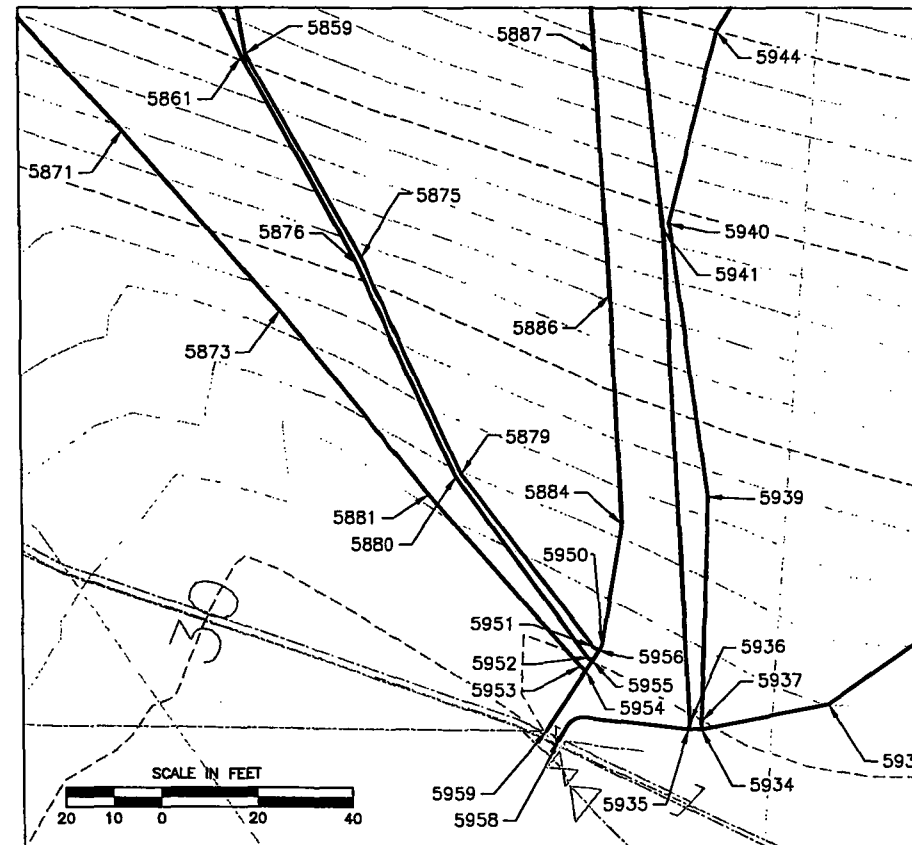
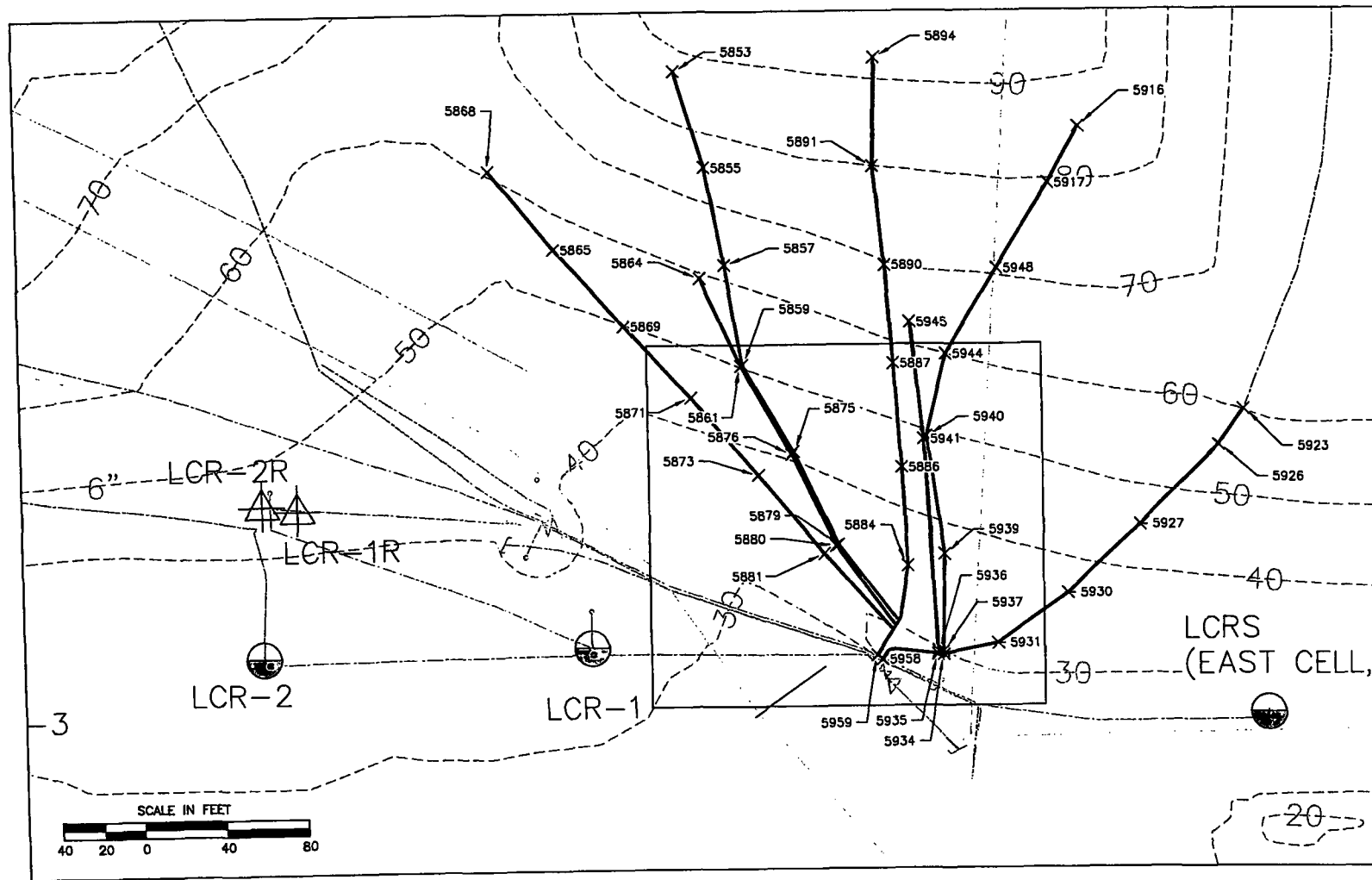
PHASE IIC IMPROVEMENT
ASBUILT SURVEY
TOMOKA FARMS ROAD LANDFILL
VOLUSIA COUNTY, FLORIDA

SCALE 1"=100' (FULL SIZE)

FIGURE 1

FILENAME|FIGURE 1.dwg





- LEGEND**
- ASBUILT VALVE (SIZE VARIES)
 - ASBUILT REDUCER (SIZE VARIES)
 - ASBUILT BLIND FLANGE (SIZE VARIES)
 - ASBUILT GAS RISER
 - EXISTING POWER POLES
 - HC-2A EXISTING HORIZONTAL WELL WELLHEAD
 - EW-15R NEWLY INSTALLED GAS EXTRACTION WELL
 - EW-1 EXISTING GAS EXTRACTION WELL
 - LCR-6R EXISTING GAS WELLHEAD
 - V-2 EXISTING VALVE (SIZE VARIES)
 - CS-3 EXISTING CONDENSATE SUMP
 - ABV-3 EXISTING AIR & BLOWOFF VALVE
 - LCR-6 EXISTING LEACHATE CLEANOUT

- NEWLY INSTALLED 6" HDPE PIPE
- ASBUILT HEADER LINE (SIZE VARIES)
- ASBUILT LATERALS (SIZE VARIES)
- EXISTING SOLID PIPE
- EXISTING PERFORATED PIPE
- ASBUILT GAS HEADER LINE
- EXISTING HEADER LINE (SIZE VARIES)
- EXISTING AIRLINE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING WATER/POND
- EXISTING MAJOR CONTOUR
- EXISTING ASPHALT ROAD

SURVEYORS' NOTES:

- NOTICE: THERE MAY BE ADDITIONAL RESTRICTIONS AND/OR OTHER MATTERS THAT ARE NOT SHOWN ON THIS PLAT OF SURVEY/SKETCH OF DESCRIPTION THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY. THIS SURVEY/SKETCH OF DESCRIPTION PREPARED WITHOUT BENEFIT OF AN ABSTRACT.
- DIMENSIONS ARE SHOWN IN FEET AND DECIMALS THEREOF.
- BEARING STRUCTURE BASED ON STATE PLANE GRID WITH THE BEARING ON THE LINE VCL20 TO VCL21 BEING S89°22'38"E.
- UNDERGROUND FOUNDATIONS, IF ANY, NOT LOCATED.
- UNDERGROUND REFER TO N.G.V.D. OF 1929, PER SITE ELEVATIONS REFER TO HAVING AN ELEVATION OF 30.64 FEET.
- UNLESS OTHERWISE SHOWN, RECORD DISTANCES AND DIRECTIONS AND FIELD MEASURED DISTANCES AND DIRECTIONS ARE THE SAME.
- "NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED PROFESSIONAL ENGINEER."

GENERAL NOTES:

- SURVEY DATA PROVIDED BY SLIGER & ASSOCIATES, INC. FROM "SPECIFIC PURPOSE SURVEY GAS LINE AS-BUILTS" DRAWINGS DATED MARCH 1, 2010 AND TAKEN FROM FIELD BOOK 1283, PAGES 21 AND FIELD BOOK 1285, PAGES 23.
- SURVEY DATA COLLECTED FOR POINTS 52-153, 6225-6267 WERE COLLECTED ON SEPTEMBER 22, 2009, DATA FOR POINTS 5526-5581 WERE COLLECTED ON OCTOBER 6, 2009 & DATA FOR POINTS 5621-5633 WERE COLLECTED ON OCTOBER 9, 2009.

NOTE:

- POINT# 5953 & 5950 WERE SURVEYED AT THE TOP OF THE VALVE PIT AND BOTTOM OF THE VALVE PIT RESPECTIVELY.

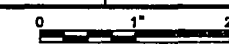
POINT #	NORTHING	EASTING	TOP OF PIPE ELEVATION	DESCRIPTION	GROUND ELEVATION	LENGTH OF PIPE	SLOPE POINT TO POINT
LINE 1-B							
5888	1745844.20	624447.87	67.30	6" HDPE SLEEVE	65.3	5888 TO 5885 43.65	(-3.8%)
5885	1745805.84	624478.34	55.89	6" HDPE	58.8	5885 TO 5889 50.48	(-3.8%)
5889	1745768.17	624512.94	50.81	6" HDPE	53.8	5889 TO 5871 47.80	(-3.8%)
5871	1745738.01	624545.32	48.95	6" HDPE	51.0	5871 TO 5873 45.53	(-10.1%)
5873	1745695.41	624577.68	41.84	6" HDPE	45.0	5873 TO 5881 48.71	(-15.9%)
5881	1745657.03	624609.18	34.08	6" HDPE	40.1	5881 TO 5884 48.17	8.5%
5884	1745621.14	624641.28	35.25	6" VALVE	36.3	5884 TO 5904 1.30	(-32.6%)
5904	1745587.03	624609.18	34.08	6" HDPE TEE	36.3	-	-
LINE 2-B							
5884	1745780.97	624550.38	54.15	6" HDPE SLEEVE	59.4	5884 TO 5881 47.08	(-14.5%)
5881	1745748.25	624570.04	52.03	6" HDPE	62.9	5881 TO 5876 45.18	(-12.9%)
5876	1745705.25	624593.78	45.72	6" HDPE	49.7	5876 TO 5880 48.20	(-20.8%)
5880	1745680.82	624614.93	35.43	6" HDPE	41.4	5880 TO 5882 43.97	(-20.1%)
5882	1745622.98	624642.72	35.40	6" VALVE	36.3	5882 TO 5885 1.27	(-32.0%)
5885	1745622.37	624643.85	35.12	6" HDPE TEE	36.3	-	-
LINE 3-B							
5945	1745789.15	624652.34	52.98	6" HDPE SLEEVE	59.7	5945 TO 5941 87.05	(-13.4%)
5941	1745712.44	624658.33	50.98	6" HDPE	58.8	5941 TO 5939 103.31	(-11.5%)
5939	1745609.29	624684.08	34.69	6" VALVE	36.3	5939 TO 5935 1.18	(-37.8%)
5935	1745608.13	624683.80	33.71	6" HDPE TEE	33.9	-	-
LINE 4-B							
5883	1745891.23	624539.39	83.67	6" HDPE SLEEVE	84.8	5883 TO 5885 48.60	(-10.7%)
5885	1745844.80	624553.39	70.69	6" HDPE	73.1	5885 TO 5887 48.31	(-22.5%)
5887	1745797.34	624569.40	59.47	6" HDPE	61.8	5887 TO 5889 48.28	(-18.8%)
5889	1745748.78	624570.70	52.08	6" HDPE	63.0	5889 TO 5876 45.61	(-12.7%)
5876	1745706.68	624594.64	45.90	6" HDPE	49.7	5876 TO 5879 60.04	(-30.9%)
5879	1745681.37	624618.08	35.44	6" HDPE	41.4	5879 TO 5881 48.51	0.3%
5881	1745657.03	624641.28	35.44	6" VALVE	36.3	5881 TO 5884 1.40	(-12.9%)
5884	1745624.62	624645.15	35.39	6" HDPE TEE	36.3	-	-
LINE 6-B							
5894	1745897.83	624636.60	86.43	6" HDPE SLEEVE	89.8	5894 TO 5891 82.48	(-30.4%)
5891	1745844.89	624635.13	75.74	6" HDPE	78.2	5891 TO 5890 48.28	(-23.6%)
5890	1745798.01	624640.22	64.87	6" HDPE	66.5	5890 TO 5887 48.08	(-15.6%)
5887	1745748.14	624644.05	58.98	6" HDPE	67.9	5887 TO 5888 50.54	(-13.3%)
5888	1745698.71	624647.34	50.55	6" HDPE	54.0	5888 TO 5884 47.80	(-20.1%)
5884	1745650.98	624649.91	38.82	6" HDPE	43.1	5884 TO 5885 23.70	(-4.1%)
5885	1745625.62	624645.77	35.78	6" VALVE	43.1	5885 TO 5886 1.17	(-33.3%)
5886	1745600.98	624649.91	36.82	6" HDPE TEE	43.1	-	-
LINE 8-B							
5916	1745863.39	624735.56	82.77	6" HDPE SLEEVE	86.7	5916 TO 5917 30.59	(-12.5%)
5917	1745836.28	624720.58	78.95	6" HDPE	80.7	5917 TO 5948 48.55	(-21.3%)
5948	1745785.08	624694.85	68.82	6" HDPE	69.8	5948 TO 5944 48.52	(-23.6%)
5944	1745753.62	624689.68	57.18	6" HDPE	62.5	5944 TO 5940 41.18	(-16.9%)
5940	1745713.73	624659.82	50.82	6" HDPE	56.8	5940 TO 5939 67.78	(-12.4%)
5939	1745656.68	624687.93	43.48	6" HDPE	45.8	5939 TO 5937 48.30	(-18.7%)
5937	1745609.29	624688.60	34.71	6" VALVE	36.3	5937 TO 5934 1.60	(-33.6%)
5934	1745608.00	624686.64	33.81	6" HDPE TEE	33.9	-	-
LINE 7-B							
5923	1745725.78	624814.08	64.39	GAS WELL 7B	68.8	5923 TO 5928 21.15	(-21.9%)
5928	1745709.81	624801.73	59.76	6" HDPE	62.6	5928 TO 5927 49.20	(-20.9%)
5927	1745670.14	624763.09	48.67	6" HDPE	62.2	5927 TO 5930 47.86	(-17.4%)
5930	1745637.28	624728.16	40.35	6" HDPE	48.9	5930 TO 5931 48.12	(-12.0%)
5931	1745613.25	624693.67	35.28	6" HDPE	36.8	5931 TO 5934 27.44	(-15.4%)
5934	1745608.00	624686.64	33.81	6" HDPE TEE	33.9	-	-

HDR

HDR Engineering, Inc.
200 W. Forsyth St
Suite 800
Jacksonville, FL 32202



A	04/10	SUBMITTED TO COUNTY
ISSUE	DATE	DESCRIPTION
PROJECT NUMBER 124386		
PROJECT MANAGER C. KOENIG		
ENGINEERING STAFF C. DAIGLE		
DRAWN BY D. SOSA		
REVIEWED BY C. LEBRON, P.E.		



**PHASE IIC IMPROVEMENT
ASBUILT SURVEY
TOMOKA FARMS ROAD LANDFILL
VOLUSIA COUNTY, FLORIDA**

SCALE AS SHOWN

FIGURE 2

FILENAME: FIGURE 2.dwg



SCALE IN FEET
100 50 0 100 200

- ASBUILT VALVE (SIZE VARIES)
- ASBUILT REDUCER (SIZE VARIES)
- ASBUILT BLIND FLANGE (SIZE VARIES)
- ASBUILT GAS RISER
- EXISTING POWER POLES
- HC-2A EXISTING HORIZONTAL WELL WELLHEAD
- EW-1 EXISTING GAS EXTRACTION WELL
- LCR-6R EXISTING GAS WELLHEAD
- V-2 EXISTING VALVE (SIZE VARIES)
- CS-3 EXISTING CONDENSATE SUMP
- ABV-3 EXISTING AIR & BLOWOFF VALVE
- LCR-6 EXISTING LEACHATE CLEANOUT

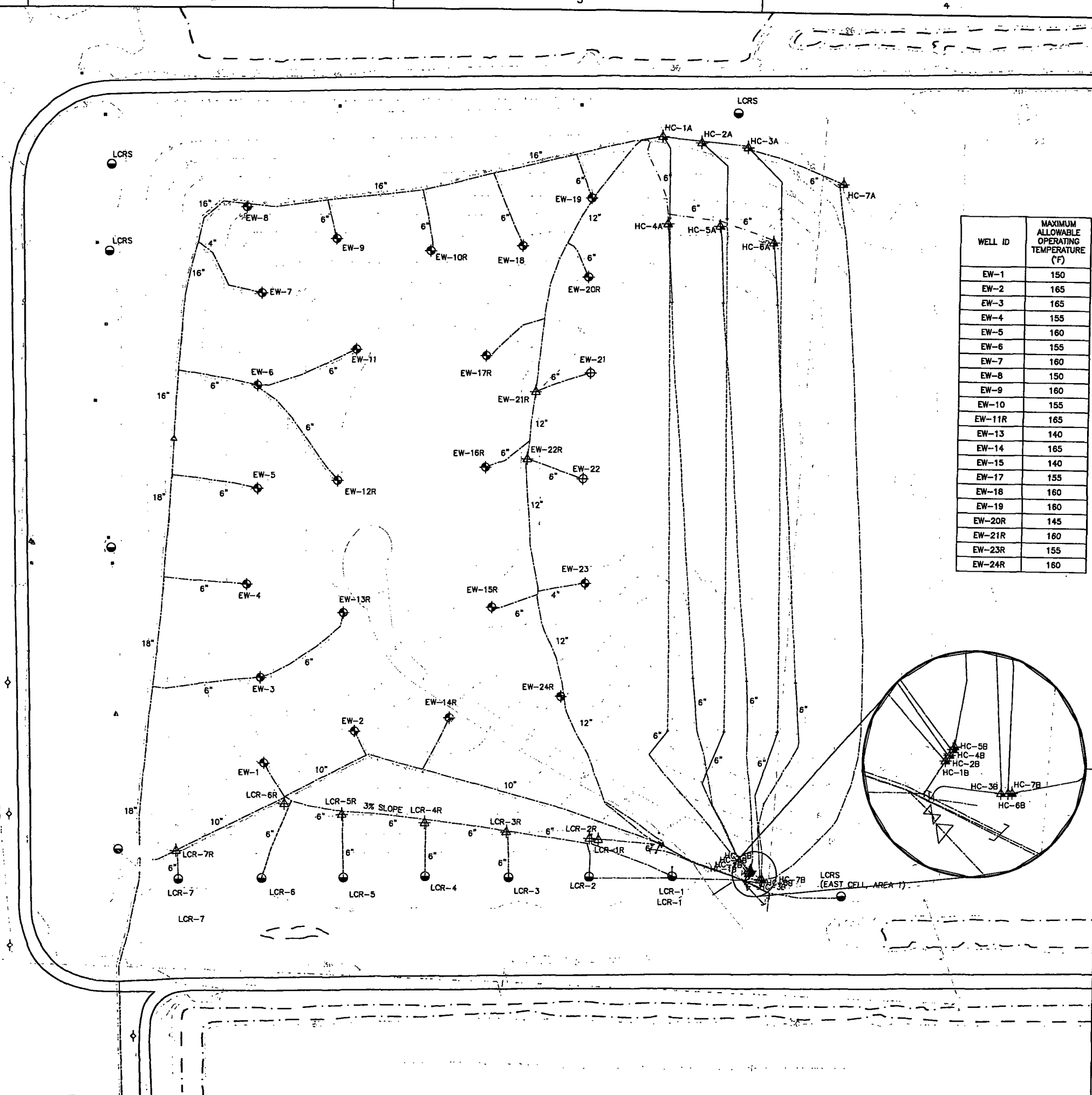
- ASBUILT HEADER LINE (SIZE VARIES)
- ASBUILT LATERALS (SIZE VARIES)
- EXISTING SOLID PIPE
- EXISTING PERFORATED PIPE
- ASBUILT GAS HEADER LINE
- EXISTING HEADER LINE (SIZE VARIES)
- EXISTING AIRLINE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- EXISTING WATER/POND
- EXISTING MAJOR CONTOUR
- EXISTING ASPHALT ROAD

GENERAL NOTES:

1. SURVEY DATA PROVIDED BY SLIGER & ASSOCIATES, INC. FROM 'SPECIFIC PURPOSE SURVEY GAS LINE AS-BUILTS' DRAWINGS DATED MARCH 1, 2010 AND TAKEN FROM FIELD BOOK 1283. PAGES 21 AND FIELD BOOK 1285, PAGES 23.
2. SURVEY DATA COLLECTED FOR POINTS 52-153, 6225-6267 WERE COLLECTED ON SEPTEMBER 22, 2009. DATA FOR POINTS 5526-5581 WERE COLLECTED ON OCTOBER 6, 2009 & DATA FOR POINTS 5621-5633 WERE COLLECTED ON OCTOBER 9, 2009.

SURVEYORS NOTES:

1. NOTICE: THERE MAY BE ADDITIONAL RESTRICTIONS AND/OR OTHER MATTERS THAT ARE NOT SHOWN ON THIS PLAT OF SURVEY/SKETCH OF DESCRIPTION THAT MAY BE FOUND IN THE PUBLIC RECORDS OF THIS COUNTY. THIS SURVEY/SKETCH OF DESCRIPTION PREPARED WITHOUT BENEFIT OF AN ABSTRACT.
2. DIMENSIONS ARE SHOWN IN FEET AND DECIMALS THEREOF.
3. BEARING STRUCTURE BASED ON STATE PLANE GRID WITH THE BEARING ON THE LINE VCL20 TO VCL21 BEING S89°22'38"E.
4. UNDERGROUND FOUNDATIONS, IF ANY, NOT LOCATED.
5. ELEVATIONS REFER TO N.G.V.D. OF 1929, PER SITE BENCHMARK VCL 20 HAVING AN ELEVATION OF 30.64 FEET.
6. UNLESS OTHERWISE SHOWN, RECORD DISTANCES AND DIRECTIONS AND FIELD MEASURED DISTANCES AND DIRECTIONS ARE THE SAME.
7. "NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED PROFESSIONAL ENGINEER."



WELL ID	MAXIMUM ALLOWABLE OPERATING TEMPERATURE (°F)
EW-1	150
EW-2	165
EW-3	165
EW-4	155
EW-5	160
EW-6	155
EW-7	160
EW-8	150
EW-9	160
EW-10	155
EW-11R	165
EW-13	140
EW-14	165
EW-15	140
EW-17	155
EW-18	160
EW-19	160
EW-20R	145
EW-21R	160
EW-23R	155
EW-24R	160



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REVIEWED BY C. LEBRON, P.E.		

0 1" 2"

Charles
5/7/10

PHASE IIC IMPROVEMENT ASBUILT SURVEY TOMOKA FARMS ROAD LANDFILL VOLUSIA COUNTY, FLORIDA

SCALE 1"=100' (FULL SIZE)

FIGURE 3

FILENAME FIGURE 3.dwg