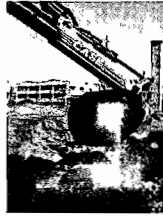


SCS ENGINEERS



RESPONSE TO RAI #1 GAS COLLECTION AND CONTROL SYSTEM CONSTRUCTION CERTIFICATION

SOUTHEAST COUNTY LANDFILL HILLSBOROUGH COUNTY, FLORIDA

Prepared for:
Hillsborough County
Solid Waste Management Division



P.O. Box 1110
Tampa, Florida 33601

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
AUG 20 2010
SOUTHWEST DISTRICT
TAMPA

Prepared by:

SCS ENGINEERS
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Florida Board of Professional Engineers
Certificate Number 00004892

August 20, 2010
File No. 09207055.00

Offices Nationwide
www.scsengineers.com



August 20, 2010
File No. 09207055.00

Mr. Steve Morgan
Florida Department of Environmental Protection
13051 North Telecom Parkway
Temple Terrace, Florida 33637

Dept. Of Environmental Protection
AUG 20 2010
Southwest District

Subject: Response to Request for Additional Information (RAI) No. 1
Gas Collection and Control System Construction Certification
Southeast County Landfill, Hillsborough County, Florida
Permit No. 35435-016-SC/08
WACS No. SWD/29/41193

Dear Mr. Morgan:

On behalf of Hillsborough County Solid Waste Management Division (County), SCS Engineers (SCS) submits the following responses to your request for additional information, RAI No. 1, in a letter directed to Mr. Barry Boldissar, dated July 14, 2010. For ease of review, your comments are restated in **bold print**, followed by our response in normal print.

CERTIFICATION OF CONSTRUCTION COMPLETION - DEP Form #62-701.900(2)

1. Please provide a revised signed and sealed DEP Form #62-701.900(2) to address the following comments.
 - a. **Deviations from Plans and Application Approved by DEP: As indicated by the comments provided below, deviations from the plans and application approved by the Department do not appear to be limited to changes in well depths, header and lateral pipe routes, and valves locations. Please verify and revise the Report of Construction to provide a narrative describing all changes in plans and the causes of the deviations from the plans and application approved by the Department, in accordance with Specific Condition #B.2.a. (3) of Permit No. 35435-016-SC/08 and revise this section to reference this narrative.**

Response: Attachment 1 of this response contains a revised signed and sealed DEP Form #62-701.900(2), which provides an updated narrative describing changes in the plans and briefly describes the reason for each change. Attachment 2 of this response contains a revised Report of Construction that now includes additional information regarding all of the items addressed in this RAI. NOTE: For ease of review, additions made to the Report of Construction are underlined (e.g., added) and any deletions have been struck through (e.g., ~~deleted~~).



Dept. Of Environmental Protection
AUG 20 2010
Southwest Region

REPORT OF CONSTRUCTION

2. **Summary of Construction:** Please revise this section to include the construction of the wellheads added to the horizontal LFG collector construction.

Response: Attachment 2 of this response contains a revised Report of Construction that now includes the upslope horizontal collector wellheads in the Summary of Construction section.

3. **Horizontal Collectors:**

a. The horizontal collector wellhead referenced in this section and shown on Detail 3 on Sheet 13 of 30 of the Record Drawings is a deviation from the plans and application approved by the Department in Permit No. 35435-016-SC/08. Department records do not appear to indicate that a permit modification was applied for and issued by the Department for this construction modification or that this construction modification was otherwise approved by the Department in accordance with Specific Condition #A.3.a. of Permit No. 35435-016-SC/08. This appears to constitute a violation of Rule 62-701.320(1), F.A.C. Please verify and revise this section to discuss this construction modification accordingly.

b. Please revise this section and/or appropriate sections of the Report of Construction to describe the design, purpose, and function of the horizontal collector wellhead.

c. The use of wellheads associated with the horizontal collectors was not considered in the landfill gas collection and condensate generation calculations provide in support of Permit No. 35435-016-SC/08. Please provide supporting information and calculations that demonstrate the impacts on landfill gas collection quantities and condensate generation as a result of the addition of the horizontal collector wellhead.

Response: Attachment 2 of this response contains a revised Report of Construction that includes additional information on the horizontal collector wellheads utilized in all appropriate sections. The revised horizontal collector wellhead design is outlined in detail as is the reasoning behind the necessary modification to allow for future filling operations while not compromising collector performance. All information on the design, purpose, and function, as well as the effect on the gas and condensate flows is included in the revised Report of Construction.

4. **Dual Gas Extraction/Leachate Dewatering Wells:**

a. The installation of the air supply lines and dewatering force main at EW-59 referenced in this section and shown on Sheet 3 of 30 of the Record Drawings is a deviation from the plans and application approved by the Department in Permit No.

35435-016-SC/08. Department records do not appear to indicate that a permit modification was applied for and issued by the Department for this construction modification or that this construction modification was otherwise approved by the Department in accordance with Specific Condition #A.3.a. of Permit No. 35435-016-SC/08. This appears to constitute a violation of Rule 62-701.320(1), F.A.C. Please verify and explain.

Response: Attachment 2 of this response contains a revised Report of Construction with the information further describing the Dual Gas Extraction/Leachate Dewatering Wells, which are also known as Extraction Wells with Optional Dewatering Pump.

b. An as-built detail or detail reference for modified EW-59 does not appear to be provided in the Record Drawings. Please verify and revise the Record Drawings, as appropriate.

Response: Detail 6 on Sheet 9 of the Record Drawings, in conjunction with Detail 5 on Sheet 9 (as referenced in Detail 6), provides the as-built detail for the construction at EW-58 and EW-59. Attachment 3 contains a revised Record Drawing Sheet 3 of 30 that includes the appropriate reference to Detail 6 on Sheet 9 for EW-58 and EW-59. At this time the dewatering pump, modified wellhead assembly, valves and regulator have yet to be installed, however the wells have been selected for the optional configuration should the need for the pump arise.

APPENDIX E - Record Drawings

Due to the difficulty in describing some comments related to these drawings, these drawings will be discussed in detail at the meeting requested at the end of this letter. Please provide revised drawings that address the comments provided below and at the above-referenced meeting, including all necessary details for the construction and operation of the facility. The drawings will be reviewed in their entirety after the responses to these requests for information are submitted.

Response: A phone discussion was held on August 9, 2010 between Steve Morgan and Dan Cooper of SCS, and additional comments related to the drawings were discussed. It was decided that a detailed list of changes will be added to the Report of Construction with information describing the changes on each of the drawings, as well as reasons for the changes added to the Report of Construction where appropriate.

SCS Engineering Record Drawings:

- 5. Please provide a revised Record Drawing set, identifying all additions, deletions, revisions to the plans previously approved by the Department (e.g. clouding changes), in accordance with Specific Condition #B.2.a. (2) of Permit No. 35435-016-SC/08.**

Response: Attachment 3 of this response contains revised Record Drawing sheets where additions, deletions and revisions to the drawings from those previously submitted with the construction certification package have been included. Rather than create a new set of Record Drawings containing clouds for each change, a table outlining all additions, deletions and revisions made to each sheet has been added to the revised Report of Construction which appears in Attachment 2.

6. **Sheet 4 of 30: Please explain the change in location and configuration between CO 5-3, UT-2, and LCO 5-3 (See Comment #1.a).**

Response: Attachment 3 of this response contains revised Sheets 3 and 4 of the Record Drawings that have been corrected and more clearly indicate the operation of the UT-2, as well as the other traps. Sheet 10 of 30 has also been updated with a more detailed cleanout tie-in schedule to clarify the system operations. The traps were installed correctly and are functioning as designed. The exact location of these lines was modified in the field to accommodate landfill topography and the location of the low points in the header and condensate lines as constructed. To further explain what is happening at this and several other low points where UT traps are utilized, each line will be explained separately. As shown in Detail 2 on sheet 10 of 30, there are potentially three lines that connect to a leachate cleanout that can be utilized for both leachate deposit and the removal of landfill gas (LFG). Below is an explanation of each line.

First: The 2-inch dewatering/condensate line that runs next to the header and receives liquids from pumps installed around the landfill will gravity feed condensate into the leachate cleanout. The connection is a 2-inch HDPE pipe that is connected from near the low point in the 2-inch condensate line into the leachate clean out. The connection does not have to be exactly at the low point since gravity will ultimately push the liquid into the cleanout once accumulation reaches the level of the connection. This line is indicated by a dashed line with a dot in between dashes on the blow up on Sheet 4 and in the legend on the plans.

Second: The 4-inch HDPE pipe from the drip leg of a U-Trap, as shown in Detail 5 on Sheet 10 of 30 and blow up on Sheet 4, delivers condensate from the main landfill gas header to the leachate cleanout. This 4-inch HDPE drip leg pipe comes out the bottom of the U-Trap (which is located at the low point in the header line) and gravity feeds into the leachate cleanout after the vacuum break. This allows for condensate to be removed from the header line without a break in header vacuum or utilization of a pump. These 4-inch lines are indicated by a solid line on the plans with 4-inch label.

Third: The 4-inch HDPE gas collection line extracts LFG from the leachate cleanouts. This pipe runs from the cleanout to the header line where a remote wellhead is placed to control the vacuum being exerted on the cleanout. The 4-inch line from the header to the cleanout does not have to be a low point on the header line but does need to slope from the header line to the cleanout so that condensate from the LFG in this pipe can also drain

back into the cleanout. This line is indicated by a solid line with 4-inch label which runs to a remote wellhead indicated by a remote wellhead symbol where the wellhead is connected to a header riser.

Three connections are the most any cleanout will ever have and most will have just the 4-inch connection to remove LFG as needed. The cleanout tie-in schedule on Sheet 10 further outlines the tie-ins at each cleanout.

7. **Sheet 5 of 30: Please explain the changes in location and configuration between CO 7-1 through CO 7-5 and LCO 7-1 through LCO 7-4, 5-3, UT-2, and LCO 5-3 (See Comment #1.a).**

Response: The location of the piping alignment to the leachate cleanout risers for gas collection was installed based upon slope of the landfill sideslopes and the ability to be constructed. Leachate cleanouts and remote wellheads for cleanouts CO7-1, CO7-2, and CO7-3 were constructed as designed with pipe routes slightly modified for ease of construction. The piping and remote wellhead for cleanout CO7-4 were modified to avoid cutting into the main access road for Sections 7 & 8. The relocation to the south side of the access road for the piping and the wellhead does not affect performance of the collector and in fact provided added efficiencies during construction. The connections for UT-2 and cleanout CO5-3 are described in the response to Question 6 above. Attachment 3 of this response contains revised Sheets 3 and 6 of the Record Drawings that have been modified to more clearly indicate the layout of the cleanout tie-ins.

8. **Sheet 6 of 30: Please explain the change in location of CV-6 (See Comment #1.a).**

Response: Attachment 2 of this response contains a revised Report of Construction that further describes the reasoning behind the relocation of all condensate valves CV-1 through CV-7 from various locations on the sideslopes to the nearest highpoint adjacent to a header access riser.

9. **Sheet 7 of 30: Please explain the change in configuration around CS-1 and the elimination of AV-8 (See Comment #1.a).**

Response: Attachment 2 of this response contains a revised Report of Construction that contains further description of the reasoning behind the relocation of AV-8, which allowed for the isolation of the air system on Section 7 & 8. The remainder of the items entering and exiting CS-1 have not changed from the approved plans.

10. **Sheet 14 of 30:**

a. **Details 3 & 4: Please explain the modifications in the LFG header pipe supports (See Comment #1.a).**

Response: Detail 3 on Sheet 14 was modified to reflect the actual pipe supports that

were installed in locations where the pipe was supported from below and no flange was present, i.e., Item 15 on Sheet 16. Detail 4 on Sheet 14 was added to reflect the second type of pipe stand that was provided by the flare manufacturer, which connected directly to one of the bolts on the HDPE flange to provide support, i.e. Item 15A on Sheet 16. Attachment 3 of this response contains a revised Sheet 16 of the Record Drawings that have been corrected to clearly indicate where each type of pipe stand is utilized.

b. Detail 5: The identified "14" LFG Outlet Pipes" on this detail appears inconsistent with the "16" HDPE Blower Inlet LFG Pipe from Knockout Pot" identified on Section 1 on Sheet 16 of 30. Please verify and revise these as-built details, as appropriate.

Response: Detail 5 on Sheet 14 is correct. The outlet piping of the knockout pot is 14-inches in diameter. Item 18 in the legend on Sheet 16 of 30 has been as modified to reflect the actual pipe diameter. Attachment 3 of this response contains a revised Sheet 16 of the Record Drawings that has been corrected to clearly indicate the appropriate pipe diameters.

11. Sheet 16 of 30: Please explain the changes made in the blower/flare station layout (See Comment #1.a.).

Response: The permitted plans showed a design layout based upon a layout utilized before by one of the several approved Landfill Gas Blower/Flare System manufacturers from the contract documents specification Section 44 11 20. The contractor that performed the work utilized a different approved blower/flare manufacturer, which resulted in a different layout on the blower flare skid, as well as the ancillary equipment and connections (i.e., pipe stands and pipe diameters). The changes to the layout on the skid were made at the manufacturer prior to the skid delivery to the site, at which time it was connected to the system as shown on the approved drawings. The system shown on Sheet 16 of 30 of the Record Drawings accurately reflects what was installed, which was manufactured by an approved vendor and meets all performance requirements specified in the contract documents.

Southern Environmental Contracting Inc. As-built Drawings

12. Sheets 1 through 5: Survey elevations for the survey points shown on the horizontal collectors do not appear to be provided on these sheets or on the subsequent pipe profiles sheets. Please either revise these or appropriate sheets to identify these survey elevations or provide a table of the survey points and elevations.

Response: Attachment 4 contains a Table showing the survey points including surface elevations for each of the horizontal collector lines. It should be noted that these lines were installed such that, in general, the collectors slope from the interior of the landfill to the edges, but because the pipes are perforated, there is no minimum slope required or one indicated on the plans.

The following comment is provided for informational purposes and does not necessarily require a response, other than acknowledgement of the comment.

13. In accordance with Specific Condition #C.1.b. of Permit No. 35435-016-SC/08, operation of the gas collection and control system is not authorized until the construction certification is approved and a modification to the facility's operation permit is issued that authorizes operation of the system. As indicated above, the certification of construction completion is not approved at the time. In addition, Permit Modification No. 35435-018-S0/MM, received on May 25, 2010, is currently incomplete and therefore has not been issued.

In accordance with Specific Condition #C.1.b., temporary operation of the system was authorized for up to 180 days to allow for system start-up and operational adjustments while the certification of construction completion and permit modification submittals and approvals required by this specific condition were completed. On December 31, 2009, the County notified the Department that temporary start-up operation of the system began on December 16, 2009. Based on the December 16, 2009 start-up date, authorization for temporary operation of the system expired on June 14, 2010. A June 22, 2010 inspection of the facility by Department personnel indicated that the gas collection and control system was operating. A July 9, 2010 e-mail from SCS Engineers on behalf of the County confirmed that the County is currently operating the system. Please be advised that operation of the system is a violation of Specific Condition #C.1.b. of Permit No. 35435-016-SC/08.

Response: Comment noted.

Attached are four copies of our response, as requested. Please do not hesitate to contact us if you need anything further.


Sincerely,



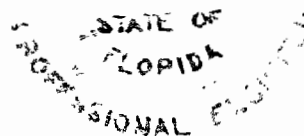
Daniel R. Cooper, P.E.
Project Manager
SCS ENGINEERS

DRC/RJD:drc

cc: Patty Berry, SWMD
Larry Ruiz, SWMD
Walter Gray, SWMD



Raymond J. Dever, P.E., BCEE
Vice President
SCS ENGINEERS



Attachment 1

FDEP Form 62-701.900(2)

Dept. Of Environmental Protection
AUG 20 2010
Southwest District



Florida Department of Environmental Protection
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

DEP Form # 62-701.900(2)
Form Title Certification of Construction Completion
Effective Date May 19, 1994

DEP Application No. _____
(Filled by DEP)

Certification of Construction Completion of a Solid Waste Management Facility

DEP of Environmental Protection
AUG 20 2010
Southwest District

DEP Construction Permit No: 35435-016-SC/08 County: Hillsborough

Name of Project: Southeast County Landfill 2009 Gas Collection and Control System

Name of Owner: Hillsborough County Solid Waste Management Division

Name of Engineer: SCS Engineers

Type of Project: Installation of the LFG collection and control system, included vertical extraction wells, horizontal collectors, header and lateral piping, and blower/flare station.

Cost: Estimate \$ 3,515,924 Actual \$ 3,242,666

Site Design: Quantity: 800-1000 ton/day Site Acreage: Landfill = 181.7 Acres

Deviations from Plans and Application Approved by DEP: The project was constructed in general conformance with the permitted plans and specifications with the following deviations: Changes to well depths, header and lateral pipe routes and valve locations. The upslope horizontal LFG collector wellhead was modified to provide the ability to raise as additional waste is placed. Air supply and dewatering line extended to wells EW-59 and EW-58 for future dewatering capabilities. Blower flare configuration has been modified to reflect manufacturer utilized by contractor.

Address and Telephone No. of Site: 15960 County Road 672, Lithia, Florida 33547-1110
(813) 671-7707

Name(s) of Site Supervisor: Larry Ruiz

Date Site inspection is requested: As soon as possible.

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction

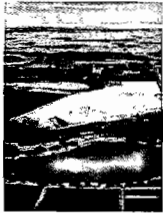
Permit No. 35435-016-SC/08 :Dated: February 4, 2009

Date: August 13, 2010

Signature of Professional Engineer

Attachment 2
Report of Construction

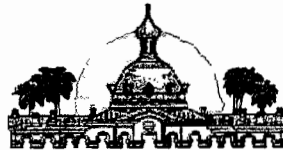
SCS ENGINEERS



Report of Construction
April 8, 2009 – February 16, 2010

**Southeast County Landfill
Gas Collection
and Control System
Permit No. 35435-016-SC/08**

Prepared for:
Hillsborough County



Solid Waste Management ~~Department~~ Division
601 E. Kennedy Blvd.
P.O. Box 1110
Tampa, Florida 33601

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
AUG 20 2010
SOUTHWEST DISTRICT
TAMPA

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Revised August 20 ~~April 15~~, 2010
File No. 09207055.00

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40 YEARS
SCS ENGINEERS

**Report of Construction
April 8, 2009 – February 16, 2010**

**Southeast County Landfill
Gas Collection and Control System
Permit No. 35435-015-SC/08**

Prepared for:

**Hillsborough County
601 E. Kennedy Blvd.
P.O. Box 1110
Tampa, Florida 33601**

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
AUG 20 2010
SOUTHWEST DISTRICT
TAMPA

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Florida Board of Professional Engineers
Certification No. 00004982

Raymond J. Dever, P.E.
Florida P.E. No. 43031

Revised August 20 April 15, 2010
File No. 09207055.00

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Appendices

Appendix A As-Built LFG Extraction Well Schedule

Appendix B Daily Field Reports

Appendix C As-Built Construction Well Logs

Appendix D Construction Photographs

Appendix E Record Drawings (24"x36" Drawing Set Included along with this Submittal)

Appendix F As-Built Survey Data Table

PROJECT SUMMARY

This report provides certification of construction for the Southeast County Landfill, Hillsborough County, Gas Collection and Control System (GCCS) constructed from April 8, through February 16, 2010. This project is permitted under Construction Permit No. 35435-016-SC/08, issued by the Florida Department of Environmental Protection (FDEP).

SITE BACKGROUND

Southeast County Landfill is an active municipal solid waste landfill that is owned by the Hillsborough County Solid Waste Management Department (SWMD). It is located at 15960 County Road 672, Lithia, Florida 33503.

The landfill gas (LFG) system was an initial installation and included the following : 97 vertical extraction wells, installation of 16" and 10" HDPE pipe for header, 6" HDPE solid and perforated pipe for horizontal collectors and laterals, 4" HDPE solid pipe for laterals and risers and 2" HDPE pipe for air supply and condensate forcemain. The project included the erection of two metal buildings on new concrete foundations, a 36" condensate trap, and a -three blower skid system with all the appurtenances including a 46' flare on a new concrete foundation with fencing around the perimeter.

Additional background information for the landfill is included in the "Application for Solid Waste Construction Permit – Landfill Gas Collection and Control System Project – Southeast County Landfill" that was prepared by SCS Engineers (SCS) dated July 18, 2008.

CONTRACT DOCUMENTS

The following documents defined the design and technical aspects of the project and governed the construction:

- "Construction Drawings" – Southeast County Landfill, Landfill Gas Collection and Control System, prepared by SCS dated October 8, 2008.
- "Contract Documents and Specifications for Southeast County Landfill Gas Collection and Control System, Bid No. C-0031-09(DV), C.I.P. No. CP54051064", prepared by Hillsborough County Department of Procurement Services.
- Construction Permit No. 35435-016-SC/08 issued by FDEP on February 4, 2009.

CONTACT LIST

The parties involved in this project are listed below:

Design Engineer, Construction Inspection:

SCS Engineers
4041 Park Oaks Blvd. Suite 100
Tampa, FL 33610
(813) 621-0080

Construction Contractor:

Southeast Environmental
Contracting, Inc.
5667 Val Del Road
Mableton, GA 31632
(229) 794-3330

Drilling Contractor:

Recovery Drilling
310 Vernon Ave
South Barre, MA 01074
(978) 422-9977

Surveyor:

Survtech
10220 U.S. Hwy 92 East
Tampa, FL 33610
(813) 621-7194

Record Documentation:

SCS Engineers
4041 Park Oaks Blvd. Suite 100
Tampa, FL 33610
(813) 621-0080

Building Contractor:

Canco General
Contracting
2502 Frontage Park
Place
Plant City, FL 33563
(813) 750-1222

Pipe Supplier:

ISCO Industries
460 Fife Road
Mulberry, FL 33860
(800) 345-4726

Electrical Subcontractor:

E.C. Electrical Contractors, Inc.
5190 Commercial Way
Spring Hill, FL 34606
(352) 683-5904

Sod & Seeding:

Quality Turf of
Okeechobee, Inc.
8731 N.E. 48th Street
Okeechobee, FL 34972
(863) 634-7140

SUMMARY OF CONSTRUCTION

On March 11, 2009, the SWMD issued Southeast Environmental Construction (SEC) the notice to proceed with construction. Substantial completion of the project, as outlined in the Contract Documents and Application for Construction Permit, was achieved on December 16, 2009, and final completion was accepted on February 16, 2010.

The project consisted of constructing/installing the following approximate quantities:

- 97 vertical LFG extraction wells (20 being vertical components of horizontal collectors), with a total drilling depth of 5,098 feet (ft)
- 12,889 ft of 16-inch diameter HDPE SDR 17 LFG header pipe
- 1,744 ft of 10-inch diameter HDPE SDR 17 LFG header pipe
- 16,843 ft of 6-inch diameter HDPE SDR 17 perforated horizontal collector pipe
- 1,970 ft of 6-inch diameter HDPE SDR 17 solid horizontal collector pipe
- 6,030 ft of 6-inch diameter HDPE SDR 17 LFG lateral pipe
- 3,606 ft of 4-inch diameter HDPE SDR 17 LFG lateral pipe and risers

- 13,820 ft of 2-inch diameter HDPE SDR 11 condensate/dewatering forcemain
- 13,339 ft of 2-inch diameter HDPE SDR 11 air supply pipe
- 21 Upslope Horizontal LFG Collector Wellheads
- One condensate trap with pump installation and enclosed controls
- Fifteen Leachate Collection Riser tie-ins for gas extraction
- Five Self Draining Condensate Traps
- Three U-traps with drip legs and valves
- Two metal buildings; one for storage and one for the blower skid and air compressor
- Blower skid with three blowers and all appurtenances including control panel and air compressor/dryer
- New flare on concrete foundation with chain link fencing around perimeter

Vertical Extraction Wells

Vertical extraction wells were constructed with 6-inch diameter schedule 80 polyvinyl chloride (PVC) pipe in a 36-inch diameter borehole. The boreholes were terminated at approximately 0 - 3 feet above the estimated bottom of the cell. The PVC pipe was slotted, as specified in the design drawings, to within 10 to 25 feet of the ground surface. Tire chips (provided by the site) were used as backfill around the slotted pipe in all wells. A geocomposite was placed over the tire chips prior to placing clean soil backfill around the solid-wall pipe. A 24-inch thick hydrated bentonite plug was installed at each well approximately 2 feet (for caisson wells) and 12-17 feet (for regular extraction wells) below the existing grade. Of the 97 vertical extraction wells installed, 20 also included a horizontal collector component.

During construction, the depths of four wells were adjusted during construction, as thick layers of ash were encountered during drilling. The as-built well locations, well schedule, and construction details are shown on the site plans included in the Record Drawings.

Horizontal Collectors

The 25 installed horizontal collectors were constructed with solid wall and perforated 6-inch diameter high-density polyethylene (HDPE) pipe with a standard dimension ration (SDR) of 17. Each horizontal collector has a minimum of 75 feet of solid wall pipe installed from the wellhead before transitioning to perforated HDPE SDR 17 pipe. The perforated section of the pipe was laid in a 6 foot deep (minimum) trench on top of 1 foot of tire chips before being topped with 2 feet of tire chips a non woven geotextile then 3 feet of clean backfill. Several of the collectors have a vertical boring component where a perforated pipe is installed vertically to provide additional LFG collection at greater depths. The as-built well schedule in Appendix A outlines the depth of each vertical boring and Sheet 13 in Appendix E illustrates the as-built construction detail for the collector trench.

The horizontal collectors are connected to the main gas extraction header line in two different wellhead configurations.

The first configuration, which is present on HC-21 through HC-25, is a remote wellhead that allows for gas to be pulled from the collector while condensate drains back into the landfill since

the pipe from the horizontal collector slopes upwards to the wellhead. This configuration can be seen on Sheet 12 of 30 Detail 5 on the plans.

The second wellhead configuration is the Upslope Horizontal LFG Collector wellhead, which has been modified from the original design. The approved design appeared on Sheet 13 of 30 Detail 3 of the approved permit drawings. The new design also appears as Detail 3 on Sheet 13 of 30 of the record drawings. Horizontal collectors HC-1 through HC-21 received the new wellhead configuration.

During construction, based on current ground elevations, it was determined that in many of the locations where the Upslope Horizontal LFG Collector wellheads were to be installed, additional waste was going to be added in order to reach permitted grades. Since the original collector sits on grade, it would have to be raised in order to access the wellhead and adjust vacuum to the collector. Raising the wellhead valve would mean that a low spot would result in the line between the horizontal collector solid pipe section and the wellhead. Additionally, a riser would have to be added to the header line in order to raise the vacuum supply. This low spot would trap condensate and render the collector ineffective once condensate had filled the pipe. In order to avoid potentially rendering 21 horizontal collectors ineffective in the future, a change was made during construction to accommodate the raising of wells, while not trapping condensate in the collection pipe.

The revised Upslope Horizontal LFG Collector wellhead design was created to accommodate the future ground surface and disposal of the condensate traveling towards the wellhead. The new design places a tee rather than an elbow at the low point where condensate would accumulate over time. The tee allows for the condensate to flow downward back into the landfill through a designed trap. The trap was designed to be very similar to the approved self draining condensate traps, Detail 6 on Sheet 11 of the approved plans. The third leg of the tee would rise vertically out of the current land surface where the vacuum could be connected to extract the gas. A riser is then added that ties into the header and the wellhead is connected between the two pipes to regulate the vacuum and flow of gas from the horizontal collector. This configuration is now very similar to the wellheads on the other horizontal collectors as described above where the liquid condensate drains back into the landfill while the gas is directed to the main landfill gas header.

The alternate design allows for the wellhead to be raised as additional waste is added without affecting the performance of the horizontal collectors. There is no increase in gas flow as the wellhead is pulling from the same amount of perforated pipe within the landfill, and some of the condensate that would have entered the main landfill gas header is directed back into the landfill at the end of the horizontal collector rather than through CT-1, CT-2, CT-3, UT-1, UT-2, or UT-3. Horizontal collectors HC-16, HC-17 and HC-18 would normally send condensate to CS-1, but the new wellhead design will actually lower the amount of condensate reaching CS-1, thus no additional calculations were necessary as the system is designed to handle a larger total condensate flow.

LFG Header and Laterals

The LFG laterals and header were constructed using HDPE SDR 17 pipe. Lateral pipes generally were installed with a minimum 3 percent slope to allow condensate in the pipes to drain into the header. The header was installed with a slope varying from approximately 3 percent to greater than 20 percent. The header is designed to drain condensate to engineered low spots at the condensate traps.

The base of the LFG lateral and header trench had a minimum of 6" of sand bedding and both the bedding and sand backfill were compacted using a vibrating compactor. Pipes were then covered with a clean soil backfill free of excavated refuse. Yellow caution tape with print stating "gas line buried below" was buried in the backfill approximately 1 foot above top of pipes.

Pipe Slope

The header, laterals, horizontal collectors and air/condensate lines were installed with a minimum slope of 3 percent, which is the standard for LFG pipes installed within an active landfill. Pipes located outside of the landfill footprint were installed with a 1 percent minimum slope.

To confirm pipe slope, the contractor checked the pipe slope at 10-foot intervals along the entire pipeline. Also per the Contract Documents, the pipe coordinates and elevations were surveyed at the intervals required by Section 31 20 00 - 9 and 31 20 00 - 10 of the Contract Documents, which includes 50-foot intervals and at each change in pipe direction, grade break, fitting, connection, and tie-in. Complete as-built survey data tables are included within this construction certification in Appendix E.

Dual Gas Extraction/Leachate Dewatering Wells

In order to facilitate the possibility of future dewatering of wells, HDPE air supply lines and dewatering forcemain lines were installed at EW-59, running beside EW-58 and south to the header trench at EW-53. The installation of air supply line and dewatering force main to EW-58 and EW-59 from the main header line was part of the installation of the approved Caisson LFG Extraction well with Optional Dewatering Pump indicated in Detail 6 on Sheet 9 of 30 of the previously submitted approved plans. Note 2 of this detail indicates that the "location of caisson extraction wells with a dewatering pump will be determined by the engineer and owner" (During Construction). In order to install a dewatering pump, the air supply line and force main must be extended to the well as shown in the detail otherwise the pump could not function. EW-58 and EW-59 were chosen as future candidates for a dewatering pump because of their proximity to Pump Station B located at the bottom of the landfill in this area. Thus the provisions for the optional dewatering wellhead were installed based on a determination by the engineer and owner. Although a pump was not installed at this time, the installation of the provisions (air and force main lines) for a Caisson LFG Extraction well with Optional Dewatering Pump was prudent and cost effective based upon the difficulty of installing air and force main once additional waste is placed in the area and the well extended vertically.

Condensate Traps

Five self draining condensate traps were installed to collect condensate from the header. No pumps were installed in traps at this time. Traps CT-1 through CT-3 are located on Phases I – VI and CT-4 and CT-5 are located on sections 7 and 8. To operate pumps, should they at some point become necessary, air supply line and condensate forcemain stub-ups were installed beside each of the traps.

Condensate Drain line/Leachate Dewatering Line Valves

~~Due to topographic conditions, the~~ The 2" condensate valves, CV-1 through CV-7, (within vaults) for the 2" condensate drain lines were moved to high points adjacent to the header access risers for two reasons. First, if additional filling occurs, the valves can be raised with the lines on each side of the valves draining to each side from the high point without causing a potential back up of silt that could have occurred if the valves were located further down the sideslopes and then raised. Second, since the valves and valve vaults are located adjacent to the 16-inch diameter access risers, which are easily visually located, the valve vaults are less like to be covered accidentally or destroyed by ongoing landfill operations. ~~to assure no condensate build-up or flow blockage occurred at the valves.~~ The new valve locations are shown on the Record Drawings.

Air Supply Line

The 2" HDPE SDR 11 Air supply line was installed from the compressor in the blower/flare building and in all the 16-inch main LFG header trench that surrounds both the Phase I-VI and Section 7 & 8 areas. The line contains 8 valves, AV-1 through AV-8, located throughout the system to allow for the isolation of the air system should maintenance be required in one area while normal operation proceeds in another area. The location of AV-8 was modified during construction from adjacent to CS-1 to its installed location behind the storage building. The valve was relocated to allow for the isolation of the air system on Sections 7 & 8. The previous location only isolated the air pressure from both landfills over the entire system, which can be accomplished by the outlet valve on the compressor or shutting the compressor down. Thus the new location allowed for improved maintenance operations.

CONSTRUCTION RECORDS

The following construction documentation is provided as appendices:

- Appendix A As-Built LFG Extraction Well Schedule
- Appendix B Daily Field Reports
- Appendix C As-Built Construction Well Logs
- Appendix D Construction Photographs
- Appendix E Record Drawings (24"x36" Drawing Set Included along with this Submittal)
- Appendix F As-Built Survey Data Table

Landfill Gas Extraction Well Schedule

A summary of the as-built well depths, length of slotted and solid-wall pipe, and thickness of tire chip backfill layers is provided on the as-built well schedule included in Appendix A, as well as on Sheet 8 of the Record Drawings.

Daily Field Reports

During the construction quality assurance (CQA) inspection activities, SCS maintained daily field reports detailing the construction progress and various issues that were addressed throughout the project. The reports included in Appendix B were used to prepare this certification report and the Record Drawings.

Construction Photographs

Photographs were taken by SCS on a regular basis in order to document each phase of the construction. The photographs included in Appendix C provide a general representation of the construction activities and methods.

Record Drawings

Other than those deviations noted As-stated above, the project was completed in general conformance with the Contract Documents. Due to contractor product choices and field conditions, there are additional minor deviations that are indicated in the Record Drawing that are outlined below on a sheet by sheet basis. Appendix D includes signed and sealed Record Drawings prepared by SCS.

<u>Sheet #</u>	<u>Changes made from permitted plans and reason for the change</u>
<u>Cover</u>	<u>Added additional sheet information for Surveyor sheets to legend</u>
<u>2</u>	<u>No Changes</u>
<u>3,4,5,6,</u>	<u>Changes to pipe routes due to topographic and field operating conditions during construction. Change to condensate valve locations for CV-1 through CV-8. Addition of air supply and condensate/dewatering line to EW-58 & EW-59. On sheet 6 LCO7-4 lateral line rerouted to avoid road crossing and improve efficiency of construction.</u>
<u>7</u>	<u>Changes to pipe routes due to topographic and field operating conditions during construction. Moved AV-8 from near CS-1 to behind building in order to better isolate air system for maintenance. Moved V-9 from near V-8 to in front of blind flange across the road in order to better isolate future expansion of system into Section 9. Route for electrical connection shown as installed above ground, not below as shown previously.</u>
<u>8</u>	<u>Changes in well depths were made based upon field elevations, ability to drill in waste, and relocating wells to avoid encountering other on-site pipes. Contractor notes were revised or</u>

	<u>removed.</u>
<u>9</u>	<u>No Changes</u>
<u>10</u>	<u>Detail 5 - Handle on valve is now a butterfly handle rather than a T handle. Contractor notes were revised or removed. Leachate cleanout schedule revised to add 2-inch condensate/dewatering line column.</u>
<u>11</u>	<u>Detail 4- Air line and Dewatering line were installed on same side of pipe (uphill side) to avoid any potential impact from the header pipe during settlement. Contractor notes were revised or removed.</u>
<u>12</u>	<u>Detail 1- Invert Elevations were added based upon installed conditions/survey. Contractor notes were revised or removed. Detail 6- Location of dewatering pipe shown on uphill side of header as installed. Detail 3 - handle on valve is now a butterfly handle rather than a T handle.</u>
<u>13</u>	<u>Detail 2-Upslope Horizontal LFG Collector Detail was changed to revised design to better facilitate the addition of waste over the area while still providing drainage. Contractor notes were revised or removed. Detail 4-added electro fusion coupling showing how tee connection was attached to vertical well pipe.</u>
<u>14</u>	<u>Detail 3- revised to reflect design of pipe stands utilized by contractor. Detail 4 added to reflect additional type of pipe stand utilized by contractor. Detail 5- revised to show actual configuration of knockout pot installed by contractor. Details 6, 7, 8- Revised to reflect actual pipe size of road crossings and where each type of crossing was utilized.</u>
<u>15</u>	<u>Detail 3- Revised to reflect actual installed elevations.</u>
<u>16</u>	<u>Detail 1 and Section A- Revised to reflect actual installed blower/flare components based upon contractor constructed flare. Configuration varied from flare shown on permitting documents, but met all performance criteria. Contractor notes were revised or removed.</u>
<u>17</u>	<u>Detail 3- Revised to reflect actual installed components and pipe routing based on contractor supplied blower/flare configuration.</u>
<u>S-1</u>	<u>Blower Building Floor Plan- revised to show revised beam layout of building (One beam on end of building towards flare) and compressor configuration. Storage Building Floor Plan- revised to show revised beam layout of building (One beam on each end rather than two).</u>
<u>S-2</u>	<u>Northeast Elevation – Overhead light added</u>
<u>S-3</u>	<u>Northwest Elevation – Overhead light added</u>
<u>S-4</u>	<u>Blower Building Floor Plan- revised to show revised beam and footer layout of building. one beam on end of building towards flare. Storage Building Floor Plan- revised to show revised beam and footer layout of building (One beam on each end rather than two). Contractor notes were revised or removed.</u>

<u>S-5</u>	<u>No Change</u>
<u>S-6</u>	<u>Storage Building Cross Section- shows one beam in center of endwall rather than two beams off center.</u>
<u>S-7</u>	<u>No Change</u>
<u>S-8</u>	<u>No Change</u>
<u>S-9</u>	<u>No Change</u>
<u>S-10</u>	<u>No Change</u>
<u>E-1</u>	<u>Power Plan – Show new Panel M next to blower skid.</u>
<u>E-2</u>	<u>Riser Diagram and Panel schedule now show Panel M, which was added due to blower/flare skid configuration and power requirements.</u>
<u>E-3</u>	<u>No Change</u>

Record Drawing Summary

The Record Drawings showing the as-built conditions were prepared by SCS and signed and sealed by Raymond J. Dever, P.E., who is a Professional Engineer registered in Florida. The structural and electrical record drawings were signed and sealed by the respective subconsultants to SCS.

- Sheet 1 Title Sheet
- Sheet 2 Site Plan Existing Conditions
- Sheet 3 Overall Site Plan
- Sheet 4 Site Plan - 1
- Sheet 5 Site Plan - 2
- Sheet 6 Site Plan - 3
- Sheet 7 Site Plan – Blower / Flare System
- Sheet 8 Details – 1
- Sheet 9 Details – 2
- Sheet 10 Details – 3
- Sheet 11 Details – 4
- Sheet 12 Details – 5
- Sheet 13 Details – 6
- Sheet 14 Details – 7
- Sheet 15 Details – 8
- Sheet 16 Detail – Blower / Flare Station
- Sheet 17 P & ID – Blower / Flare Station
- Sheet S-1 Blower / Storage Buildings – Floor Plan
- Sheet S-2 Blower / Storage Buildings – Blower Building Elevations
- Sheet S-3 Blower / Storage Buildings – Storage Building Elevations
- Sheet S-4 Blower / Storage Buildings – Foundation Plan
- Sheet S-5 Blower / Storage Buildings – Roof Framing Plan
- Sheet S-6 Blower / Storage Buildings – Cross Sections
- Sheet S-7 Blower / Storage Buildings – General Notes
- Sheet S-8 Blower / Storage Buildings – Product Approval 1

- Sheet S-9 Blower / Storage Buildings – Product Approval 2
- Sheet S-10 Blower / Storage Buildings – Product Approval 3
- Sheet E-1 Power Plan and General Notes
- Sheet E-2 Riser Diagram and Panel Schedules
- Sheet E-3 Electrical Line Diagram
- Survey Southeastern Survey Inc. – As-Built Survey Date 12-16-09

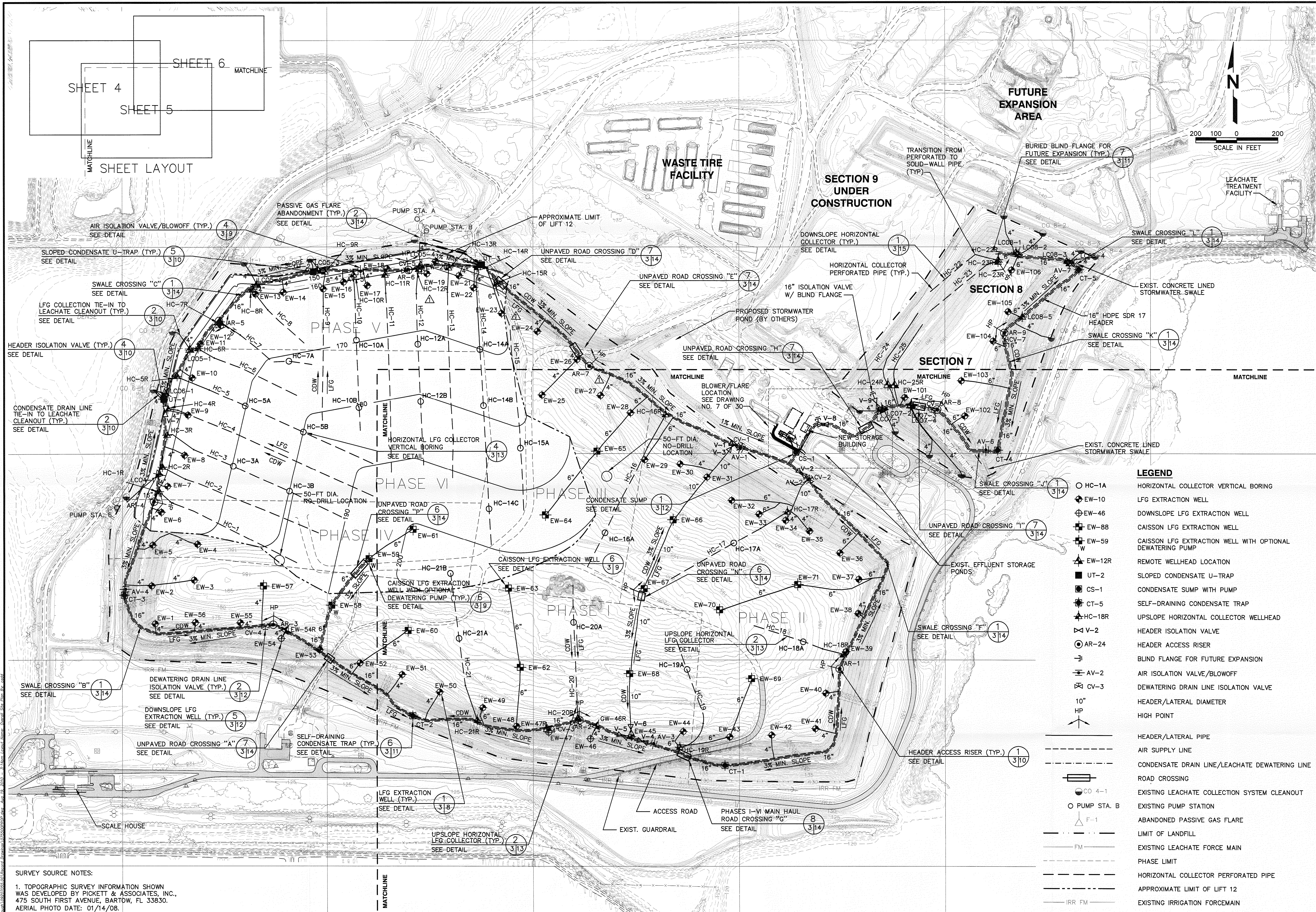
VENDOR LIST

The following vendors supplied Southeast Environmental Contracting (SEC) the materials used for the project:

PVC Pipe and Fittings	Freedom Plastics, Inc. 3206 Enterprise Road Fort Pierce, FL 34982 (800) 432-6143
HDPE Pipe	Rinker Materials (PolyPipe, Inc.) 2406 N. I-35 Gainesville, TX 76240 (800) 433-5632
HDPE Pipe and Fittings	ISCO Industries 460 Fife Road Mulberry, FL 33860 (800) 345-4726
Stone backfill	Conrad Yelvington 2326 Bellevue Avenue Daytona Beach, FL 32114 (386) 257-5504
Wellheads	ISCO Industries 460 Fife Road Mulberry, FL 33860 (800) 345-4726
Pneumatic Leachate Pumps Well Caps	QED Environmental Systems 15310 Amberly Drive, Suite 250 Tampa, FL 33647 (813) 972-0955
Flare Station Control Panel	LFG Specialties, LLC Shaw Environmental & Infrastructure Group 16406 US Route 224 E Findlay, OH 45840 (419) 424-4915

Attachment 3

Record Drawings (Revised Sheets 3,4,5,6,7,10,12,16)



SURVEY SOURCE NOTES:

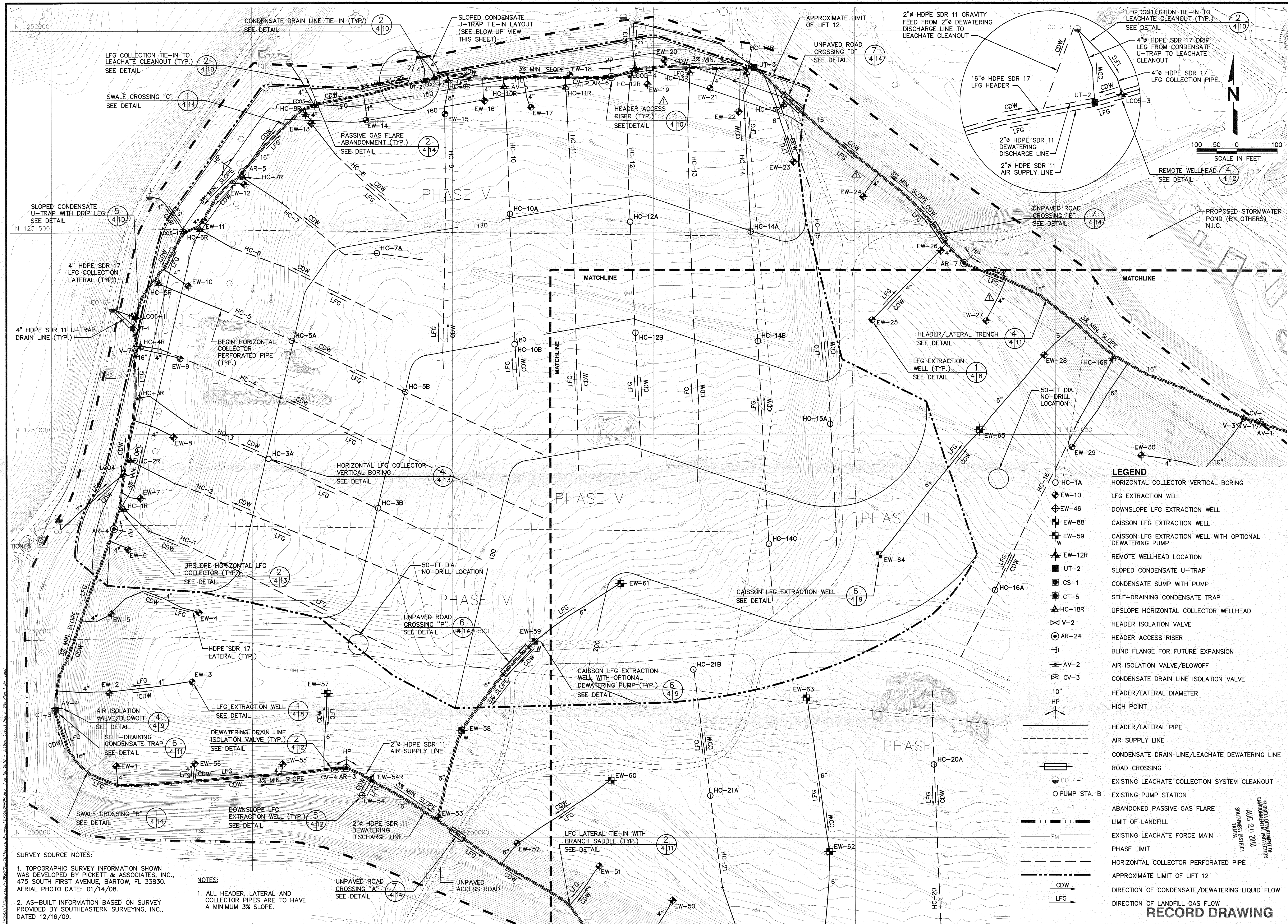
1. TOPOGRAPHIC SURVEY INFORMATION SHOWN WAS DEVELOPED BY PICKETT & ASSOCIATES, INC., 475 SOUTH FIRST AVENUE, BARTOW, FL 33830. AERIAL PHOTO DATE: 01/14/08.

2. AS-BUILT INFORMATION BASED ON SURVEY PROVIDED BY SOUTHEASTERN SURVEYING, INC., DATED 12/16/09.

RECORD DRAWING
DATE: APRIL 15, 2010

BY	DESCRIPTION
DRC	WELL SCHEDULE UPDATED PER FIELD CONDITIONS
DRC	REVISED FOR THE RECORD
DRC	REVISED PER CERTIFICATION
DRC	REPORT RAI #1
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A	5/8/09
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DRAWING TITLE	
OVERALL SITE PLAN	
PROJECT TITLE	
SOUTHEAST COUNTY LANDFILL LANDFILL GAS COLLECTION AND CONTROL SYSTEM PROJECT	
CLIENT	
HILLSBOROUGH COUNTY SOLID WASTE MANAGEMENT DEPARTMENT TAMPA, FLORIDA	
SCS ENGINEERS	
STEVENS, CONRAD AND SCHMIDT CONSULTING ENGINEERS 600 SOUTH GORRISON STREET, TAMPA, FL 33610 813.241.6000 FAX 813.241.6775	
PROJ. NO.	09207055.00
DATE	09/20/05
BY	DAW/DRC
CHECK BY	DRC
APP. BY	RJD
CADD FILE:	075500PROP
DATE:	OCTOBER 8, 2008
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FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AUG 20 2010
SOUTHWEST DISTRICT TAMPA



SURVEY SOURCE NOTES:

1. TOPOGRAPHIC SURVEY INFORMATION SHOWN WAS DEVELOPED BY PICKETT & ASSOCIATES, INC., 475 SOUTH FIRST AVENUE, BARTOW, FL 33830. AERIAL PHOTO DATE: 01/14/08.

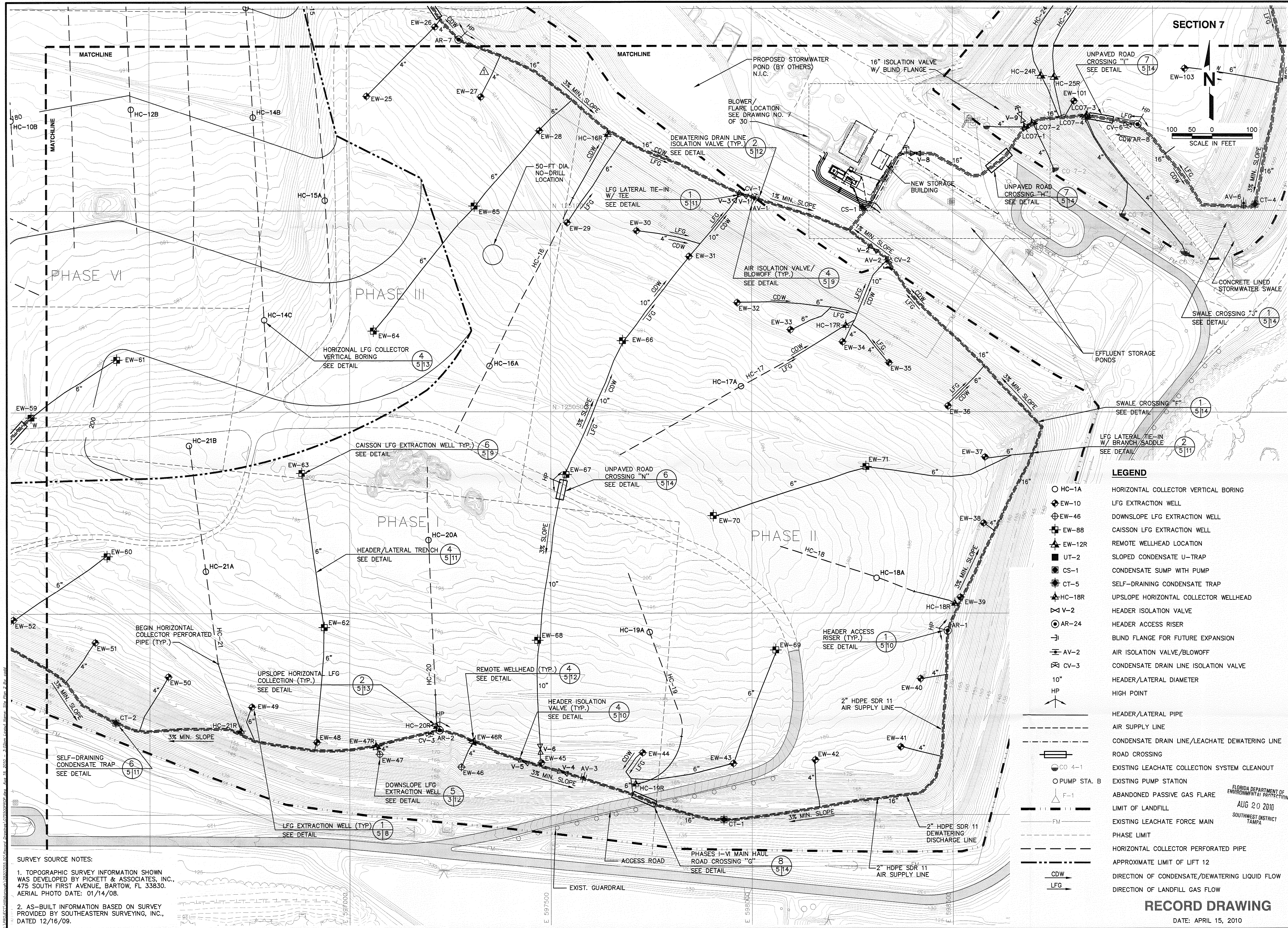
2. AS-BUILT INFORMATION BASED ON SURVEY PROVIDED BY SOUTHEASTERN SURVEYING, INC., DATED 12/16/09.

NOTES:

1. ALL HEADER, LATERAL AND COLLECTOR PIPES ARE TO HAVE A MINIMUM 3% SLOPE.

- LEGEND**
- HORIZONTAL COLLECTOR VERTICAL BORING
 - LFG EXTRACTION WELL
 - DOWNSLOPE LFG EXTRACTION WELL
 - CAISSON LFG EXTRACTION WELL
 - CAISSON LFG EXTRACTION WELL WITH OPTIONAL DEWATERING PUMP
 - REMOTE WELLHEAD LOCATION
 - SLOPED CONDENSATE U-TRAP
 - CONDENSATE SUMP WITH PUMP
 - SELF-DRAINING CONDENSATE TRAP
 - UPSLOPE HORIZONTAL COLLECTOR WELLHEAD
 - HEADER ISOLATION VALVE
 - HEADER ACCESS RISER
 - BLIND FLANGE FOR FUTURE EXPANSION
 - AIR ISOLATION VALVE/BLOWOFF
 - CONDENSATE DRAIN LINE ISOLATION VALVE
 - HEADER/LATERAL DIAMETER
 - HIGH POINT
 - HEADER/LATERAL PIPE
 - AIR SUPPLY LINE
 - CONDENSATE DRAIN LINE/LEACHATE DEWATERING LINE
 - ROAD CROSSING
 - EXISTING LEACHATE COLLECTION SYSTEM CLEANOUT
 - EXISTING PUMP STATION
 - ABANDONED PASSIVE GAS FLARE
 - LIMIT OF LANDFILL
 - EXISTING LEACHATE FORCE MAIN
 - PHASE LIMIT
 - HORIZONTAL COLLECTOR PERFORATED PIPE
 - APPROXIMATE LIMIT OF LIFT 12
 - DIRECTION OF CONDENSATE/DEWATERING LIQUID FLOW
 - DIRECTION OF LANDFILL GAS FLOW
- RECORD DRAWING**
- DATE: APRIL 15, 2010

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SCS ENGINEERS STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS 604 PARK GARDEN BLVD., SUITE 100, TAMPA, FL 33610 813.821.0080 FAX 813.823.6757 FLORIDA CERTIFICATE OF AUTHORIZATION NO. 00004882	
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SURVEY SOURCE NOTES:

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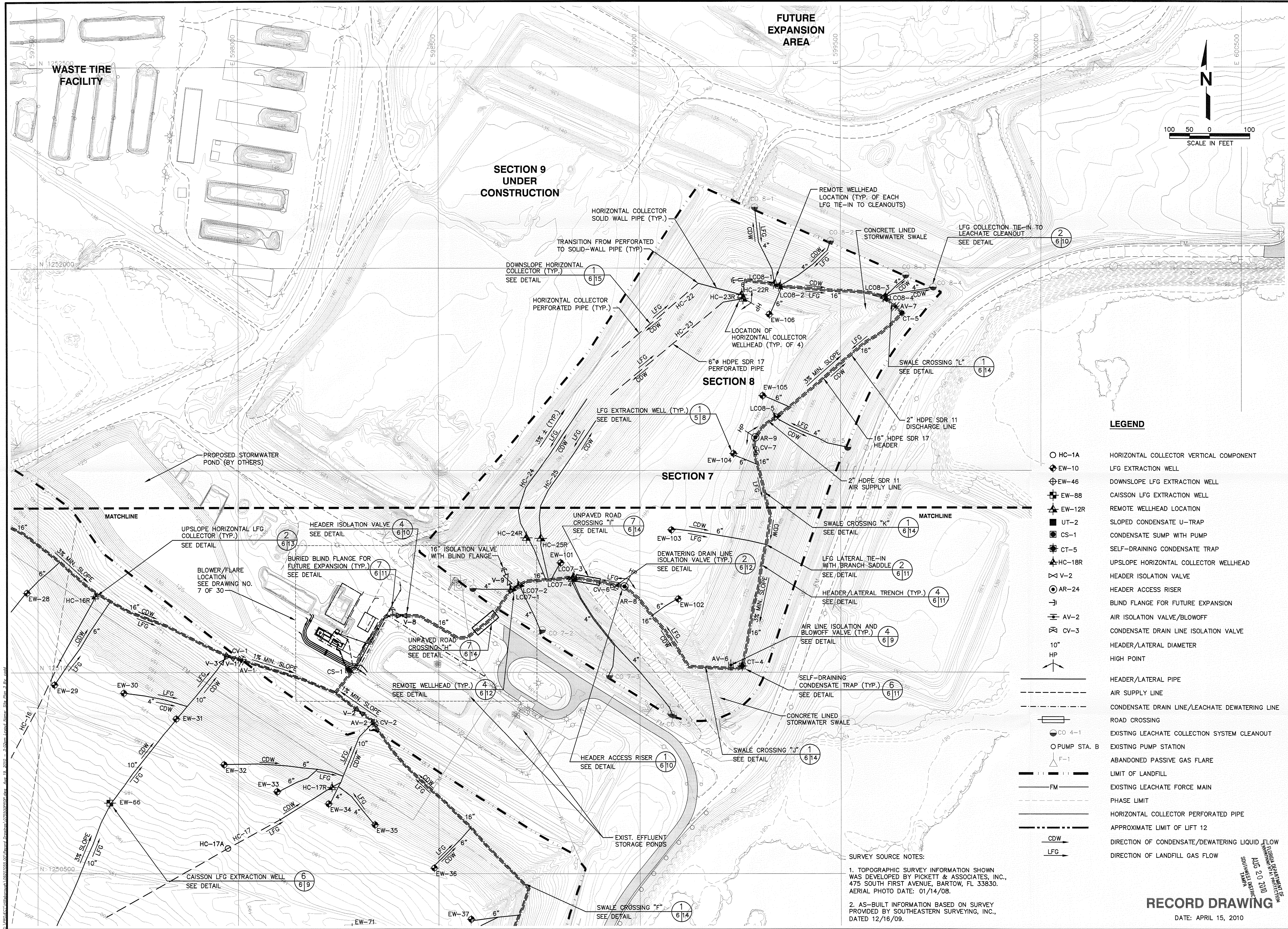
2. AS-BUILT INFORMATION BASED ON SURVEY PROVIDED BY SOUTHEASTERN SURVEYING, INC., DATED 12/16/09.

- LEGEND**
- HC-1A HORIZONTAL COLLECTOR VERTICAL BORING
 - ⬢ EW-10 LFG EXTRACTION WELL
 - ⬢ EW-46 DOWNSLOPE LFG EXTRACTION WELL
 - ⬢ EW-88 CAISSON LFG EXTRACTION WELL
 - ⬢ EW-12R REMOTE WELLHEAD LOCATION
 - ⬢ UT-2 SLOPED CONDENSATE U-TRAP
 - ⬢ CS-1 CONDENSATE SUMP WITH PUMP
 - ⬢ CT-5 SELF-DRAINING CONDENSATE TRAP
 - ⬢ HC-18R UPSLOPE HORIZONTAL COLLECTOR WELLHEAD
 - ⬢ V-2 HEADER ISOLATION VALVE
 - ⬢ AR-24 HEADER ACCESS RISER
 - ⬢ BLIND FLANGE FOR FUTURE EXPANSION
 - ⬢ AV-2 AIR ISOLATION VALVE/BLOWOFF
 - ⬢ CV-3 CONDENSATE DRAIN LINE ISOLATION VALVE
 - 10" HEADER/LATERAL DIAMETER
 - HP HIGH POINT
 - HEADER/LATERAL PIPE
 - AIR SUPPLY LINE
 - CONDENSATE DRAIN LINE/LEACHATE DEWATERING LINE
 - ROAD CROSSING
 - EXISTING LEACHATE COLLECTION SYSTEM CLEANOUT
 - PUMP STA. B EXISTING PUMP STATION
 - ABANDONED PASSIVE GAS FLARE
 - LIMIT OF LANDFILL
 - EXISTING LEACHATE FORCE MAIN
 - PHASE LIMIT
 - HORIZONTAL COLLECTOR PERFORATED PIPE
 - APPROXIMATE LIMIT OF LIFT 12
 - CDW DIRECTION OF CONDENSATE/DEWATERING LIQUID FLOW
 - LFG DIRECTION OF LANDFILL GAS FLOW

RECORD DRAWING

DATE: APRIL 15, 2010

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SITE PLAN - 3

SOUTHEAST COUNTY LANDFILL
LANDFILL GAS COLLECTION
AND CONTROL SYSTEM PROJECT

HILLSBOROUGH COUNTY
SOLID WASTE
MANAGEMENT DEPARTMENT
TAMPA, FLORIDA

CLIENT

SCS ENGINEERS
STEARN, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
404 PARK GARDEN BLVD., SUITE 100, TAMPA, FL 33610
813-821-0880 FAX 813-823-6757
FLORIDA CERTIFICATE OF AUTHORIZATION NO. 00008892
PRG: NO. 09207055.00
DWN: BY: DAW/CNT
CHK: BY: DRC
APP: BY: RUD

CADD FILE: 075500PROP

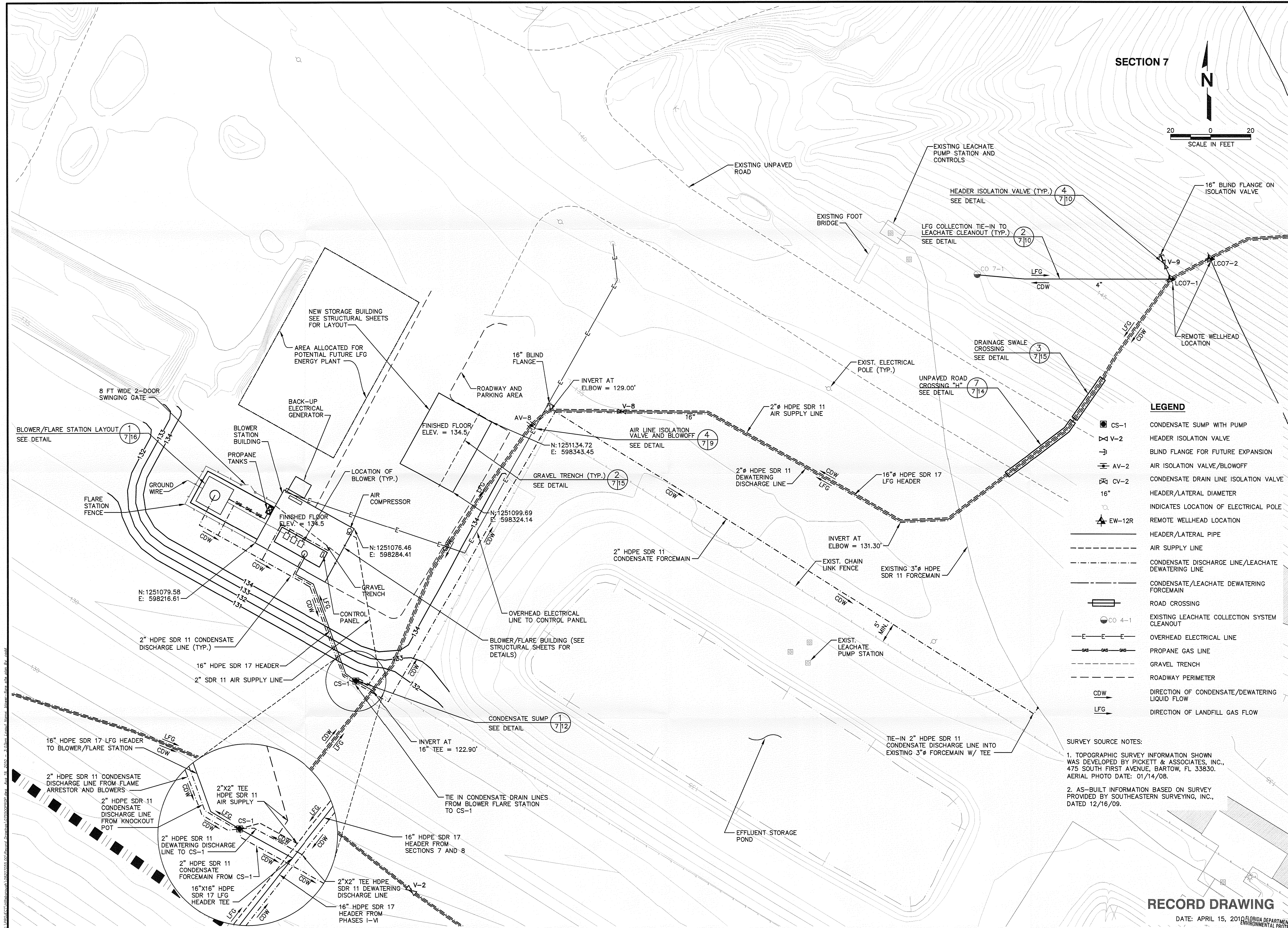
DATE: OCTOBER 8, 2008

SCALE: AS SHOWN

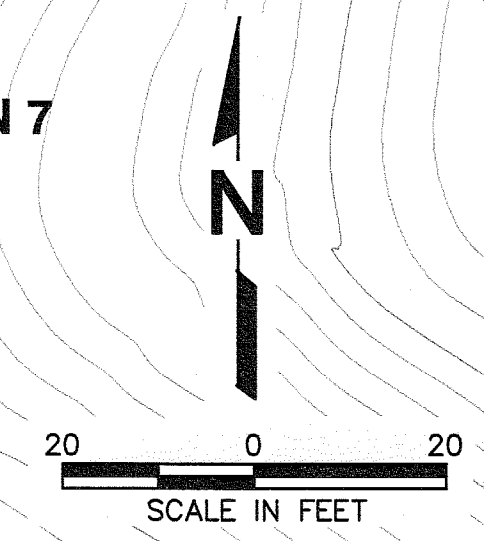
DRAWING NO.

RECORD DRAWING
DATE: APRIL 15, 2010

6 of 30



SECTION 7



LEGEND

- CS-1 CONDENSATE SUMP WITH PUMP
- V-2 HEADER ISOLATION VALVE
- BLIND FLANGE FOR FUTURE EXPANSION
- AV-2 AIR ISOLATION VALVE/BLOWOFF
- CV-2 CONDENSATE DRAIN LINE ISOLATION VALVE
- 16" HEADER/LATERAL DIAMETER
- EW-12R INDICATES LOCATION OF ELECTRICAL POLE
- REMOTE WELLHEAD LOCATION
- HEADER/LATERAL PIPE
- AIR SUPPLY LINE
- CONDENSATE DISCHARGE LINE/LEACHATE DEWATERING LINE
- CONDENSATE/LEACHATE DEWATERING FORCEMAIN
- ROAD CROSSING
- EXISTING LEACHATE COLLECTION SYSTEM CLEANOUT
- OVERHEAD ELECTRICAL LINE
- PROPANE GAS LINE
- GRAVEL TRENCH
- ROADWAY PERIMETER
- CDW DIRECTION OF CONDENSATE/DEWATERING LIQUID FLOW
- LFG DIRECTION OF LANDFILL GAS FLOW

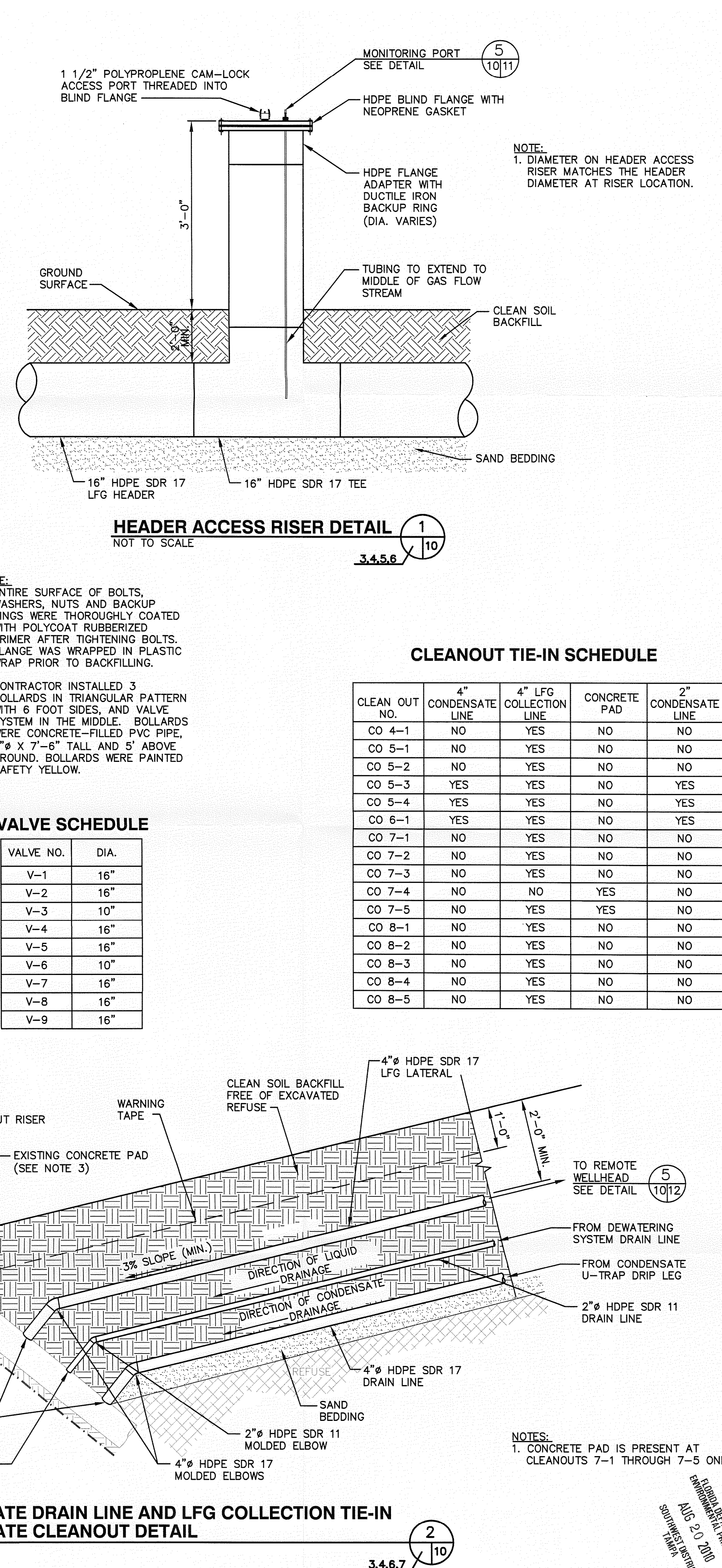
SURVEY SOURCE NOTES:

1. TOPOGRAPHIC SURVEY INFORMATION SHOWN WAS DEVELOPED BY PICKETT & ASSOCIATES, INC., 475 SOUTH FIRST AVENUE, BARTOW, FL 33830. AERIAL PHOTO DATE: 01/14/08.
2. AS-BUILT INFORMATION BASED ON SURVEY PROVIDED BY SOUTHEASTERN SURVEYING, INC., DATED 12/16/09.

BY	DESCRIPTION
DRC	REVISION FOR THE RECORD
DRC	REVISED PER CERTIFICATION
	REPORT RAI #1
REV	DATE
4/15/10	8/12/10
DRAWING TITLE SITE PLAN - BLOWER/FLARE STATION	
PROJECT TITLE SOUTHEAST COUNTY LANDFILL LANDFILL GAS COLLECTION AND CONTROL SYSTEM PROJECT	
CLIENT HILLSBOROUGH COUNTY SOLID WASTE MANAGEMENT DEPARTMENT TAMPA, FLORIDA	
CADD FILE: 075500PROP	
DATE: OCTOBER 8, 2008	
SCALE: AS SHOWN	
DRAWING NO. 7 of 30	
AUG 20 2010 SOUTHWEST DISTRICT TAMPA	

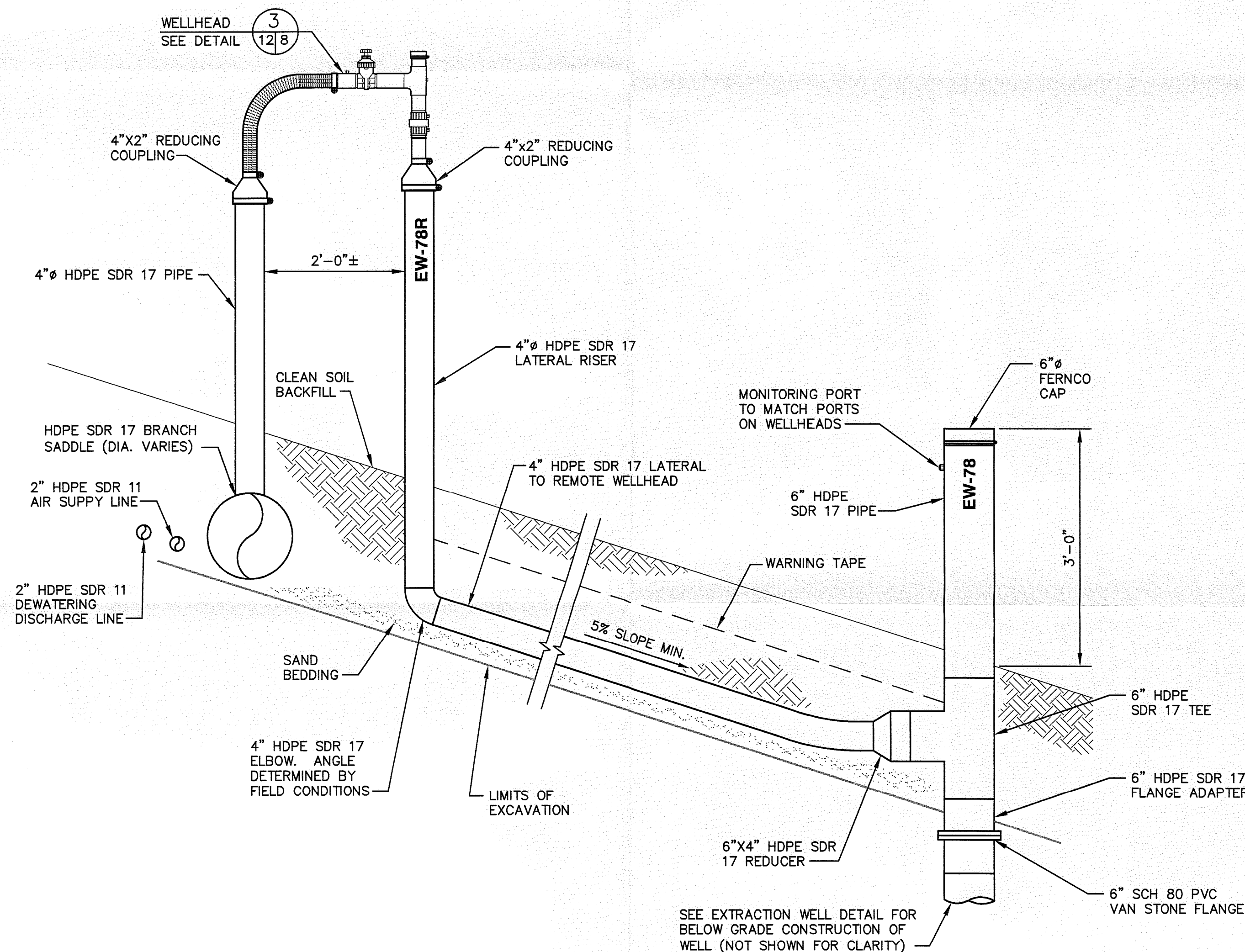
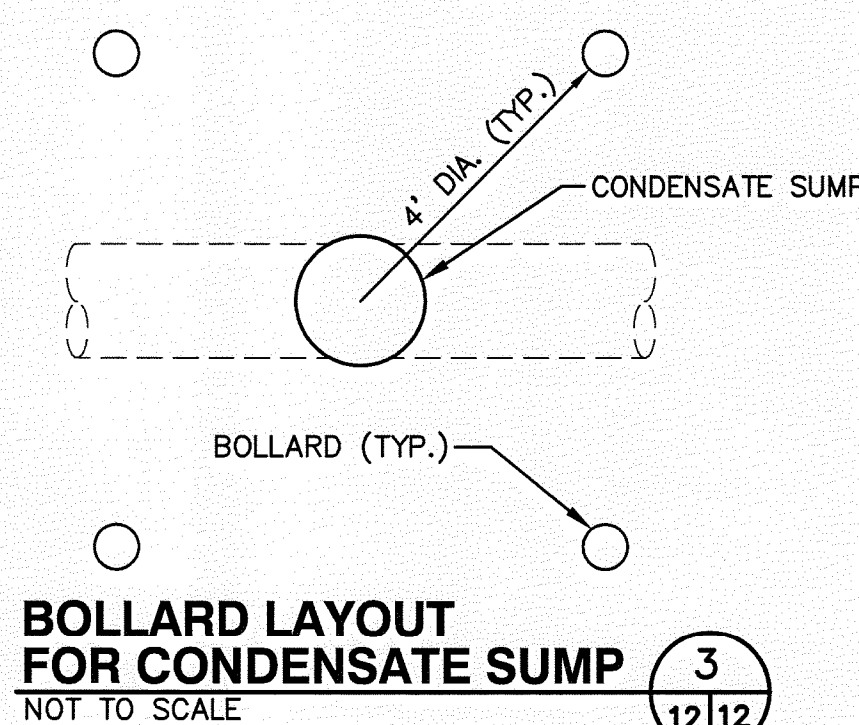
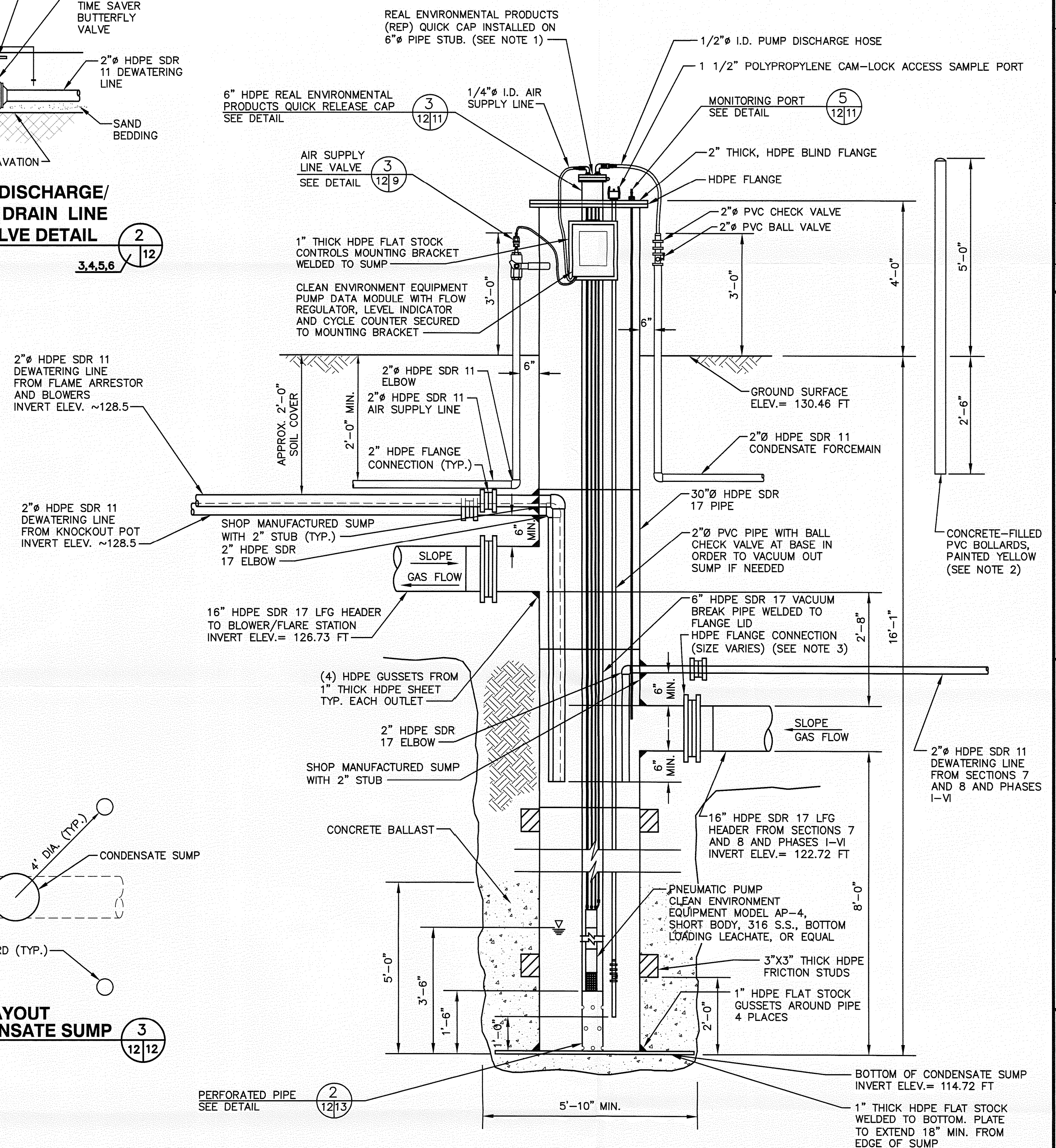
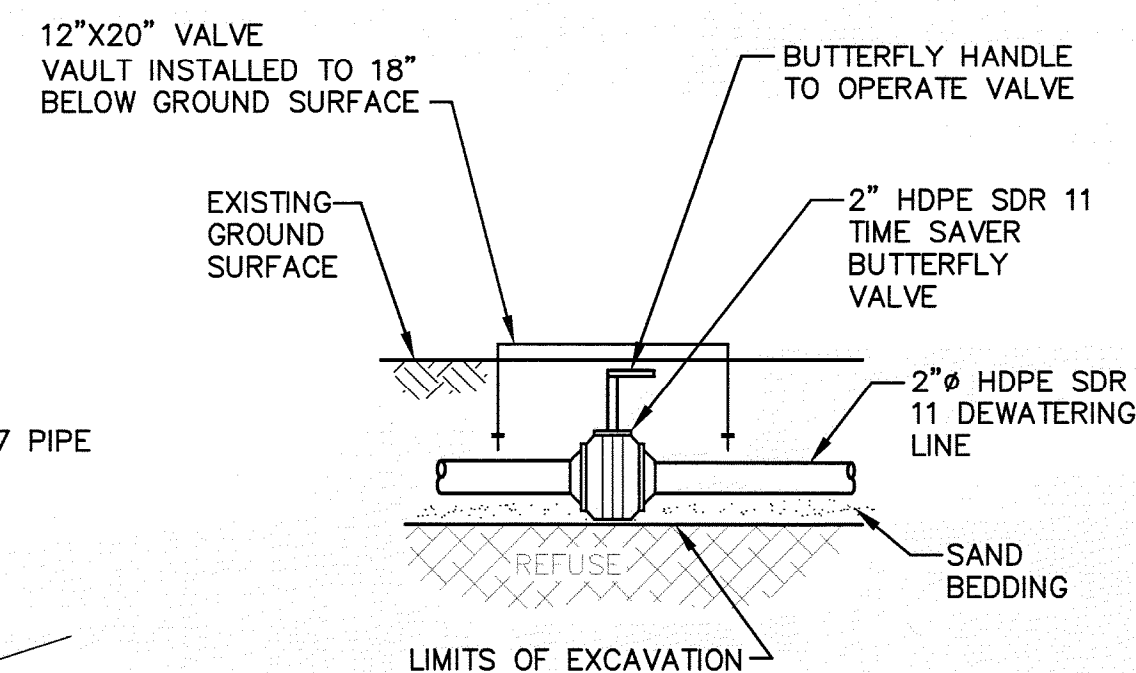
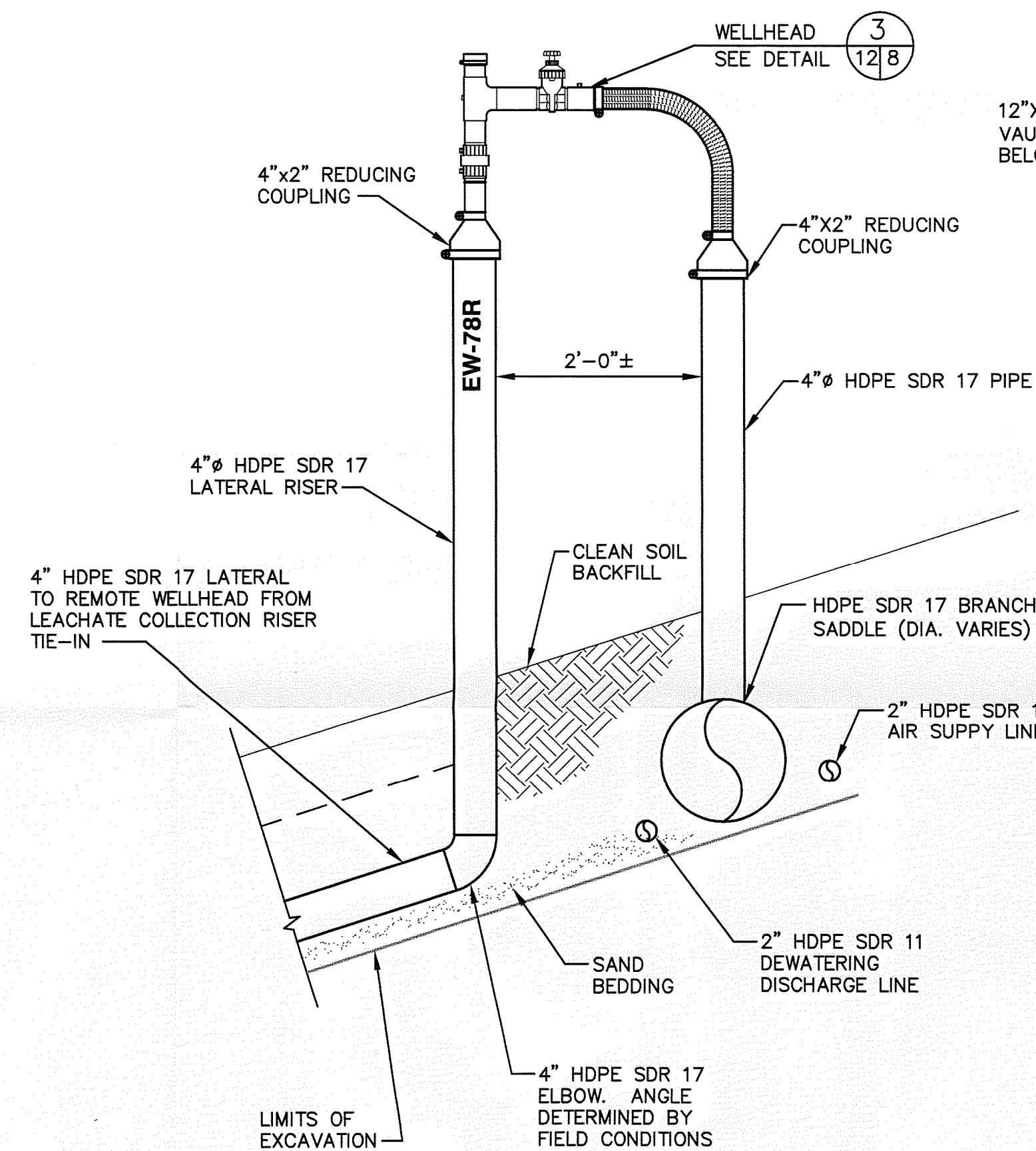
RECORD DRAWING

DATE: APRIL 15, 2010 FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION



CLEAN OUT NO.	4" CONDENSATE LINE	4" LFG COLLECTION LINE	CONCRETE PAD	2" CONDENSATE LINE
CO 4-1	NO	YES	NO	NO
CO 5-1	NO	YES	NO	NO
CO 5-2	NO	YES	NO	NO
CO 5-3	YES	YES	NO	YES
CO 5-4	YES	YES	NO	YES
CO 6-1	YES	YES	NO	YES
CO 7-1	NO	YES	NO	NO
CO 7-2	NO	YES	NO	NO
CO 7-3	NO	YES	NO	NO
CO 7-4	NO	NO	YES	NO
CO 7-5	NO	YES	YES	NO
CO 8-1	NO	YES	NO	NO
CO 8-2	NO	YES	NO	NO
CO 8-3	NO	YES	NO	NO
CO 8-4	NO	YES	NO	NO
CO 8-5	NO	YES	NO	NO

VALVE NO.	DIA.
V-1	16"
V-2	16"
V-3	10"
V-4	16"
V-5	16"
V-6	10"
V-7	16"
V-8	16"
V-9	16"



RECORD DRAWING
DATE: APRIL 15, 2010

SUS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS
 4041 PARK OAKS BLVD., SUITE 100, TAMPA, FL 33610
 813 621-0080 FAX 813 624-6757
 FLORIDA CERTIFICATE OF AUTHORIZATION NO. 00040892

Q/A REV. BY: DHP
 APP. BY:
 DRC

ADD FILE: 0755000DETL1

DATE: OCTOBER 8, 2008

SCALE: NOT TO SCALE

DRAWING NO. 12 of 30

OWN: SDA/RDJ
 CHG: BNY
 DAW/DRC

HILLSBOROUGH COUNTY
SOLID WASTE
MANAGEMENT DEPARTMENT
TAMPA, FLORIDA

Q/A REV. BY: DHP
 APP. BY:
 DRC

DETAILS - 5

Q/A REV. BY: DHP
 APP. BY:
 DRC

SOUTHEAST COUNTY LANDFILL
LANDFILL GAS COLLECTION
AND CONTROL SYSTEM PROJECT

Q/A REV. BY: DHP
 APP. BY:
 DRC

PROJECT TITLE

Q/A REV. BY: DHP
 APP. BY:
 DRC

REVISIONS

Q/A REV. BY: DHP
 APP. BY:
 DRC

REVISIONS

Q/A REV. BY: DHP
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 DRC

REVISIONS

Attachment 4

Horizontal Collector Survey

ATTACHMENT 4

Southeast County Landfill Gas Collection and Control System
 Bid No. C-0031-09(DV)
 C.I.P. CP54051064

Horizontal Collector Pipe Survey Information. Ground shots taken from As-Built survey submitted by Southeast Environmental Contracting, Inc.

Horizontal Collector	Survey Point No.	Northing	Easting	Elevation	Comments
HC-1	1115	1250821.4	595170.2	151.5	Per survey drawing
	1083	1250819.3	595176.5	152.2	
	1076	1250758.7	595241.8	158.8	
	2771	1250717.8	595349.3	169.9	
	2767	1250508.4	595769.7	182.1	
	End of pipe	1250468.6	595849.7	185.4	
HC-2	1120	1250939.4	595187.9	144.8	Per survey drawing
	1101	1250931.7	595206.4	150.4	
	1092	1250876.2	595307.4	161.2	
	2772	1250852.4	595376.5	169.2	
	2770	1250811.1	595476.9	169.7	
	2768	1250722.5	595692.6	180.2	
	2766	1250645.4	595880.0	184.2	
	End of pipe	1250613.4	595957.7	187.1	
HC-3	1127	1251089.2	595207.7	140.1	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1130	1251094.4	595245.0	148.4	
	1095	1251020.7	595347.7	159.4	
	1457	1250939.5	595541.3	173.7	
	2769	1250891.5	595647.6	174.5	
	1459	1250814.4	595814.2	183.7	
	2765	1250689.1	596070.9	189.8	
HC-4	1148	1251218.9	595213.4	135.9	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1141	1251214.4	595251.5	145.6	
	1137	1251211.2	595270.7	148.1	
	2762	1251095.1	595557.9	169.3	
	2763	1250953.2	595868.4	179.2	
	2764	1250852.1	596090.4	189.3	
	End of pipe	1250791.4	596223.5	193.2	
HC-5	1167	1251381.3	595256.3	136.9	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1179	1251367.3	595280.5	145.2	
	1177	1251356.6	595306.2	148.7	
	1241	1251309.5	595423.7	157.7	
	2761	1251292.9	595467.1	166.5	
	1455	1251232.6	595599.9	172.3	
	1461	1251104.5	595882.8	181.1	
	2760	1251024.3	596060.2	183.5	
	End of pipe	1250950.7	596223.4	188.8	
HC-6	1197	1251513.2	595362.1	146.2	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1200	1251531.6	595379.5	151.4	
	1243	1251463.3	595448.8	153.2	
	2756	1251414.0	595582.0	165.5	
	2757	1251356.1	595699.8	170.1	
	2758	1251282.8	595849.9	173.6	
HC-7	1210	1251641.8	595471.7	152.6	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1244	1251574.0	595575.3	157.2	
	2755	1251513.5	595652.6	165.0	
	2754	1251444.4	595732.4	169.9	
	2753	1251435.9	595756.0	168.6	
	1454	1251447.6	595812.7	173.0	
	2752	1251450.4	595862.5	169.0	
	2751	1251431.6	595925.5	169.9	
HC-8	1219	1251810.3	595637.9	145.0	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1226	1251769.8	595649.7	155.4	
	1247	1251695.0	595709.6	158.2	
	2750	1251641.9	595764.7	164.5	
	2749	1251535.0	595886.5	167.8	
HC-9	1283	1251796.3	595981.3	156.3	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1285	1251710.9	595981.9	161.1	
	2748	1251578.8	595982.5	166.2	
	2747	1251438.4	595980.8	170.3	
	2746	1251294.5	595977.6	175.4	
	2745	1251193.8	595975.8	178.5	
HC-10	2759	1251161.4	595977.3	179.4	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AUG 20 2010 SOUTHWEST DISTRICT TAMPA
	1301	1251886.0	596126.5	144.9	
	1306	1251867.1	596128.3	152.5	
	1287	1251743.2	596136.4	157.9	
	1452	1251547.4	596141.8	171.8	
	2743	1251368.1	596149.3	176.0	
	1463	1251222.3	596155.6	183.2	
	2744	1251111.7	596161.3	182.5	

Horizontal Collector	Survey Point No.	Northing	Easting	Elevation	Comments
HC-11	1319	1251885.0	596281.5	150.9	Per survey drawing
	1324	1251870.4	596281.7	156.5	
	1327	1251774.9	596286.5	159.1	
	2742	1251706.0	596291.1	166.1	
	2741	1251476.5	596299.8	171.2	
	2740	1251333.9	596304.4	178.2	
	2739	1251187.2	596308.5	180.3	
	2738	1251040.8	596310.7	186.7	
	2737	1250947.8	596312.2	189.8	
	End of pipe	1250908.1	596312.9	191.1	
HC-12	1340	1251900.4	596447.4	155.1	Per survey drawing
	1331	1251871.5	596441.0	157.6	
	1328	1251790.8	596433.7	159.2	
	2733	1251663.6	596436.5	167.8	
	2734	1251594.2	596438.2	167.7	
	1449	1251527.4	596441.5	173.5	
	2735	1251349.5	596449.5	175.5	
	1465	1251251.5	596453.8	181.7	
	2736	1251091.9	596461.8	184.6	
	End of pipe	1250943.6	596469.2	190.0	
HC-13	1393	1251909.7	596590.5	146.6	Per survey drawing
	1396	1251886.1	596590.4	153.1	
	1382	1251779.1	596585.1	160.9	
	2732	1251554.7	596589.0	170.5	
	2731	1251372.4	596596.0	175.3	
	2730	1251269.3	596600.1	180.3	
	2729	1251073.7	596612.5	184.5	
	2728	1250880.7	596609.4	190.5	
	No point no.	1251906.9	596728.8	141.9	
HC-14	1373	1251886.4	596734.3	143.7	Per survey drawing
	1376	1251874.1	596737.6	145.5	
	1377	1251841.6	596724.0	151.3	
	1448	1251502.7	596741.7	174.9	
	2726	1251366.2	596751.6	175.0	
	1467	1251230.2	596759.3	182.9	
	1471	1250728.6	596785.8	197.2	
	2727	1250555.0	596796.7	197.7	
	End of pipe	1250721.8	596954.7	200.4	
HC-15	1424	1251868.5	596797.2	142.5	Per survey drawing
	1418	1251810.2	596817.0	153.3	
	1445	1251614.3	596888.2	171.8	
	2725	1251484.8	596896.3	175.1	
	2724	1251377.4	596909.6	178.0	
	2723	1251252.9	596921.6	183.7	
	2722	1251111.5	596935.9	187.9	
	1469	1251026.7	596939.3	195.0	
	2721	1250950.9	596944.8	193.3	
	End of pipe	1250721.8	596954.7	200.4	
HC-16	1490	1251196.3	597646.5	142.0	Per survey drawing
	1485	1251172.8	597636.4	148.9	
	1478	1251031.1	597555.8	173.2	
	2785	1250912.9	597499.8	184.8	
	2784	1250769.5	597423.3	190.5	
	1972	1250613.9	597348.3	199.4	
	2783	1250462.2	597270.3	203.5	
HC-17	1573	1250725.8	598256.2	153.5	Per survey drawing
	1578	1250714.7	598235.2	159.4	
	1556	1250634.1	598104.3	174.5	
	1667	1250563.1	597973.7	186.2	
	2782	1250475.0	597817.9	195.1	
	2781	1250392.9	597671.3	199.3	
HC-18	1773	1250018.9	598515.2	172.4	Per survey drawing
	1777	1250031.1	598491.6	175.8	
	1778	1250053.4	598403.9	178.8	
	1781	1250088.3	598312.7	186.8	
	2780	1250127.9	598188.5	191.6	
	2779	1250167.3	598061.7	195.1	
HC-19	1906	1249608.2	597686.3	169.1	Per survey drawing
	1858	1249693.8	597824.7	176.1	
	2778	1249759.7	597816.3	183.2	
	2777	1249903.7	597762.7	189.0	
	1969	1249953.3	597745.7	190.9	
	2776	1250098.6	597692.8	198.9	

Horizontal Collector	Survey Point No.	Northing	Easting	Elevation	Comments
HC-20	1951	1249709.3	597216.3	178.4	Per survey drawing
	1954	1249726.3	597204.1	177.5	
	HC-20A	1250180.5	597195.9	197.0	
	2775	1250273.6	597192.8	197.9	
	2774	1250362.1	597193.3	201.7	
HC-21	5659	1249696.3	596731.7	153.3	Per survey drawing
	HC-21A	1250104.0	596639.9	188.0	
	2088	1250417.3	596599.2	202.6	
	2773	1250435.2	596596.7	198.2	
HC-22	2475	1251935.1	599257.3	182.5	
	19	1251962.5	599146.9	156.6	
	20	1251781.7	598930.1	141.0	
HC-23	2474	1251924.6	599257.9	184.4	
	21	1251916.1	599208.7	174.0	
	22	1251687.5	598928.6	153.9	
HC-24	5660	1251228.6	598766.7	167.7	
	2534	1251300.8	598738.4	175.6	
	2533	1251303.3	598737.3	175.9	
	2786	1251334.9	598720.6	174.4	
	2787	1251368.6	598703.6	166.4	
	2788	1251400.2	598698.4	162.7	
	2793	1251456.3	598716.8	155.7	
	2798	1251545.7	598780.0	152.4	
	2797	1251588.4	598807.9	151.5	
	2796	1251677.6	598869.2	150.5	
HC-25	2664	1251229.0	598773.1	168.6	
	2529	1251314.2	598753.6	179.3	
	2528	1251318.9	598755.0	179.5	
	2789	1251352.6	598752.9	178.4	
	2790	1251382.8	598750.5	173.1	
	2791	1251412.0	598753.7	169.0	
	2792	1251450.5	598772.9	166.1	
	2794	1251533.9	598830.7	166.4	
	2795	1251623.7	598891.2	162.8	