September 30, 2010

Steven G. Morgan
Solid Waste Section
Southwest District Office
13051 North Telecom Parkway
Temple Terrace, Florida 33637-0926

RE: Response to Request for Additional Information
Central County Solid Waste Disposal Complex, Sarasota County
Phase I, Sequence 1 Gas Collection/ Control System Construction Certification
Permit No.: 130542-009-SO/08
WACS No.: SWD/58/51614

Dear Mr. Morgan:

On behalf of Sarasota County, HDR Engineering, Inc. (HDR) is pleased to provide the following information in response to the Florida Department of Environmental Protection's (FDEP) September 10, 2010 Request for Additional Information (RAI # 1) regarding the Central County Solid Waste Disposal Complex - Phase I, Sequence 1 Gas Collection/Control System Construction Certification.

All revisions to the narrative reports are shown with deletions struckthrough (~~struckthrough~~) and additions underlined (underlined) along with a change line indicator in the left margin.

Responses to each of the comments in the September 10, 2010 RAI are provided below in the same order presented in the RAI. In each case the FDEP request is repeated in italics with the response immediately following in **bold**.

The following appendices are enclosed with the response document and are referenced in the responses to comments:

APPENDIX A REVISED CERTIFICATION OF CONSTRUCTION COMPLETION REPORT

HDR Engineering, Inc.
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CERTIFICATION OF CONSTRUCTION COMPLETION – DEP FORM # 62-701.900(2)

Comment 1. *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 listed in Section 1.0 of the construction completion report, nor does it appear that "no significant deviations occurred during construction". Please verify and revise the narrative in Section 1.0 of the report to identify all changes in plans and a description of the cause of the deviations from the plans and application approved by the Department, in accordance with Specific Condition #B.2.a.(3) of Permit 130542-009-SC/08.*

Response 1: The Landfill Gas Collection and Control System (LFGCCS) Sequence 1 was constructed in general accordance with Permit No. 130542-009-SC/08 (Permit) and associated permit drawings. The deviations as stated in the Certification of Construction Completion Report were evaluated to determine if they were in compliance and to ensure they met or exceeded the general requirements of the gas collection system. The deviations were necessary in order to comply with general standards and to facilitate construction and installation. Therefore, the deviations stated were not considered "significant" for the construction of the LFGCCS Sequence 1.

A revised Certification of Construction Completion Report has been included in Appendix A. The revised report provides a more detail explanation of minor deviations during construction of the gas collection system.

Comment 2. *Except for the change from dual containment condensate force main pipe to a single pipe discussed in Section 4.5 of the construction completion report, Department records do not appear to indicate that a permit modification was applied for and issued by the Department for the construction deviations discussed in Section 1.0 of the construction completion report identified in the Department comments provided below, or that these deviations were otherwise approved by the Department in accordance with Specific Condition #A.3.a. of the Permit No. 130542-009-SC/08. This appears to constitute a violation of Rule 62-701.320(1), F.A.C. Please verify and provide an explanation of why prior approval of these changes was not obtained from the Department, in accordance with Specific Condition #A.3.a. of Permit No. 130542-009-SC/08.*

Response 2: As stated in Response 1 above, the deviations as stated in the Certification of Construction Completion Report were evaluated to determine if they were in compliance with the general requirements of the gas collection system Permit. The deviations were necessary in order to comply with general standards and to facilitate construction and installation. Therefore, the deviations stated were not considered "significant" for the

construction of the LFGCCS Sequence 1 and were not interpreted as a violation of Rule 62-701.320(1).

CERTFICATION OF CONSTRUCTION COMPLETION REPORT

Comment 3. ***Section 1.0****:*

a. *Please revise this section to indicate whether the remainder of the Phase I Sequence 1 gas system will be installed when the southeast corner reaches final design grade or as part of the Phase I Sequence 2 gas system construction.*

Response 3a: The remainder of the LFGCCS Sequence 1 (Gas Wells 27 through 29 with corresponding header, laterals, airline, forcemain lines, sump and valve pits) at the southwest corner of Phase I will be installed as part of the Phase I Sequence 2 gas system during partial closure of the Phase I landfill. It is anticipated that construction of the partial closure for the Phase I landfill will commence in the first half of 2011. Please refer to the revised Certification of Construction Completion Report (Appendix A).

b. *In addition to the replacement of a knockout pot with an HDPE wye at the southeast corner of Phase I, all other knockout pots that were part of the permitted design of the Phase I gas system do not appear to have been constructed. Department records do not appear to indicate that a permit modification or prior Department approval was obtained for this construction modification. Please verify and explain the cause and/or justification for this construction modification, including all supporting information and/or calculations utilized, and revise the appropriate sections of the construction certification report accordingly.*

Response 3b: Sheet 00C-03A of the permit drawings submitted as part of the RAI # 1 (dated March 2009) indicated knockout pots at the northwest and southwest areas, intersection of the south and east slope, intersection of the 18", 24" and 30" header lines at the southeast corner, and north of the flare station.

The knockout pots located at the northwest and southwest areas of the Phase I landfill were to serve as a transition for the future LFGCCS expansion for Phase II. Given that Phase II will not require an active LFGCCS in the near future, these knockout pots would provide no benefit since the adjacent U-trap U-3 and Sump S-1 serve as condensate knockouts. (Note that Sump S-1 will be installed as part of the Phase I Sequence 2 gas system during partial closure of the Phase I landfill). Therefore, the knockouts at the northwest and southwest corners of Phase I were not required and were not installed.

The knockout pot at the southeast corner (intersection of south and east slopes) was initially designed as more of a junction box to allow for the sharp turn northward. However, the contractor was able to install the 18-inch header pipe using a large radius sweep and therefore the knockout was not required given that the condensate drains to the installed wye and then to Sump S-3.

The knockout pot located at the southeast corner (intersection of the 18", 24" and 30" header lines) was replaced with a wye which serves as a knockout which drains the condensate to Sump S-3.

The knockout pot near the flare station was retrofitted with a pump (renamed as Sump S-5) since it is anticipated that significant condensate will drain to Sump S-5 from the header system and the skid-mounted knock out. Sump S-5 serves not only as a knockout but also a condensate pump station. Therefore, other than installing a pump in the knockout, the knockout across from the flare station has not been deleted.

In addition, the flare knockout pot located on the blower skid is the primary liquid stripping mechanism which contains a moisture separator for improved moisture removal efficiency. Please refer to the revised Certification of Construction Completion Report included in Appendix A.

Comment 4. ***Section 2.2.4****: Section 3.4 of the approved Engineering Report states, "Initially, two blowers will be installed to collect the gas from the landfill." And "One blower will be operated at any given time to insure continuous system operation. Typically, the blowers will be utilized on an alternating basis to reduce wear and tear, and to allow service on one of the blowers while the other is operation." This section indicates and Sheet 00C-06 of the as-built drawings shows that only one blower was installed. This appears to be a deviation from the plans and application approved by the Department in Permit No. 130542-009-Sc/08. Department records do not appear to indicate that a permit modification or prior Department approval was obtained for this construction modification. Please verify and explain cause and/or justification for this construction modification, including all supporting information and/or calculations utilized, and revise this section of the construction certification report accordingly.*

Response 4:

The Permit drawings and Operations Plan indicated two blowers. However, as shown on the drawings (e.g., Drawing 00C-06, Note 4), the blower skid layout was for information only and subject to change based on the final design by the blower/flare manufacturer. HDR anticipated up to two blowers based on initial discussions with the flare vendor. The final design of the blower/flare station as provided by the manufacturer required only one

blower to meet the required LFG flow rate from the Phase I landfill. The final design by the blower/flare manufacturer was provided at the beginning of construction of the Phase I LFGCCS, after the FDEP construction permit was issued.

The CCSWDC Title V permit indicates that the facility is not regulated under the New Source Performance Standards (NSPS). Therefore, the facility is not required to continually operate the LFGCCS. A Tier 2 analysis was performed for the site in July 2010. The result of the Tier 2 testing indicates that the site will not trip the NSPS threshold of 50Mg of NMOC emissions until 2017. However, it is the intent to operate the LFGCCS continuously unless the system needs to be down for short-term, periodic maintenance.

In addition, Sarasota County is currently in the process of developing a LFG to Energy Facility (LFGTE) at the site, to be located adjacent to the blower/flare skid. The LFGTE facility will serve as the primary gas moving equipment whereby the blower/flare skid will serve as a redundant system in the event of a malfunction and/or maintenance shut-down of the LFGTE system.

Comment 5. ***Section 4.6****: This section indicates that constructed Condensate Sump S-5 is a 48-inch diameter condensate sump, instead of the permitted 36-inch diameter condensate sump design. Sheet 00C-03 indicates that Condensate Sump S-5 was constructed at the location where a knockout pot was to be installed in the gas header line immediately prior to the landfill flare station and that the knockout pot was not constructed. This construction modification appears to be a deviation from the plans and application approved by the department in Permit No. 130542-009-SC/08. Department records do not appear to indicate that a permit modification or prior Department approval was obtained for this construction modification. Please verify and explain cause and/or justification for this construction modification, including all supporting information and/or calculations utilized, and revise this section of the construction certification report accordingly.*

Response 5: Please see Response 3b in regards to the knockout pot removal from the LFGCCS Sequence 1. Sump S-5 from the approved Engineering Report was to be located along the 30" header line west of the yard waste processing area. Due to renumbering of the sumps, Sump S-5 from the approved design was replaced with Sump S-4. Sump S-4 is a 36" diameter HDPE. The knockout pot originally designed to be installed north of the Flare Station was retrofitted with a pump (renamed as Sump S-5). The Sump S-5 was increased from 36-inch diameter pipe to a 48-inch diameter pipe to provide for additional storage capacity. The increase in sump size does not reduce or hinder the function of the gas collection system. Sump S-5 serves as

a knockout pot and has a pump for discharging the collected condensate to the leachate collection system within Phase I. Moreover, Sump S-5 also receives the most liquid from the gas collection system, primarily from the moisture separator pad and the compressor drying towers. The increased size gives the Sump S-5 greater storage capacity if there are any issues with the sump pump. Please refer to the revised Certification of Construction Completion Report included in Appendix A.

Appendix G – Phase I Landfill GCCS As-Built Drawings

Please provide revised drawings that address the comments provided above and below, including all necessary details for the certification of the construction of the GCCS. ***The drawings may be reviewed in their entirety after the responses to these requests for information are submitted.***

Comment 6. ***Sheet 00C-03A & 00C-03C****: Please explain the changes in location of the access points adjacent to GW-8 and GW-23.*

Response 6: The access points near GW-8 and GW-23 were moved to allow for easier connection for the Phase 1 Sequence 2 lateral lines from the top deck. The moving of the access points will still allow future access to the LFGCCS after closure. No changes to As-Built Drawings are required. Information already provided to FDEP as part of Certification of Construction Completion Report is still valid.

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

Comment 7. In accordance with Specific Condition #C.1.b. of Permit No. 130542-009-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. Permit Modification #130542-010-SO/MM, authorizing operation of the GCCS once construction certification is completed and approved by the Department, was issued on June 18, 2009. However, as indicated above, the certification of construction completion is not approved at the time.

Response 7: We respectfully request that the solid waste bureau review this response letter as quickly and conveniently as possible. In addition, please see response below.

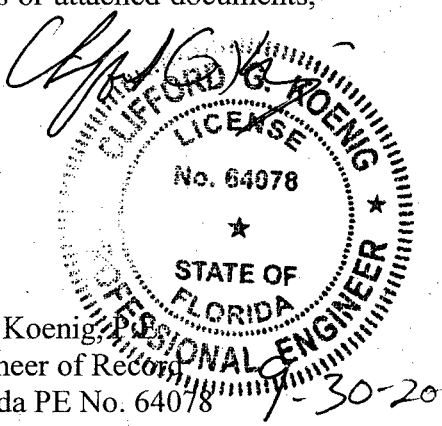
In accordance with Specific Condition #C.1.b., temporary operation of the system was authorized for up to 180 days to allow for system start-up and operational adjustments while the certification of construction completion and permit modification submittals and approvals required by this specific condition were completed. On May 25, 2010, the Department's Air Section received notification of start-up operations for the Phase I landfill gas collection and control system flare station at the Central County Solid Waste Disposal Complex on May 18, 2010. Based on the May 18, 2010 start-up date, authorization for the temporary operation of the system expires on November 19, 2010.

Response: We respectfully request an extension to allow operation of the LFGCCS Sequence 1 at the Central County Solid Waste Disposal Complex (CCSWDC) until the FDEP issues the certification of construction completion acceptance. Continued operation of the LFGCCS would allow the CCSWDC to reduce landfill gas emissions and hazardous air pollutants, reduce the potential for vegetative cover to be damaged, reduce the potential for odors and reduce the potential for landfill gas migration outside the waste limits. Furthermore, this would allow the CCSWDC to greatly reduce greenhouse gas emissions through the combustion of methane which is approximately 21 times more powerful at warming the atmosphere than carbon dioxide (CO_2) by weight. CCSWDC staff has been trained in the typical operation and maintenance procedures for the LFGCCS. It would be more beneficial to allow the continued operation of the LFGCCS to reduce hazardous air pollutants, reduce the potential for landfill gas migration and reduce greenhouse gas emissions.

If you have any questions or concerns regarding the comment responses or attached documents, please contact me at (813) 282-2776 or (813) 270-8058.

Sincerely,
HDR Engineering, Inc.

Richard A. Siemering
Solid Waste Section Manager



Cliff Koenig, P.E.
Engineer of Record
Florida PE No. 64078

9-30-2010

cc: Spencer Anderson, P.E.,Sarasota County
Jack Gibson, Sarasota County
Gary Bennett, Sarasota County
Lois Rose, Sarasota County

APPENDIX A
REVISED CERTIFICATION OF CONSTRUCTION COMPLETION REPORT

Sarasota County
Solid Waste Operations

Central County Solid Waste Disposal Complex
Phase I – Sequence 1
Landfill Gas Collection and Control System
Certification of Construction Completion Report

August 2010
Revised September 2010

Prepared by
HDR Engineering, Inc.
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Sarasota, Florida 34232-6212
(941) 342-2700

HDR Project No. 124467-096
Florida Certification of Authorization No. 00004213

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ATTACHMENTS

1.0 INTRODUCTION

On behalf of Sarasota County Solid Waste Operations (SWO), HDR Engineering, Inc. (HDR) has prepared this Certification of Construction Completion Report to document the construction activities of the Phase I Landfill Gas Collection and Control System (LFGCCS) at the Central County Solid Waste Disposal Complex (CCSWDC). The Phase I LFGCCS construction included only the first sequence of wells and piping on the side slopes of Phase I up to a maximum elevation 80 feet (Sequence 1) and not in the active disposal area. The landfill gas collection system will be expanded into further areas of the Phase I landfill after final build-out elevations have been reached (Sequence 2) during closure construction activities for Phase I currently being permitted under FDEP File No. 130542-014-SF/01.

Construction of the Phase I LFGCCS Sequence 1 began on January 19, 2010, and Final Completion was achieved by the Contractor on June 14, 2010. HDR provided Engineer of Record (EOR) and Construction Quality Assurance (CQA) services to SWO throughout the duration of the project. Ardaman and Associates, Inc. (Ardaman) was retained by HDR to provide as requested testing services during the construction of the project.

HDR's responsibilities during construction of the Phase I LFGCCS Sequence 1 included:

- Original design and construction documents;
- Daily CQA monitoring of all construction activities;
- Attendance at progress meetings during construction;
- Review of shop drawings and other contractor submittals;
- Review and address contractor Requests for Information (RFI) during construction;
- Review of contractor's pay requests; and
- Preparation of the Certification of Construction Completion Report for submittal to FDEP.

The CQA activities were performed to confirm that the construction materials and procedures were in compliance with the Construction Permits No. 130542-009-SC/08 dated July 15, 2009, and 1150089-005-AC dated August 5, 2009 issued by the Florida Department of Environmental Protection (FDEP), Southwest District and in accordance with Chapter 62-701, Solid Waste Management Facilities, and Florida Administrative Code (FAC). A copy of the Phase I LFGCCS construction permits are provided in Attachment A.

The Phase I LFGCCS Sequence 1 was constructed in general accordance with the above mentioned permits and associated permit drawings. Minor deviations from the approved permit documents were required to facilitate construction or to update the documents to comply with current industry standards.

These minor deviations include the following:

- Construction Permit Drawings required the installation of 29 Gas Extraction Wells (GW). Due to revised filling sequence and operations on Phase I, the southwest corner of Phase I has not reached final design grades, therefore, only GW-1 through 26 were installed. The remainder of GWs (GW-27 through GW-29), header, laterals, airline, and forcemain lines, Sump # 1, and

valve pits at the southwest corner of Phase I will be installed as part of the LFGCCS Sequence 2 during partial closure of the Phase I landfill;

- The Construction Permit Drawings require the connection to the leachate cleanout (LCO) pipes on the north and south slopes. Ten connections were designed but due to the revised filling sequence, LCO-4S and LCO-5S connections were not installed. LCO-4S and LCO-5S will be connected as part of the LFGCCS Sequence 2 during partial closure of the Phase I landfill;
- 5 Knockout Pots (KO) were designed as part of the permitted design of the Phase I gas collection system. The KOs were located at the northwest and southwest areas, intersection of the south and east slope, intersection of the 18", 24" and 30" header line at the southeast corner, and north of the flare station. **Note that removal of KOs do not alter the intent of the gas collection system; therefore, this deviation is not considered a "significant deviation".** During construction of the LFGCCS Sequence 1 the KOs were not installed due to the following considerations:
  - ❖ The KOs located at the northwest and southwest areas of the Phase I landfill were to serve as a transition for the future LFGCCS expansion for Phase II. Given that Phase II will not require an active LFGCCS in the near future, these knockout pots would provide no benefit since the adjacent U-trap U-3 and Sump S-1 serve as condensate knockouts. (Note that Sump S-1 will be installed as part of the LFGCCS Sequence 2 during partial closure of the Phase I landfill). Therefore, the knockouts at the northwest and southwest corners of Phase I were not required and were not installed.
  - ❖ The knockout pot at the southeast corner (intersection of south and east slopes) was initially designed as more of a junction box to allow for the sharp turn northward. However, the contractor was able to install the 18-inch header pipe using a large radius sweep and therefore the knockout was not required given that the condensate drains to the installed wye and then to Sump S-3.
  - ❖ The knockout pot located at the southeast corner (intersection of the 18", 24" and 30" header lines) was replaced with a wye which serves as a knockout which drains the condensate drains to Sump S-3.
  - ❖ The knockout pot near the flare station was retrofitted with a pump (renamed as Sump S-5) since it is anticipated that significant condensate will drain to Sump S-5 from the header system and the skid-mounted knock out. Sump S-5 serves not only as a knock out but also a condensate pump station. Therefore, other than installing a pump in the knock out, the knock out across from the flare station has not been deleted. In addition, the flare knockout pot located on the blower skid is the primary liquid stripping mechanism for improved moisture removal efficiency.
- ~~A Condensate Knockout Pot at the southeast corner was replaced with an HDPE wye;~~
- The 2" SDR 9 (airline) and 4" SDR 9 (forcemain) were installed in the up-gradient side of the header pipe to facilitate connections to GWs;
- The high point of the 24-inch header pipe on the east slope was placed approximately 10 feet further north than shown on the Pre-Construction survey; hence, the high point elevation was lowered and the overall pipe length from the high point was increased, resulting in the location of

the header, forcemain, airline valve pits and wye at the southeast corner being deeper than designed. Extensions to the valve pits were required in order to provide a minimum of 2 feet from the top of the valve pit to existing grade. Valve stem extensions were also necessary to extend the valve actuators to near the top of the valve pit. Please refer to Section 4. 4 for additional information.

- As a result of the lower invert elevation of the wye, the slope of the 30-inch header pipe from the wye to the south access road varies from 1.3% to 1.8% along the final 150 feet of trench before passing the anchor trench (Refer to as-built Sheet 00C-3D for control point numbers 10174, 50082, and 50084). Waste was only located along the initial 50 feet of trench. Please refer to Section 4. 4 for additional information.
- The subbase for the corrugated metal pipe (CMP) within the landfill footprint was not required to be compacted to 95% modified proctor. A gravel layer compacted with the hoe was placed as a subbase;
- GW-3, GW-8, and GW-18 were installed as Type 1 GW instead of Type 2 GW. The location of the header pipe was not close enough to the GWs to facilitate a Type 2 connection;
- The header and forcemain valve pit diameters were increased in order to facilitate the installation of valves inside the HDPE pits.
- Access ports at each GW were replaced with 1-inch ball valves. The ball valves allow liquid level measurements to be measured by inserting a liquid level sensor through the ball valve at the GW.
- As part of the permitted design of the Phase I gas system, one Access Points (AP) was located at the high point of the header line in the north slope between GW-7 and GW-8 and another AP on the header line in the south slope just east of GW-23. During construction of the LFGCCS Sequence 1, the AP on the north slope was placed between GW-8 and GW-9 and the AP on the south slope located west of of GW-23. This change in location was based on easier connection of Sequence 2 top deck lateral piping to the header pipe. **Note that relocation of APs do not alter the intent of the gas collection system; therefore, this deviation is not considered a "significant deviation".**
- As part of the permitted design of the Phase I gas system, four Sumps (S-2 through S-5) were to be installed as part of the LFGCCS Sequence 1. S-2 and S-3 located on the south slope of Phase I and S-4 and S-5 along the 30" header line west of the yard waste area. Due to revised filling sequence in Phase I, S-2 (to be located at the southwest corner of Phase I) could not be installed. The sequence number for all sumps was adjusted and one more sump was added (S-1 through S-5) as part of the LFGCCS Sequence 1 (Refer to KO removal explanation above). S-2 was installed on the south slope, S-3 and S-4 were installed along the 30" header line west of the yard waste area and S-5 was installed immediately north of the Flare Station. The knockout pot originally designed to be installed north of the Flare Station was retrofitted with a pump (renamed as Sump S-5) The Sump S-5 was increased from 36-inch diameter pipe to a 48-inch diameter pipe to provide for additional storage capacity. The increase in sump size does not reduce or hinder the function of the gas collection system. Sump S-5 serves as a knockout pot and has a pump for discharging the collected condensate to the leachate collection system within Phase I. Moreover, Sump S-5 also receives the most liquid from the gas collection system, primarily from the

moisture separator pad and the compressor drying towers. The increased size gives the Sump S-5 greater storage capacity. S-1 was not installed due to revised filling sequence in Phase I. S-1 will be installed as part of the LFGCCS Sequence 2 during partial closure of the Phase I landfill. **Note that renumbering of sumps do not alter the intent of the gas collection system; therefore, this deviation is not considered a "significant deviation".**

- The Permit drawings and Operations Plan indicated two blowers were to be installed at the Flare Station. During construction of the LFGCCS Sequence 1 only one blower was installed at the Flare Station. Refer to Section 2.2.4 for additional information. **Note that installing only one blower does not alter the intent of the gas collection system; therefore, this deviation is not considered a "significant deviation".**

2.0 PROJECT DESCRIPTION

2.1 General

The CCSWDC site encompasses approximately 6,150 acres and is located two miles east of I-75 and three miles south of S.R. 72 in central Sarasota County. The Class I landfill is located within a 550 acre special exception area which is located at the approximate center of the site.

The Phase I LFGCCS Sequence 1 included 26 vertical GWs,header and lateral piping of various sizes, condensate sumps, isolation valves for airlines, condensate, and landfill gas, access points for header, forcemain and air lines, and a skid mounted flare station for the efficient combustion of the collected gas.

2.2 Construction Activities

Construction activity observations by the CQA inspectors were recorded in CQA daily logs provided in Attachment B. Construction and documentation for Phase I LFGCCS Sequence 1included the following components:

- Gas extraction wells;
- Piping installation (including header and lateral trenching, road crossing);
- Condensate sump and U-traps installation;
- Header, forcemain, and valve pit installation; and
- Flare station installation;

2.2.1 Gas Extraction Wells

The Phase I LFGCCS was considered critical with respect to the adequate performance of the CCSWDC and protection of the environment. The Phase I LFGCCS Sequence 1 system consists of 26 vertical GWs drilled into the waste. Each vertical GW has the following components (from top to bottom):

- Minimum 18-inch thick intermediate soil layer;
- 2-foot thick hydrated bentonite seal;
- Minimum 18-inch thick soil plug layer;
- 2-foot thick hydrated bentonite seal;

- 1-foot thick soil plug layer;
- Geonet with heat bonded geotextile; and
- Washed non-calcareous stone (size 1 to 3-inch) surrounding the perforated pipe.

The GWs were designed to be installed to a depth of approximately two-thirds of the waste depth and at least 15 feet from the bottom liner system. Therefore, the installed GWs did not interfere with the liner or leachate collection system in Phase I.

CQA personnel were on-site full-time during the entire duration of the installation of the GWs to observe construction activities related to the installation of the GW components. Please refer to Attachment C for GW installation and drilling logs.

2.2.2 Gas Remote Wellheads

The Phase I LFGCCS Sequence 1 system consists of 8 remote wellheads connected to the existing LCO piping. The gas system was connected on the north slope to LCO-1N, 2N, 3N, 4N, and 5N, and on the south slope to LCO-1S, 2S, and 3S. LCO-4S and 5S were not installed due to the southwest corner of Phase I not at final design grades. LCO-4S and 5S will be installed as part of the LFGCCS Sequence 2 during partial closure of the Phase I landfill). The remote wellheads will provide for gas extraction from the existing LCO piping.

2.2.3 Condensate Sumps

Condensate generated from the LFGCCS will gravity drain to 4 condensate sumps (S-2 through S-5) located on the south slope and along the east access road outside of the landfill. On the north slope, condensate drains to three U-traps. The U-traps have a drain line that allows accumulated condensate being discharge into the existing Phase I collection system. Condensate forms within the interior of the gas collection pipes as landfill gas contacts the cooler HDPE pipe surface. The condensate sumps serve as low points within the LFGCCS for the condensate to collect via gravity flow. The pneumatic condensate sump pumps are activated independently by the condensate level in each sump. The condensate is then pumped to the existing Cell 1 leachate collection system, located at the north slope of Phase I and ultimately routed to the existing leachate storage tank. Refer to Attachment D for leak test results obtained for condensate sumps 3, 4, and 5 located outside of the Phase I landfill. Sump 2 did not require a leak test since it is located within the landfill footprint. Sump 1 will be installed as part of the LFGCCS Sequence 2 during partial closure of the Phase I landfill.

2.2.4 Flare Station

The Flare Station includes one blower. The blower system is used to draw landfill gas through the LFGCCS to the flare. The blower for the LFGCCS is located at the flare station on the blower skid. The Permit drawings and Operations Plan indicated two blowers. However, as shown on the drawings (e.g., Drawing 00C-06, Note 4), the blower skid layout was for information only and subject to change based on the final design by the blower/flare manufacturer. HDR anticipated up to two blowers based on initial discussions with the flare vendor. The final design of the blower/flare station as provided by the manufacturer required only one blower to meet the required LFG flow rate from the Phase I landfill. The

final design by the blower/flare manufacturer was provided at the beginning of construction of the Phase I LFGCCS, after the FDEP construction permit was issued.

The CCSWDC Title V permit indicates that the facility is not regulated under the New Source Performance Standards. Therefore, the facility is not required to continually operate the LFGCCS. A Tier 2 analysis was performed for the site in July 2010. The result of the Tier 2 testing indicates that the site will not trip the NSPS threshold of 50Mg of NMOC emissions until 2017. However, it is the intent to operate the LFGCCS continuously unless the system needs to be down for short-term, periodic maintenance.

In addition, Sarasota County is currently in the process of developing a LFG to Energy Facility (LFGTE) at the site, to be located adjacent to the blower/flare skid. The LFGTE facility will serve as the primary gas moving equipment whereby the blower/flare skid will serve as a redundant system in the event of a malfunction and/or maintenance shut-down of the LFGTE system.

The blower will be operated ~~continuously~~ in accordance with FDEP Air Program permit and Title V regulatory requirements. The Flare Station includes an additional connection for a future blower if needed. The Flare Station equipment includes:

- Condensate demister separator/condensate knock-out pot.
- Blower system to provide vacuum pressure to draw the gas from the landfill.
- Candlestick flare station.

3.0 CONSTRUCTION QUALITY ASSURANCE PROGRAM

3.1 General

The scope of CQA monitoring, testing, and documentation services performed during the construction of the Phase I LFGCCS Sequence 1 included review of documents, record drawings, field CQA operations, and preparation of the final Construction Certification Report. These activities are summarized in the following sections. A list of personnel involved in the construction of the Phase I LFGCCS Sequence 1 is included in Section 3.5.

Installation of the GWs began on January 28, 2010 and was completed on February 5, 2010. Installation of header piping, laterals to GWs, sumps, U-traps, and the Flare Station began on February 8, 2010 and reached substantial completion on May 12, 2010. Construction of the Phase I LFGCCS Sequence 1 reached final acceptance on June 12, 2010.

3.2 Related Documents

As previously noted, this Report summarizes the CQA activities performed by HDR during construction of Phase I LFGCCS Sequence 1. The following documents define the design and technical aspects of the project which governed the construction:

- Permit Application entitled "Central County Solid Waste Disposal Complex Class I landfill Phase I LFGCCS Construction/Operation Permit Application" prepared by HDR, dated December 29, 2008, and amendments dated March 13, 2009, and April 20, 2009.

- Construction Permit entitled "Central County Solid Waste Disposal Complex Class I Landfill (CCSWDC) Phase I Gas Collection and Control System Construction Permit No.: 130542-009-SC/08, Sarasota County", dated July 15, 2009.

- Permit drawings entitled "Central County Solid Waste Disposal Complex, Sarasota County, Phase I – Sequence I Landfill Gas Collection and Control System, dated April 20, 2009, prepared by HDR Engineering, Inc.

- "Contract Documents and Specifications for CCSWDC Landfill Gas Collection – Phase I – Sequence 1, CIP # 95215, Bid # 09803CS", prepared by Sarasota County Capital Management Services and HDR.

All of the above documents are hereafter collectively referred to as the CQA Documents in this Report. During the construction of Phase I LFGCCS Sequence 1, some minor modifications from the approved permit documents were required to facilitate construction or to update the documents to comply with current industry standards. These minor modifications are discussed in detail within Section 1.0 of this certification report.

3.3 Field CQA Operations

The following activities were performed as part of CQA services provided by HDR:

- Notifying contractor of areas that needed additional compaction based on failing in-situ tests and re-testing these areas to ensure compliance with the requirements of the CQA Documents;
- Observing placement, grading, and compaction of earthwork related construction activities (including the flare station pad);
- Observing delivery, storage, and tracking the inventory of materials delivered for the project;
- Observing installation of GWs;
- Documenting and observing leak tests on installed piping;
- Observing construction of U-traps, and connection of U-traps to existing leachate collection system; and
- Observing repair of the perimeter roads;

During construction activities involving CQC and CQA testing, the observations made by CQA personnel and results for both CQC and CQA tests obtained by CQA personnel were compared with the requirements of the CQA Documents. The Contractor was notified of deficiencies in construction practices and/or materials to ensure appropriate corrective actions were taken. Corrective actions and CQA/CQC retesting were monitored by CQA personnel for compliance with the requirements of the CQA Documents.

3.4 Certification Report and Record Drawings

During construction of the Phase I LFGCCS Sequence 1, CQA monitoring and testing activities were documented by CQA personnel in Daily Logs. CQA Daily Logs are included in Attachment B. Compaction test results completed by the CQA laboratory are included in Attachment F.

Record drawings for the Phase I LFGCCS Sequence 1 and this Construction Certification Report were prepared as the final task of the construction of the Phase I LFGCCS. Record drawings are included in Attachment G.

3.5 Project Personnel and Responsibility

The principal organizations involved in designing and construction of the Phase I LFGCCS Sequence 1 include the facility owner/operator, Design Engineer, CQA organization, and Contractor as listed below.

Owner: Sarasota Solid Waste Operations Central County Solid Waste Disposal Complex 4000 Knights Trail Road Nokomis, FL (941) 861-1570	Name Lois Rose, Manager Solid Waste Operations. Jack Gibson, Construction Manager
Design Engineering: HDR Engineering, Inc. 200 W. Forsyth Street, Suite 800 Jacksonville, FL 32202-4321 (904) 598-8900	Name Cliff Koenig, P.E, Engineer of Record
Construction Quality Assurance: HDR Engineering, Inc. 2421 Cattlemen Road, Suite 106 Sarasota, FL 34232 (941) 342-2700	Name Richard A. Siemering, Solid Waste Section Manager Carlos Restrepo, P.E, Field CQA Representative
LFG General Contractor: SCS Field Services 1901 Central Drive, Suite 550 Bedford, TX 76021 (817) 571-2288	Name Robert Butler, Project Manager Johnny Meier, Field Superintendent
Flare Station Contractor: LFG Specialties, LLC/Shaw E&I Group 16406 US Route 224 E. Findlay, OH 45840 (419) 424-4915	Name Lawrence Derr, Project Manager
CQA Geotechnical Testing Laboratory: Ardaman and Associates, Inc. 78 Sarasota Center Blvd. Sarasota, FL 34240 (941) 922-3526	Name Jerry Kuehn., P.E, Senior Project Engineer

4.0 SUMMARY OF CONSTRUCTION

4.1 Gas Extraction Wells

Gas extraction wells (GW) were constructed with 6-inch diameter high density polyethylene (HDPE), SDR 11 inserted into a 36-inch diameter borehole. The boreholes were terminated at approximately 15 feet above the estimated bottom of the cell with a maximum depth equivalent to two-thirds of the waste depth.

The GWs have 10 feet of solid HDPE pipe near the surface of the landfill (not including 4 foot stick up) welded to perforated HDPE pipe deeper in the landfill in order to minimize the potential for air intrusion into the landfill and gas system. Perforations in the HDPE pipes were fabricated by the manufacturer in the configuration shown in the Record Drawings provided in Attachment G on Sheet D-01, Detail 2. All GWs were capped at the bottom of the well.

Before placing the HDPE pipe into the GW borehole, CQA personnel verified the depths. After the GW was installed, 1-inch to 3-inch, washed, non-calcareous gravel was deposited in the bottom of the borehole, as well as around the perforated pipe. The gravel was placed up to 2 feet above the end of the perforated pipe length. Above the gravel, a 6-ounce non-woven geotextile bonded to geonet (geocomposite ring) was placed before installation of a 1-foot soil plug around the solid-wall pipe. A 2-foot thick hydrated bentonite seal was installed and filled on top with a minimum of 18-inch thick backfill. A second 2-foot hydrated bentonite seal was installed on top of the backfill. The remainder of the borehole was backfilled with cover soils to grade.

The solid HDPE pipe was extended approximately 4 feet above the existing ground surface. This allows for final cover placement during closure of Phase I with approximately 2 feet of pipe extension above the final cover grade.

During drilling, CQA personnel verified the type of waste excavated and temperature. The maximum waste temperature was recorded at GW-2 with 102 °F. Adjustments to GWs depths were not necessary. Contractor's GW installation and drilling logs are included in Attachment C.

4.2 Wellheads

Each GW was fitted with Landtec Accu-Flo wellheads. The wellheads were installed with a 2-inch diameter vertical wellhead assembly, kanaflex hose, and fittings. The Accu-Flo wellhead is specifically designed to allow easy installation and maintenance. The installed wellhead is built with quick connect access ports, allowing the connection of a landfill gas monitor. The Accu-Flo wellhead can be adjusted with a built-in gate valve. This valve can be manipulated to increase or decrease the amount of vacuum available to the GW.

4.3 Gas Extraction Header and Lateral Pipes

Landfill gas will be collected from the GWs and conveyed to the flare through a network of header and lateral pipelines constructed of HDPE SDR 17 pipe. Condensate flowing in the header and lateral lines along the south slope and east access road drains to four condensate sumps (Sumps 2, 3, 4, and 5). Condensate flowing along the north slope drains to three U-traps (U-1, 2, and 3). The condensate is then pumped into the existing leachate collection system via the 4-inch SDR 9 forcemain line. The 4-inch SDR-9 forcemain line is connected to the existing Cell 1 leachate collection system. A minimum slope of 5 percent for header and laterals within the landfill footprint and 1 percent slope for headers outside of the landfill footprint were provided to minimize surging and blockage problems due to condensate buildup and landfill settling.

The location and alignment of the headers and laterals were adjusted during construction where conditions in the landfill varied from the design or to facilitate meeting the required slope. The header and lateral piping was installed by the Contractor according to the design criteria.

Lateral piping is used to transmit landfill gas from the GW into the main header piping of the gas collection system and provide a pathway for the vacuum present in the header line to influence the GWs. The lateral pipingwas installed using HDPE SDR 11 piping. Depending on the type of GW, a 4-inch, 6–inch, or 8-inch diameter pipe was used for laterals.

Access points were also installed in the header line. 18-inch x 8-inch SDR 11 tees and 24-inch x 8-inch tees were fused to the header line. An 8-inch SDR 11 riser extension with a blind flange was fused to the tees.

Header and lateral pipes were subjected to air pressure tests to detect any leaks in the piping. The required test pressure was 10 psig, to be held for one hour. HDR allowed a test pressure of 5 psi for portions of piping connected to Sump 2 due to the sump manufacturer's recommendation that the sump not be pressurized to greater than 5 psi. The pressure drop, in any test, could not exceed 5 percent of the testing gauge pressure over the 1 hour test period. As shown in Table 1, all piping sections, requiring an air pressure test, passed air pressure testing. These tests are documented in the CQA Daily Field Logs provided in Attachment B.

Header and lateral pipe sections were joined using butt-fusion methods. CQA personnel monitored the butt-fusion techniques to ensure that industry accepted procedures were used during construction. CQA personnel also verified the diameter to ensure compliance with the requirements of the Contract Documents.

Table 1 – Air Pressure Test Summary

Date	Pipe Dia.	Length (ft)	Description	Stationing	Location	Pressure (psig)	Duration (hrs)	Pass/ Fail
3/8/2010	18" SDR 17	1,773	Header	0+00 (U-3) to 16+75 (U-1) and 0+00 (U-3) to 0+95 (EOP)	North Slope	10	1.0	Pass
	8" SDR 11	96	Lateral GW-6		North Slope	10	1.0	Pass
	6" SDR 11	190	Laterals GW-1,4,7, LCO-5N		North Slope	10	1.0	Pass
	4" SDR 11	240	Laterals GW-2,3,5,8,9,10		North Slope	10	1.0	Pass
	4" SDR 9	2,265	Along header and laterals		North Slope	10	1.0	Pass
	2" SDR 9	2,265	Along header and laterals		North Slope	10	1.0	Pass
3/9/2010	6" SDR 11	283	Remote Wellheads LCO-1N, 2N, 3N, 4N		North Slope	10	1.0	Pass
4/8/2010	24" SDR 17	1,164	Header	0+00 (U-1) to 11+64 (Wye)	East Slope	10	1.0	Pass
	6" SDR 11	96	Laterals GW-14,15,16		East Slope	10	1.0	Pass
	4" SDR 11	347	Laterals GW-11,12,13,17, 18		East Slope	10	1.0	Pass
	4" SDR 9	1,607	Along header and laterals		East Slope	10	1.0	Pass
4/13/2010	2" SDR 9	1,607	Along header and laterals		East Slope	10	1.0	Pass
4/15/2010	18" SDR 17	1,400	Header	0+00 (Sump 2) to 10+70 (Wye) and 0+00 (sump 2) to 3+30 (EOP)	South Slope	5*	1.0	Pass
	6" SDR 11	120	Laterals GW-19,20, LCO-3S		South Slope	5*	1.0	Pass
	4" SDR 11	270	Laterals GW-21,22,23,24, 25,26		South Slope	5*	1.0	Pass
	4" SDR 9	1,750	Along header and laterals		South Slope	10	1.0	Pass
	2" SDR 9	1,750	Along header and laterals		South Slope	10	1.0	Pass
4/16/2010	6" SDR 11	233	Remote Wellheads LCO-1S, 2S		South Slope	10	1.0	Pass
4/19/2010	30" SDR 17	400	Header	0+00 (Wye) to 4+00 (Sump 3)	East of Phase V	10	1.0	Pass
4/24/2010	30" SDR 17	545	Header	4+00 (Sump 3) to 9+45 (Sump 4)	East of Phase V	10	1.0	Pass
4/29/2010	30" SDR 17	505	Header	9+45 (Sump 4) to 14+50	East of Phase V	10	1.0	Pass
5/8/2010	30" SDR 17	400	Header	14+50 to 18+50 (Sump 5)	East of Phase V	10	1.0	Pass
5/5/2010	36" SDR 17 / 90 elbow	90	Header	Sump 5 to Flare Station	Flare Station	10	1.0	Pass
5/12/2010	4" SDR 9	1,850	Forcemain line	0+00 (Wye) to 18+50 (Sump 5)	East slope to Flare Station	10	1.0	Pass
	2" SDR 9	1,850	Air return line	0+00 (Wye) to 18+50 (Sump 5)	East slope to Flare Station	10	1.0	Pass
	14" SDR 17	12	26" x 14" reducer at Knockout		Flare Station	10	1.0	Pass

* 18" SDR 17 header in south slope tested at 5 psig for 1 hr. Sump 2 connected to 18" header not recommended to be tested at 10 psig

The header line crossed 5 access roads. The Contractor excavated to the required depths to install the 42-inch and 48-inch Reinforced Concrete Pipes (RCP) to protect the header line. A limerock base was placed before installing the RCPs. During backfilling, Contractor and CQA personnel conducted compaction tests to meet a 95% modified proctor. Compaction test results are provided in Attachment F.

The header and lateral for LCO-1S, on the south slope, were installed inside a corrugated metal pipe (CMP) where the future access road on the south slope of Phase I crosses the header and LCO-1S lateral. The access road will be constructed once Phase I reaches final build-out elevations. The subbase for the CMP was not compacted to 95% modified proctor. The Contractor installed a compacted gravel base layer for the CMP as recommended by HDR.

4.4 Pipe Slope

The header, lateral, air, and forcemain lines were installed with a minimum slope of 5 percent within the landfill footprint. Pipes located outside of the landfill footprint were installed with a 1 percent minimum slope.

The Contractor and CQA personnel field verified the slope of the header pipe at 25-foot intervals along the length of thepipe before backfilling. Survey tubes for pipe coordinates and elevations were placed every 50-foot intervals for as-builts. Changes in pipe direction, fittings, and connections were also surveyed. The final as-built survey is included in Attachment G as part of the Record Drawings.

During installation of the 24-inch header line from the high point to the wye along the east side slope, CQA personnel informed the Contractor that the trench depth was becoming deeper than required in the Contract Documents to maintain minimum cover, which would provide an excessive depth of cover over the pipe. Further review of as-builts demonstrated that the Contractor moved the high point location approximately 10 feet further north than that shown on the pre-construction survey; hence, the high point elevation was lowered and the overall pipe length from the high point to the wye was increased, resulting in a flatter slope along the surface of the pipe route, causing the Contractor to progressively excavate a deeper trench to meet the minimum 5 percent slope.

Given the high point invert was installed lower than designed and staked-out, as well as the pipe length in this area, the difference between the pipe surface slope and the actual pipe slope resulted in the wye invert being approximately 5 feet deeper than designed. Thus, rather than having an invert elevation of approximately 40 feet NGVD at the wye as shown on the Contract Drawings (C-004), the installed invert elevation is approximately 35.3 feet NGVD.

As a result, the lower invert elevation of the wye required that the 30-inch header pipe at the road crossing just south of the southeast corner of Phase I be adjusted to maximize pipe slope. The header, airline, and forcemain valve pits were extended and valve stem extensions were installed for the header valves in order to provide the required clearance from the top of the pits to the existing grade.

The 30-inch header line from the wye to the road just south of Phase I southeast corner (approximately 150 feet) varied from 1.3 percent (60.15 feet) to 1.8 percent (49.94 feet) and then to 2.4 percent (41.60 feet). Waste was only found during the first 50 feet of trench. HDR reviewed the header pipe configuration and based on waste being found only on the first 50 feet of trench, accepted the pipe slope obtained in this area. The Contractor provided an additional 2 year warranty to SWO to cover any repairs along this section of pipe. Due to the limited depth and area of waste at this section of pipe, HDR does not anticipate settlement which would cause the pipe to exhibit condensate drainage issues.

4.5 Air and Forcemain Lines

Air and forcemain lines were constructed of 2-inch and 4-inch HDEP SDR 9 pipe, respectively. The air line serves as an air source for the operation of pneumatic pumps which are commonly installed in GWs to reduce the volume of liquid contained within the well boring when needed to improve GW performance. The GWs installed as part of the LFGCCS Sequence 1 were not provided with pneumatic pumps. The forcemain line allows discharge of water pumped from the GW into the existing leachate collection system.

The air and forcemain lines were installed in the same trench as the GW lateral and connected to the air and forcemain lines along the header. Air and forcemain lines along the header were installed on the up-gradient side of the slope to facilitate connections to the GWs. The air and forcemain lines were fused together to create one complete system. Air and forcemain line risers were installed at each GW and Sumps with 1-inch stainless steel ball valves.

Air and forcemain pipes were subjected to air pressure test to detect any leaks in the piping. No loss in pressure was reported as shown in Table 1 provided in Section 4.3.

As part of the design, a dual containment forcemain line was required to be installed outside of the landfill footprint. Based on the meeting minutes between HDR and FDEP on October 17, 2008, dual contained condensate forcemain lines are not required. HDR approved the change from a dual containment pipe to a single pipe.

4.6 Condensate Sumps

Three 36-inch HDPE SDR 17 condensate sumps (S-2, S-3, and S-4) ~~and~~ and one 48-inch HDPE SDR 17 condensate sump (S-5) were installed. Sump S-1, to be located at the southwest corner of Phase I, will be installed as part of the Phase I Closure LFGCCS – Sequence 2. The sumps were installed at low points in the header line to serve as a removal location for condensate which is present in the header line.

During excavation of Sumps 3, 4, and 5, outside of the landfill footprint, a layer of rock was found during the bottom 4 feet of excavation. The Contractor was able to remove the rock to the required depth level. Once the Sumps were installed, 10 cubic yards of concrete was placed around the sump to serve as ballast to prevent uplift forces.

The condensate sumps have a 6-inch flanged access point for the pneumatic pump. QED pneumatic pumps were installed with a bubbler system that will turn the pump on or off based on the liquid level inside the sump. Condensate removed from the sump is pumped into the 4-inch forcemain return line. Condensate sumps S-3, S-4, and S-5 (located outside of the landfill footprint) were leak tested by the manufacturer. Please refer to Attachment D for leak test results for the sumps. Sump S-2 located on the south side slope of Phase I was not required to be tested since it was located within the lined footprint of Phase I.

4.7 Leachate Cleanouts

The Phase I LFGCCS Sequence 1 incorporated the connection to existing Phase I leachate cleanouts. Existing 6-inch leachate cleanouts risers extended along the base liner of the landfill to the leachate sump at the base of the landfill. These leachate cleanouts give access to the landfill gas which is present at the base of the landfill.

Gas accumulation in the existing leachate collection system flowed passively and was flared by solar flares located at each leachate cleanout riser. As part of the Phase I LFGCCS Sequence 1, the solar flares were removed. Condensate lines were connected between the U-traps and the existing leachate cleanout risers. An additional tee was installed at the leachate cleanout riser connecting to remote GWs. The remote GWs were located next to each U-trap. The forcemain line was connected at the Cell 1 leachate cleanout riser for discharge of condensate accumulated in the landfill gas system.

All fusions at the cleanout risers were made with electrofusion collars. CQA personnel verified that excavations at the cleanouts were made with all necessary precautions to prevent any damage to the bottom liner system. No damage to the liner was reported. A total of 8 leachate cleanout risers were connected to the landfill gas system including 5 cleanouts on the north side slope and 3 on the south side slope. The remaining 2 leachate cleanout risers on the south slope will be connected to the landfill gas system as part of the LFGCCS Sequence 2 during partial closure of the Phase I landfill.

4.8 U-traps

The Contractor field fabricated all U-traps. Three U-traps were installed on the north slope and were connected to the existing leachate collection system for Cells 1, 3, and 5 of Phase I. Gas condensate accumulated in the LGFCCS at the north slope will gravity drain to the U-traps. The U-traps include a 4" condensate drain line that is connected to the LCO risers. CQA personnel verified that dimensions based on the construction documents were met. All U-traps were filled with water before flare station start-up.

4.9 Isolation Valves

The Phase I LFGCCS Sequence 1 was designed and constructed using header isolation valves, air line valve pits, and forcemain valve pits. The first set of valve pits are located at the northwest corner of Phase

I. This will allow reduction of the supply of vacuum or the ability to close the landfill gas system for the future Phase II landfill.

The remaining two sets of valve pits are located at the southeast corner of Phase I where the header line diameter increases from 18-inch to 24-inch and where the header increases from a 24-inch to a 30-inch diameter header. These valve pits will allow reduction of the supply of vacuum or complete closing of the landfill gas system to the south side slope or to the east and north side slopes.

The header, forcemain, and air line isolation valves are housed in the valve pits. The header and forcemain valve pits were constructed using a 48-inch diameter HDPE SDR 32.5 standard manhole pipe with a 1-inch thick square HDPE bottom, the airline valve pit was constructed using a 36-inch diameter HDPE SDR 32.5 standard manhole pipe with an open bottom. All valve pits have a lockable lid using a metal rod.

The airline valves are used for isolating the air supply to the air line installed in parallel with the header line. The air line valve pit contains a 2-inch diameter ball valve. The airline valve pit located along the 24-inch header line (at the southeast corner of Phase I) controls the supply of pressurized air to the north and east side slopes. The airline valve pit located along the 18-inch header line (at the southeast corner of Phase I) controls the supply of pressurized air to the south side slope.

The forcemain valves are used for isolating leachate pumped from GWs to the forcemain line installed in parallel with the header line. The forcemain valve pit contains a 2-inch diameter ball valve and a 2-inch check valve. The forcemain valve pit located along the 24-inch header line (at the southeast corner of Phase I) controls the condensate or leachate from the south side slope and the condensate sumps outside of the landfill. The forcemain valve pit located along the 18-inch header line (at the southeast corner of Phase I) controls the condensate or leachate from the south side slope.

4.10 Flare Station

The flare station at the CCSWDC consists of a condensate knockout pot, a blower skid (the vacuum source), several meters and analyzers, an air compressor, a flame arrestor, the flare stack with a propane ignition tip, and the programmable logic controller (PLC). The skid mounted system was provided by Shaw LFG Specialties.

Ardaman conducted a subsurface soil exploration for the area selected for the flare station to determine soil conditions and provide a recommendation on the foundation design. Ardaman's geotechnical report is included in Attachment F.

The Contractor surveyed the areas for the flare, compressor pads, and fence. The compaction of the flare and compressor pad areas was observed by CQA personnel. Soil was filled to grade in 6- to 8- inch lifts. Each lift was rolled approximately 6 times each prior to the addition of the next lift. Once it was

determined that the grade surrounding the future location of the flare station was adequately compacted and raised, the area was prepared for the construction of the concrete pad which the flare station would be placed on. The soil foundation was compaction tested and the test results are provided in Attachment F. The soil foundation for the Flare Station passed compaction by achieving 95% of modified proctor maximum dry density.

Once the area designated for the concrete pad was prepared, the forms were installed for the edge of the concrete pad. Rebar was placed within the forms for the concrete padand spaced according to the recommendations of the Flare Station manufacturer. CQA personnel reviewed the rebar placement and documented that the rebar was placed in substantial accordance with the Flare Station manufacturer's recommendations.

Once the concrete was poured into the forms, a vibratory shaker was used to evenly spread the concrete over the entire area of the pad. A chamfer was used on the edge of the concrete to create an edge on all sides of the flare station pad. The concrete was spread to ensure that sections did not set before other sections were installed. Once the concrete was partially set a brush was used to create traction grooves on the surface of the flare station concrete pad. Once the concrete was set, the forms were removed and the area surrounding the concrete pad was backfilled with stone, raising it to the level of the concrete pad.

A concrete cylinder test was taken to measure the strength of the concrete for the pad at 7, 14, and 28 days. The concrete achieved 4,000 psi, as required by the specifications, within 28 days. The concrete strength test result report is provided in Appendix F. Once it was determined that the concrete had reached the specified strength, the Contractor used a crane to move the skid mounted flare station and place it onto the concrete pad. The flare stack was elevated off the ground using two thick wires connected with hooks to small indentations on the wind screen of the flare stack. Prior to complete installation, the UV Sensor and associated sealant was placed in the ignition area of the flare stack. Once this was completed the flare stack was raised into the correct position on the skid. The flare stack was then bolted to the flare skid.

After the flare station was set and connected to the gas collection system, an overall walkthrough was performed by the CQA representative and the Contractor. Drain lines and additional fittings provided by the flare manufacturer were installed. After all of the checks were completed, Shaw began commissioning and start up of the flare station. A training seminar was provided to County staff and HDR by Shaw.

4.11 Utilities

Existing overhead power lines located west of the maintenance building area were used to provide power to the flare station. Florida Power and Light Company (FPL) installed the transformer and junction box. The Contractor was responsible for connecting electrical lines to the junction box. The installation of the power lines and transformers were completed by FPL on March 1, 2010. The Contractor connected a phone line from the Flare Station control panel to the County's Maintenance Building.

5.0 CONCLUSION

During construction of the above components, CQA personnel checked that conformance testing was performed at the frequencies required by the Contract Documents and that the installation met or exceeded the requirements of the Contract Documents. CQA personnel checked that conditions or materials identified as not conforming to the Contract Documents were replaced, repaired, and/or retested as described in this report.

The observations associated with the construction of Phase I LFGCCS Sequence 1 indicate that the construction was completed in compliance with Construction Permit No. 130542-009-SC/08 and the Contract Documents. Deviations identified in this Report are believed to be minor in nature and were approved by HDR before implementation by the Contractor. HDR has determined that the final completed construction satisfied project specifications and permit requirements.