

Application for an Intermediate Modification
to the Operations Permit
for the
Construction and Operation
of a
Landfill Gas Recovery Facility



Central County Solid Waste Disposal Complex
Sarasota County, Florida

Submitted to:

Florida Department of Environmental Protection
Permitting and Compliance Assistance Program – Solid Waste Section
2600 Blair Stone Road, MS 4565
Tallahassee, FL 32399

Submitted by:

Landfill Energy Systems Florida, LLC.
2999 Judge Road
Oakfield, NY 14125-9771
Phone: (585) 948-8580 FAX: (585) 948-8584

Prepared by:



S2L, Incorporated
531 Versailles Drive, Suite 202
Maitland, Florida 32751
407-475-9163 Fax 407-475-9169
COA #7831

February 14, 2014

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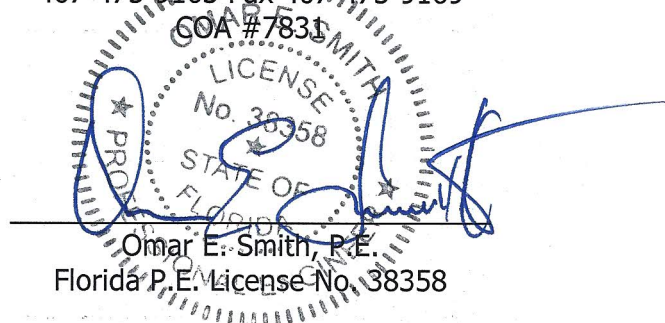
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Omar E. Smith, P.E.
Florida P.E. License No. 38358

Distribution:

1 electronic copy – FDEP, Tallahassee
1 electronic copy – FDEP, Ft. Myers
1 electronic copy – LES
1 electronic copy – Sarasota County

February 14, 2014



February 14, 2014

Mr. Cory Dewayne Dilmore, P.E.
Solid Waste Section
Florida Department of Environmental Protection
2600 Blair Stone Road, MS4565
Tallahassee, FL 32399

**RE: Application for an Intermediate Modification to the Operations Permit for the
Construction and Operation of a Landfill Gas Recovery Facility
Sarasota County, Florida – Central County Solid Waste Disposal Complex
Existing FDEP Permit No. 0013542-022-SO/01, WACS ID No. SWD/58/51614**

Dear Mr. Dilmore:

On behalf of Sarasota County and Landfill Energy Systems Florida, LLC (LES), S2L, Incorporated (S2Li) is pleased to enclose an application for an intermediate modification to the Operations Permit for the Central County Solid Waste Disposal Complex (CCSWDC) located in Sarasota County, Florida. The purpose of this request for the permit modification is to provide for the construction and operation of a Landfill Gas Recovery Facility (Plant) to allow landfill gas to be diverted into the Plant for processing and converting into electricity. LES is proposing the following:

- 1) The construction and operation of a Landfill Gas Recovery Facility at the Central County Solid Waste Disposal Complex. This facility will convert the landfill gas collected at the landfill into electricity;
- 2) Tie-in to the landfill gas collection system; and
- 3) Discharge of collected condensate from the Plant into the landfill leachate collection system.

This permit modification application also includes a completed Florida Department of Environmental Protection (Department) Form 62-701.900(1) in accordance with Chapter 62-701.320(5)(a), Florida Administrative Code (F.A.C.) which is provided in Section 2. Responses to requirements described within Chapter 62-701.530(5), F.A.C. for Landfill Gas Recovery Facilities are provided in Section 3. Also sent under separate cover is a check in the amount of Five Thousand (\$5,000) dollars payable to the Department for the permit fee as discussed at our meeting on December 20, 2013.

S2Li appreciates the Department's assistance in reviewing this permit modification application. If you have any questions or comments regarding the enclosed document, please contact me at 770-517-9759 or e-mail me at osmith@s2li.com.

Sincerely,
S2Li, Incorporated

No. 38358

Omar E. Smith, P.E., V.P.

P.E. License No. 38358

February 14, 2014

Enclosures

cc: Bill Krumbholz, FDEP-Fort Myers
Lois Rose, Sarasota County
Jason Timmons, P.E., Sarasota County
Emily Zambuto, Innovative Energy Systems/Landfill Energy Systems
Sam Levin, P.E., S2Li

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SECTION 1

Introduction

SECTION 1

INTRODUCTION

Sarasota County (County) owns and operates the Central County Solid Waste Disposal Complex (CCSWDC) located at 4000 Knights Trail Road in Nokomis, Florida. The County is submitting this application to apply for an intermediate modification to its CCSWDC's Operations Permit No. 0013542-022-SO/01 to allow for the construction and operation of a Landfill Gas Recovery (Landfill Gas-to-Energy, Landfill Gas-to-Electricity, or Plant) facility and its connection to the landfill gas/leachate collection systems within the CCSWDC's property boundaries. The construction, operations, and connections will allow landfill gas to be diverted from the CCSWDC's landfill gas collection system into a facility or Plant that will process and convert the landfill gas into electricity. The Plant will be owned and operated by Landfill Energy Systems Florida, LLC, 2999 Judge Road, Oakfield, New York 14125-9771, on property licensed from the County adjacent to the existing landfill gas flare station.

This intermediate modification application has been prepared in accordance with the applicable sections of Chapter 62-701, Florida Administrative Code (F.A.C.), effective 08-12-12, more specifically Chapter 62-701.530(5), F.A.C. which lists the requirements for the application of a Landfill Gas Recovery Facility. This application provides the required facility information for agency review and approval. Some required information, which has been previously submitted and is applicable to this permit modification, has not been resubmitted. The portions of the application that have not been resubmitted have been checked as "No Substantial Change" or "N/C" on the application form. Anything that is checked a "N/A" on the application form means that it is "Not Applicable" to this particular application for the construction and operation of a Landfill Gas Recovery Facility and does not mean that it is "Not Applicable" for the CCSWDC's Operation Permit. Anything that is checked as "N/C" which means "No Change" on the application form can be found within the following documents:

1. *Sarasota County CSWDC Solid Waste Operations Permit Renewal Application*, dated September 16, 2013, received by the Department September 18, 2013.
2. Any "Request for Information" (RAIs), memorandums, supplemental information, or documentation associated with the submittal above.

For other permits for this facility, LES plans to, has applied for, or has obtained, a separate Environmental Resource Permit, and registration of the oil/waste oil and ethylene glycol tanks. LES has obtained Air Permit No. 1150089-008-AC / PSD-FL-422 for the construction of the Plant.

This permit application has been submitted to the Florida Department of Environmental Protection (FDEP or Department) Tallahassee office in electronic form along with a check sent under separate cover for Five Thousand Dollars (\$5,000) for the Operations Permit Intermediate Modification Application fee.

SECTION 2

Application Form

DEP Form #: 62-701.900(1), F.A.C.

**Form Title: Application to Construct,
Operate, Modify, or**

**Close a Solid Waste Management
Facility**

Effective Date: August 12, 2012



Florida Department of Environmental Protection

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

DEP Form #: 62-701.900(1), F.A.C.

Form Title: Application to Construct, Operate, Modify, or
Close a Solid Waste Management Facility

Effective Date: August 12, 2012

Incorporated in Rule: 62-701.330(3), F.A.C.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

APPLICATION TO CONSTRUCT, OPERATE, MODIFY, OR CLOSE A SOLID WASTE MANAGEMENT FACILITY

APPLICATION INSTRUCTIONS AND FORMS

Northwest District
160 Governmental Center
Suite 308
Pensacola, FL 32502-5794
850-595-8300

Northeast District
7777 Baymeadows Way West
Suite 100
Jacksonville, FL 32256-7590
904-256-1700

Central District
3319 Maguire Boulevard
Suite 232
Orlando, FL 32803-3767
407-897-4100

Southwest District
13051 North Telecom Pkwy
Temple Terrace, FL 33637
813-632-7600

South District
2295 Victoria Ave, Suite 364
P.O. Box 2549
Fort Myers, FL 33901-3881
239-344-5600

Southeast District
400 North Congress Avenue
Suite 200
West Palm Beach, FL 33401
561-681-6600

INSTRUCTIONS TO APPLY FOR A SOLID WASTE MANAGEMENT FACILITY PERMIT

I. General

Solid Waste Management Facilities shall be permitted pursuant to Section 403.707, Florida Statutes (FS) and in accordance with Florida Administrative Code (FAC) Chapter 62-701. A minimum of four copies of the application shall be submitted to the appropriate Department office having jurisdiction over the facility. The appropriate fee in accordance with Rule 62-701.315, FAC, shall be submitted with the application by check made payable to the Department of Environmental Protection (DEP).

Complete appropriate sections for the type of facility for which application is made. Entries shall be typed or printed in ink. All blanks shall be filled in or marked "Not Applicable" or "No Substantial Change". Information provided in support of the application shall be marked "Submitted" and the location of this information in the application package indicated. The application shall include all information, drawings, and reports necessary to evaluate the facility. Information required to complete the application is listed on the attached pages of this form.

II. Application Parts Required for Construction and Operation Permits

- A. Landfills and Ash Monofills - Submit Parts A through S
- B. Asbestos Monofills - Submit Parts A, B, C, D, E, F, I, K, M, O through S
- C. Industrial Solid Waste Disposal Facilities - Submit Parts A through S

NOTE: Portions of some Parts may not be applicable.

NOTE: For facilities that have been satisfactorily constructed in accordance with their construction permit, the information required for A, B and C type facilities does not have to be resubmitted for an operation permit if the information has not substantially changed during the construction period. The appropriate portion of the form should be marked "no substantial change".

III. Application Parts Required for Closure Permits

- A. Landfills and Ash Monofills - Submit Parts A, B, L, N through S
- B. Asbestos Monofills - Submit Parts A, B, M, O through S
- C. Industrial Solid Waste Disposal Facilities - Submit Parts A, B, L through S

NOTE: Portions of some Parts may not be applicable.

IV. Permit Renewals

The above information shall be submitted at time of permit renewal in support of the new permit. However, facility information that was submitted to the Department to support the expiring permit, and which is still valid, does not need to be re-submitted for permit renewal. Portions of the application not re-submitted shall be marked "no substantial change" on the application form.

V. Application Codes

S	-	Submitted
LOCATION	-	Physical location of information in application
N/A	-	Not Applicable
N/C	-	No Substantial Change

VI. Listing of Application Parts

PART A:	GENERAL INFORMATION
PART B:	DISPOSAL FACILITY GENERAL INFORMATION
PART C:	PROHIBITIONS
PART D:	SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL
PART E:	LANDFILL PERMIT REQUIREMENTS
PART F:	GENERAL CRITERIA FOR LANDFILLS
PART G:	LANDFILL CONSTRUCTION REQUIREMENTS
PART H:	HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS
PART I:	GEOTECHNICAL INVESTIGATION REQUIREMENTS
PART J:	VERTICAL EXPANSION OF LANDFILLS
PART K:	LANDFILL OPERATION REQUIREMENTS
PART L:	WATER QUALITY AND LEACHATE MONITORING REQUIREMENTS
PART M:	SPECIAL WASTE HANDLING REQUIREMENTS
PART N:	GAS MANAGEMENT SYSTEM REQUIREMENTS
PART O:	LANDFILL CLOSURE REQUIREMENTS
PART P:	OTHER CLOSURE PROCEDURES
PART Q:	LONG-TERM CARE
PART R:	FINANCIAL ASSURANCE
PART S:	CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
APPLICATION FOR A PERMIT TO CONSTRUCT, OPERATE, MODIFY OR CLOSE A
SOLID WASTE MANAGEMENT FACILITY**

Please Type or Print

PART A. GENERAL INFORMATION

1. Type of disposal facility (check all that apply):

- | | |
|--|--|
| <input checked="" type="checkbox"/> Class I Landfill | <input type="checkbox"/> Ash Monofill |
| <input type="checkbox"/> Class III Landfill | <input type="checkbox"/> Asbestos Monofill |
| <input type="checkbox"/> Industrial Solid Waste | |
| <input type="checkbox"/> Other (describe): | |
-
-
-

NOTE: Waste Processing Facilities should apply on Form 62-701.900(4), FAC;
Yard Trash Disposal Facilities should notify on Form 62-701.900(3), FAC;
Compost Facilities should apply on Form 62-709.901(1), FAC; and
C&D Disposal Facilities should apply on Form 62-701.900(6), FAC

2. Type of application:

- ☐ Construction
☐ Operation
☒ Construction/Operation
☐ Closure
☐ Long-term Care Only

3. Classification of application:

- | | |
|----------------------------------|---|
| <input type="checkbox"/> New | <input type="checkbox"/> Substantial Modification |
| <input type="checkbox"/> Renewal | <input checked="" type="checkbox"/> Intermediate Modification |
| | <input type="checkbox"/> Minor Modification |

4. Facility name: Sarasota County Central County Solid Waste Disposal Complex

5. DEP ID number: SWD/58/51614 County: Sarasota

6. Facility location (main entrance):

North end of Knights Trail Road, 2 miles east of I-75, northeast of Venice, FL
4000 Knights Trail Road, Nokomis, FL 34275

7. Location coordinates:

Section: 1-4, 9-16, 12 Township: 38S Range: 19E
Latitude: 27 ° 12 ' 11 N " Longitude: 82 ° 23 ' 16 W "
Datum: NAD83 Coordinate method: GIS Mapping/Electronic/Google Earth
Collected by: Sarasota County Company/Affiliation: Sarasota County

8. Applicant name (operating authority): Sarasota County Solid Waste Operations
Mailing address: 4000 Knights Trail Road Nokomis FL 34275
Street or P.O. Box City State Zip
Contact person: Lois Rose Telephone: (941) 861-1589
Title: Solid Waste Operations Manager
lerose@scgov.net
E-Mail address (if available)
9. Authorized agent/Consultant: For this Permit Modification: S2L, Incorporated
Mailing address: 531 Versailles Dr., Suite 202, Maitland, FL 32751-4589
Street or P.O. Box City State Zip
Contact person: Omar E. Smith, P.E. Telephone: (407) 475-9163
Title: Vice President and Regional Manager
osmith@s2li.com
E-Mail address (if available)
10. Landowner (if different than applicant): Same as Applicant
Mailing address: _____
Street or P.O. Box City State Zip
Contact person: _____ Telephone: (____) _____

E-Mail address (if available)
11. Cities, towns, and areas to be served:
Unincorporated Sarasota County, City of Sarasota, City of Venice, City of Northport

12. Population to be served:
Current: 383,664 Five-Year Projection: 411,872
13. Date site will be ready to be inspected for completion: N/A
14. Expected life of the facility: 12.7 years for the Class I landfill.
15. Estimated costs:
Total Construction: \$ 2,000,000 Closing Costs: \$ N/A
16. Anticipated construction starting and completion dates:
From: March 2014 To: September 2014
17. Expected volume or weight of waste to be received:
_____ yds³/day 1,000 tons/day _____ gallons/day

PART B. DISPOSAL FACILITY GENERAL INFORMATION

*Indicates operations permitted under a separate FDEP permit or registration.
**Indicates operations are exempted from permitting.

1. Provide brief description of disposal facility design and operations planned under this application:
This is a permit application for an intermediate modification of the operating permit to allow 1) the construction and operation of a landfill gas recovery facility and 2) connections (tie-ins) to the landfill gas/leachate collection systems.

2. Facility site supervisor: Lois Rose
Title: Solid Waste Operations Manager Telephone: (941) 861-1589

lerose@scgov.net
E-Mail address (if available)

3. Disposal area: Total acres: 118 Used acres: 55 (Phase I) Available acres: 63 (Phase II)

4. Weighing scales used: ☒ Yes ☐ No

5. Security to prevent unauthorized use: ☒ Yes ☐ No

6. Charge for waste received: Varies (see note) \$/yds³ Varies (see note) \$/ton

Note: See tipping fee schedule provided in Attachment A of the Engineering Report, CCSWDC Solid Waste Operations Permit Renewal Application, September 16, 2013.

7. Surrounding land use, zoning:

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Residential | <input type="checkbox"/> Industrial |
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> None |
| <input type="checkbox"/> Commercial | <input checked="" type="checkbox"/> Other (describe): |

Governmental Use, Open Use Conservation, Rural

8. Types of waste received:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Household | <input checked="" type="checkbox"/> C & D debris |
| <input checked="" type="checkbox"/> Commercial | <input checked="" type="checkbox"/> Shredded/cut tires |
| <input type="checkbox"/> Incinerator/WTE ash | <input checked="" type="checkbox"/> Yard trash |
| <input checked="" type="checkbox"/> Treated biomedical | <input type="checkbox"/> Septic tank |
| <input checked="" type="checkbox"/> Water treatment sludge | <input checked="" type="checkbox"/> Industrial |
| <input type="checkbox"/> Air treatment sludge | <input checked="" type="checkbox"/> Industrial sludge |
| <input checked="" type="checkbox"/> Agricultural | <input checked="" type="checkbox"/> Domestic sludge |
| <input checked="" type="checkbox"/> Asbestos | <input checked="" type="checkbox"/> Other (describe): |

Other: Mobile homes and marine vessels when all engines, fuel tanks (either removed or punctured), appliances, air conditioners, other fluids and batteries are removed from the mobile home or marine vessel.

9. Salvaging permitted: ☐ Yes ☒ No
10. Attendant: ☒ Yes ☐ No Trained operator: ☒ Yes ☐ No
11. Trained spotters: ☒ Yes ☐ No Number of spotters used: 1
12. Site located in: ☐ Floodplain ☐ Wetlands ☒ Other (describe):
Uplands
-
13. Days of operation: Monday through Saturday
14. Hours of operation: 8:00 am to 5:00 pm
15. Days working face covered: Daily
16. Elevation of water table: 20.5 ft. Datum Used: NGVD 1929
17. Number of monitoring wells: 10 for Landfill Cells; None at LFG Recovery Facility
18. Number of surface monitoring points: 2
19. Gas controls used: ☒ Yes ☐ No Type controls: ☒ Active ☐ Passive
- Gas flaring: ☒ Yes ☐ No Gas recovery: ☒ Yes ☐ No
20. Landfill unit liner type:
- | | |
|--|---|
| <input type="checkbox"/> Natural soils | <input type="checkbox"/> Double geomembrane |
| <input type="checkbox"/> Single clay liner | <input checked="" type="checkbox"/> Geomembrane & composite |
| <input type="checkbox"/> Single geomembrane | <input type="checkbox"/> Double composite |
| <input checked="" type="checkbox"/> Single composite | <input type="checkbox"/> None |
| <input type="checkbox"/> Slurry wall | <input checked="" type="checkbox"/> Other (describe): |
- Phase I is a single HDPE liner and clay layer. Phase II is a double HDPE geomembrane and drainage composite with a geosynthetic clay liner (GCL).
-
21. Leachate collection method:
- | | |
|--|--|
| <input checked="" type="checkbox"/> Collection pipes | <input checked="" type="checkbox"/> Double geomembrane |
| <input checked="" type="checkbox"/> Geonets | <input type="checkbox"/> Gravel layer |
| <input type="checkbox"/> Well points | <input type="checkbox"/> Interceptor trench |
| <input type="checkbox"/> Perimeter ditch | <input type="checkbox"/> None |
| <input type="checkbox"/> Other (describe): | |
- See 20 above.
-

22. Leachate storage method:

☒ Tanks ☐ Surface impoundments

☐ Other (describe):

Prestressed concrete leachate storage tank and secondary containment tank.

23. Leachate treatment method:

☐ Oxidation ☐ Chemical treatment

☐ Secondary ☐ Settling

☐ Advanced ☐ None

☒ Other (describe):

Off-site treatment.

24. Leachate disposal method:

☐ Recirculated ☒ Pumped to WWTP

☒ Transported to WWTP ☐ Discharged to surface water/wetland

☐ Injection well ☐ Percolation ponds

☐ Evaporation ☒ Spray irrigation

☐ Other (describe):

Spray irrigation to working face and initial cover areas of Class I Landfill only for dust control.

25. For leachate discharged to surface waters:

Name and Class of receiving water:

N/A

26. Storm Water:

Collected: ☒ Yes ☐ No

Type of treatment:

Wet detention ponds and retention ditches.

Name and Class of receiving water:

Cow Pen Slough, Class III water

27. Environmental Resources Permit (ERP) number or status:

SWFWMD Permit #407932.01

FDEP ERP #58-0272622-001 (Phase II)

FDEP ERP #58-0246654-003 (Roadway Widening/Swale)

FDEP ERP for Landfill Gas Recovery Facility: Submitted Request for Verification of an Exemption (Determination Pending)

PART C. PROHIBITIONS (62-701.300, FAC)

LOCATION

- | | | |
|----------------------------------|--|--|
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 1. Provide documentation that each of the siting criteria will be satisfied for the facility; (62-701.300(2), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 2. If the facility qualifies for any of the exemptions contained in Rules 62-701.300(12) through (18), FAC, then document this qualification(s); |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 3. Provide documentation that the facility will be in compliance with the burning restrictions; (62-701.300(3), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 4. Provide documentation that the facility will be in compliance with the hazardous waste restrictions; (62-701.300(4), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 5. Provide documentation that the facility will be in compliance with the PCB disposal restrictions; (62-701.300(5), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 6. Provide documentation that the facility will be in compliance with the biomedical waste restrictions; (62-701.300(6), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 7. Provide documentation that the facility will be in compliance with the Class I surface water restrictions; (62-701.300(7), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 8. Provide documentation that the facility will be in compliance with the special waste for landfills restrictions; (62-701.300(8), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 9. Provide documentation that the facility will be in compliance with the liquid restrictions; (62-701.300(10), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 10. Provide documentation that the facility will be in compliance with the used oil and oily waste restrictions; (62-701.300(11), FAC) |

PART D. SOLID WASTE MANAGEMENT FACILITY PERMIT REQUIREMENTS, GENERAL (62-701.320, FAC)

LOCATION

- | | | | |
|---|-----------------------|---|--|
| S <input checked="" type="checkbox"/> _____ | Electronic Submission | N/A <input type="checkbox"/> N/C <input type="checkbox"/> | 1. Four copies, at minimum, of the completed application form, all supporting data and reports; (62-701.320(5)(a), FAC) |
| S <input checked="" type="checkbox"/> _____ | Electronic Submission | N/A <input type="checkbox"/> N/C <input type="checkbox"/> | 2. Engineering and/or professional certification (signature, date, and seal) provided on the applications and all engineering plans, reports, and supporting information for the application; (62-701.320(6), FAC) |
| S <input checked="" type="checkbox"/> _____ | Included | N/A <input type="checkbox"/> N/C <input type="checkbox"/> | 3. A letter of transmittal to the Department; (62-701.320(7)(a), FAC) |

LOCATION**PART D CONTINUED**S ☒ Included N/A ☐ N/C ☐S ☒ Submitted Separately N/A ☐ N/C ☐S ☒ Section 3 N/A ☐ N/C ☐S ☒ Appendix D N/A ☐ N/C ☐S ☒ Appendix D, Section 6 N/A ☐ N/C ☐S ☒ Appendix B N/A ☐ N/C ☐S ☒ Appendix A, Fig. A-1 N/A ☐ N/C ☐S ☒ Appendix A, Fig. A-2 N/A ☐ N/C ☐S ☐ N/A ☐ N/C ☒S ☐ N/A ☐ N/C ☒S ☐ N/A ☐ N/C ☒S ☒ Section 3.3 (b) 1. a. N/A ☐ N/C ☐

4. A completed application form dated and signed by the applicant; (62-701.320(7)(b), FAC)

5. Permit fee specified in Rule 62-701.315, FAC in check or money order, payable to the Department; (62-701.320(7)(c), FAC)

6. An engineering report addressing the requirements of this rule and with the following format: a cover sheet, text printed on 8 ½ inch by 11 inch consecutively numbered pages, a table of contents or index, the body of the report and all appendices including an operation plan, contingency plan, illustrative charts and graphs, records or logs of tests and investigations, engineering calculations; (62-701.320(7)(d), FAC)

7. Operation Plan and Closure Plan; (62-701.320(7)(e)1, FAC)

8. Contingency Plan; (62-701.320(7)(e)2, FAC)

9. Plans or drawings for the solid waste management facilities in appropriate format (including sheet size restrictions, cover sheet, legends, north arrow, horizontal and vertical scales, elevations referenced to NGVD 1929) showing: (62-701.320(7)(f), FAC)

a. A regional map or plan with the project location in relation to major roadways and population centers;

b. A vicinity map or aerial photograph no more than one year old showing the facility site and relevant surface features located within 1000 feet of the facility;

c. A site plan showing all property boundaries certified by a Florida Licensed Professional Surveyor and Mapper;

d. Other necessary details to support the engineering report, including referencing elevations to a consistent, nationally recognized datum, and identifying the method used for collecting latitude and longitude data;

10. Documentation that the applicant either owns the property or has legal authority from the property owner to use the site; (62-701.320(7)(g), FAC)

11. For facilities owned or operated by a county, provide a description of how, if any, the facilities covered in this application will contribute to the county's achievement of the waste reduction and recycling goals contained in Section 403.706, FS; (62-701.320(7)(h), FAC)

LOCATION**PART D CONTINUED**S ☐ _____ N/A ☐ N/C ☒

12. Provide a history and description of any enforcement actions taken by the Department against the applicant for violations of applicable statutes, rules, orders, or permit conditions relating to the operation of any solid waste management facility in the state; (62-701.320(7)(i), FAC)

S ☒ Appendix C N/A ☐ N/C ☐

13. Proof of publication in a newspaper of general circulation of notice of application for a permit to construct or substantially modify a solid waste management facility; (62-701.320(8), FAC)

S ☐ _____ N/A ☒ N/C ☐

14. Provide a description of how the requirements for airport safety will be achieved, including proof of required notices if applicable. If exempt, explain how the exemption applies; (62-701.320(13), FAC)

S ☐ _____ N/A ☐ N/C ☒

15. Explain how the operator and spotter training requirements and special criteria will be satisfied for the facility; (62-701.320(15), FAC)

PART E. LANDFILL PERMIT REQUIREMENTS (62-701.330, FAC)**LOCATION**S ☒ Appendix A, Fig. A-5 N/A ☐ N/C ☐

1. Regional map or aerial photograph no more than five years old showing all airports that are located within five miles of the proposed landfill; (62-701.330(3)(a), FAC)

S ☒ Appendix A N/A ☐ N/C ☐

2. Plot plan with a scale not greater than 200 feet to the inch showing: (62-701.330(3)(b), FAC)

S ☒ Appendix B, Drawing A1 N/A ☐ N/C ☐

a. Dimensions;

S ☒ Appendix A, Fig. A-4 N/A ☐ N/C ☐

b. Locations of proposed and existing water quality monitoring wells;

S ☒ Appendix A, Fig. A-6 N/A ☐ N/C ☐

c. Locations of soil borings;

S ☐ _____ N/A ☒ N/C ☐

d. Proposed plan of trenching or disposal areas;

S ☐ _____ N/A ☒ N/C ☐

e. Cross sections showing original elevations and proposed final contours which shall be included either on the plot plan or on separate sheets;

S ☐ _____ N/A ☒ N/C ☐

f. Any previously filled waste disposal areas;

S ☒ Appendix B, Drawing G2 N/A ☐ N/C ☐

g. Fencing or other measures to restrict access;

LOCATION**PART E CONTINUED**S ☒ Appendix B N/A ☐ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☒ Appendix A & B N/A ☐ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☒ Appendix B, Drawing G2 N/A ☐ N/C ☐S ☒ Appendix B, Drawing A1 N/A ☐ N/C ☐S ☐ _____ N/A ☐ N/C ☒S ☐ _____ N/A ☐ N/C ☒S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☐ N/C ☒S ☐ _____ N/A ☒ N/C ☐

3. Topographic maps with a scale not greater than 200 feet to the inch with five foot contour intervals showing: (62-701.330(3)(c), FAC)

a. Proposed fill areas;

b. Borrow areas;

c. Access roads;

d. Grades required for proper drainage;

e. Cross sections of lifts;

f. Special drainage devices if necessary;

g. Fencing;

h. Equipment facilities;

4. A report on the landfill describing the following: (62-701.330(3)(d), FAC)

a. The current and projected population and area to be served by the proposed site;

b. The anticipated type, annual quantity, and source of solid waste expressed in tons;

c. Planned active life of the facility, the final design height of the facility, and the maximum height of the facility during its operation;

d. The source and type of cover material used for the landfill;

5. Provide evidence that an approved laboratory shall conduct water quality monitoring for the facility in accordance with Chapter 62-160, FAC; (62-701.330(3)(g), FAC)

6. Provide a statement of how the applicant will demonstrate financial responsibility for the closing and long-term care of the landfill; (62-701.330(3)(h), FAC)

PART F. GENERAL CRITERIA FOR LANDFILLS (62-701.340, FAC)

LOCATION

- S ☐ _____ N/A ☒ N/C ☐ 1. Describe (and show on a Federal Insurance Administration flood map, if available) how the landfill or solid waste disposal unit shall not be located in the 100 year floodplain where it will restrict the flow of the 100 year flood, reduce the temporary water storage capacity of the floodplain unless compensating storage is provided, or result in a washout of solid waste; (62-701.340(3)(b), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 2. Describe how the minimum horizontal separation between waste deposits in the landfill and the landfill property boundary shall be 100 feet, measured from the toe of the proposed final cover slope; (62-701.340(3)(c), FAC)

PART G. LANDFILL CONSTRUCTION REQUIREMENTS (62-701.400, FAC)

LOCATION

- S ☐ _____ N/A ☒ N/C ☐ 1. Describe how the landfill shall be designed so the solid waste disposal units will be constructed and closed at planned intervals throughout the design period of the landfill, and shall be designed to achieve a minimum factor of safety of 1.5 using peak strength values to prevent failures of side slopes and deep-seated failures; (62-701.400(2), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 2. Landfill liner requirements; (62-701.400(3), FAC)
- S ☐ _____ N/A ☒ N/C ☐ a. General construction requirements; (62-701.400(3)(a), FAC)
- S ☐ _____ N/A ☒ N/C ☐ (1) Provide test information and documentation to ensure the liner will be constructed of materials that have appropriate physical, chemical, and mechanical properties to prevent failure;
- S ☐ _____ N/A ☒ N/C ☐ (2) Document foundation is adequate to prevent liner failure;
- S ☐ _____ N/A ☒ N/C ☐ (3) Constructed so bottom liner will not be adversely impacted by fluctuations of the ground water;
- S ☐ _____ N/A ☒ N/C ☐ (4) Designed to resist hydrostatic uplift if bottom liner located below seasonal high ground water table;
- S ☐ _____ N/A ☒ N/C ☐ (5) Installed to cover all surrounding earth which could come into contact with the waste or leachate;

LOCATIONS ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐**PART G CONTINUED**

b. Composite liners; (62-701.400(3)(b), FAC)

- (1) Upper geomembrane thickness and properties;
- (2) Design leachate head for primary leachate collection and removal system (LCRS) including leachate recirculation if appropriate;
- (3) Design thickness in accordance with Table A and number of lifts planned for lower soil component;

c. Double liners; (62-701.400(3)(c), FAC)

- (1) Upper and lower geomembrane thickness and properties;
- (2) Design leachate head for primary LCRS to limit the head to one foot above the liner;
- (3) Lower geomembrane sub-base design;
- (4) Leak detection and secondary leachate collection system minimum design criteria ($k \geq 10$ cm/sec, head on lower liner ≤ 1 inch, head not to exceed thickness of drainage layer);

d. Standards for geosynthetic components; (62-701.400(3)(d), FAC)

- (1) Factory and field seam test methods to ensure all geomembrane seams achieve the minimum specifications;
- (2) Geomembranes to be used shall pass a continuous spark test by the manufacturer;
- (3) Design of 24-inch-thick protective layer above upper geomembrane liner;
- (4) Describe operational plans to protect the liner and leachate collection system when placing the first layer of waste above a 24-inch-thick protective layer;
- (5) HDPE geomembranes, if used, meet the specifications in GRI GM13, and LLDPE geomembranes, if used, meet the specifications in GRI GM17;
- (6) PVC geomembranes, if used, meet the specifications in PGI 1104;

LOCATIONS ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐**PART G CONTINUED**

(7) Interface shear strength testing results of the actual components which will be used in the liner system;

(8) Transmissivity testing results of geonets if they are used in the liner system;

(9) Hydraulic conductivity testing results of geosynthetic clay liners if they are used in the liner system;

e. Geosynthetic specification requirements; (62-701.400(3)(e), FAC)

(1) Definition and qualifications of the designer, manufacturer, installer, QA consultant and laboratory, and QA program;

(2) Material specifications for geomembranes, geocomposites, geotextiles, geogrids, and geonets;

(3) Manufacturing and fabrication specifications including geomembrane raw material and roll QA, fabrication personnel qualifications, seaming equipment and procedures, overlaps, trial seams, destructive and non-destructive seam testing, seam testing location, frequency, procedure, sample size, and geomembrane repairs;

(4) Geomembrane installation specifications including earthwork, conformance testing, geomembrane placement, installation personnel qualifications, field seaming and testing, overlapping and repairs, materials in contact with geomembranes, and procedures for lining system acceptance;

(5) Geotextile and geogrids specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil materials and any overlying materials;

(6) Geonet and geocomposites specifications including handling and placement, conformance testing, stacking and joining, repair, and placement of soil materials and any overlying materials;

(7) Geosynthetic clay liner specifications including handling and placement, conformance testing, seams and overlaps, repair, and placement of soil materials and any overlying materials;

LOCATIONS ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐**PART G CONTINUED**

f. Standards for soil liner components; (62-701.400(3)(f), FAC)

- (1) Description of construction procedures including over-excavation and backfilling to preclude structural inconsistencies and procedures for placing and compacting soil components in layers;
- (2) Demonstration of compatibility of the soil component with actual or simulated leachate in accordance with EPA Test Method 9100, or an equivalent test method;
- (3) Procedures for testing in situ soils to demonstrate they meet the specifications for soil liners;
- (4) Specifications for soil component of liner including at a minimum:
 - (a) Allowable particle size distribution, and Atterberg limits including shrinkage limit;
 - (b) Placement moisture and dry density criteria;
 - (c) Maximum laboratory-determined saturated hydraulic conductivity using simulated leachate;
 - (d) Minimum thickness of soil liner;
 - (e) Lift thickness;
 - (f) Surface preparation (scarification);
 - (g) Type and percentage of clay mineral within the soil component;
- (5) Procedures for constructing and using a field test section to document the desired saturated hydraulic conductivity and thickness can be achieved in the field;

g. If a Class III landfill is to be constructed with a bottom liner system, provide a description of how the minimum requirements for the liner will be achieved;

LOCATION**PART G CONTINUED**S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐**3. Leachate collection and removal system (LCRS); (62-701.400(4), FAC)****a. The primary and secondary LCRS requirements; (62-701.400(4)(a), FAC)**

- (1) Constructed of materials chemically resistant to the waste and leachate;
- (2) Have sufficient mechanical properties to prevent collapse under pressure;
- (3) Have granular material or synthetic geotextile to prevent clogging;
- (4) Have a method for testing and cleaning clogged pipes or contingent designs for reducing leachate around failed areas;

b. Other LCRS requirements; (62-701.400(4)(b) and (c), FAC)

- (1) Bottom 12 inches having hydraulic conductivity $\geq 1 \times 10^{-3}$ cm/sec;
- (2) Total thickness of 24 inches of material chemically resistant to the waste and leachate;
- (3) Bottom slope design to accommodate for predicted settlement and still meet minimum slope requirements;
- (4) Demonstration that synthetic drainage material, if used, is equivalent or better than granular material in chemical compatibility, flow under load, and protection of geomembranes liner;

4. Leachate recirculation; (62-701.400(5), FAC)

- a. Describe general procedures for recirculating leachate;
- b. Describe procedures for controlling leachate runoff and minimizing mixing of leachate runoff with storm water;
- c. Describe procedures for preventing perched water conditions and gas buildup;

LOCATION**PART G CONTINUED**S ☐ _____ N/A ☒ N/C ☐

d. Describe alternate methods for leachate management when it cannot be recirculated due to weather or runoff conditions, surface seeps, wind-blown spray, or elevated levels of leachate head on the liner;

S ☐ _____ N/A ☒ N/C ☐

e. Describe methods of gas management in accordance with Rule 62-701.530, FAC;

S ☐ _____ N/A ☒ N/C ☐

f. If leachate irrigation is proposed, describe treatment methods and standards for leachate treatment prior to irrigation over final cover, and provide documentation that irrigation does not contribute significantly to leachate generation;

S ☐ _____ N/A ☒ N/C ☐

5. Leachate storage tanks and leachate surface impoundments; (62-701.400(6), FAC)

S ☐ _____ N/A ☒ N/C ☐

a. Surface impoundment requirements; (62-701.400(6)(b), FAC)

S ☐ _____ N/A ☒ N/C ☐

(1) Documentation that the design of the bottom liner will not be adversely impacted by fluctuations of the ground water;

S ☐ _____ N/A ☒ N/C ☐

(2) Designed in segments to allow for inspection and repair, as needed, without interruption of service;

S ☐ _____ N/A ☒ N/C ☐

(3) General design requirements;

S ☐ _____ N/A ☒ N/C ☐

(a) Double liner system consisting of an upper and lower 60-mil minimum thickness geomembrane;

S ☐ _____ N/A ☒ N/C ☐

(b) Leak detection and collection system with hydraulic conductivity ≥ 1 cm/sec;

S ☐ _____ N/A ☒ N/C ☐

(c) Lower geomembrane place on subbase ≥ 6 inches thick with $k \leq 1 \times 10^{-5}$ cm/sec or on an approved geosynthetic clay liner with $k \leq 1 \times 10^{-7}$ cm/sec;

S ☐ _____ N/A ☒ N/C ☐

(d) Design calculation to predict potential leakage through the upper liner;

S ☐ _____ N/A ☒ N/C ☐

(e) Daily inspection requirements, and notification and corrective action requirements if leakage rates exceed that predicted by design calculations;

S ☐ _____ N/A ☒ N/C ☐

(4) Description of procedures to prevent uplift, if applicable;

LOCATIONS ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐**PART G CONTINUED**

(5) Design calculations to demonstrate minimum two feet of freeboard will be maintained;

(6) Procedures for controlling vectors and off-site odors;

b. Above-ground leachate storage tanks; (62-701.400(6)(c), FAC)

(1) Describe tank materials of construction and ensure foundation is sufficient to support tank;

(2) Describe procedures for cathodic protection for the tank, if needed;

(3) Describe exterior painting and interior lining of the tank to protect it from the weather and the leachate stored;

(4) Describe secondary containment design to ensure adequate capacity will be provided and compatibility of materials of construction;

(5) Describe design to remove and dispose of stormwater from the secondary containment system;

(6) Describe an overfill prevention system, such as level sensors, gauges, alarms, and shutoff controls to prevent overfilling;

(7) Inspections, corrective action, and reporting requirements;

(a) Weekly inspection of overfill prevention system;

(b) Weekly inspection of exposed tank exteriors;

(c) Inspection of tank interiors when tank is drained, or at least every three years;

(d) Procedures for immediate corrective action if failures detected;

(e) Inspection reports available for Department review;

c. Underground leachate storage tanks; (62-701.400(6)(d), FAC)

LOCATION**PART G CONTINUED**S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐

(1) Describe materials of construction;

(2) A double-walled tank design system to be used with the following requirements:

(a) Interstitial space monitoring at least weekly;

(b) Corrosion protection provided for primary tank interior and external surface of outer shell;

(c) Interior tank coatings compatible with stored leachate;

(d) Cathodic protection inspected weekly and repaired as needed;

(3) Describe an overfill prevention system, such as level sensors, gauges, alarms, and shutoff controls to prevent overfilling, and provide for weekly inspections;

(4) Inspection reports available for Department review;

d. Schedule provided for routine maintenance of LCRS; (62-701.400(6)(e), FAC)

6. Liner systems construction quality assurance (CQA); (62-701.400(7), FAC)

a. Provide CQA Plan including:

(1) Specifications and construction requirements for liner system;

(2) Detailed description of quality control testing procedures and frequencies;

(3) Identification of supervising professional engineer;

(4) Identify responsibility and authority of all appropriate organizations and key personnel involved in the construction project;

(5) State qualifications of CQA professional engineer and support personnel;

LOCATION**PART G CONTINUED**S ☐ _____ N/A ☒ N/C ☐

(6) Description of CQA reporting forms and documents;

S ☐ _____ N/A ☒ N/C ☐

b. An independent laboratory experienced in the testing of geosynthetics to perform required testing;

S ☐ _____ N/A ☒ N/C ☐

7. Soil liner CQA; (62-701.400(8), FAC)

S ☐ _____ N/A ☒ N/C ☐

a. Documentation that an adequate borrow source has been located with test results, or description of the field exploration and laboratory testing program to define a suitable borrow source;

S ☐ _____ N/A ☒ N/C ☐

b. Description of field test section construction and test methods to be implemented prior to liner installation;

S ☐ _____ N/A ☒ N/C ☐

c. Description of field test methods, including rejection criteria and corrective measures to insure proper liner installation;

S ☐ _____ N/A ☒ N/C ☐

8. For surface water management systems at aboveground disposal units, provide documentation showing the design of any features intended to convey stormwater to a permitted or exempted treatment system; (62-701.400(9), FAC)

S ☐ _____ N/A ☒ N/C ☐

9. Gas control systems; (62-701.400(10), FAC)

S ☐ _____ N/A ☒ N/C ☐

a. Provide documentation that if the landfill is receiving degradable wastes, it will have a gas control system complying with the requirements of Rule 62-701.530, FAC;

S ☐ _____ N/A ☒ N/C ☐

10. For landfills designed in ground water, provide documentation that the landfill will provide a degree of protection equivalent to landfills designed with bottom liners not in contact with ground water; (62-701.400(11), FAC)

PART H. HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS (62-701.410(1), FAC)**LOCATION**S ☐ _____ N/A ☒ N/C ☐

1. Submit a hydrogeological investigation and site report including at least the following information:

S ☐ _____ N/A ☒ N/C ☐

a. Regional and site specific geology and hydrology;

S ☐ _____ N/A ☒ N/C ☐

b. Direction and rate of ground water and surface water flow including seasonal variations;

LOCATIONS ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐

2. Report signed, sealed, and dated by P.E. and/or P.G.;

PART H CONTINUED

c. Background quality of ground water and surface water;

d. Any on-site hydraulic connections between aquifers;

e. Site stratigraphy and aquifer characteristics for confining layers, semi-confining layers, and all aquifers below the landfill site that may be affected by the landfill;

f. Description of topography, soil types, and surface water drainage systems;

g. Inventory of all public and private water wells within a one mile radius of the landfill including, where available, well top of casing and bottom elevations, name of owner, age and usage of each well, stratigraphic unit screened, well construction technique, and static water level;

h. Identify and locate any existing contaminated areas on the site;

i. Include a map showing the locations of all potable wells within 500 feet of the waste storage and disposal areas;

PART I. GEOTECHNICAL INVESTIGATION REQUIREMENTS (62-701.410(2), FAC)**LOCATION**S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐

1. Submit a geotechnical site investigation report defining the engineering properties of the site including at least the following:

a. Description of subsurface conditions including soil stratigraphy and ground water table conditions;

b. Investigate for the presence of muck, previously filled areas, soft ground, lineaments, and sink holes;

c. Estimates of average and maximum high water table across the site;

d. Foundation analysis including:

(1) Foundation bearing capacity analysis;

LOCATION**PART I CONTINUED**S ☐ _____ N/A ☒ N/C ☐

(2) Total and differential subgrade settlement analysis;

S ☐ _____ N/A ☒ N/C ☐

(3) Slope stability analysis;

S ☐ _____ N/A ☒ N/C ☐

e. Description of methods used in the investigation, and includes soil boring logs, laboratory results, analytical calculations, cross sections, interpretations, and conclusions;

S ☐ _____ N/A ☒ N/C ☐

f. An evaluation of fault areas, seismic impact zones, and unstable areas as described in 40 CFR 258.13, 40 CFR 258.14, and 40 CFR 258.15;

S ☐ _____ N/A ☒ N/C ☐

2. Report signed, sealed, and dated by P.E. and/or P.G.;

PART J. VERTICAL EXPANSION OF LANDFILLS (62-701.430, FAC)**LOCATION**S ☐ _____ N/A ☒ N/C ☐

1. Describe how the vertical expansion shall not cause or contribute to leachate leakage from the existing landfill, shall not cause objectionable odors, or adversely affect the closure design of the existing landfill;

S ☐ _____ N/A ☒ N/C ☐

2. Describe how the vertical expansion over unlined landfills will meet the requirements of Rule 62-701.400, FAC with the exceptions of Rule 62-701.430(1)(c), FAC;

S ☐ _____ N/A ☒ N/C ☐

3. Provide foundation and settlement analysis for the vertical expansion;

S ☐ _____ N/A ☒ N/C ☐

4. Provide total settlement calculations demonstrating that the final elevations of the lining system, gravity drainage, and no other component of the design will be adversely affected;

S ☐ _____ N/A ☒ N/C ☐

5. Minimum stability factor of safety of 1.5 for the lining system component interface stability and for deep stability;

S ☐ _____ N/A ☒ N/C ☐

6. Provide documentation to show the surface water management system will not be adversely affected by the vertical expansion;

S ☐ _____ N/A ☒ N/C ☐

7. Provide gas control designs to prevent accumulation of gas under the new liner for the vertical expansion;

PART K. LANDFILL OPERATION REQUIREMENTS (62-701.500, FAC)

LOCATION

- | | | |
|----------------------------------|--|---|
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 1. Provide documentation that the landfill will have at least one trained operator during operation and at least one trained spotter at each working face; (62-701.500(1), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 2. Provide a landfill operation plan including procedures for: (62-701.500(2), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | a. Designating responsible operating and maintenance personnel; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | b. Emergency preparedness and response, as required in subsection 62-701.320(16), FAC; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | c. Controlling types of waste received at the landfill; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | d. Weighing incoming waste; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | e. Vehicle traffic control and unloading; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | f. Method and sequence of filling waste; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | g. Waste compaction and application of cover; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | h. Operations of gas, leachate, and stormwater controls; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | i. Water quality monitoring; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | j. Maintaining and cleaning the leachate collection system; |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 3. Provide a description of the landfill operation record to be used at the landfill, details as to location of where various operational records will be kept (i.e. DEP permit, engineering drawings, water quality records, etc.); (62-701.500(3), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 4. Describe the waste records that will be compiled monthly and provided to the Department annually; (62-701.500(4), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 5. Describe methods of access control; (62-701.500(5), FAC) |
| S <input type="checkbox"/> _____ | N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/> | 6. Describe load checking program to be implemented at the landfill to discourage disposal of unauthorized waste at the landfill; (62-701.500(6), FAC) |

LOCATION**PART K CONTINUED**S ☐ _____ N/A ☒ N/C ☐

7. Describe procedures for spreading and compacting waste at the landfill that include: (62-701.500(7), FAC)

S ☐ _____ N/A ☒ N/C ☐

a. Waste layer thickness and compaction frequencies;

S ☐ _____ N/A ☒ N/C ☐

b. Special considerations for first layer of waste placed above the liner and leachate collection system;

S ☐ _____ N/A ☒ N/C ☐

c. Slopes of cell working face and side grades above land surface, and planned lift depths during operation;

S ☐ _____ N/A ☒ N/C ☐

d. Maximum width of working face;

S ☐ _____ N/A ☒ N/C ☐

e. Description of type of initial cover to be used at the facility that controls:

S ☐ _____ N/A ☒ N/C ☐

(1) Vector breeding/animal attraction;

S ☐ _____ N/A ☒ N/C ☐

(2) Fires;

S ☐ _____ N/A ☒ N/C ☐

(3) Odors;

S ☐ _____ N/A ☒ N/C ☐

(4) Blowing litter;

S ☐ _____ N/A ☒ N/C ☐

(5) Moisture infiltration;

S ☐ _____ N/A ☒ N/C ☐

f. Procedures for applying initial cover, including minimum cover frequencies;

S ☐ _____ N/A ☒ N/C ☐

g. Procedures for applying intermediate cover;

S ☐ _____ N/A ☒ N/C ☐

h. Time frames for applying final cover;

S ☐ _____ N/A ☒ N/C ☐

i. Procedures for controlling scavenging and salvaging;

S ☐ _____ N/A ☒ N/C ☐

j. Description of litter policing methods;

S ☐ _____ N/A ☒ N/C ☐

k. Erosion control procedures;

LOCATION**PART K CONTINUED**S ☐ _____ N/A ☒ N/C ☐

8. Describe operational procedures for leachate management including: (62-701.500(8), FAC)

S ☐ _____ N/A ☒ N/C ☐

a. Leachate level monitoring;

S ☐ _____ N/A ☒ N/C ☐

b. Operation and maintenance of leachate collection and removal system, and treatment as required;

S ☐ _____ N/A ☒ N/C ☐

c. Procedures for managing leachate if it becomes regulated as a hazardous waste;

S ☐ _____ N/A ☒ N/C ☐

d. Identification of treatment or disposal facilities that may be used for off-site discharge and treatment of leachate;

S ☐ _____ N/A ☒ N/C ☐

e. Contingency plan for managing leachate during emergencies or equipment problems;

S ☐ _____ N/A ☒ N/C ☐

f. Procedures for recording quantities of leachate generated in gal/day and including this in the operating record;

S ☐ _____ N/A ☒ N/C ☐

g. Procedures for comparing precipitation experienced at the landfill with leachate generation rates and including this information in the operating record;

S ☐ _____ N/A ☒ N/C ☐

h. Procedures for water pressure cleaning or video inspecting leachate collection systems;

S ☐ _____ N/A ☒ N/C ☐

9. Describe how the landfill receiving degradable wastes shall implement a gas management system meeting the requirements of Rule 62-701.530, FAC; (62-701.500(9), FAC)

S ☐ _____ N/A ☒ N/C ☐

10. Describe procedures for operating and maintaining the landfill stormwater management system to comply with the requirements of Rule 62-701.400(9), FAC; (62-701.500(10), FAC)

S ☐ _____ N/A ☒ N/C ☐

11. Equipment and operation feature requirements; (62-701.500(11), FAC)

S ☐ _____ N/A ☒ N/C ☐

a. Sufficient equipment for excavating, spreading, compacting, and covering waste;

S ☐ _____ N/A ☒ N/C ☐

b. Reserve equipment or arrangements to obtain additional equipment within 24 hours of breakdown;

S ☐ _____ N/A ☒ N/C ☐

c. Communications equipment;

LOCATION**PART K CONTINUED**S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐

d. Dust control methods;

e. Fire protection capabilities and procedures for notifying local fire department authorities in emergencies;

f. Litter control devices;

g. Signs indicating operating authority, traffic flow, hours of operation, and disposal restrictions;

12. Provide a description of all-weather access road, inside perimeter road, and other on-site roads necessary for access at the landfill; (62-701.500(12), FAC)

13. Additional record keeping and reporting requirements; (62-701.500(13), FAC)

a. Records used for developing permit applications and supplemental information maintained for the design period of the landfill;

b. Monitoring information, calibration and maintenance records, and copies of reports required by permit maintained for at least 10 years;

c. Maintain annual estimates of the remaining life of constructed landfills, and of other permitted areas not yet constructed, and submit this estimate annually to the Department;

d. Procedures for archiving and retrieving records which are more than five years old;

PART L. WATER QUALITY MONITORING REQUIREMENTS (62-701.510, FAC)**LOCATION**S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐

1. A water quality monitoring plan shall be submitted describing the proposed ground water and surface water monitoring systems, and shall meet at least the following requirements:

a. Based on the information obtained in the hydrogeological investigation and signed, dated, and sealed by the P.G. or P.E. who prepared it; (62-701.510(2)(a), FAC)

LOCATIONS ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐**PART L CONTINUED**

b. All sampling and analysis performed in accordance with Chapter 62-160, FAC; (62-701.510(2)(b), FAC)

c. Ground water monitoring requirements; (62-701.510(3), FAC)

(1) Detection wells located downgradient from and within 50 feet of disposal units;

(2) Downgradient compliance wells as required;

(3) Background wells screened in all aquifers below the landfill that may be affected by the landfill;

(4) Location information for each monitoring well;

(5) Well spacing no greater than 500 feet apart for downgradient wells and no greater than 1500 feet apart for upgradient wells, unless site specific conditions justify alternate well spacings;

(6) Properly selected well screen locations;

(7) Monitoring wells constructed to provide representative ground water samples;

(8) Procedures for properly abandoning monitoring wells;

(9) Detailed description of detection sensors, if proposed;

d. Surface water monitoring requirements; (62-701.510(4), FAC)

(1) Location of and justification for all proposed surface water monitoring points;

(2) Each monitoring location to be marked and its position determined by a registered Florida land surveyor;

e. Initial and routine sampling frequency and requirements; (62-701.510(5), FAC)

(1) Initial background ground water and surface water sampling and analysis requirements;

LOCATION**PART L CONTINUED**S ☐ _____ N/A ☒ N/C ☐

(2) Routine monitoring well sampling and analysis requirements;

S ☐ _____ N/A ☒ N/C ☐

(3) Routine surface water sampling and analysis requirements;

S ☐ _____ N/A ☒ N/C ☐

f. Describe procedures for implementing evaluation monitoring, prevention measures, and corrective action as required; (62-701.510(6), FAC)

S ☐ _____ N/A ☒ N/C ☐

g. Water quality monitoring report requirements; (62-701.510(8), FAC)

S ☐ _____ N/A ☒ N/C ☐

(1) Semi-annual report requirements; (see paragraphs 62-701.510(5)(c) and (d), FAC for sampling frequencies)

S ☐ _____ N/A ☒ N/C ☐

(2) Documentation that the water quality data shall be provided to the Department in an electronic format consistent with requirements for importing into Department databases, unless an alternate form of submittal is specified in the permit;

S ☐ _____ N/A ☒ N/C ☐

(3) Two and one-half year report requirements, or every five years if in long-term care, signed dated, and sealed by P.G. or P.E.;

PART M. SPECIAL WASTE HANDLING REQUIREMENTS (62-701.520, FAC)**LOCATION**S ☐ _____ N/A ☒ N/C ☐

1. Describe procedures for managing motor vehicles; (62-701.520(1), FAC)

S ☐ _____ N/A ☒ N/C ☐

2. Describe procedures for landfilling shredded waste; (62-701.520(2), FAC)

S ☐ _____ N/A ☒ N/C ☐

3. Describe procedures for asbestos waste disposal; (62-701.520(3), FAC)

S ☐ _____ N/A ☒ N/C ☐

4. Describe procedures for disposal or management of contaminated soil; (62-701.520(4), FAC)

S ☐ _____ N/A ☒ N/C ☐

5. Describe procedures for disposal of biological wastes; (62-701.520(5), FAC)

PART N. GAS MANAGEMENT SYSTEM REQUIREMENTS (62-701.530, FAC)

LOCATION

S ☐ _____ N/A ☐ N/C ☒

1. Provide documentation for a gas management system that will: (62-701.530(1), FAC)

S ☐ _____ N/A ☐ N/C ☒

a. Be designed to prevent concentrations of combustible gases from exceeding 25% the LEL in structures and 100% the LEL at the property boundary;

S ☐ _____ N/A ☐ N/C ☒

b. Be designed for site specific conditions;

S ☐ _____ N/A ☐ N/C ☒

c. Be designed to reduce gas pressure in the interior of the landfill;

S ☐ _____ N/A ☐ N/C ☒

d. Be designed to not interfere with the liner, leachate control system, or final cover;

S ☐ _____ N/A ☐ N/C ☒

2. Provide documentation that will describe locations, construction details, and procedures for monitoring gas at ambient monitoring points and with soil monitoring probes; (62-701.530(2), FAC)

S ☐ _____ N/A ☐ N/C ☒

3. Provide documentation describing how the gas remediation plan and odor remediation plan will be implemented; (62-701.530(3), FAC)

S ☒ **Section 3.3** _____ N/A ☐ N/C ☐

4. Landfill gas recovery facilities; (62-701.530(5), FAC)

S ☒ Section 3.3(b)1. _____ N/A ☐ N/C ☐

a. Provide information required in Rules 62-701.320(7) and 62-701.330(3), FAC;

S ☒ Section 3.3(b)2. _____ N/A ☐ N/C ☐

b. Provide information required in Rule 62-701.600(4), FAC, where relevant and practical;

S ☒ Section 3.3(b)3. _____ N/A ☐ N/C ☐

c. Provide estimates of current and expected gas generation rates and description of condensate disposal methods;

S ☒ Section 3.3(b)4. _____ N/A ☐ N/C ☐

d. Provide description of procedures for condensate sampling, analyzing, and data reporting;

S ☒ Section 3.3(b)5. _____ N/A ☐ N/C ☐

e. Provide closure plan describing methods to control gas after recovery facility ceases operation, and any other requirements contained in Rule 62-701.400(10), FAC;

PART O. LANDFILL FINAL CLOSURE REQUIREMENTS (62-701.600, FAC)

LOCATION

S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	1. Closure permit requirements; (62-701.600(2), FAC)
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	a. Application submitted to the Department at least 90 days prior to final receipt of wastes;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	b. Closure plan shall include the following:
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	(1) Closure design plan;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	(2) Closure operation plan;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	(3) Plan for long-term care;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	(4) A demonstration that proof of financial assurance for long-term care will be provided;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	2. Closure design plan including the following requirements: (62-701.600(3), FAC)
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	a. Plan sheet showing phases of site closing;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	b. Drawings showing existing topography and proposed final grades;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	c. Provisions to close units when they reach approved design dimensions;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	d. Final elevations before settlement;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	e. Side slope design including benches, terraces, down slope drainage ways, energy dissipaters, and description of expected precipitation effects;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	f. Final cover installation plans including:
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	(1) CQA plan for installing and testing final cover;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	(2) Schedule for installing final cover after final receipt of waste;
S <input type="checkbox"/> _____	N/A <input checked="" type="checkbox"/> N/C <input type="checkbox"/>	(3) Description of drought resistant species to be used in the vegetative cover;

LOCATIONS ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☐ _____ N/A ☒ N/C ☐S ☒ Section 3.3(b)5. N/A ☐ N/C ☐S ☐ _____ N/A ☐ N/C ☒S ☐ _____ N/A ☐ N/C ☒S ☐ _____ N/A ☐ N/C ☒S ☐ _____ N/A ☐ N/C ☒S ☐ _____ N/A ☐ N/C ☒**PART O CONTINUED**

(4) Top gradient design to maximize runoff and minimize erosion;

(5) Provisions for cover material to be used for final cover maintenance;

g. Final cover design requirements;

(1) Protective soil layer design;

(2) Barrier soil layer design;

(3) Erosion control vegetation;

(4) Geomembrane barrier layer design;

(5) Geosynthetic clay liner design, if used;

(6) Stability analysis of the cover system and the disposed waste;

h. Proposed method of stormwater control;

i. Proposed method of access control;

j. Description of the proposed or existing gas management system which complies with Rule 62-701.530, FAC;

3. Closure operation plan shall include: (62-701.600(4), FAC)

a. Detailed description of actions which will be taken to close the landfill;

b. Time schedule for completion of closing and long-term care;

c. Describe proposed method for demonstrating financial assurance for long-term care;

d. Operation of the water quality monitoring plan required in Rule 62-701.510, FAC;

e. Development and implementation of gas management system required in Rule 62-701.530, FAC;

LOCATION**PART O CONTINUED**

- S ☐ _____ N/A ☒ N/C ☐ 4. Certification of closure construction completion including: (62-701.600(6), FAC)
- S ☐ _____ N/A ☒ N/C ☐ a. Survey monuments; (62-701.600(6)(a), FAC)
- S ☐ _____ N/A ☒ N/C ☐ b. Final survey report; (62-701.600(6)(b), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 5. Declaration to the public; (62-701.600(7), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 6. Official date of closing; (62-701.600(8), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 7. Justification for and detailed description of procedures to be followed for temporary closure of the landfill, if desired; (62-701.600(9), FAC)

PART P. OTHER CLOSURE PROCEDURES (62-701.610, FAC)**LOCATION**

- S ☐ _____ N/A ☒ N/C ☐ 1. Describe how the requirements for use of closed solid waste disposal areas will be achieved; (62-701.610(1), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 2. Describe how the requirements for relocation of wastes will be achieved; (62-701.610(2), FAC)

PART Q. LONG-TERM CARE (62-701.620, FAC)**LOCATION**

- S ☐ _____ N/A ☒ N/C ☐ 1. Maintaining the gas collection and monitoring system; (62-701.620(5), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 2. Stabilization report requirements; (62-701.620(6), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 3. Right of access; (62-701.620(7), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 4. Requirements for replacement of monitoring devices; (62-701.620(8), FAC)
- S ☐ _____ N/A ☒ N/C ☐ 5. Completion of long-term care signed and sealed by professional engineer; (62-701.620(9), FAC)

PART R. FINANCIAL ASSURANCE (62-701.630, FAC)

LOCATION

S ☐ _____ N/A ☒ N/C ☐

1. Provide cost estimates for closing, long-term care, and corrective action costs estimated by a P.E. for a third party performing the work, on a per unit basis, with the source of estimates indicated; (62-701.630(3) & (7), FAC)

S ☐ _____ N/A ☒ N/C ☐

2. Describe procedures for providing annual cost adjustments to the Department based on inflation and changes in the closing, long-term care, and corrective action plans; (62-701.630(4) & (8), FAC)

S ☐ _____ N/A ☒ N/C ☐

3. Describe funding mechanisms for providing proof of financial assurance and include appropriate financial assurance forms. (62-701.630(5), (6), & (9), FAC)

PART S. CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

1. Applicant:

The undersigned applicant or authorized representative of Sarasota County Solid Waste Operations is aware that statements made in this form and attached information

are an application for a Intermediate Modification to the Operations permit from the Florida Department of Environmental Protection, and certifies that the information in this application is true, correct, and complete to the best of his/her knowledge and belief. Further, the undersigned agrees to comply with the provisions of Chapter 403, Florida Statutes, and all rules and regulations of the Department. It is understood that the Permit is not transferable, and the Department will be notified prior to the sale or legal transfer of the permitted facility.


Signature of Applicant or Agent

Lois Rose, SW Ops Manager

Name and Title (please type)

lerose@scgov.net

E-Mail Address (if available)

4000 Knights Trail Road

Mailing Address

Nokomis, FL 34275

City, State, Zip Code

(941) 861-1589

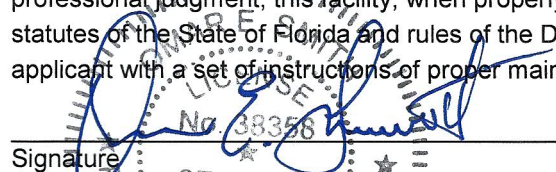
Telephone Number

Date: 2/10/14

Attach letter of authorization if agent is not a government official, owner, or corporate officer.

2. Professional Engineer registered in Florida (or Public Officer if authorized under Sections 403.707 and 403.7075, Florida Statutes):

This is to certify that the engineering features of this solid waste management facility have been designed/examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, this facility, when properly maintained and operated, will comply with all applicable statutes of the State of Florida and rules of the Department. It is agreed that the undersigned will provide the applicant with a set of instructions of proper maintenance and operation of the facility.


Signature

Omar E. Smith, P.E., V.P.

Name and Title (please type)

2-14-14

38358

Florida Registration Number (please affix seal)

531 Versailles Drive, Suite 202

Mailing Address

Maitland, Florida 32751

City, State, Zip Code

osmith@s2li.com

E-Mail Address (if available)

(407) 475-9163

Telephone Number

Date: 2-14-14

SECTION 3

Engineering Report And Discussion of Applicable Sections

SECTION 3

ENGINEERING REPORT AND DISCUSSION OF APPLICABLE SECTIONS

3.1 GENERAL INFORMATION

Sarasota County has entered into an agreement with Landfill Energy Systems Florida, LLC, (LES), (Contract No. 2013-470), to recover landfill gas from Sarasota County's Central County Solid Waste Disposal Complex (CCSWDC) and convert the collected gas into electricity. The location of the proposed new facility that is to accomplish this conversion is depicted on Figures A-2 and A-4 in Appendix A.

This Landfill Gas Recovery Facility (Plant) will connect to the CCSWDC's existing landfill gas collection system at the landfill's flare station area which is located outside of the landfill liner and monitoring well system. No additional landfill gas collection wells or headers within the landfill footprint are being proposed. The only modification to the landfill gas collection system is the proposed 14-inch connection header from the Plant tying into the landfill gas collection system at the existing flare station as shown on Drawings G-4 and G-5 in Appendix B. Condensate generated by the Plant will be collected and gravity drained to a sump outside the Plant. The condensate from the Plant will be pumped to an existing condensate drain line at the CCSWDC's flare station. This existing gravity line drains to sump (S-5) north of the flare station where it is pumped into the landfill's leachate collection system.

This Plant is being constructed to enable the CCSWDC to beneficially recover energy from landfill gas. The Plant will destruct a majority of the landfill gas in lieu of the landfill gas flare presently in use at the landfill. Any collected landfill gas not utilized at the Plant, such as when the Plant is down for scheduled or unscheduled maintenance, or any other circumstance, will be directed to the existing utility flare for destruction via combustion. Operation of the landfill gas collection system and compliance with the requirements under Title V and NSPS (future compliance) are not dependent on the operation of this Plant. CCSWDC will continue to expand the collection system and flaring capability as necessary in order to meet regulatory requirements without the need of the Plant. Since this Plant is not being installed to meet any regulatory requirements under Title V, NSPS (future), and closure regulations, the approval of this application will not impact CCSWDC's present closure plan or financial assurance requirements as stipulated by Chapter 62-701.530(5), F.A.C.

The Plant has already obtained (or in the process of obtaining) applicable air and stormwater management permits (separate from those for the landfill) and registration of applicable tanks from the Department. LES

has obtained Air Permit No. 1150089-008-AC / PSD-FL-422 for the construction of the Plant. Local (Sarasota County) development permits will also be applied for.

3.2 LANDFILL GAS RECOVERY FACILITY DESCRIPTION

a) The Plant

The Plant is designed to convert up to 2,200 cfm of landfill gas from the CCSWDC to electricity. The Plant will utilize four (4) caterpillar G3520C IC engine generator sets designed to operate on landfill gas. Each engine is rated at 1,600 kW. The Plant will be capable of producing approximately 6,400 kW (6.4 MW) net to the electrical grid through a 13.2 kV to 23 kV transformer/interconnect scheme before the power is sent to the Auburn Substation for delivery. The Plant will be equipped with all ancillary and pollution control equipment necessary to support the operation of the Plant including gas filtration, engine cooling, condensate collection, lube oil supply/disposal and make-up, gas analyzer, gas flow meter, plant controls, generator paralleling switchgear, and utility transformer. A majority of the equipment will be housed within a block building that includes a segregated engine room, gas treatment room, and sound attenuated control/switchgear room. Equipment located outside the building includes bulk oil storage (new and used), engine radiators, engine exhaust silencers, building vent fans, a station service transformer, and a utility transformer. The existing flare will be retained in its current location and used as necessary to control residual landfill gas not fired in the engines.

The Plant will operate 24 hours per day; 7 days per week except during any scheduled or unscheduled downtime for maintenance. A trained LES operator will be at the Plant usually from 7:00 am to 3:30 pm, Monday through Friday, to monitor the conditions of the equipment, gas flows, and other operations. If there is any fault that causes an alarm in the system during unattended operations, a telephone dialer will notify a trained LES operator to address an operations issue or upset condition. See Appendix D for additional operations information.

b) Connection to the Landfill Gas Collection System

The Plant will be connected with a new 14-inch HDPE (SDR-17) line to the existing landfill gas collection system at a 14-inch header at the flare station by means of a "Tee" connection as shown on Drawings G-4 and G-5 in Appendix B. No penetration of the liner system or surface disturbance will be required

for the connection of this pipe. This Plant is not expected to impact the collection efficiency and thus should not impact the quantity of landfill gas collected per operating day.

The plant is designed to a capacity to allow the processing of all the landfill gas currently being collected and burned at the CCSWDC's existing flare station (~1,900 cfm) up to a total capacity of 2,200 cfm. When the quantity of landfill gas collected exceeds equipment capacity and cannot be processed at the Plant, excess gas will be sent to the flare station for burning.

There will be an automatic shutoff valve at the main inlet to the Plant that will close upon shutdown of the Plant. The main automatic shutoff valve only closes for a plant shutdown caused by a utility failure, fire alarm, high methane detection or if the plant emergency stop is activated. Each engine will have a shutoff valve, which closes whenever the engine is not requested to run. If the flare is not already operating and the Plant is either partially or totally shutdown, the Plant will signal the flare to start up through "contact closure". This sequence will start the blower at the flare, open the automatic shutoff valve at the flare station (at the outlet of the knockout pot but before the blower) and light the flare. Additional information is provided in the Appendix D - Operations Plan.

c) Connection to the Leachate Collection System (LCS) for Condensate Disposal

Condensate generated by the Plant will be collected and drained to a sump outside the Plant as seen on Drawing G-4 in Appendix B. The condensate from the Plant will be pumped to an existing condensate drain line at the flare station. This existing gravity line drains to an existing 48-inch diameter sump (S-5) north of the flare station across the road where it is pumped into the landfill leachate collection system (See Drawings G-4, G-5, and M-16 in Appendix B). The leachate then is pumped from the landfill by the LCS pumps into an existing 1,800,000 gallon on-site storage tank, with the contents of the storage tanks transported and/or pumped off-site. The leachate accumulated in the leachate storage tank will be removed by a leachate pumping station that will pump through a forcemain to a connection to the Sarasota County wastewater collection system south of the landfill on Knights Trail Road. The Sarasota County wastewater collection system in this area flows to the City of Venice Water Reclamation Facility (WRF) for treatment. The leachate pumping and forcemain system is the primary disposal method for the CCSWDC leachate. Transfer pumps that discharge to tanker trucks for hauling to a wastewater treatment plant will serve as a secondary disposal location.

In addition, some of the leachate may be recirculated by spray irrigation to the working face and initial cover area of the Class I landfill for dust control.

d) Oil and Used Oil Storage

Since the Plant will be utilizing gas engines to generate power, the engines will consume oil and generate used oil as a by-product of the operations. This oil storage facility will be located adjacent to the Plant.

The “clean oil supply system” consists of a 8,000 gallon double wall storage tank, an air-operated lube oil transfer pump, above ground piping from the lube oil tank to the engine and to the new oil make-up tank. The make-up oil tank will be inside the building on a support structure. The engines are to be provided with an automatic lube oil make-up system.

The used oil collection system consists of a 2,000 gallon used oil double wall tank, air-operated used oil transfer pump, above ground piping from the engine to the used oil storage tank. Used oil from the engine oil changes will be transferred to the 2,000 gallon used oil storage tank via the used oil transfer pump and stored until removed.

Both of the tanks are double-walled with a leak detection (high level) alarm system between the walls. The oil and used oil tanks are not interconnected. The locations of these tanks are shown on Drawing G2 in Appendix B.

3.3 APPLICABLE DISCUSSION OF SECTIONS OF CHAPTER 62-701.530(5)

- a) This Plant is considered a solid waste management facility and is to be constructed and operated in accordance with a permit received from the Florida Department of Environmental Protection (FDEP or Department).
- b) The application Form 62-701.900(1) has been provided in Section 2 and the following information has been addresses:

1. Information to address Chapter 62-701.320(7) and 62-701.330(3):

- a) Information to address Chapter 62-701.320(7):

- A letter of transmittal is provided at the beginning of this application;
- A completed form dated and signed by the applicant is included in Section 2;
- A check in the amount of \$5,000 for this intermediate permit application has been sent to the Department under separate cover;
- An engineering report is included in this Section 3 of the Application;
- Appendices have been included and are a part of this Application;
- Project figures are provided in Appendix A and plans are provided in Appendix B of this Application;
- A Landfill Gas Recovery Facility Operation & Maintenance Plan is to be made a part of the overall Landfill Operations Plan for the CCSWDC as Attachment K-12 to the Operations Plan in Appendix D;
- The Contingency Plan is discussed and referenced in Section 6 of Appendix D;
- A Notice of Application and Notification to Public Officials information are provided in Appendix C; and
- Under State Statutes, the County will be eligible to achieve additional recycling credits depending upon the quantity of electricity generated from the Plant.

b) Information to address Chapter 62-701.330(3):

- A regional map is provided in Appendix A, Figure A-1;
- An aerial map showing a 1-mile radius of the site is provided in Appendix A, Figure A-2;
- A Site Plan showing fencing, drainage, topographic information, and equipment layout is provide on the Drawings in Appendix A and B; and
- Soil boring locations are provided in Appendix A, Figure A-6.

2. Information required in Chapter 62-701.600(4) where relevant and practical:

Since this Plant is not being installed to meet any regulatory requirements under Title V, NSPS, and closure regulations, the approval of this application will not impact the CCSWDC's present closure plan or financial assurance requirements as stipulated by Chapter 62-701.530(5), F.A.C. Upon closure of the landfill, the Plant will continue to operate until it is no longer economically feasible. After the Plant is no longer in use, the landfill gas flare(s) will be utilized to burn the landfill gas for the purpose of satisfying the Title V requirements, odor control, and gas migration.

3. Condensate Quantity Calculations and Disposal

a) Condensate Quantity Estimates (From the Landfill Gas Collection System to the Flare Station)

This section addresses the current quantity of condensate flow from the CCSWDC's landfill gas collection system based on landfill gas collection rates for up to 2,200 cfm. It is noted that much of the collection system utilizes gravity drained condensate drop-out structures and knockouts; therefore, a direct measure of the condensate flow is not possible without system modification.

As stated in the CCSWDC's Operations Plan:

"Condensate is conveyed through the gas collection system and collected at condensate drop-out structures located throughout the gas collection system and also at the knockout pot prior to the existing blower at the gas control unit. The condensate will either drain or be pumped from the condensate collection trap/sump and gas control unit into the existing leachate collection system for disposal..."

According to calculations performed for this site, about 7,962 gallons per day of condensate is expected to be collected from the gas system during peak gas generation (year 2054). This equates to only about 5.5 gallons per minute from the entire gas collection system. This minimal amount of condensate from the gas system will not significantly impact the operations of the leachate collection and storage system, even at peak discharge."

To calculate the quantity of condensate generated at the present capacity of the Plant (2,200 cfm), the U.S. Army Corps of Engineers' (Corps) Document EM 1110-1-4016, *Landfill Off-Gas Collection and Treatment Systems*, May 30, 2008, methods of estimating condensate generation rates were utilized.

Some reasonable assumptions are made when estimating condensate generation:

- landfill gas temperature at the wellhead is the warmest.
- landfill gas temperature depends on the distance traveled in the buried header pipe and the thermal conductivity of the header pipe.
- landfill gas is completely saturated with water vapor.

A conservative Corps method equation is as follows:

$$q_{cond} = \left(\frac{Q_{TOT}}{\rho_{H_2O}} \right) \left[(H_{AIR} * \rho_{AIR})_{HOT} - (H_{AIR} * \rho_{AIR})_{COLD} \right]$$

where:

- q_{cond} = flow rate of condensate (gpm)
- Q_{TOT} = total gas collection rate (ft³/min)
- ρ_{H_2O} = density of water (lb/gal)
- H_{AIR} = humidity of air (lb H₂O / lb dry air)
- ρ_{AIR} = density of air (lb H₂O / ft³)

Essentially, the procedure quantifies the mass flow rate of water vapor in the landfill gas as it is being extracted and as it reaches the flare. The difference is the flow rate of condensate collected. Although the CCSWDC is currently (December 2013) approximately 1,900 cfm, for calculation purposes, the design flow of the Plant at 2,200 cfm will be utilized.

In addition, the above procedure assumes that landfill gas is 100% saturated at both the hot and cold temperatures, and that the density of condensate is equal to the density of water. Further, it is assumed that the temperature of the extracted landfill gas is 130°F at an extraction well and 90°F at the flare station connection. From that point, the landfill gas temperature goes from 90°F to 70°F after processing at the Plant. Utilizing the formula above at varying temperature ranges, the estimates of condensate generation is presented in Table 3.1. The Corps acknowledges in the Technical Letter that this method is conservative (overestimates).

For the LFG Collection System Calculations:

$$= \left[\frac{0.111 \text{ lb } H_2O}{\text{lb dry air}} \left(\frac{0.0645 \text{ lb dry air}}{\text{ft}^3} \right)_{130F} - \frac{0.031 \text{ lb } H_2O}{\text{lb dry air}} \left(\frac{0.0692 \text{ lb dry air}}{\text{ft}^3} \right)_{90F} \right] \\ * \left(\frac{2200 \text{ ft}^3}{\text{min}} \right) \left(\frac{\text{gal}_{90F}}{8.32 \text{ lb } H_2O} \right) = \mathbf{1.33 \text{ gpm} = \underline{1,910 \text{ gpd}}}$$

For the Plant Operation Calculations:

$$= \left[\frac{0.031 \text{ lb } H_2O}{\text{lb dry air}} \left(\frac{0.0692 \text{ lb dry air}}{\text{ft}^3} \right)_{90F} - \frac{0.015 \text{ lb } H_2O}{\text{lb dry air}} \left(\frac{0.0718 \text{ lb dry air}}{\text{ft}^3} \right)_{70F} \right] \\ * \left(\frac{2200 \text{ ft}^3}{\text{min}} \right) \left(\frac{\text{gal}_{70F}}{8.32 \text{ lb } H_2O} \right) = \mathbf{0.28 \text{ gpm} = 407 \text{ gpd}}$$

Table 3.1 – Results for Estimates of Condensate Generation		
	Plant Design Flow – 2,200 cfm	
	Gallons per Day	Gallons per Minute
Landfill Gas Collection System (total at Plant Design Flow Prior to Plant Operations)	1,910	1.3
Plant Contribution After Gas Cooling	410	0.3
Total	2,320	1.6

b) Additional Condensate Discharge from the Plant into the Landfill Leachate Collection System

The condensate from the Plant's gas system, primary and final gas filters, and main gas header drain will be collected and piped via a HDPE (SDR-11) line into an existing condensate gravity line at the flare station which then drains to a sump (S-5) as shown on Drawings G-4, G-5, and M16 (in Appendix B) which is then pumped to the leachate collection system. It is expected that the amount of condensate being generated will not drastically change as a result of Plant operation. Additional cooling and pressure increases in the gas as a result of Plant operations which could result in an increase in condensate quantity up to 410 gallons per operating day at flow rates up to 2,200 cfm. Therefore, the quantity of condensate collected by this system in conjunction with any extra produced at the Plant should have an estimated flow of 2,320 gallons per day (1,910 gpd + 410 gpd) or 1.6 gallons per minute at flow rates of 2,200 cfm. This minimal amount of condensate from the gas system will not significantly impact the operations of the leachate collection and storage system as further discussed below.

c) Size of Existing Condensate Sump/Pump Station (S-5)

The existing sump S-5 will receive the additional condensate generated by Plant operations. S-5 is 48-inch diameter HDPE sump with an estimated of 4 feet of storage (~400 gallons) below the incoming landfill gas headers. The sump has a QED AP-4 AutoPump® (short bottom) air driven pump set at a pumping rate of approximately 13 gallons per minute. Not all of the condensate generated by the landfill gas collection system is collected at S-5. However, for checking the adequacy of the size of the sump and pump, if it is assumed that all of the condensate is collected at S-5 and allowing for the additional condensate generated by the Plant, the sump and pump are more than adequate to handle the additional flow (13 gpm vs. 1.6 gpm @ 2,200 cfm). In fact, S-5 with the current size pump should be able to handle landfill gas collection rates up to 5,500 cfm (flare station total capacity flow) without any flow restriction issues.

4. Condensate Sampling, Analyzing, and Reporting

Since the condensate is drained into the existing landfill leachate collection system where it is eventually treated at the WRF (see section 3.2 c) above), condensate sampling, analyzing, and reporting are not required. However, if condensate is directly removed at the Plant and hauled off for disposal and not drained into the landfill leachate collection system, the condensate will be sampled, analyzed, and the results reported to the Department.

5. Closure Plan to Control LFG After the Plant Ceases Operations

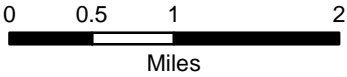
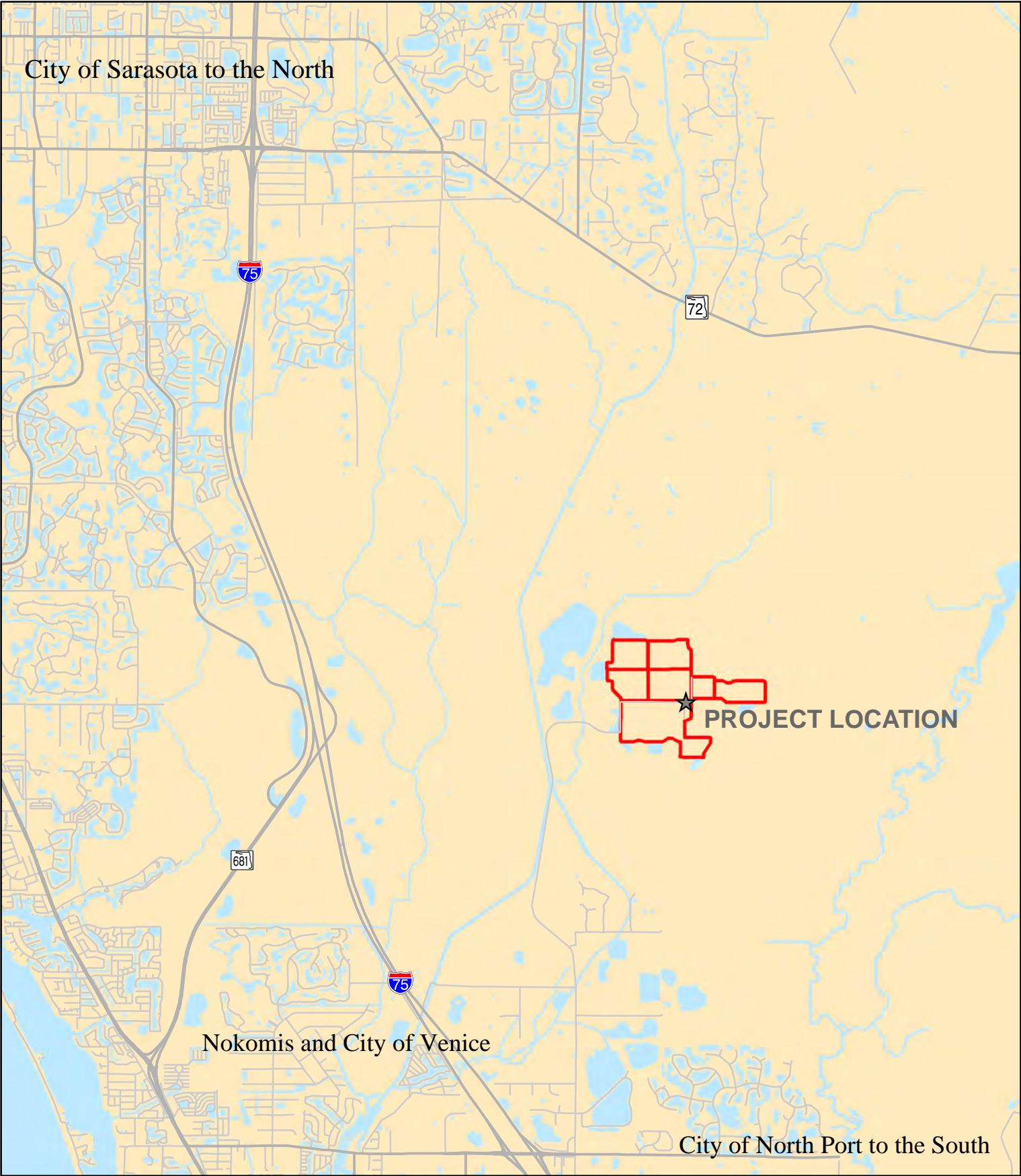
Since this Plant is not being installed to meet any regulatory requirements under Title V, NSPS, and closure regulations, the approval of this application will not impact the CCSWDC's present closure plan or financial assurance requirements as stipulated by Chapter 62-701.530(5), F.A.C. Upon closure of the landfill, the Plant will continue to operate until it is no longer economically feasible. After the Plant is no longer in use, the landfill gas flare(s) will be utilized to burn the landfill gas for the purpose of satisfying the Title V requirements, odor control, and gas migration.

APPENDIX A

Figures

Figure A-1

Central County Solid Waste Disposal Complex Regional Map



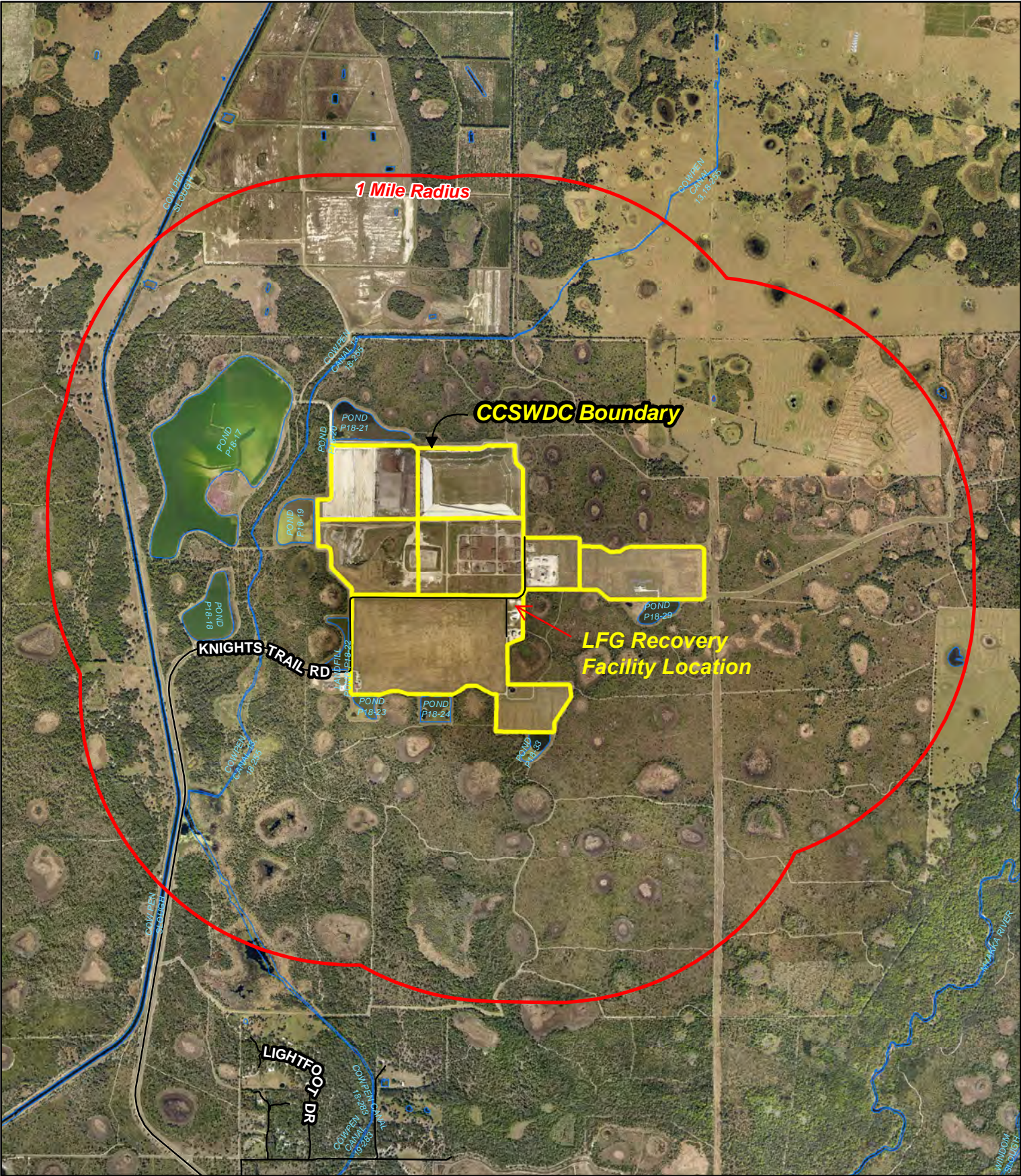
Map published using ArcGIS 10.0 by kdotson on Wednesday, September 11, 2013

Path: N:\Environmental\Solid Waste\CentralLandfill\CCSWDC Solid Waste Operation Permit Renewal\CCSWDCRegional052013.mxd

Figure A-2

Central County Solid Waste Disposal Complex

Aerial Photograph, 1 Mile Radius



Aerial Imagery Provided by Pictometry International:
Sarasota County, FL
February 2013
4" Resolution
N.A.D. 1983 HARN State Plane Florida West FIPS 0902 (U.S. Survey Feet)



0 0.25 0.5
Miles

Map published using ArcGIS 10.0 by kdotson on Wednesday, September 11, 2013

Path: N:\Environmental\Solid Waste\Central and Hill CCSWDC Solid Waste Operation Permit Renewal\CCSWDC Aerial052013.mxd

Central County Solid Waste Disposal Complex Landfill Gas to Energy Facility

CIP# 95215

From Sarasota County:

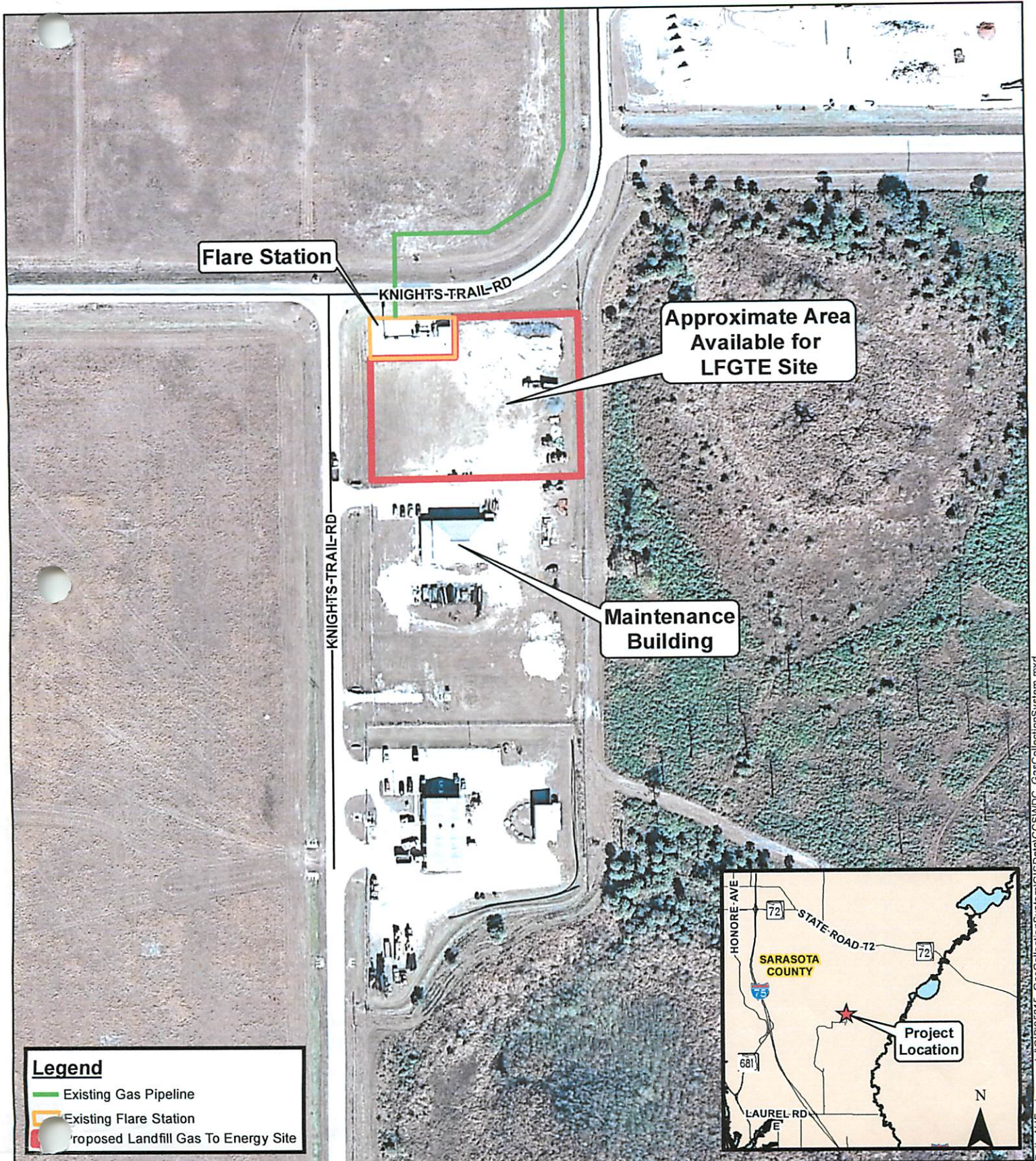


Figure A-4

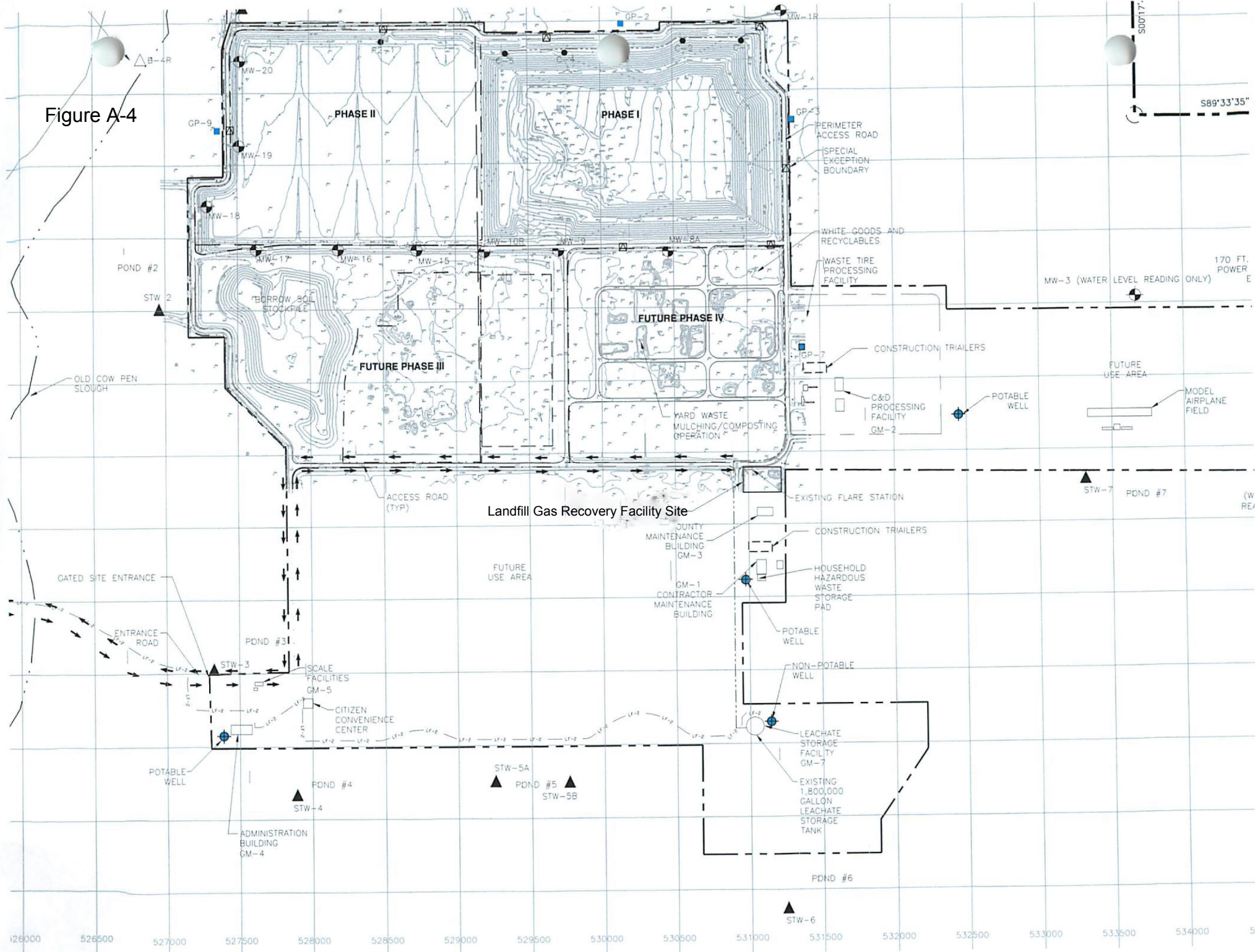
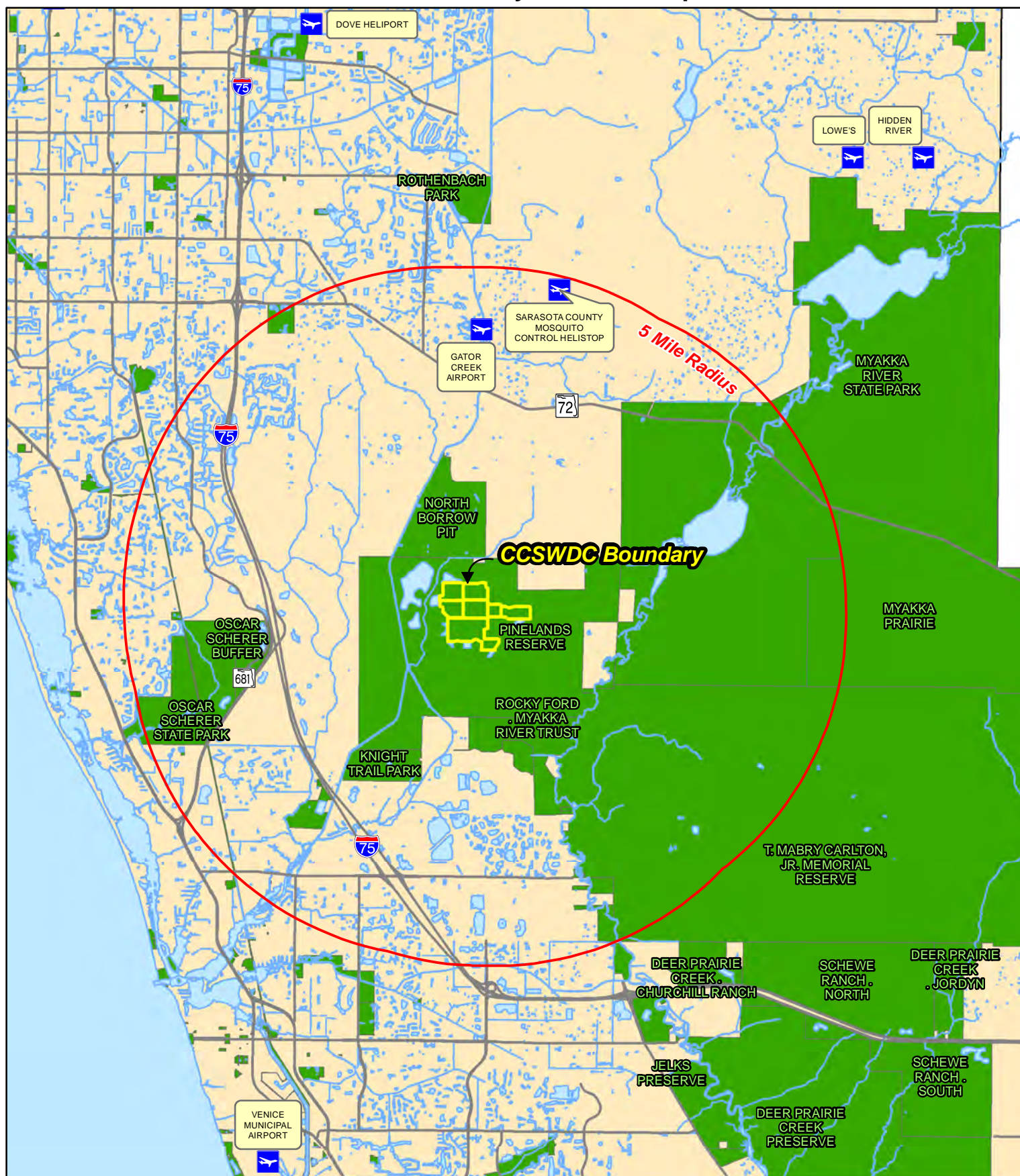


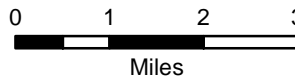
Figure A-5

Central County Solid Waste Disposal Complex Aviation Facility Location Map



Map published using ArcGIS 10.0 by kdot on Wednesday, September 11, 2013

Aviation facility location information was obtained from the Federal Aviation Administration website: (http://www.faa.gov/airports/airport_safety/airportdata_5010/) The information was current as of 05/02/2013.



Path: N:\Environmental\Solid Waste\CentralLandfill\CCSWDC Solid Waste Operation Permit Renewal\CCSWDC\AirportLocation052013.mxd



NOTE: BASE MAP PROVIDED BY LANDFILL ENERGY SYSTEMS FLORIDA, LLC

BORING LOCATION PLAN



LEGEND

- APPROXIMATE LOCATION OF SPT BORING
- APPROXIMATE LOCATION OF AUGER BORING
- APPROXIMATE LOCATION OF PERMEABILITY TEST
- WENNER 4-NODE SOIL RESISITIVITY TEST TRANSECT LINE

DRAWN BY:
SW
CHECKED BY:
DM

APPROVED BY:
JTS
DATE:
OCT 2013

ENGINEER OF RECORD:
JESSE T. STRICKLAND, P.E.
FLORIDA LICENSE NO.:
74564



SCALE:
NOTED

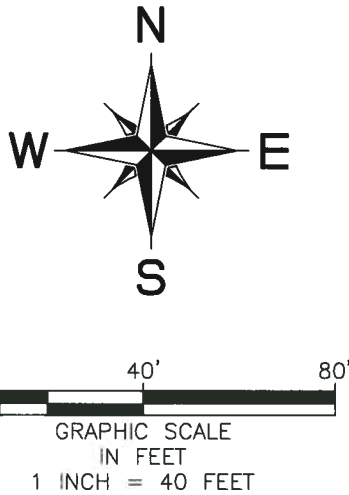
PROJECT NUMBER:
6511-13-190

GEOTECHNICAL ENGINEERING SERVICES
SARASOTA LANDFILL
SARASOTA COUNTY, FLORIDA

Figure A-6

APPENDIX B

Drawings



GRADING NOTE:
ALL STORMWATER RUNOFF
SHALL BE DIRECTED TO THE
EXISTING SWALES LOCATED
TO THE EAST AND WEST OF
THE PROJECT. STORMWATER
RUNOFF SHALL NOT IMPACT
THE SURROUNDING
FACILITIES, SUCH AS (BUT
NOT LIMITED TO) THE
MAINTENANCE FACILITY,
LAYDOWN YARD, PARKING
LOT, FLARE STATION, ETC.

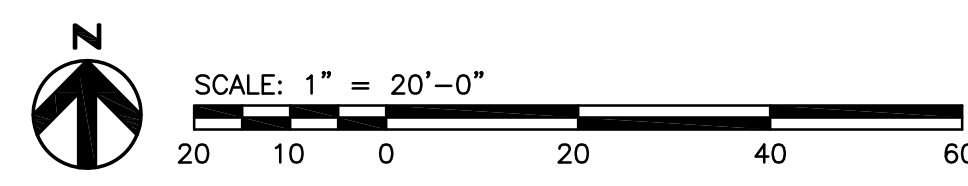
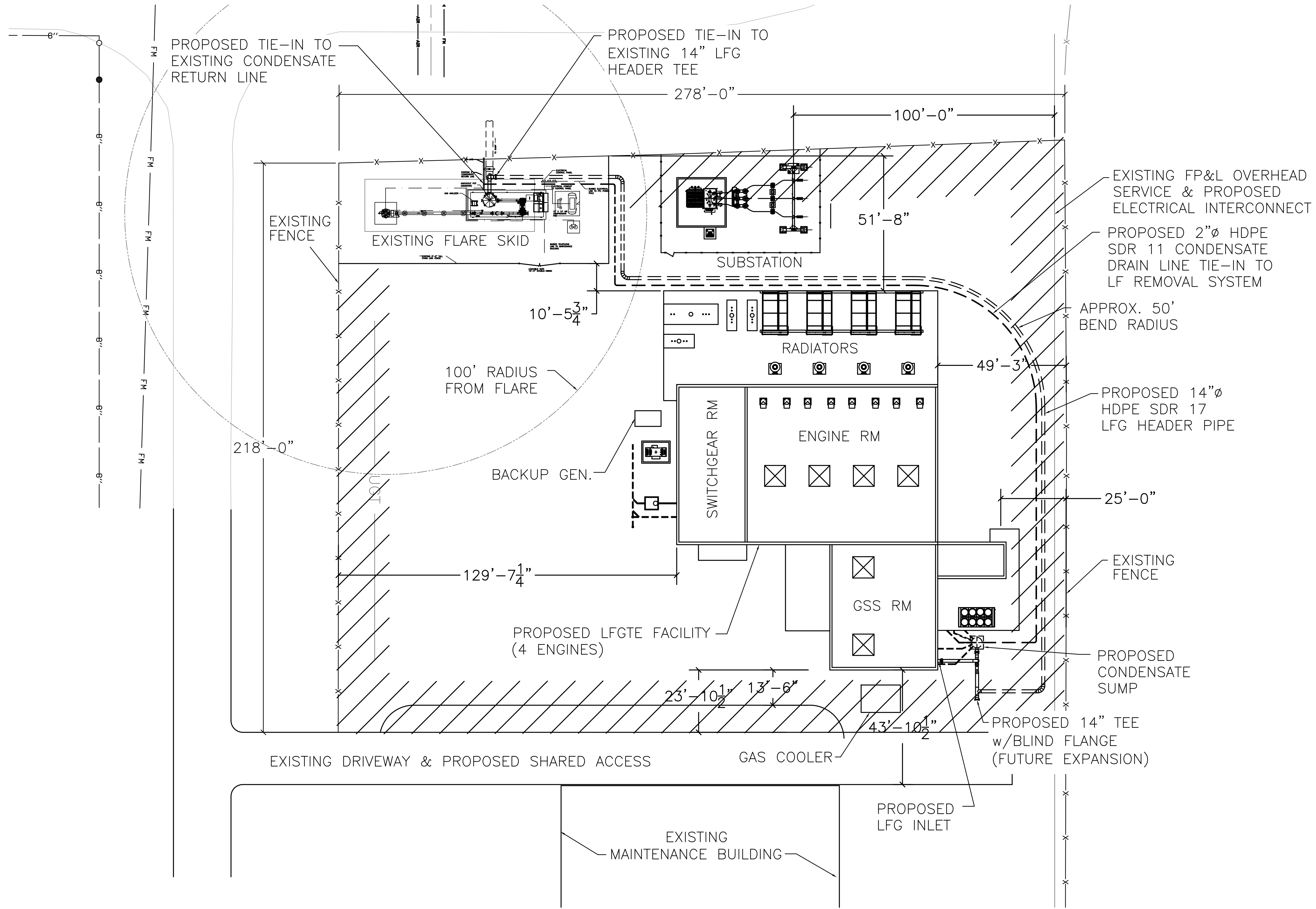


FRANKLIN, HART & REID
CIVIL ENGINEERS - LAND SURVEYORS
1368 East Vine Street, Kissimmee FL, 34744
Telephone (407) 846-1216 Fax (407) 343-0324
e-mail: eng@franklinhart.com

PRELIMINARY SITE PLAN
SARASOTA COUNTY LFGTE FACILITY

VERTICAL DATUM: N/A
SARASOTA COUNTY

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ARCON
STRUCTURAL ENGINEERS, INC.
2201 GLENVIEW, SUITE E - SARASOTA, FL 34237
(941) 552-1100 - FAX (941) 552-1101

[Signature]
No. 72767
STATE OF FLORIDA
PROFESSIONAL ENGINEER

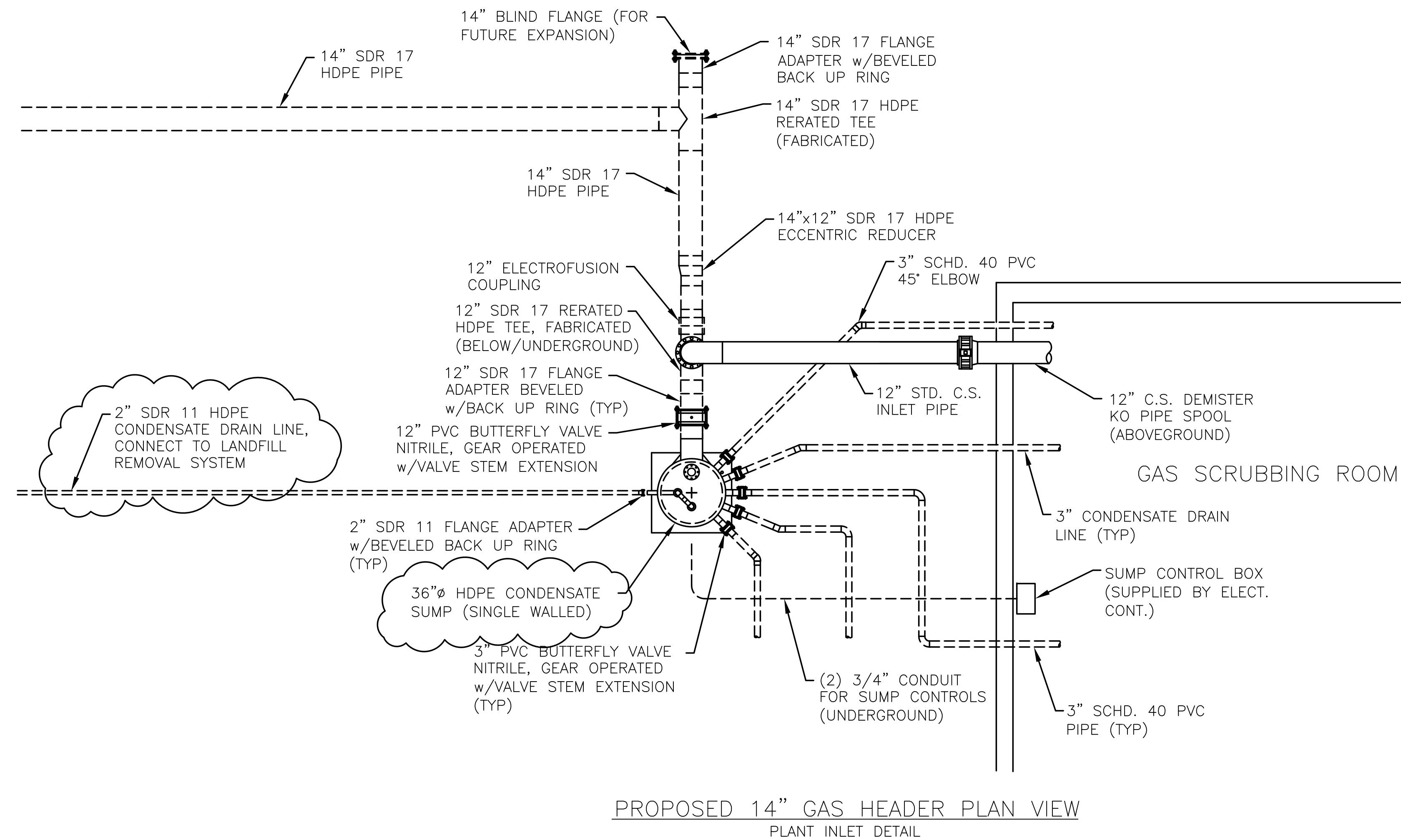
2-11-14

Landfill Energy Systems

PROJECT: SARASOTA LFGTE FACILITY
DRAWING TITLE: PROPOSED LFG COLLECTION SYSTEM SITE PLAN

DRAWN BY: JG	DATE: 1/15/14	CAD DRAWING NO.: 1037-04	DRAWING NO.: G4
CHECKED BY:	SCALE: AS NOTED	SHEET NO.:	

46280 DYLAN DRIVE
NOVI, MICHIGAN 48377
(248) 380-3920

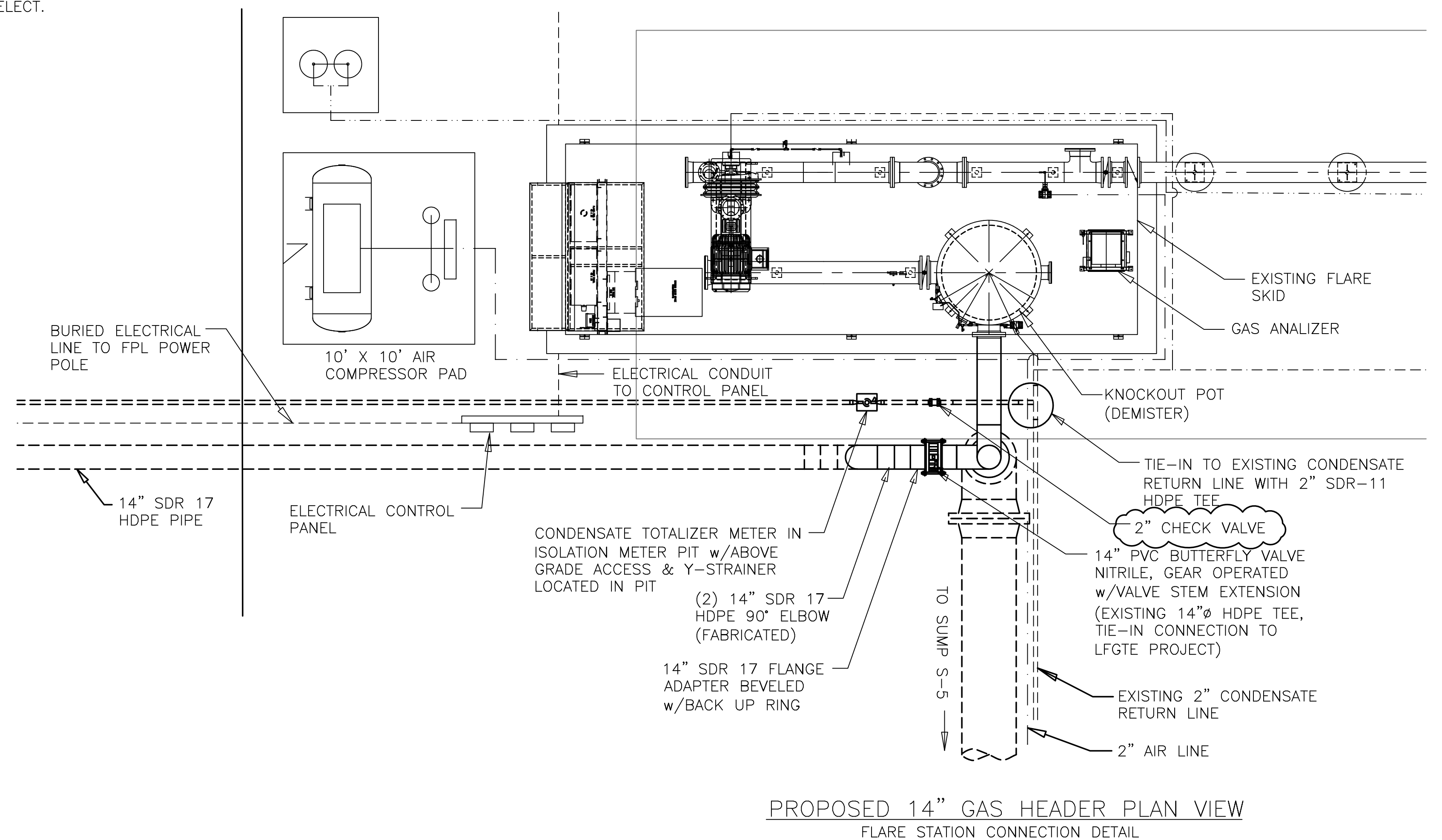


NOTES:

1. ALL PIPE BEDDING & BACKFILLING TO BE AS PER THE PIPE BEDDING DETAIL ON CAD DRAWING NO. 1037-MIR1600.
2. THE 2" CONDENSATE DRAIN LINE TO BE IN SAME TRENCH AS 14" GAS HEADER. SLOPE TO DRAIN INTO EXISTING CONDENSATE FOREMAIN AS REQUIRED.
3. THE GAS COLLECTION PIPING & 2" CONDENSATE DRAIN LINE SHALL BE SLOPED A MINIMUM OF 1%.

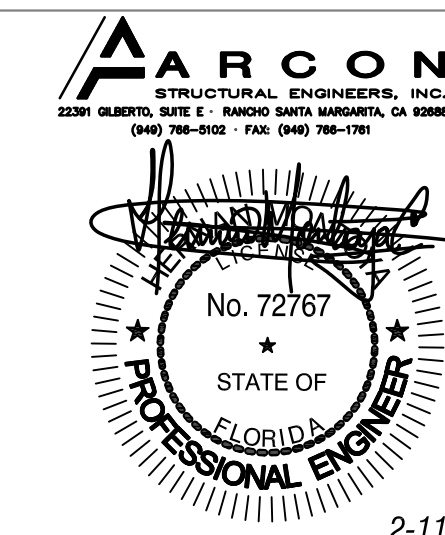
NOTE:

PRIOR TO THE START OF DIGGING OF THE TRENCH FOR THE GAS HEADER, LOCATE FIBER OPTIC CABLE AND/OR OTHER UTILITIES THAT MAY BE BURIED ALONG THE PROPOSED ROUTE. ADJUST THE GAS HEADER AND/OR THE CONDENSATE DRAIN LINE ROUTE AS REQUIRED TO AVOID ANY UTILITIES ENCOUNTERED.



NO.	REVISIONS	DATE	BY

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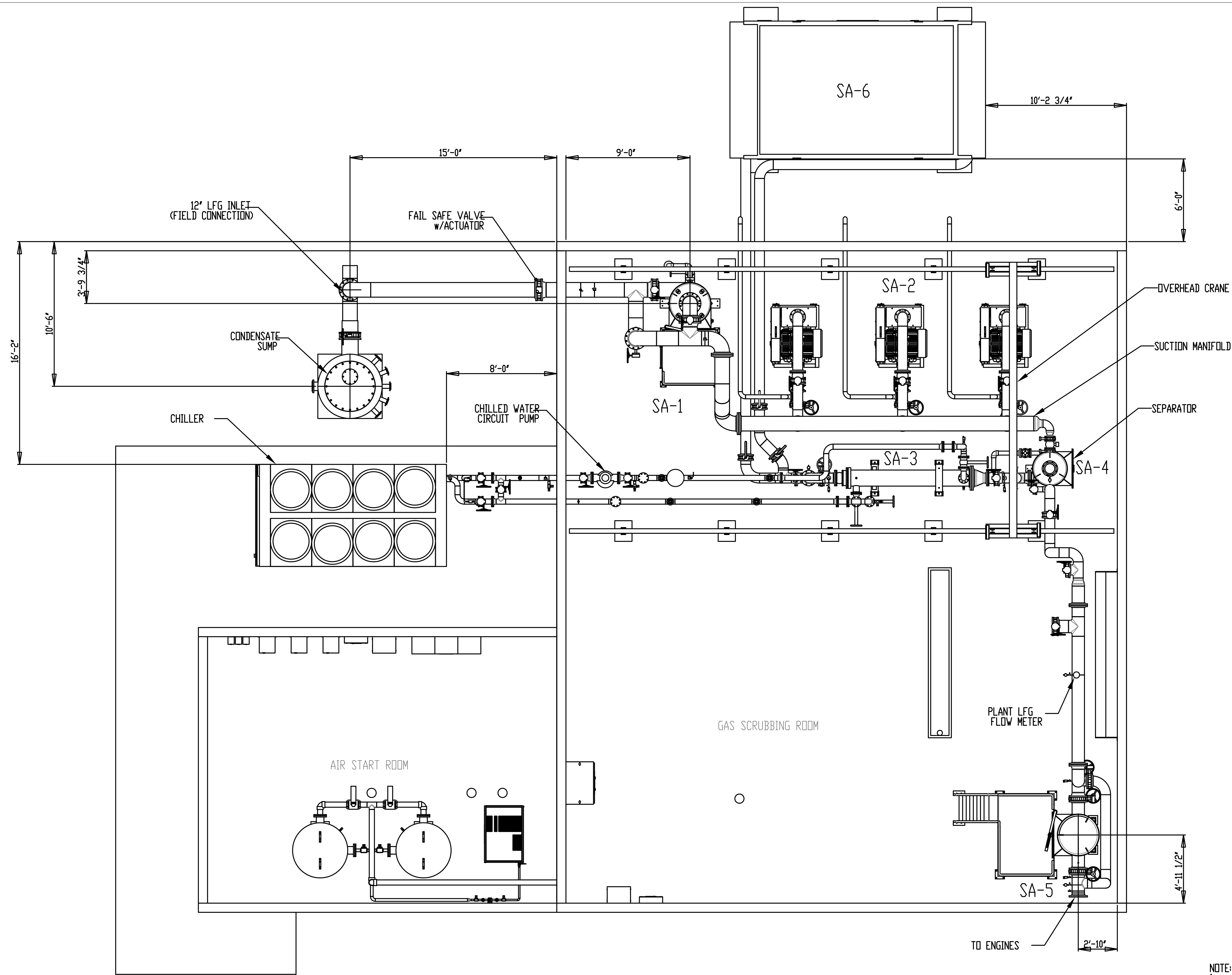
Landfill Energy Systems

PROJECT: SARSOTA LFGTE FACILITY

DRAWING TITLE: PROPOSED GAS HEADER COLLECTION SYSTEM DETAILS

DRAWN BY: JG	DATE: 1/15/14	CAD DRAWING NO.: 1037-05	DRAWING NO.: G-5
CHECKED BY:	SCALE: AS NOTED	SHEET NO.:	

46280 DYLAN DRIVE
NOVI, MICHIGAN 48377
(248) 380-3920




NOTE:
1. ALL DIMENSIONS ARE FOR REFERENCE ONLY.

LEGEND
SA-1 (DEMISTER KD VESSEL #1)
SA-2 (BLOWER SKID)
SA-3 (GAS TUBE HEAT EXCHANGER)
SA-4 (KD VESSEL #2)
SA-5 (KD VESSEL #3)
SA-6 (GAS COOLER)

0	ISSUE FOR PERMIT		
NO.	REVISIONS	DATE	BY
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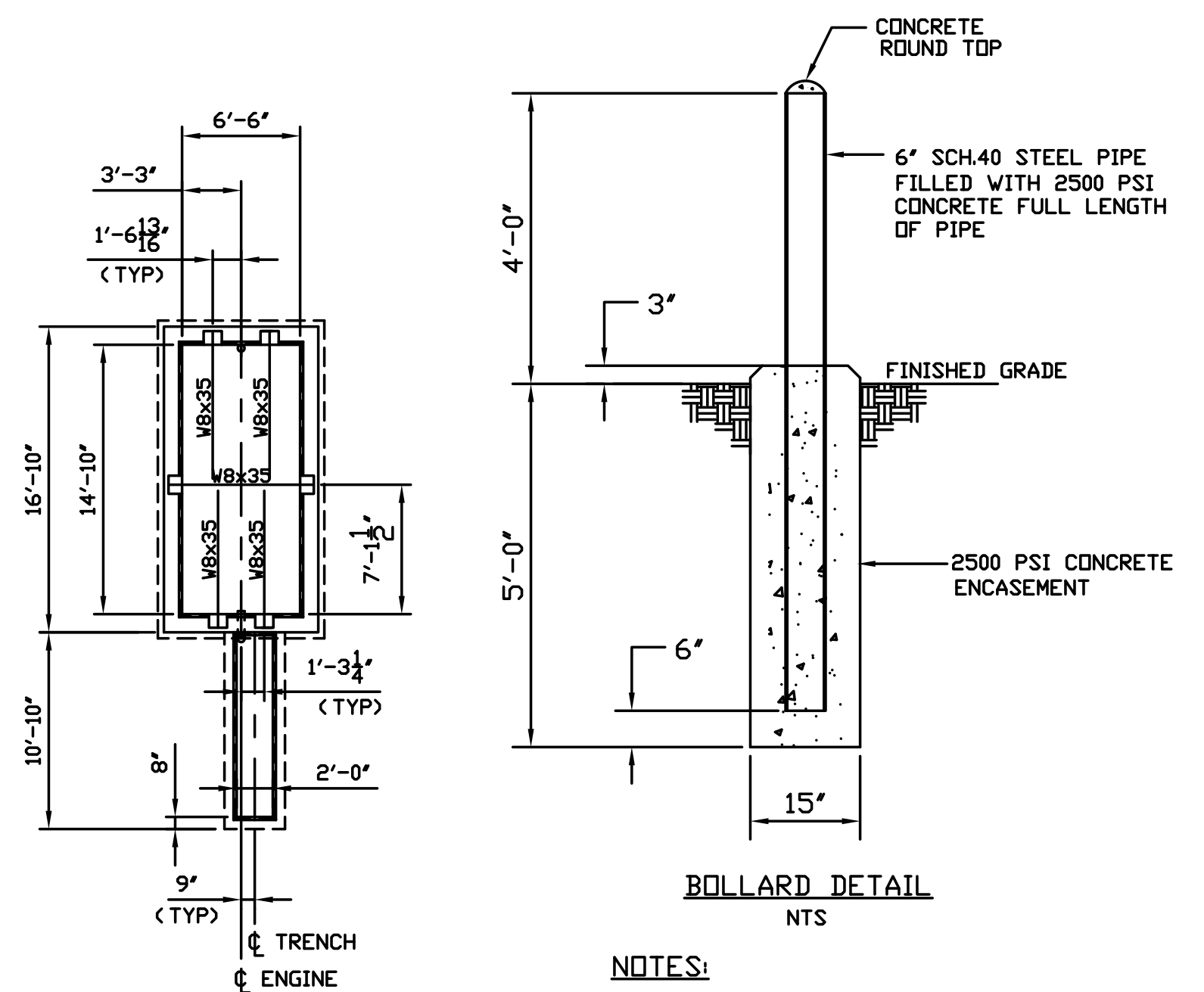

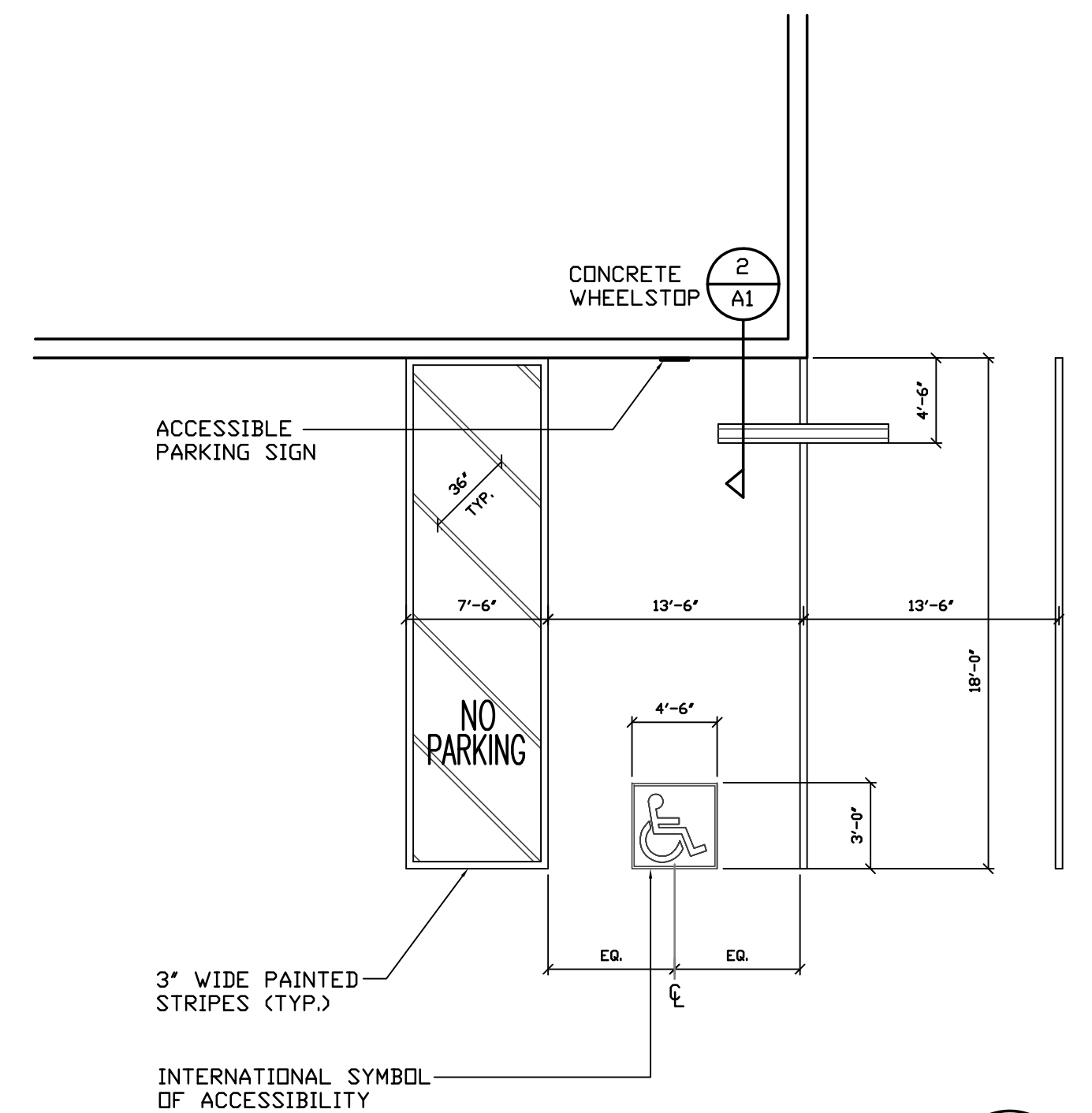

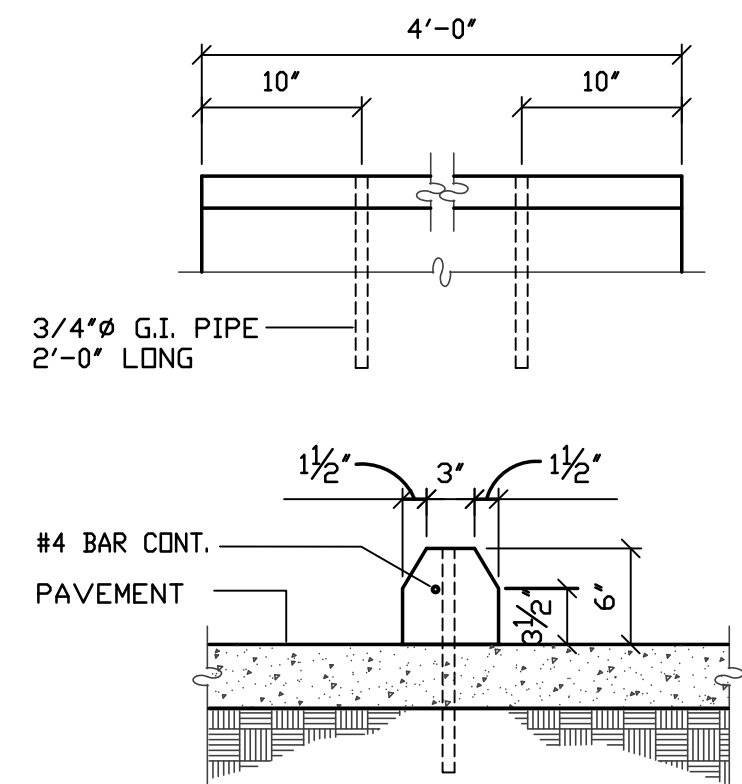
**Landfill Energy Systems**

PROJECT: SARASOTA LFGTE FACILITY

DRAWING TITLE: GAS SCRUBBING SYSTEM LAYOUT

DRAWN BY: JG	DATE: 1/15/14	CAD DRAWING NO: 1037-G600	DRAWING NO: G-6
CHECKED BY:	SCALE: 1:45	SHEET NO:	

46280 DYLAN DRIVE
NOVI, MICHIGAN 48377
(248) 380-3920

BOLLARD DETAIL

NOTES:

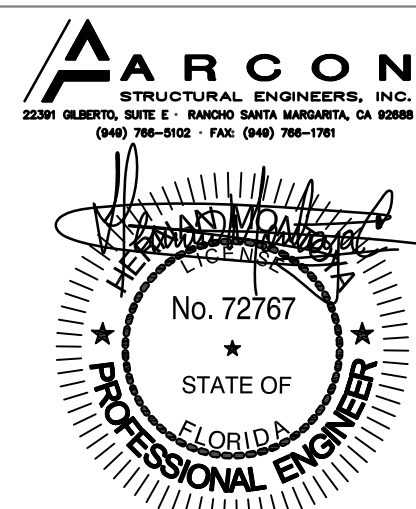
1. ALL BOLLARDS TO BE SET PLUMB.
2. ALL BOLLARDS TO BE SPACED AS SHOWN.
3. ALL BOLLARDS TO BE SHOP PRIMED AND RECEIVE 2 FINAL COATS OF GLOSS ENAMEL OSHA SAFETY YELLOW.

ENGINE FOUNDATION & SUPPORT
TYPICAL DETAIL

WATER HEATER CLOSET
ABOVE BATHROOM/JANITOR ROOM
AT EL 8'-2"

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2-11-14



LANDFILL ENERGY SYSTEMS

PROJECT: **SARASOTA LEGISLATIVE FACILITY**

DRAWING TITLE: **BUILDING FLOOR PLAN**

DRAWN BY:

JG

CHECKED BY

DATE:

12/10/13

SCALE:

CAD DRAWING NO.:

SHEET NO.:

DRAWING NO.

A1

46280 DYLAN DRIVE
NOVI, MICHIGAN 43377
(248) 380-3920

APPENDIX C

Notice of Application And Elected Official Notifications

Appendix C

Notice of Application

In accordance with the requirements of Rules 62-701.320(8), Florida Administrative Code (F.A.C.), a Notice of Application (Notice) will be published in a newspaper of general circulation in the area where the Landfill Gas Recovery Facility will operate. A copy of the draft Notice is provided in this Appendix. The Notice will be published within 14 days of the application submittal to the Department and the Notice will conform to the requirements of Chapter 62-110.106, F.A.C. The Notice will be mailed to Chair of the Board of County Commissioners, the local District 4 County Commissioner and each State Senator and Representative serving the jurisdiction for this facility, as required in the aforementioned rules. A list of the officials receiving the Notice and a copy of the letters are provided at the end of this Appendix. It is assumed that the Department will provide the Applicant with the final draft of the Notice and the Applicant will then make arrangements for publishing. The Applicant will provide the Department with proof that the Notice was published and distributed to the appropriate officials. After the Department completes the permit review, the Department will send a copy of the notice of intent to issue or deny the permit to these same officials.

February xx, 2014

Honorable Nancy C. Detert
Florida Senate – District 28
417 Commercial Court, Suite D
Venice, FL 34292

RE: Certified Mail No. XXXXXXXXXXXXXXXX
Notice of Application for an Intermediate Modification to the Operations Permit
For the Construction and Operation of a Landfill Gas Recovery Facility
Central County Solid Waste Disposal Complex
Sarasota County, Florida

Dear [Senator Detert]:

On behalf of Sarasota County, Florida, we am hereby formally notifying you that Sarasota County recently filed an application with the Florida Department of Environmental Protection (FDEP) for a permit to construct and operate a new Landfill Gas-to-Energy facility in an unincorporated area of Sarasota County at the Central County Solid Waste Disposal Complex. This new facility will convert gases generated from decomposing wastes at the landfill into electricity and at the same time:

- Reduce emissions of greenhouse gases that contribute to global climate change.
- Offset the use of non-renewable resources, such as coal, oil, and natural gas.
- Help improve local air quality.
- Provide revenues for the landfill and energy cost savings for users of energy derived from landfill gas.

To comply with the requirements of Section 62-701.320 (8). F.A.C., this notice is being provided to you, **[State Representative Doug Holder, Sarasota County Commissioner Nora Patterson (local District 4)]** and Mr. Charles D. Hines, Esq., Chair of the Board of County Commissioners of Sarasota County. In addition, the attached notice will be published in the *[local newspaper]* newspaper.

This firm has been hired to design, construct, and operate the landfill gas-to-energy facility and provide other services to Sarasota County. Please call me at (585) 948-8580 if you have any questions about this project.

Sincerely,
Innovative Energy Systems/Landfill Energy Systems

Emily Zambuto
Manager of Environmental Programs

Enclosure, Notice of Application

cc: Lois Rose, Sarasota County
 Jason Timmons, P.E., Sarasota County
 Cory Dewayne Dillmore, P.E., FDEP

State of Florida
Department of Environmental Protection
Notice of Application

The Department announces receipt of an application for an intermediate permit modification to the Operations Permit (Permit No. 0130542-022-SO/01) from Sarasota County Solid Waste Operations and Landfill Energy Systems Florida, LLC, to construct and operate a Landfill Gas Recovery Facility to generate electricity. This proposed project will be located at Sarasota County Central County Solid Waste Disposal Complex, 4000 Knights Trail Road, in Nokomis.

This application is being processed by the Department. The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at the Department of Environmental Protection, Permitting and Compliance Assistance Program, Solid Waste Program and Permitting, 2600 Blair Stone Road, Mail Station 4565, Tallahassee, Florida 32399, telephone (850) 245-8705. Any comments or objections should be filed in writing with the Department at this address. Comments or objections should be submitted as soon as possible to ensure there is adequate time for consideration in the Department's review and decision process on the application.

The application may also be found here:

http://appprod.dep.state.fl.us/WWW_WACS/Reports/SW_Facility_Docs.asp?wacsid=51614

List of Elected Officials to be Notified at Permit Submittal

(as required by Chapter 62-701.320 (8)(b) F.A.C.)

1. Board of County Commissioners

Chair of the Commission

Commissioner Charles D. Hines, Esq.

1660 Ringling Blvd.

Sarasota, FL 34236

941-861-5344

chines@scgov.net

District 4 (Local District)

Commissioner Nora Patterson

1660 Ringling Blvd.

Sarasota, FL 34236

941-861-5344

npatters@scgov.net

2. State Legislators

State Senate - District 28

Senator Nancy C. Detert

417 Commercial Court

Suite D

Venice, FL 34292

(941) 480-3547

State House - District 74

Representative Doug Holder

District Office

8486 South Tamiami Trail

Sarasota, FL 34238-2953

Phone: (941) 918-4028

APPENDIX D

Updated

CCSWDC's Operations Plan

To Add

Attachment K-12

**Landfill Gas Recovery Facility Operation
& Maintenance Plan**



Sarasota County
Solid Waste Operations

Central County Solid Waste Disposal Complex Operations Plan

September 2013

Prepared by
Sarasota County Solid Waste Operations
4000 Knights Trail Road
Nokomis, FL 34275

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ATTACHMENTS

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Attachment K-9	LFGCCS Operations and Maintenance Plan
Attachment K-10	FDEP Approval Letter for Leachate Reuse
Attachment K-11	Phase II Temporary Gas Vent Information
<u>Attachment K-12</u>	<u>Landfill Gas Recovery Facility Operation & Maintenance Plan</u>

K.8.g Precipitation and Leachate Generation Rates

Rainfall for each 24-hour period measured at an official gauge located on-site will be recorded and entered onto a spreadsheet (format included in Attachment K-6) to compare precipitation to leachate generation.

K.8.h Leachate Collection System Inspection and Cleaning

The County will water pressure clean or conduct a video inspection of the leachate collection systems in Phase I and Phase II at least once every five years in accordance with Rule 62-701.500 F.A.C. requirements. Leachate pumps, metering manholes, and leak detection manholes at CCSWDC will be inspected for operation failures at least daily. Control panels will be inspected and operational data recorded as described in Section K.8.f.

K.9 LANDFILL GAS MANAGEMENT AND MONITORING

K.9.a Landfill Gas Management

The CCSWDC is located near the center of over 6,000 acres of County-owned property. The minimum distance from the Class I landfill to the nearest property line is 1,800 feet. This distance represents a substantial buffer to allow for dispersion of odors normally associated with MSW landfill operations. Therefore, it is not anticipated that collection of landfill gas will be necessary for odor control.

In order to comply with air quality requirements, a Non-Methane Organic Compound (NMOC) emission report will be submitted to the implementing authority on an annual basis following the requirements of New Source Performance Standards (NSPS). Within 12 months after reporting NMOC emissions greater than or equal to 50 Mg/year (megagram per year), a detailed landfill gas collection and controls system design plan submittal shall be made to the NSPS implementing agency. Within 18 months after this submittal, the installation of the landfill gas collection and control system shall be completed. Based on current Tier 2 sampling and model projections, the CCSWDC Class I landfill has not exceeded the NMOC threshold at the time of this report and is not expected to exceed the threshold until 2015. Operation of the Landfill Gas System is provided in greater detail in Attachment K-9. [Operation of the LFG Recovery Facility is provided in greater detail in Attachment K-12.](#)

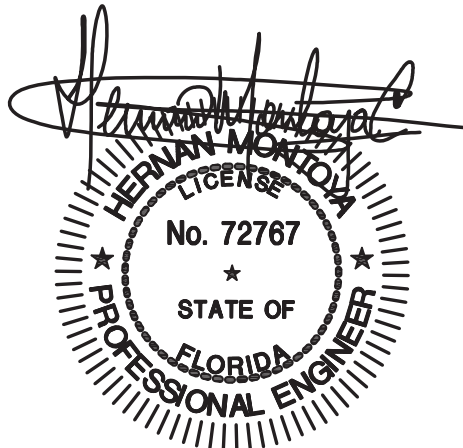
K.9.b Landfill Gas Monitoring Program

A gas monitoring program will be implemented to prevent explosions and fires and to minimize off-site odors and damage to vegetation. The landfill gas monitoring program for CCSWDC will include monitoring of the landfill perimeter and enclosed on-site structures at the monitoring locations shown on Figure 1 in Attachment K-3. Monitoring will be conducted on a quarterly basis and a report submitted to FDEP within 15 days after the end of the quarter in which monitoring occurred. The outside monitoring locations, as shown on Figure 1 provided in Attachment K-3, will consist of gas monitoring probes as shown on Figure L-3 in Attachment K-3. All gas probes will be clearly labeled and easily visible at all times.

The CCSWDC gas monitoring locations include four gas monitoring probes as described above and numbered GP-2, GP-3, GP-7, and GP-9 and six gas monitoring locations GM-1, GM-2, GM-3, GM-4, GM-5, and GM-7 in structures as shown on Figure 1 provided in Attachment K-3.

ATTACHMENT K-12

**LANDFILL GAS RECOVERY FACILITY OPERATION &
MAINTENANCE PLAN**



February 14, 2014

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1.0 Introduction and Purpose

As discussed in previous sections of this Operations & Maintenance Plan, the County operates and maintains the landfill gas collection and control system (LFGCCS). This document presents an Operation and Maintenance (O&M) Plan for the Sarasota Landfill Gas-to-Energy Project (GTE Facility) owned by Landfill Energy Systems Florida, LLC.

Landfill Energy Systems Florida (LES) will operate a reciprocating internal combustion engine (RICE) GTE Facility at the Central County Solid Waste Disposal Complex which is located in Sarasota County at 4000 Knights Trail Road, Nokomis, Florida. The GTE Facility is permitted for the operation of four lean-burn engine-generator sets that will fire landfill gas to produce up to a combined nominal 6.4 megawatts (MW) of power to the electrical grid. Methane rich landfill gas is produced by the decomposition of material in the landfill. This gas will be collected, treated, and compressed to be used as fuel to run the engine-generator sets. The gas treatment will include dewatering (a moisture knockout vessel), gas compressors and blowers, air-to-gas coolers and 1 micron filtration.

2.0 Personnel Requirements

2.1 Management Organization

LES is responsible for the management and operation of the Sarasota Landfill Gas-to-Energy Project (GTE Facility). The Regional Manager is responsible for making all primary decisions related to the administration and operation of all the LES sites in Florida. A GTE Lead Operator is responsible for the operation of the GTE Facility and reports to the Regional Manager. The GTE Lead Operator also receives instructions from the Operations staff concerning the daily operation of the GTE Facility; technical repairs and diagnostic troubleshooting; and purchasing tools, equipment and supplies for the GTE Facility.

2.2. Personnel Responsibilities

Operation of the GTE Facility requires full-time staff. The GTE Facility staff members can vary in number and level of responsibility. However, in general, staff members and their responsibilities follow:

- One Regional Manager who will manage all LES Florida GTE operations.
- One Manager of Environmental Programs who will (i) ensure that the GTE Facility is operating in compliance with the terms and conditions of all permits; (ii) monitor the environmental compliance of the facility.
- Two (2) GTE Facility Plant Operators who will operate and maintain the landfill gas recovery plant. The Plant Operator's responsibilities will include: (i) the management of all daily activities with regard to the operation, maintenance, and security of the facility in compliance with all regulatory requirements; (ii) the provision of scheduled transportation and disposal of materials and residue from production and storage areas; (iii) procedures which maintain a high degree of personnel safety and housekeeping standards through appropriate planning; (iv) engine and facility maintenance including

appropriate recordkeeping; (v) engine oil analysis management; and (vi) compression and gas treatment system maintenance.

In addition to the normal full-time staff, additional engineering, operations and safety personnel may be obtained from other LES facilities/offices during periods of scheduled and unscheduled maintenance at the facility. The Plant Operators will be scheduled to work five days a week, 7:00 AM to 3:30 PM and will be on call the remainder of the time. A plant system failure will alert the Operator by phone if the Operator is away from the plant.

Personnel related to the GTE Facility operations are trained to perform their specific duties and to recognize potentially hazardous or dangerous situations at the GTE Facility. Training for the GTE Facility includes but is not limited to the following topics:

- Safety Topics (including Lock Out Tag Out Procedures)
- Equipment Operation
- Construction and Operating Permit Conditions
- Spill Prevention
- Emergency Management and Reporting Procedures

3.0 Facility Operations

The GTE Facility operation is divided into five main segments:

- Facility Startup and Shutdown
- Landfill Gas Collection System
- Engine-Generator
- Facility Control System

Electrical power transmission to the local utilities transmission lines is controlled by two main circuit breakers, 52U and 52T. Tie breaker 52T is used to control electrical power from the generators, and utility circuit breaker 52U is the main breaker connecting the GTE Facility to the utility's grid system. Breaker 52U is located in the transformer switchyard and breaker 52T is located in the switchgear in the control room with generator breakers. For initial start up of the GTE Facility, power from the local electrical utility system is used via a 4.16 KV switchgear, to activate the GTE Facility systems. This is accomplished by closing the utility circuit breaker (52U), and tie breaker (52T). An electrical interlock controls the sequencing of the utility breaker (52U) and tie breaker (52T). The tie breaker (52T) cannot be closed until the utility breaker (52U) has been closed.

3.1 Facility Startup

3.1.1 Startup Precautions

The following section describes the precautionary activities and procedures which must be followed during facility start-up.

- Before beginning start-up procedures, ensure all maintenance work is completed and all HOLD and WARNING tags are cleared and removed.
- For normal operation, maintain engine outlet cooling water temperature between 220°F and 235°F.
- For normal operation, maintain engine oil temperature above 190°F.
- For normal operation, engine exhaust temperature should be between 900°F and 1000°F. Temperatures higher or lower can be an indication of serious mechanical problems.
- Do not attempt to operate the engine and/or gas blower by wiring around (Jumping) automatic shutdown devices.
- Do not allow the engine to be motored by the generator or rotated in a direction opposite from normal. Rotation without lubrication can be harmful to the engine bearings and reverse rotation can damage engine components.
- Check the oil levels and proper lubrication of all equipment. If necessary, lubricate using the proper type and amount of lubricant.
- Verify fluid levels and coolant and oil valve positions for each engine prior to startup.
- Particular attention should be paid to normal operating conditions so that the operator will be able to detect any variation from normal. Abnormal conditions shall be reported to the Plant Operator.
- Check coolant levels of all engines/generators.
- Check engine air filters for high differential pressure. Do not attempt to run engine if differential pressure exceeds manufacturer's recommendations.
- Check gas blower belts for tension.

3.1.2 Start-up Prerequisites

Prior to facility start-up, the Plant Operator must verify the following system or components are in service:

- Incoming Electrical Power Supply.
- 24 volt DC Control Power System.
- Instrument Air System.
- Fire Protection System.
- Explosive Gas Detection System.
- Auto Dialer System.
- Condensate Pump System.
- Check all protective relays for flags, and reset.

3.1.3 Engine-Generator Start-Up

After the auxiliary load has been activated, normal operation of the reciprocating engine-generator set is started as follows:

- Verify that the Main Gas Inlet Valve for the wellfield header to the plant is in the open position.
- Open Main Header Bleed valve for re-circulation of gas to the condensate knockout tank.
- Start the compressor and verify compressor pressure to the main gas header.
- Place Engine Control Switch to the Run position.
- Depress start button on switchgear to initiate engine start sequence.
- Unit should start and obtain normal operating RPM.
- After engine oil has obtained a minimum temperature of 190°F, then the unit can be paralleled with utility and loaded to desired load.
- Once at load, verify proper operation by checking all panels and instrument readings.

After achieving the required voltage and frequency, the generator is synchronized with the utility electrical system and breaker 52G1 is closed. After breaker 52G1 is closed, generator loading takes place and the generator power is supplied to the 4.16 KV switchgear and the utility system. This procedure is the same for the remaining generators (G2, G3, G4).

3.2 Facility Shutdown

- Unload engine by depressing the unload button. The engine will gradually unload at a rate of 3 kW per second and then will automatically trip the generator breaker at 50 kW.
- Once the main generator breaker trips offline, the unit will then go into cool down mode. The engine will operate for an additional five minutes and will then shutdown.
- Once all three or four units have been shut down, the gas compressors will be automatically switch from “run” to “off” mode.

3.3 Landfill Gas Collection System

The existing LFG collection system at the Central County Solid Waste Disposal Complex, operated by the County, consists of vertical gas extraction wells and associated header piping. The collected gas is currently being flared. The GTE Facility will be the prime consumer of the landfill gas once operational. However, if the gas collected exceeds the gas needed to operate the engines or the GTE engine-generators are offline, the existing candlestick flare system will ensure control of all the gas collected by burning off the excess gas. The volume of gas sent to the flare will be greater than or equal to the lowest turn down ratio for continuous flare operation.

3.4 Gas Treatment System

The GTE Facility gas treatment room contains the equipment required to draw the LFG from the main header and treat the LFG prior to combustion in the engines. The equipment and processes used to treat (dewater, filter and compress) the LFG received from the landfill (prior to combustion as fuel in the IC engines) will consist of:

1. Initial two-stage inlet gas dewatering/filter vessels (bottom chambers are used for moisture knockout, top chambers are equipped with coalescing filters to remove gas particles having a diameter of 1-micron and larger).
2. Gas compressor/blowers.
3. Air-to-gas coolers, which will be used to reduce the elevated temperatures of LFG received from the compressors to approximately 10°F above ambient temperatures.
4. Final two-stage dewatering/filter vessels (the bottom chambers are used for moisture knock out, top chambers are equipped with coalescing filter media to remove gas particles having a diameter of 1-micron and larger).

Components of the specified gas treatment system will not be equipped with atmospheric vents. Therefore, all of the LFG received by the system will be directed to the IC engines for use as a fuel.

3.5 Engine-Generator Sets

The four engine-generator sets are comprised of a Caterpillar G3520C landfill gas V-20 engine driving a Caterpillar 1600 kilovolts (kV) generator. The Caterpillar G3520C engine/generator set is rated at 1000 KVA, 1200 RPM, 0.8 power factor, 3 phase, 4160 volts output, wye connected 60 hertz. The generator output is connected to a 4.16 KV switchgear, providing power to station auxiliary loads with the balance of power exported to the utility grid via a 3 phase station transformer which steps up the generated voltage from 4160V to the high line voltage (13200V) and provides power as “sell-back” to the utility grid.

The engine-generator sets are supplied lube oil and coolant from two storage tanks located in the outdoor tank storage area. Adjacent to these two tanks is the used oil storage and used coolant storage. A level alarm panel in the remote transfer areas in the engine room monitors the tank levels and leak detection.

3.6 Facility Control System

The GTE Facility control room contains master controls for landfill gas recovery through the gas compressor, control of the engine and generator systems, synchronization control for the utility grid, and an annunciation panel and autodialer in the event of an upset condition in the GTE Facility.

Seven control panels make up the station switchboard and include a Utility Tie Compartment, Plant Load Compartment, Master Compartment, Generator Control Compartments. These compartments include the following:

- One Utility Tie compartment, which contains the digital metering display, a synchroshope switch and synchronizing model selector switch for manual paralleling. This compartment also contains the bus tie breaker control switches, tie breaker status indicators, tie breaker protective relays, and the 86T lockout relay.
- One Plant Load compartment, which contains digital metering display, control switches, status indicators and protective relays.

- One Master compartment, which contains the station operator interface module with a touch screen mounted on the cubical door, system indicating lights and control switches, and the utility protective relays.
- Three/Four engine-generator set control cubicles for Generator 1 (52G1), Generator 2 (52G2), Generator 3 (52G3), and Generator 4 (52G4). The cubicle contains a digital metering display, generator protective relays, engine control module with a touchscreen mounted on the cubicle door, control switches, a high speed relay trip (86 device) and the generator emergency stop pushbutton.

Each cubicle is constructed of a metal cabinet with internal steel barriers. Each cabinet has hinged front and rear doors for access to the cabinet interiors.

3.7 Planned and Unplanned Shutdowns

Company records indicate that the average online time for a GTE Facility operated by LES using Caterpillar engines exceeds 95%. The 5% offline time includes planned and unplanned shutdowns. Any planned or unplanned shutdowns are recorded in the daily log book and/or on EnergyWeb. This information includes the date/time offline, date/time online, shutdown cause and corrective actions.

3.7.1 Planned Shutdowns

Planned shutdowns are generally performed for maintenance reasons, or at scheduled intervals as requested by the utility receiving the electrical power from the GTE facility. The Lead Operator will use the following Facility Maintenance as a general guideline. Scheduled Facility Maintenance items shown below may be adjusted for specific operating conditions:

- Change gas treatment system micron filters every 4,500 to 9,000 hours based on sample results
- Change oil and oil filter in gas compressors every 4,500 to 9,000 hours based on inspection.
- All other repairs as needed.

Engine preventative maintenance is scheduled at intervals based on the operational experience of LES. The Lead Operator will use the following maintenance schedule as a general guideline. Scheduled maintenance items, shown below, may be adjusted for specific operating conditions as required by the engine:

- Replace engine oil and filter every 800 to 1,800 hours.
- Check and clean or replace spark plugs every 1,000 to 1,800 hours.
- Engine valve inspections and adjustments every 1,000 to 1,800 hours.
- Inspect cylinder heads, clean and replace as necessary every 8,000 to 10,000 hours.

The replacement of IC engine parts (such as cylinder seals) is performed during top-end IC engine overhauls that are performed every 8,000 to 10,000 operating hours.

Planned shutdowns for regularly scheduled maintenance occur as follows:

- Each engine is typically shutdown for approximately 1.5 hours each month for general service including oil, filter and sparkplug changes. These guidelines may be adjusted if operational characteristics require change.
- Each engine is typically shutdown annually for approximately 8 to 12 hours for overhauling of the engine top end (heads and valves) based on operating characteristics of the engine.
- The plant is shut down for approximately one day each year in order to service the LFG compressor (treatment) system and the electrical system by changing oil and filters in the compressor and checking the safety system. Specific maintenance schedules and procedures are described in the manufacturer's operational and maintenance guides, which is kept onsite and can be provided upon request.
- The flow meter will be calibrated annually in accordance with instructions and guidelines in the manufacturer's operation and maintenance manual.
- Leak testing of the gas header entry to the plant will be performed prior to commissioning of the plant. Leak tests will also be performed on pipe connections and valves whenever an engine or compressor is replaced.
- Methane detection is provided throughout the plant. The system is calibrated and maintained as per the manufacturer's recommendations. In the event of a methane leak, an alarm will sound, the gas supply to the plant will be shutoff, and the engines will shut down.

3.7.2 Unplanned Shutdowns

Unplanned shutdowns are generally the result of unexpected events such as:

- Power interruptions within the local utility grid due to increased power usage tripping main breakers or weather related incidents.
- High levels of oxygen in the LFG.
- Failure of a LFG treatment compressor/blower within the GTE Facility.
- Radiator faults/trips.
- Detection of explosive concentrations of flammable gases within the GTE Facility.

In all cases, unexpected events listed above will trigger an automatic shutdown of the fuel supply to the GTE Facility, the compressor/blowers and automatic shutdown of the engine-generator sets. At the same time, an annunciator alarm and panel light will be activated in the control room and the GTE on-call operator will be automatically notified of the shutdown through the autodialer.

The on-call operator, as part of his/her job responsibilities, is required to respond to the alert and troubleshoot and correct the cause of the unexpected shutdown.

During times when the GTE Facility is down for planned or unplanned reasons, LFG that will be normally combusted in the plant will be diverted to the open flare by automatic valve operation and starting the flare. LES and Landfill personnel will work together on this.

4.0 Description of Safety Features

The GTE Facility has been designed to detect a number of upset conditions during facility operation as described below. Upset conditions are sensed by relay elements that will cause the autodialer to be activated notifying the on-call operator of the upset condition. The autodialer functions as a remote alarm monitor. Operators are on call 24 hours a day, seven days a week to respond to upset conditions at the GTE Facility.

In addition to notifying the on-call operator of an upset condition, the relay elements can also shutdown all or a portion of the GTE Facility. An upset condition might result in the termination of electrical energy flow to the utility grid, shutdown of one or more engine-generator sets, and/or shutdown of the compressor/blowers (gas treatment system).

4.1 Power Interruptions

When a power failure, voltage or frequency disturbance occurs on the utility line, the event is detected by one of the relays which will initiate a trip to the utility breaker (52U). Opening breaker 52U will cause the tie breaker 52T to trip. Upon restoration of the utility line voltage, the on-call operator can close the utility breaker (52U) and the process of restarting power generation can occur.

Overpower, overcurrent or a grounding fault on the utility line side of the main transformer is detected by relays which will trip the utility breaker (52U) and tie breaker (52T) via lockout relays 86U and 86T.

Each generator is equipped with an automatic voltage regulator and an automatic power factor controller. The generator is also protected by a relay against unbalanced current, instantaneous and time delay overcurrent, reverse power, loss of excitation and faults that cause a flow of differential currents through the generator windings. Neutral grounding of the generator is achieved through the neutral grounding resistor, to limit ground fault current to 100 amps.

The facility high voltage distribution system is provided with the necessary relay protective devices to guard against the ever present threat of damage caused by overcurrents and transient over voltages that can result in equipment loss and system failure. The relays utilized at this plant are solid-state devices which require no routine maintenance. Each relay should be checked annually as described in the Vendor Operations and Maintenance Manual to confirm its operation. If a relay is found to be inoperative it should be returned to the vendor for repair.

The programmable logic controller (PLC) and remote terminal units (RTU) connects all relays/sensors in the GTE Facility and converts the relays/sensor signals to digital data. During upset conditions, most control actions are performed automatically by RTUs or by PLCs. Data acquisition begins at the RTU or PLC level and includes meter readings and equipment status reports that are communicated to supervisory control and data acquisition (SCADA) as required. Data is then compiled and formatted in such a way that an operator using the human-machine interface (HMI) can make supervisory decisions to adjust or override normal RTU (PLC) controls.

4.2 Fire Prevention within the Facility

The GTE Facility has been designed so that if any of the following faults occur, the generator breaker (52Gx) is tripped and the engine-generator set is shutdown:

- High oxygen.
- Blower failure.
- Air compressor failure.
- Fire detection alarm.
- High methane alarm.

The engine-generator set is shutdown in order to control the potential for fire and explosion within the plant. It should be noted that the GTE Facility building is constructed with minimum of combustible material, so as to limit the propagation of fire. The building fire protection consists of ionization detectors, thermal detectors, smoke detectors on the ceiling and duct work, methane detectors, audible and visual alarm devices, and manual fire pull stations.

4.3 Gas Treatment System Alarms

The GTE Facility has a HMI Gas Panel located in the gas treatment room (which can also be accessed in the control room). The Gas Panel has screens for system alarms. Each screen is provided with alarm windows labeled for alarm and shutdown functions.

The on-call operator uses the Gas Panel as an initial diagnostic tool to determine where the upset condition is. Each screen also provides an acknowledge button to acknowledge alarms. There is also a system reset button to reset/clear an alarm once the upset condition has been corrected.

4.4 Engine-Generator Alarms

Each generator control panel has an HMI located in the system control cubical in the control room. The HMI has screens for system alarms. Each screen is provided with alarm windows labeled for both alarm and shutdown functions.

The on-call operator uses the panel as an initial diagnostic tool to determine where the upset condition is. Each screen panel provides an acknowledge button to acknowledge the alarm. There is also a button to reset/clear an alarm once the upset condition has been corrected.

4.5 Methane Detection Alarm Panel

The LFG GTE Facility will be equipped with an Explosive Gas Detection System which is utilized to continuously monitor ambient air in the gas treatment room, engine-generator room and plant control room for the presence of methane gas. The gas detection system control panel, located in the control room, measures methane concentrations taken from four methane sensors.

Methane gas is explosive only between certain concentrations. This explosive range is 5% to 15% methane in air. The 5% level is defined as the LOWER EXPLOSIVE LIMIT (LEL) and the 15% level is defined as the UPPER EXPLOSIVE LIMIT (UEL). Below the LEL, an explosion will not occur

because the concentration of methane is not high enough to support an explosion. Above the UEL, an explosion will not occur because the methane concentration in relation to the oxygen concentration is too high to support an explosion. An explosion being the VERY RAPID combustion of gas. Methane concentration levels are indicated on the methane detection control panel from 0 to 100% of the LEL.

Should the methane detection unit detect a concentration of methane, the unit will initiate the alarms as described in the following:

- High Concentration of Methane Gas (10% LEL, or 0.5% in air by volume)
Initiates HIGH FACILITY GAS CONCENTRATION alarm in the control room.
Illuminates an ALARM CONDITION on the methane detection control panel.
- High-High Concentration of Methane Gas (25% LEL, 1.25% in air by volume)
Indicates HIGH-HIGH FACILITY GAS CONCENTRATION alarm in the control room.
Illuminates an ALARM CONDITION on the methane detection control panel.

The control panel is provided with back-lights labeled for both alarm and fault conditions. The on-call operator uses the panel as an initial diagnostic tool to determine where the alarm/fault is located. After the area with the high methane condition has been determined, the operator should proceed to the affected area with a portable gas detector to determine the validity and/or source of the methane gas leak. If a leak is confirmed, the GTE Facility should be shutdown and the affected area should be ventilated using confined space blowers and/or the exhaust/supply fans. After sufficient time has been allowed for ventilation, recheck the concentration from the control room panel. When safe limits are met, enter the affected building with a portable gas detector and attempt to find and repair the leak.

4.6 Storage Tank Alarms

The GTE Facility will have an alarm panel for the Oil and Coolant Storage System. The tank level alarm panel has nine channels/indicators (eight of which are used) as noted below. When an alarm is received, a light on the alarm panel is illuminated; the green light at the pump controls/transfer station in the engine room turn off as well as sounding an audible alarm.

- Coolant Tank #1 High Level.
- Coolant Tank #2 High Level.
- Lube Oil Tank High Level.
- Used Oil Tank High Level.
- Coolant Tank #1 Leak Detection.
- Coolant Tank #2 Leak Detection.
- Lube Oil Tank Leak Detection.
- Used Oil Tank Leak Detection.

The on-call operator uses the alarm panel as an initial diagnostic tool to determine where the upset condition is. The alarm panel has a button to clear the horn. The alarm indicator will remain lit until the alarm condition has been corrected.

5.0 Site Security

The landfill is enclosed by a fence with locking gates in all areas where the public has access. The GTE Facility is locked during times when the GTE operators are not present. The access doors to the control room, engine room and gas treatment room from the outside are steel insulated doors with locking deadbolts. Steel overhead doors also provide access to engine room and gas treatment room. The overhead doors are controlled from inside the GTE Facility.

6.0 Emergency Response

Site emergencies are handled in accordance with the CCSWDC emergency response/contingency plan. This plan covers the following:

- Fire response.
- Medical emergencies response.
- Spill/release/emission response.
- Natural disasters.

A list of emergency telephone numbers is provided below:

- | | |
|---|----------------|
| • Ambulance Service | 911 |
| • Police Department | 911 |
| • Fire Department | 911 |
| • CCSWDC Administration Building | (941) 861-1573 |
| • Main Switchboard Sarasota County Government | (941) 861-5000 |
| • South District, Dept. of Environmental Protection | (239)-344-5600 |

7.0 Recordkeeping

Various readings are recorded at the start of each daily shift. The different spreadsheets used by the facility are generated by using the information recorded in the Plant Daily Readings sheet as provided below. All records and data relating to the physical operations of the facility will be made available for inspection by Florida Department of Environmental Protection employees during normal hours of operations.

Daily Readings - Sarasota LFGTE Facility

Unit #	1	2	3	4	Date:
Serial #					
JW Temperature Out / In F	/	/	/	/	
M/U Oil Level (fill below 6 gal)	gal	gal	gal	gal	
Dipstick Oil Level					Time:
Combustion Air Temp	F	F	F	F	
Battery Charger Amps / Volts	A/ V	A/ V	A/ V	A/ V	
SCAC Temperature In / Out F	/	/	/	/	
Gas Pressure	psi	psi	psi	psi	Operator:
Engine Hours	Hrs	Hrs	Hrs	Hrs	
Generator KW Setpoint	kW	kW	kW	kW	
Megawatt Hours (489)					
Filtered Engine Oil Pressure	psi	psi	psi	psi	Engine Room Temperature:
Engine Oil Diff. Press.	psi	psi	psi	psi	
Engine Coolant Pressure	psia	psia	psia	psia	
Engine Coolant Temp	F	F	F	F	
Engine Oil Temp	F	F	F	F	Ambient Temperature:
MAP/MAT	/	/	/	/	
Turbo Inlet Temps (Even/Odd)	/	/	/	/	
Throttle Angle	%	%	%	%	

Compressor Station	Frequency (HZ)	Temp Left	Temp Right	Gas Filter Towers	Primary Filter
Compressor 1	amps	HZ	F	Differential Pressure (IN H2O)	Empty/Full
Compressor 2	amps	HZ	F	Primary	Polishing Polish Filter
Compressor 3	amps	HZ	F	"H2O	"H2O
Compressor 4	amps	HZ	F		Empty/Full

Tie Screen Panel	Gas Quality	Plant
Date / /	Field VAC ("H2O)	Air Press Hrs/psi Hrs/ psi
Time	Post Pri VAC ("H2O)	Air Comp Temp F
Volts V	CH4 %	Plant/Outside F
Amps A	CO2 %	Cond Count gal
Total KW (Tie Meter Screen) kW	O2 %	Flare Flow scfm
kW HR Total (Tie Meter Screen) kWh	Balance %	CCV-DP North- Yes/No South- Yes/No
kWh Total Net (Ion 7330) kWh	BTU	48 Volt Batteries: A V
kW swd (Ion 7330) kW	Gas Head Temp	Notes: (any leaks or other potential problems below)
Gas Flow Rate (scf/m) scfm	Gas Head Press psi	
Gas Flow Total (scf) scfm		
Parasitic load kW (Ion 6200) kW	Oil Tanks	Coolant Tanks
Total Parasitic kWh (ion 6200) kWh	New: gal	New: gal
	Used: gal	Used: gal