## SCS ENGINEERS

March 22, 2021 Project No. 09217088.18

El Kromhout, PG, Environmental Administrator Florida Department of Environmental Protection - Division of Waste Management Permitting & Compliance Assistance Program - Solid Waste Permitting 2600 Blair Stone Road, MS 4565 Tallahassee, FL 32399

Subject: Application for Minor Permit Modification and 5-Year Update Report Manatee County, Lena Road Landfill, Class I WACS Facility #44795 Permit #39884-021-S0-01

#### Dear Ms. Kromhout:

On behalf of Manatee County Solid Waste Division (County), SCS Engineers, Inc. (SCS) is pleased to submit the attached 5-Year Update Report as required by permit specific condition (Section 2) A.5, a permit Fee of \$10,000.00 as required by permit specific condition 6 (Section 2), a minor permit modification fee of \$250, and an application for minor permit modification (Application) as described below.

The 5-Year Update Report includes:

- An updated closure plan to reflect changes in closure design, long-term care requirements, and financial assurance requirements.
- A revised closure cost estimate, made by recalculating the total cost of closure construction and long-term care, in current dollars.
- A demonstration that the leachate collection system has been water pressure cleaned.
- An updated operation plan and HHW operation plan.

The Application for minor permit modification is submitted to:

- Revise the waste filling sequence and return the remaining terraces to the previously permitted parameters that included widths of 20-feet and terrace elevations at 55, 75, 95 and 110-feet NGVD.
- Permit the option for direct landfill disposal of yard waste.
- Update the descriptions of the stormwater management system consistent with ERP Permit #41-0224996-004 issued November 4, 2020.

Each of these modifications is described in detail within the Application and Engineering Report herein. The Application and Report have been prepared in accordance with applicable sections of Chapter 62-701, Florida Administrative Code, and Florida Statutes, to provide required facility information for review by the Florida Department of Environmental Protection. Ms. El Kromhout, PG March 22, 2021 Page 2

Sincerely,

Robert B. Curtis, P.E. Project Director SCS Engineers

an

Shane Fischer, P.E. Vice President/Project Director SCS Engineers

cc: Rob Shankle, Manatee County Bryan White, Manatee County Steven Tafuni, FDEP Southwest District Kate Newsome, FDEP Southwest District

Attachments

	SCS ENGINEERS	MUFG UNION BANK, N.A. 445 Figueroa Street Los Angeles, CA 90071	326677 CHECK DATE
	3900 Kilroy Airport Way, Suite 100 Long Beach, CA 90806-6816 1-800-767-4727	<u>16-49</u> 1220	March 10, 2021
PAY	Ten Thousand Two Hundred Fifty and 00/100 Dollars		
то	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECT 2600 Blair Stone Road, MS #4565 Tallahassee, FL 32399		10,250.00
SCSE	ENGINEERS		326677

Check Date: 3/10/2021					020011	
Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
39884-021-SO-1	3/10/2021	4236265	10,250.00			10,250.00
FLORIDA DEPARTMENT	OF	TOTAL	10,250.00			10,250.00
Union Bank-Accts Payable	e 1	0145910				

## Lena Road Landfill 5-Year Report and Operation Permit Modification Manatee County, Florida

3333 Lena Road Bradenton, FL 34211

Florida Board of Professional Engineers Certificate No. 00004892

## SCS ENGINEERS

March 22, 2021 Project No. 09217088.18

3922 Coconut Palm Drive, Suite 102 Tampa, FL 33619 813-621-0080

#### Lena Road Landfill 5-Year Report and Operation Permit Modification Manatee County, Florida

#### Submitted to:

Florida Department of Environmental Protection 13051 North Telecom Parkway Temple Terrace, Florida 33637

#### Prepared for:

Manatee County Utilities Department Solid Waste Division 3333 Lena Road Bradenton, FL 34211

#### Prepared by:

SCS Engineers 3922 Coconut Palm Drive, Suite 102 Tampa, Florida Orlando, Florida 33619 813-621-0080

> March 22, 2021 Project No. 09217088.18

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Lena Road Landfill

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#### Section

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## 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: February 15, 2015

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 Street 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 813-470-5700 South District 2295 Victoria Ave, Suite 364 P.O. Box 2549 Fort Myers, FL 33901-3881 239-344-5600 Southeast District 3301 Gun Club Road MSC 7210-1 West Palm Beach, FL 33406 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 permit application shall be submitted in accordance with the requirements of Rule 62-701.320(5)(a), F.A.C., 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):
  - ☑ Class I Landfill

🗆 Ash Monofill

Class III La	andfil
UIDIO 111 LC	
0.0.00 =0	

□ Asbestos Monofill

Industrial Solid Waste

 $\Box$  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

Lena Road Class I Landfill

#### 2. Type of application:

- $\Box$  Construction
- Operation
- □ Construction/Operation
- $\Box$  Closure
- □ Long-term Care Only

#### 3. Classification of application:

- □ New
- □ Renewal

Substantial Modification

- □ Intermediate Modification
- ☑ Minor Modification

4.	Facility name:					
5.	DEP ID number: SWD-41-4479	15	County: Manate	e		
6.	Facility location (main entrance): 3333 Lena Road					
	Bradenton, FL 34211					
7.	Location coordinates: Section: (1&12)(31)(6&7)	Township: (35S	)(34S)(35S)	Range: (18E)	)(19E)(19E	E)
	Latitude: 27 <u>28</u> 10	0 "	Longitude: 82	。26	4 35	"
	Datum: NGVD29 Co	oordinate method:	State Plane NAD	83 West Zone (2	011 adjustmer	ıt)
	Collected by: Jeff Young, PSN	Cor	mpany/Affiliation: _	Pickett and As	sociates, In	С.

8.	Applicant name (operating authority): Manatee Co	ounty Utilities Depart	ment
	<sub>Mailing address:</sub> 3333 Lena Road	Bradenton	FL 34211
	Street or P.O. Box	City	State Zip
	Contact person: Robert Shankle	Telephone: ()	748-5543x5275
	Title: Solid Waste Division Manager		
		robert.shankle@m	nymanatee.org
		E-Mail addres	ss (if available)
9.	Authorized agent/Consultant: SCS Engineers		
	Mailing address: 3922 Coconut Palm Drive	, Suite 102, Tampa I	FL 33619
	Street or P.O. Box	City	State Zip
	Contact person: Shane Fischer, P.E.	Telephone: ( <u>813</u> )	804-6714
	Title: Vice President		
		sfischer@scsengi	neers.com
	0	E-Mail address	s (if available)
10.	Landowner (if different than applicant): Same as a	applicant	
	Mailing address:	0.1	
	Street or P.O. Box	City	State Zip
	Contact person:	Telephone: ()	
11.	Cities, towns, and areas to be served:	E-Mail addres	ss (if available)
	Manatee County, including its municipalities, Lon	g-Boat Key, and portions o	f neighboring counties.
12.	Population to be served:		
	<sub>Current:</sub> 395,800	Five-Year Projection: 434,600	
13.	Date site will be ready to be inspected for completion:	N/A	
14.	Expected life of the facility: 21.5 years		
15.	Estimated costs:		
	Total Construction: \$ NA	_ Closing Costs: \$ Refer	to Appendix E
16.	Anticipated construction starting and completion dates	:	
	From: NA	To: NA	
17.	Expected volume or weight of waste to be received:		
	yds³/day _1035ton	s/dayga	llons/day
	62 701 000(1)		

#### PART B. DISPOSAL FACILITY GENERAL INFORMATION

 Provide brief description of disposal facility design and operations planned under this application: This application is to revise the filling sequence and final contours for the Stage II landfill area and make other minor changes and updates. The filling sequence revisions include revising the terrace widths from 30-feet to 20-feet as previously permitted.

	044	740 5540,0000
Title: Landfill Superintendent	Telephone: ( <u>941</u> )	748-5543x8008
	bryan.white	e@mymanatee.org
		E-Mail address (if available
Disposal area: Total acres: <u>316</u>	Used acres: 236	Available acres: 80
Weighing scales used: ✓Yes No		
Security to prevent unauthorized use:	Yes No	
Charge for waste received:	\$/yds³ _40.00	\$/ton
Surrounding land use, zoning:		
Residential	Industrial	
☑ Agricultural	□ None	
☑ Commercial	Other (describe):	
Types of waste received:		
Types of waste received: ☑ Household	☑ C & D debris	
Types of waste received: ☑ Household ☑ Commercial	☑ C & D debris ☑ Shredded/cut tires	
Types of waste received: ☑ Household ☑ Commercial ❑ Incinerator/WTE ash	<ul> <li>☑ C &amp; D debris</li> <li>☑ Shredded/cut tires</li> <li>☑ Yard trash</li> </ul>	
Types of waste received: ☑ Household ☑ Commercial □ Incinerator/WTE ash □ Treated biomedical	☑ C & D debris ☑ Shredded/cut tires ☑ Yard trash □ Septic tank	
Types of waste received: ☑ Household ☑ Commercial □ Incinerator/WTE ash □ Treated biomedical ☑ Water treatment sludge	<ul> <li>☑ C &amp; D debris</li> <li>☑ Shredded/cut tires</li> <li>☑ Yard trash</li> <li>□ Septic tank</li> <li>□ Industrial</li> </ul>	
Types of waste received: ☑ Household ☑ Commercial □ Incinerator/WTE ash □ Treated biomedical ☑ Water treatment sludge □ Air treatment sludge	<ul> <li>☑ C &amp; D debris</li> <li>☑ Shredded/cut tires</li> <li>☑ Yard trash</li> <li>□ Septic tank</li> <li>□ Industrial</li> <li>□ Industrial sludge</li> </ul>	
Types of waste received: ☑ Household ☑ Commercial □ Incinerator/WTE ash □ Treated biomedical ☑ Water treatment sludge □ Air treatment sludge ☑ Agricultural	<ul> <li>☑ C &amp; D debris</li> <li>☑ Shredded/cut tires</li> <li>☑ Yard trash</li> <li>□ Septic tank</li> <li>□ Industrial</li> <li>□ Industrial sludge</li> <li>☑ Domestic sludge</li> </ul>	

9.	Salvaging permitted: Yes 🗸 No			
10.	Attendant: 🗸 Yes No	Trained operator:		
11.	Trained spotters:	Number of spotters used: <u>16</u>		
12.	Site located in: □ Floodplain Upland	□ Wetlands	☑ Other (describe):	
13.	Days of operation: Monday through Sa	turday		
14.	Hours of operation: 8:00 AM - 5:00 PM			
15	Days working face covered. Daily Monda	y through Saturday		
16	Elevation of water table: 29 (varies)	ft Datum Lload: NG	VD29	
10.	Number of manifesting walls 18	II. Datum Oseu		
17.	Number of monitoring wells:			
18.	Number of surface monitoring points: 2			
19.	Gas controls used: Ves No	Type controls:	Passive	
	Gas flaring: 🗸 Yes 🗌 No	Gas recovery: ✓ Yes N	0	
20.	Landfill unit liner type:			
	☑ Natural soils	□ Double geomembrane		
	□ Single clay liner	□ Geomembrane & comp	osite	
	□ Single geomembrane	□ Double composite		
	☑ Slurry wall	☐ Other (describe):		
21.	Leachate collection method:			
	☑ Collection pipes	Double geomembrane		
	□ Geonets	□ Gravel layer		
	□ Well points	☑ Interceptor trench		
	□ Perimeter ditch	□ None		
	□ Other (describe):			

Leachate storage method: □ Tanks	□ Surface impoundments
☑ Other (describe):	·
No storage. Direct conveyand	ce to onsite WWTP.
Leachate treatment method:	
Oxidation	Chemical treatment
Secondary	□ Settling
□ Advanced	□ None
☑ Other (describe):	
No pre-treatment. Direct conv	veyance to onsite WWTP.
_eachate disposal method:	
□ Recirculated	Pumped to WWTP
□ Transported to WWTP	Discharged to surface water/wetland
Injection well	Percolation ponds
Evaporation	Spray irrigation
□ Other (describe):	
For leachate discharged to surface wa	iters:
Name and Class of receiving water	
N/A	

#### 26. Storm Water:

Collected: Ves No

Type of treatment:

Detention and retention. An Individual ERP was recently issued to modify the stormwater management system treating the Stage I landfill area: Permit # 41-0224996-004.

Name and Class of receiving water: Cypress Strand and Gates Creek via onsite wetlands

27. Environmental Resources Permit (ERP) number or status: ERP # 41-0224996 (001, 002, 003 and 004)

ERP # 41-0177559-011-EI

#### PART C. PROHIBITIONS (62-701.300, FAC)

	LOCATION	
s□	Part C.1 <sub>N/A</sub> □ N/C ☑	1. Provide documentation that each of the siting criteria will be satisfied for the facility; (62-701.300(2), FAC)
s 🗆	Part C.2 <sub>N/A □ N/C ☑</sub>	2. If the facility qualifies for any of the exemptions contained in Rules 62-701.300(12), (13) and (16) through (18), FAC, then document this qualification(s);
s□	Part C.3 <sub>N/A</sub> □ <sub>N/C</sub> ☑	3. Provide documentation that the facility will be in compliance with the burning restrictions; (62-701.300(3), FAC)
s□	Part C.4 <sub>N/A □ N/C ℤ</sub>	4. Provide documentation that the facility will be in compliance with the hazardous waste restrictions; (62-701.300(4), FAC)
s□	Part C.5 <sub>N/A □ N/C ℤ</sub>	5. Provide documentation that the facility will be in compliance with the PCB disposal restrictions; (62-701.300(5), FAC)
s□	Part C.6 <sub>N/A □ N/C ℤ</sub>	6. Provide documentation that the facility will be in compliance with the biomedical waste restrictions; (62-701.300(6), FAC)
s□	Part C.7 <sub>N/A</sub> □ <sub>N/C</sub> ☑	7. Provide documentation that the facility will be in compliance with the Class I surface water restrictions; (62-701.300(7), FAC)
s□	Part C.8 <sub>N/A □ N/C ℤ</sub>	8. Provide documentation that the facility will be in compliance with the special waste for landfills restrictions; (62-701.300(8), FAC)
s□	Part C.9 <sub>N/A □ N/C ℤ</sub>	9. Provide documentation that the facility will be in compliance with the liquid restrictions; (62-701.300(10), FAC)
s□	Part C.10 <sub>N/A □ N/C ☑</sub>	10. Provide documentation that the facility will be in compliance with the used oil and oily waste restrictions; (62-701.300(11), FAC)
s□	Part C.11 <sub>N/A □ N/C ☑</sub>	11. Provide documentation that the facility will be in compliance with the CCA treated wood restrictions; (62-701.300(14), FAC)
s□	Part C.12 <sub>N/A □ N/C ☑</sub>	12. Provide documentation that the facility will be in compliance with the dust control restrictions; (62-701.300(15), FAC)

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



	LOCATION	PART D CONTINUED
s□	Part D.10 <sub>N/A</sub> □ <sub>N/C</sub> ☑	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)
s 🗆	Part D.11 <sub>N/A</sub> □ N/C ☑	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)
s 🗹	Part D.12 <sub>N/A</sub> □ <sub>N/C</sub> □	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 🗆	Part D.13 <sub>N/A</sub> ☑ <sub>N/C</sub> □	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 🗆	Part D.14 <sub>N/A</sub> □ 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 🗹	Part D.15 <sub>N/A</sub> □ <sub>N/C</sub> □	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 🗆	Part E.1 <sub>N/A</sub> □ 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 🗹	Part E.2 <sub>N/A □ N/C □</sub>	2. Plot plan with a scale not greater than 200 feet to the inch showing: (62-701.330(3)(b), FAC)
s 🗹	Part E.2.a <sub>N/A □ N/C □</sub>	a. Dimensions;
s□	Part E.2.b N/A 🗆 N/C 🛛	b. Locations of proposed and existing water quality monitoring wells;
s□	Part E.2.c <sub>N/A I N/C I</sub>	c. Locations of soil borings;
s 🗹	Part E.2.d <sub>N/A I N/C I</sub>	d. Proposed plan of trenching or disposal areas;
s 🗹	Part E.2.e <sub>N/A □ N/C □</sub>	e. Cross sections showing original elevations and proposed final contours which shall be included either on the plot plan or on separate sheets;

LOCATION		PART E CONTINUED
s ☑ Part E.2.f	N/A 🗆 N/C 🗆	f. Any previously filled waste disposal areas;
s □ Part E.2.g	N/A 🗌 N/C 🗹	g. Fencing or other measures to restrict access;
s ☑ Part E.3	N/A 🗌 N/C 🗌	3. Topographic maps with a scale not greater than 200 feet to the ir five foot contour intervals showing: (62-701.330(3)(c), FAC)
s ☑ Part E.3.a	N/A 🗌 N/C 🗌	a. Proposed fill areas;
s □ Part E.3.b	N/A 🗌 N/C 🗹	b. Borrow areas;
s ፼ Part E.3.c	N/A 🗌 N/C 🗌	c. Access roads;
s ፼ Part E.3.d	N/A 🗌 N/C 🗌	d. Grades required for proper drainage;
s ☑ Part E.3.e	N/A 🗆 N/C 🗆	e. Cross sections of lifts;
s □ Part E.3.f	N/A 🗌 N/C 🗹	f. Special drainage devices if necessary;
s □ Part E.3.g	N/A 🗌 N/C 🗹	g. Fencing;
s □ Part E.3.h	N/A 🗌 N/C 🗹	h. Equipment facilities;
s ⊭ Part E.4	N/A 🗌 N/C 🗌	4. A report on the landfill describing the following: (62-701.330(3)(d)
s ፼ Part E.4.a	N/A 🗌 N/C 🗌	a. The current and projected population and area to be serving proposed site;
s ☑ Part E.4.b	N/A 🗌 N/C 🗌	b. The anticipated type, annual quantity, and source of solic expressed in tons;
s ፼ <mark>Part E.4.c</mark>	N/A 🗌 N/C 🗌	c. Planned active life of the facility, the final design height o facility, and the maximum height of the facility during its ope
s □ Part E.4.d	N/A 🗌 N/C 🗹	d. The source and type of cover material used for the landfi
s □ Part E.5	N/A 🗌 N/C 🗹	5. Provide evidence that an approved laboratory shall conduct wate monitoring for the facility in accordance with Chapter 62-160, FAC; 701.330(3)(g), FAC
s ፼ Part E.6	N/A 🗌 N/C 🗌	6. Provide a statement of how the applicant will demonstrate financi responsibility for the closing and long-term care of the landfill; (62-

he inch with

3)(d), FAC)

served by the

solid waste

ht of the operation;

water quality AC; (62-

ancial 62-701.330(3)(ĥ), FAC)

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



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

	LOCATION		
s□	Part G.1	N/A 🗌	N/C ☑

s □ Part G.2 <sub>N/A □ N/C Ø</sub>

s □ Part G.2 N/A □ N/C ☑

Part G.2 N/A D N/C Z

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)

2. Landfill liner requirements; (62-701.400(3), FAC)

(5)

- a. General construction requirements; (62-701.400(3)(a), FAC)
- 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;
- (2) Document foundation is adequate to prevent liner failure;
- (3) Constructed so bottom liner will not be adversely impacted by fluctuations of the ground water;
- (4) Designed to resist hydrostatic uplift if bottom liner located below seasonal high ground water table;
  - Installed to cover all surrounding earth which could come into contact with the waste or leachate;



s □ Part G.2 <sub>N/A □ N/C Ø</sub>

- s □ Part G.2 <sub>N/A □ N/C Ø</sub>
- s □ Part G.2 <sub>N/A □ N/C Ø</sub>

#### LOCATION

- s □ **Part G.2** <sub>N/A</sub> Ø <sub>N/C</sub> □
- s □ Part G.2 <sub>N/A Ø N/C □</sub>
- s □ Part G.2 <sub>N/A</sub> ☑ <sub>N/C</sub> □
- s □ Part G.2 <sub>N/A Ø N/C</sub> □
- s □ Part <u>G.2</u> <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A</sub> ☑ <sub>N/C</sub> □
- s □ <u>Part G.2</u> <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A ☑ N/C □</sub> s □ Part G.2 <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A Ø N/C □</sub>
- s □ Part G.2 <sub>N/A Ø N/C</sub> □
- s □ Part G.2 <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A ☑ N/C □</sub>
- s □ **Part G.2** <sub>N/A</sub> ☑ <sub>N/C</sub> □
- s □ \_ Part G.2 <sub>N/A</sub> ☑ <sub>N/C</sub> □
- s □ **Part G.2** <sub>N/A ☑ N/C □</sub>

(6)

#### 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;
- Leak detection and secondary leachate collection system
   minimum design criteria (k ≥ 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)
- 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;
- 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;
  - PVC geomembranes, if used, meet the specifications in PGI 1104;

# $\frac{\text{LOCATION}}{\text{S} \square} \frac{\text{Part G.2}}{\text{Part G.2}} \xrightarrow{\text{N/A} \square} \xrightarrow{\text{N/C} \square}$

- s □ Part G.2 <sub>N/A Ø N/C □</sub>
- s □ <u>Part G.2</u> <sub>N/A</sub> ☑ <sub>N/C</sub> □
- s □ Part G.2 <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A ☑ N/C □</sub>
- s □ Part G.2 <sub>N/A Ø N/C □</sub>
- s □ \_ Part G.2 <sub>N/A ☑ N/C □</sub>

(6)

s □ Part G.2 <sub>N/A</sub> ☑ <sub>N/C</sub> □

#### 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 nondestructive 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;
  - 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;

s □ Part G.2	N/A 🗆 N/C 🗹	f. Stand	lards for s	soil liner components; (
s □ Part G.2	N/A 🗌 N/C 🗹	(1)	Descript excavati inconsis soil com	ion of construction proc on and backfilling to pr tencies and procedures ponents in layers;
s □ Part G.2	N/A 🗌 N/C 🗹	(2)	Demons actual or Method	tration of compatibility - simulated leachate in 9100, or an equivalent
s □ Part G.2	N/A 🗌 N/C 🗹	(3)	Procedu the spec	res for testing in situ so ifications for soil liners;
<sub>s □</sub> Part G.2	N/A 🗌 N/C 🗹	(4)	Specifica minimun	ations for soil compone n:
s □ Part G.2	N/A 🗌 N/C 🗹		(a)	Allowable particle size limits including shrinka
<sub>s □</sub> Part G.2	N/A 🗌 N/C 🗹		(b)	Placement moisture an
s □ Part G.2	N/A 🗌 N/C 🗹		(c)	Maximum laboratory-de
<sub>s □</sub> Part G.2	N/A 🗌 N/C 🗹		(d)	Minimum thickness of s
s □ Part G.2	N/A 🗆 N/C 🗹		(e)	Lift thickness;
<sub>s □</sub> Part G.2	N/A 🗌 N/C 🗹		(f)	Surface preparation (so
s □ Part G.2	N/A 🗌 N/C 🗹		(g)	Type and percentage c component;
s □ Part G.2	N/A 🗌 N/C 🗹	(5)	Procedu documei thicknes	res for constructing and nt the desired saturated s can be achieved in th
<sub>s □</sub> Part G.2	N/A 🛛 N/C 🗆	g. If a C	lass III la	Indfill is to be construct

#### PART G CONTINUED

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

- cedures including overeclude structural s for placing and compacting
- of the soil component with accordance with EPA Test test method:
- oils to demonstrate they meet
- ent of liner including at a
  - distribution, and Atterberg ge limit;
  - d dry density criteria;
  - etermined saturated hydraulic ulated leachate;
  - soil liner;
  - carification);
  - of clay mineral within the soil
- d using a field test section to d hydraulic conductivity and ne 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

LOCATION		
<sub>s □</sub> Part G.3	N/A 🗆 N/C 🗹	3. Le
s □ Part G.3	N/A 🗌 N/C 🗹	
s □ Part G.3	N/A 🗌 N/C 🗹	
s □ Part G.3	N/A 🗌 N/C 🗹	
s □ Part G.3	N/A 🗌 N/C 🗹	
s □ Part G.3	N/A 🗌 N/C 🗹	
<sub>s □</sub> Part G.3	N/A □ N/C 🛛	
s □ Part G.3	N/A 🗌 N/C 🗹	
s □ Part G.3	N/A □ N/C 🗹	
s □ Part G.3	N/A 🗌 N/C 🗹	
s □ Part G.3	N/A 🛛 N/C 🗆	
s □ Part G.3	N/A 🗆 N/C 🗹	
s □ Part G.4	N/A 🛛 N/C 🗆	4. Le
$s \square$ Part G.4	N/A 🗹 N/C 🗆	
$_{s\Box}$ Part G.4	N/A 🗹 N/C 🗆	
s □ Part G.4	N/A 🛛 N/C 🗆	

#### PART G CONTINUED

B. 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;
- 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), (c) and (d), FAC
- Bottom 12 inches having hydraulic conductivity ≥ 1 x 10<sup>3</sup> cm/sec;
- (2) Total thickness of 24 inches of material chemically resistant to the waste and leachate;
- 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;
- (5) Schedule provided for routine maintenance of LCRS.
- 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 🗆	Part G.4	N/A 🗹	N/C 🗆		d. Desc cannot seeps, liner;	cribe alte be recire wind-blo	ernate methods for leachate management when it culated due to weather or runoff conditions, surface own spray, or elevated levels of leachate head on the
s□	Part G.4	N/A 🗹	N/C		e. Desc 62-701	ribe me .530, FA	thods of gas management in accordance with Rule C;
s□	Part G.4	N/A 🗹	N/C 🗆		f. If lead standar and pro significa	chate irri ds for le ovide doo antly to l	gation is proposed, describe treatment methods and achate treatment prior to irrigation over final cover, cumentation that irrigation does not contribute eachate generation;
s□	Part G.5	N/A 🗌	N/C 🗹	5. Leac 701.40	chate sto 0(6), FA	rage tan C)	ks and leachate surface impoundments; (62-
s 🗆	Part G.5	N/A 🔽	N/C		a. Surfa	ace impo	oundment requirements; (62-701.400(6)(b), FAC)
s□	Part G.5	N/A 🛛	N/C		(1)	Docum adverse	entation that the design of the bottom liner will not be ely impacted by fluctuations of the ground water;
s□	Part G.5	N/A 🗹	N/C		(2)	Design needed	ed in segments to allow for inspection and repair, as l, without interruption of service;
s□	Part G.5	N/A 🗹	N/C		(3)	Genera	Il design requirements;
s□	Part G.5	N/A 🗹	N/C			(a)	Double liner system consisting of an upper and lower 60-mil minimum thickness geomembrane;
s□	Part G.5	N/A 🗹	N/C			(b)	Leak detection and collection system with hydraulic conductivity $\geq 1$ cm/sec;
s□	Part G.5	N/A 🗹	N/C 🗆			(c)	Lower geomembrane place on subbase $\geq$ 6 inches thick with k $\leq$ 1 x 10 <sup>-5</sup> cm/sec or on an approved geosynthetic clay liner with k $\leq$ 1 x 10 <sup>-7</sup> cm/sec;
s 🗆	Part G.5	N/A 🗹	N/C			(d)	Design calculation to predict potential leakage through the upper liner:
s□	Part G.5	N/A 🗹	N/C 🗆			(e)	Daily inspection requirements, and notification and corrective action requirements if leakage rates exceed that predicted by design calculations:
s□	Part G.5	N/A 🗹	N/C		(4)	Descrip	tion of procedures to prevent uplift, if applicable;

#### Part G.5 N/A 🛛 N/C 🗆 sП (5) Part G.5 <sub>N/A IZ N/C II</sub> sП (6) Part G.5\_ N/A 🛛 N/C 🗆 sП Part G.5 N/A 🛛 N/C 🗆 (1) Part G.5 N/A 🛛 N/C 🗆 sП (2) needed; s □ Part G.5 <sub>N/A Ø N/C □</sub> (3) s □ Part G.5 <sub>N/A Ø N/C □</sub> (4) construction; s □ Part G.5 <sub>N/A Ø N/C □</sub> (5) Part G.5 N/A 🛛 N/C 🗆 (6) overfilling; Part G.5 N/A 🛛 N/C 🗆 (7)s □ Part G.5 <sub>N/A ☑ N/C □</sub> (a) Part G.5\_ <sub>N/A</sub> ☑ <sub>N/C</sub> □ sП (b) Part G.5 N/A 🛛 N/C 🗆 sП (c) s □ Part G.5 <sub>N/A ☑ N/C □</sub> (d) s □ Part G.5 <sub>N/A ☑ N/C □</sub> (e) s □ Part G.5 <sub>N/A ☑ N/C □</sub>

#### PART G CONTINUED

- 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)

- Describe tank materials of construction and ensure foundation is sufficient to support tank;
  - Describe procedures for cathodic protection for the tank, if needed;
  - Describe exterior painting and interior lining of the tank to protect it from the weather and the leachate stored;
  - 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;
- Describe an overfill prevention system, such as level sensors, gauges, alarms, and shutoff controls to prevent overfilling;
- 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

#### LOCATION PART G CONTINUED Part G.5 N/A 🛛 N/C 🗆 sП (1) Describe materials of construction: Part G.5 <sub>N/A Ø N/C D</sub> sП A double-walled tank design system to be used with the (2) following requirements: Part G.5 <sub>N/A IZ N/C II</sub> (a) Interstitial space monitoring at least weekly; Part G.5 <sub>N/A Ø N/C D</sub> sП (b) Corrosion protection provided for primary tank interior and external surface of outer shell; Part G.5 N/A 🛛 N/C 🗆 sП (c) Interior tank coatings compatible with stored leachate; Part G.5 <sub>N/A Ø N/C □</sub> sП Cathodic protection inspected weekly and repaired (d) as needed; Part G.5 <sub>N/A Ø N/C □</sub> sП (3)Describe an overfill prevention system, such as level sensors, gauges, alarms, and shutoff controls to prevent overfilling, and provide for weekly inspections; Part G.5 <sub>N/A IZ N/C II</sub> (4) Inspection reports available for Department review; Part G.6 N/A 🛛 N/C 🗆 sП 6. Liner systems construction quality assurance (CQA); (62-701.400(7), FAC) Part G.6 N/A 🛛 N/C 🗆 a. Provide CQA Plan including: Part G.6\_ <sub>N/A</sub> 🛛 <sub>N/C</sub> sП (1) Specifications and construction requirements for liner system; Part G.6 sП (2) Detailed description of quality control testing procedures and frequencies: s □ Part G.6 <sub>N/A ☑ N/C □</sub> (3) Identification of supervising professional engineer; Part G.6 <sub>N/A I N/C I</sub> sП (4) Identify responsibility and authority of all appropriate organizations and key personnel involved in the construction project; Part G.6 (5) State qualifications of CQA professional engineer and support personnel;



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



d. Evaluation of potential for fault areas and seismic impact zones;

e. Foundation analysis including:

sП

Part I.1

N/A 🗆 N/C 🗹


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

s 🗹	$\frac{\text{LOCATION}}{\text{Part K.1}}$	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 🗹	Part K.2 <sub>N/A □ N/C □</sub>	2. Provide a landfill operation plan including procedures for: (62-701.500(2), FAC)
s 🗹	Part K.2.a <sub>N/A □ N/C □</sub>	a. Designating responsible operating and maintenance personnel;
s 🗹	Part K.2.b <sub>N/A</sub> □ N/C □	b. Emergency preparedness and response, as required in subsection 62-701.320(16), FAC;
s 🗹	Part K.2.c	c. Controlling types of waste received at the landfill;
s 🗹	Part K.2.d N/A D N/C D	d. Weighing incoming waste;
s 🗹	Part K.2.e <sub>N/A □ N/C □</sub>	e. Vehicle traffic control and unloading;
s 🗹	Part K.2.f	f. Method and sequence of filling waste;
s 🗹	Part K.2.g <sub>N/A I N/C I</sub>	g. Waste compaction and application of cover;
s 🗹	Part K.2.h	h. Operations of gas, leachate, and stormwater controls;
s 🗹	Part K.2.i <sub>N/A □ N/C □</sub>	i. Water quality monitoring;
s 🗹	Part K.2.j <sub>N/A □ N/C □</sub>	j. Maintaining and cleaning the leachate collection system;
s 🗹	Part K.3 <sub>N/A</sub> _ N/C _	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-
s 🗹	Part K.4 <sub>N/A □ N/C □</sub>	<ul> <li>4. Describe the waste records that will be compiled monthly and provided to the Department appually: (62-701 500(4), EAC)</li> </ul>
s 🗹	Part K.5 <sub>N/A □ N/C □</sub>	5. Describe methods of access control; (62-701.500(5), FAC)
s 🗹	Part K.6	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.7 <sub>N/A D N/C D</sub> s 🗸 Part K.7.a \_\_\_\_ <sub>N/A</sub> □ \_ <sub>N/C</sub> □ s 🗸 Part K.7.b s 🗸 Part K.7.c <sub>N/A □ N/C □</sub> s 🗸 s ☑ \_\_\_\_\_ Part K.7.d <sub>N/A □ N/C □</sub> s ☑ <u>Part K.7.e</u> <sub>N/A □ N/C □</sub> Part K.7.e s 🗹 Part K.7.e \_\_\_\_ <sub>N/A</sub> \_\_\_ <sub>N/C</sub> \_\_\_ s 🗸 Part K.7.e s 🗸 Part K.7.e <sub>N/A □ N/C □</sub> s 🗹 Part K.7.e s 🛛 s ☑ <u>Part K.7.f</u> <sub>N/A □ N/C □</sub> Part K.7.g s 🗸 s ☑ <u>Part K.7.h</u> <sub>N/A □ N/C □</sub> Part K.7.i <sub>N/A</sub> \_\_\_ <sub>N/C</sub> \_\_\_ s 🗸 s ☑ Part K.7.j <sub>N/A □ N/C □</sub> s ☑ <u>Part K.7.k</u> <sub>N/A □ N/C □</sub>

#### PART K CONTINUED

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

a. Waste layer thickness and compaction frequencies;

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

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

d. Maximum width of working face;

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

- (1) Vector breeding/animal attraction;
- (2) Fires;
- (3) Odors;
- (4) Blowing litter;
- (5) Moisture infiltration;

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

- g. Procedures for applying intermediate cover;
- h. Time frames for applying final cover;
- i. Procedures for controlling scavenging and salvaging;
- j. Description of litter policing methods;
- k. Erosion control procedures;

LOCATION	PART K CONTINUED
s ☑ <u>Part K.8</u> <sub>N/A □ N/C □</sub>	8. Describe operational procedures for leachate management including: (62-701.500(8), FAC)
s ☑ <u>Part K.8.a</u> <sub>N/A □ N/C □</sub>	a. Leachate level monitoring;
s ☑ <u>Part K.8.b</u> <sub>N/A</sub> □ <sub>N/C</sub> □	<ul> <li>b. Operation and maintenance of leachate collection and removal system, and treatment as required;</li> </ul>
s ☑ <u>Part K.8.c</u> <sub>N/A</sub> □ <sub>N/C</sub> □	c. Procedures for managing leachate if it becomes regulated as a hazardous waste;
s ☑ <u>Part K.8.d</u> <sub>N/A</sub> □ <sub>N/C</sub> □	<ul> <li>d. Identification of treatment or disposal facilities that may be used for off-site discharge and treatment of leachate;</li> </ul>
s ☑ <u>Part K.8.e</u> <sub>N/A □ N/C □</sub>	e. Contingency plan for managing leachate during emergencies or equipment problems;
s ☑ <u>Part K.8.f</u> <sub>N/A □ N/C □</sub>	f. Procedures for recording quantities of leachate generated in gal/day and including this in the operating record:
s ☑ <u>Part K.8.g</u> <sub>N/A □ N/C □</sub>	g. Procedures for comparing precipitation experienced at the landfill with leachate generation rates and including this information in the operating record;
s ☑ <u>Part K.8.h</u> <sub>N/A □ N/C □</sub>	h. Procedures for water pressure cleaning or video inspecting leachate collection systems;
s ☑ <u>Part K.9</u> <sub>N/A □ N/C □</sub>	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 ☑ <u>Part K.10</u> <sub>N/A</sub> □ <sub>N/C</sub> □	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 ☑ <u>Part K.11</u> <sub>N/A □ N/C □</sub>	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 ☑ Part K.11.c	c. Communications equipment;

#### PART K CONTINUED

	LOCATION		PART K CONTINUED			
s 🗹	Part K.11.d		d. Dust control methods;			
s 🗹	Part K.11.e	N/A 🗌 N/C 🗌	e. Fire protection capabilities and procedures for notifying local fire department authorities in emergencies;			
s 🗹	Part K.11.f	N/A 🗌 N/C 🗌	f. Litter control devices;			
s 🗹	Part K.11.g	N/A 🗌 N/C 🗌	g. Signs indicating operating authority, traffic flow, hours of operation, and disposal restrictions;			
s 🗹	Part K.12	N/A 🗆 N/C 🗆	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)			
s 🗹	Part K.13	N/A 🗆 N/C 🗆	13. Additional record keeping and reporting requirements; (62-701.500(13), FAC)			
s 🗹	Part K.13.a	N/A 🗆 N/C 🗆	a. Records used for developing permit applications and supplemental information maintained for the design period of the landfill;			
s 🗹	Part K.13.b	N/A 🗌 N/C 🗌	b. Monitoring information, calibration and maintenance records, and copies of reports required by permit maintained for at least 10 years;			
s 🗹	Part K.13.c	N/A 🗆 N/C 🗆	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;			
s 🗹	Part K.13.d	N/A 🗌 N/C 🗌	d. Procedures for archiving and retrieving records which are more than five years old;			
PARI	PART L. WATER QUALITY MONITORING REQUIREMENTS (62-701.510, FAC)					
s 🗆	LOCATION Part L.1	N/A 🗆 N/C 🗹	1. A water quality monitoring plan shall be submitted describing the proposed			

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)

s □ Part L.1 <sub>N/A □ N/C Ø</sub>



- s □ <u>Part L.1</u> <sub>N/A □ N/C ☑</sub>
- $s \square$  Part L.1  $_{N/A \square N/C \square}$
- s □ Part L.1 <sub>N/A □ N/C Ø</sub>
- s □ Part L.1 <sub>N/A Ø N/C □</sub>
- s □ Part L.1 <sub>N/A □ N/C Ø</sub>
- s <u>□</u> Part L.1 <sub>N/A □ N/C</sub> Ø
- s □ <u>Part L.1</u> <sub>N/A □ N/C ℤ</sub>
- s □ Part L.1 <sub>N/A □ N/C Ø</sub>
- s □ **Part L.1** <sub>N/A □ N/C ☑</sub>

#### 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;



#### PART M. SPECIAL WASTE HANDLING REQUIREMENTS (62-701.520, FAC)



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



s 🗸

s 🗸

Part O.2.f

Part O.2.f

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

#### LOCATION Part O.1 N/A D N/C D s 🗸 Part O.1.a N/A D N/C D s 🔽 Part O.1.b N/A IN/C I s 🗹 Part O.1.b \_\_\_\_\_\_\_ N/A □\_\_ N/C □ s 🗸 Part 0.1.b N/A 🗆 N/C 🗆 s 🗸 Part O.1.b N/A IN/C I s 🗹 Part O.1.b \_\_\_\_ \_\_\_ \_\_ \_\_ \_\_ \_\_ ∧/⊂ □ s 🗹 s ☑ Part O.2 Part O.2.a N/A IN/C I s 🗸 Part O.2.b s 🗸 Part O.2.c <sub>N/A I N/C I</sub> s 🗹 Part O.2.d N/A IN/C I s 🗸 s ☑ Part O.2.e Part O.2.f s 🗸 Part O.2.f s 🗸

1. Closure permit requirements; (62-701.600(2), FAC)

a. Application submitted to the Department at least 90 days prior to final receipt of wastes;

- b. Closure plan shall include the following:
- (1) Closure design plan;
- (2) Closure operation plan;
- (3) Plan for long-term care;
- A demonstration that proof of financial assurance for longterm care will be provided;
- 2. Closure design plan including the following requirements: (62-701.600(3), FAC)
  - a. Plan sheet showing phases of site closing;
  - b. Drawings showing existing topography and proposed final grades;

c. Provisions to close units when they reach approved design dimensions;

d. Final elevations before settlement;

e. Side slope design including benches, terraces, down slope drainage ways, energy dissipaters, and description of expected precipitation effects;

- f. Final cover installation plans including:
- (1) CQA plan for installing and testing final cover;
- (2) Schedule for installing final cover after final receipt of waste;
- (3) Description of drought resistant species to be used in the vegetative cover;

#### PART O CONTINUED

- LOCATION Part O.2.f s 🗸 s ☑ Part O.2.f Part O.2.g s 🗸 Part O.2.g s 🗸 Part O.2.g <sub>N/A I N/C I</sub> s 🗹 Part O.2.g N/A D N/C D s 🗸 Part O.2.g s 🗸 s ☑ Part O.2.g Part O.2.g s 🗹 s ☑ Part O.2.h N/A □ N/C □ s ☑ Part O.2.i <sub>N/A □ N/C □</sub> s ☑ Part O.2.j <sub>N/A □ N/C □</sub> s ☑ Part O.3 <sub>N/A □ N/C □</sub> s ☑ Part O.3 <sub>N/A □ N/C □</sub> s ☑ <u>Part 0.3</u> <sub>N/A □ N/C □</sub> s ☑ Part O.3 <sub>N/A □ N/C □</sub> s ☑ <u>Part 0.3</u> <sub>N/A □ N/C □</sub> s ☑ Part O.3 <sub>N/A □ N/C □</sub>
- (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;



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



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



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

s 🗹	LOCATION Part R.1	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 🗹	Part R.2	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 🗹	Part R.3	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 \_\_\_\_\_\_Manatee County Utilities Department

\_ is aware that statements made in this form and attached information

are an application for a <u>minor modification of Operation</u> 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 Robert Shankle, Solid Waste Manager Name and Title (please type) robert.shankle@mymanatee.org E-Mail Address (if available)

#### 3333 Lena Road

Mailing Address

Bradenton, FL 34211

City, State, Zip Code

941 , 748-5543x5275

**Telephone Number** 

Date: \_\_\_

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 Shane R. Fischer, PE Name and Title (please type)

58026

Florida Registration Number (please affix seal)

2021

3922 Coconut Palm Drive, Suite 102

Mailing Address

Tampa, FL 33619

City, State, Zip Code

sfischer@scsengineers.com

E-Mail Address (if available)

813 , 804-6714

Telephone Number

122/2021

#### INTRODUCTION

SCS Engineers (SCS) has prepared this 5-Year Submittal Report and Operations Permit Minor Modification (Report) for the Class I Lena Road Landfill in conjunction with Manatee County (County) in accordance with applicable Sections of Chapter 62-701, Florida Administrative Code (FAC). The Report is divided into Sections following the State of Florida Department of Environmental Protection (FDEP) Application for a Permit to Construct, Operate, Modify or Close a Solid Waste Management Facility Application Form 62-701.900(1), FAC, included at the beginning of the Report.

Explanations are provided within the Report as necessary within the corresponding Section/Parts as listed in FDEP Form 62-701.900(1). Please note the Section/Parts marked as "No Change (N/C)" or "Not Applicable (N/A)" (i.e., those related to previous investigations, design, and/or analyses) have been submitted to the Department in previous application submittals and are considered still valid for this Report. When applicable, sections of FDEP Form 62-701.900(1) marked as N/C are incorporated herein by referencing previously submitted documents on file with FDEP.

Per the requirement of Operation Permit Number 39884-021-S0-01 Specific Condition A.5, the following information is required as part of this Report for submittal to FDEP no later than March 24, 2021:

- Five Year Submittal No later than March 24, 2021, March 24, 2026 and March 24, 2031, the permittee shall submit a report to the Department that contains the following:
  - a. An updated closure plan to reflect changes in closure design, long-term care requirements, and financial assurance requirements.
  - b. A revised closure cost estimate, made by recalculating the total cost of closure or longterm care, in current dollars.
  - c. A demonstration that the leachate collection system has been water pressure cleaned or inspected by video recording.
  - d. An updated operation plan, if operational procedures have changed.

Additionally, this Report addresses minor permit modifications as follows:

- Revised waste filling sequence drawings are presented in Appendix C. These revisions include revising the terraces in Stage II to their previously permitted widths of 20-feet (currently permitted at 30-feet).
- Within Appendix B, the Operation Plan addresses the option to direct dispose of yard waste and land clearing debris within the Class I Landfill. Further discussion is also provided within this Report, Section C.2.c.
- Within Appendix B, the updated Operation Plan includes an updated description of the stormwater management system and HHW operations.

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# GENERAL INFORMATION

#### OVERVIEW

This Section addresses general requirements in Chapter 62-701, FAC, that are not addressed in other Sections or Appendices of this Report.

#### LOCATION

The Lena Road Landfill is located at 3333 Lena Road in Bradenton, Florida, in all or portions of Sections 1 and 12, Township 35 South, Range 18 East, Section 31, Township 34 South, Range 19 East, and Sections 6 and 7, Township 35 South, Range 19 East. The coordinates to the approximate center of the facility are latitude 27°28'10" North and longitude 82°26'35" West. The Lena Road Landfill location is shown in Appendix A.

#### SITE DESCRIPTION

The Lena Road Landfill encompasses 316 acres. Stage I (132 acres), Stage II (118 acres), and Stage III (66 acres) are permitted by the FDEP as a Class I landfill under Operation Permit Number 39884-021-SO-01. Currently waste filling operations are conducted in Stage II, (Sequence 3). The Lena Road Landfill currently receives an average of 1,035 tons per day (tpd). The Lena Road Landfill receives Municipal Solid Waste from incorporated and unincorporated Manatee County, Long Boat Key, and small portions of neighboring counties. The Lena Road Landfill currently has the following active permits:

- Stages I, II, III Class I Landfill: FDEP Operation Permit #39884-021-S0-01, Expires March 24, 2036
- Title V Air Operation Permit: FDEP Permit #0810055-015-AV, Expires October 8, 2024
- Environmental Resource Permit: FDEP Permit #41-0224996 (001, 002, 003 and 004)
- Environmental Resource Permit: FDEP Permit #41-0177559-011-EI

# DISPOSAL FACILITY GENERAL INFORMATION

See Application Form (page 6 of 36) for this information. The designated responsible person is:

Bryan White, Landfill Superintendent 3333 Lena Road Bradenton, FL 34211 Phone: (941) 748-5543 Email: bryan.white@mymanatee.org

The information required for Section B - Disposal Facility General Information for the Lena Road Landfill has been provided on pages 6, 7, 8 and 9 of the State of Florida Department of

Environmental Protection Application for a Permit to Construct, Operate, Modify or Close a Solid Waste Management Facility Application Form 62-701.900(1), which is attached at the beginning of this Report.

The Landfill is open for disposal of solid waste Monday through Saturday between the hours of 8:00 a.m. and 5:00 p.m. excluding Manatee County Holidays.

# SECTION C PROHIBITIONS

There are no proposed changes to the horizontal extents of the disposal areas as part of this Report.

# C.1 SITING

The Lena Road Landfill was permitted under the siting criteria of Rule 62-701.300(2), FAC.

#### C.1.a In Geological Formations or Other Subsurface Features that will not Provide Support for Solid Waste

Per Rule 62-701.300(2)(a), FAC several geotechnical investigations have previously been conducted at the Lena Road Landfill to determine the adequacy of the underlying geologic formations to support the facility. Documentation previously submitted for the geotechnical investigations are on file at the FDEP Southwest District Office.

#### C.1.b Within 500 Feet of an Existing or Approved Potable Water Well

Per Rule 62-701.300(2)(b), FAC solid waste will not be disposed within 500 feet of an existing or approved potable water well. A potable water well is defined under Rule 62-701.200(86), FAC as any excavation that is drilled or bored, or converted from non-potable water use, when the intended use of such excavation is for the location and acquisition of groundwater which supplies water for human consumption.

#### C.1.c In a Dewatered Pit

Per Rule 62-701.300(2)(c), FAC solid waste will not be disposed within a dewatered pit.

#### C.1.d In Any Natural or Artificial Body of Water

Per Rule 62-701.300(2)(d), FAC solid waste is not disposed in any natural or artificial body of water, including groundwater or wetlands within the jurisdiction of the Department.

#### C.1.e Within 200 Feet of Any Natural or Artificial Body of Water

Per Rule 62-701.300(2)(e), FAC prohibits placing solid waste within 200 feet of any natural or artificial body of water. For purposes of this paragraph a "body of water" includes wetlands within the jurisdiction of the Department, but does not include impoundments or conveyances which are part of an onsite, permitted stormwater management system, or bodies of water contained completely within the property boundaries of the disposal site which do not discharge from the site to surface waters. The Lena Road Landfill does not include the placement of waste within 200 feet of any body of water.

#### C.1.f On A Right-of-Way of Any Public Highway, Road, or Alley

Per Rule 62-701.300(2)(f), FAC prohibits placing waste in a public right-of-way. The Lena Road Landfill is located entirely on property owned by the County and is not located on any public right-of-way.

# C.2 EXEMPTIONS

The Lena Road Landfill is subject to the prohibitions that were in effect at the time the original construction permit was issued as indicated in the general exemptions contained in Rules 62-701.300(12), (13) and (16) through (18), FAC.

#### C.2.c Yard Trash

Rule 62-701.300(12), FAC applies to yard trash. Currently, loads primarily containing yard waste and tree debris are not directly disposed in the landfill, but are processed in the yard waste processing facility onsite. The County proposes the option to directly dispose of loads of yard trash within the Class I landfill as provided in Section 403.708(12)(c)1, Florida Statutes (FS). As the Lena Road Landfill collects and beneficially uses landfill gas in accordance with Title V Air Operation Permit #0810055-015-AV, it is eligible for the exemption provided in the aforementioned FS. This option will provide the County more flexibility in managing the incoming loads of yard waste.

The yard waste processing area meets is located inside the slurry wall, so it meets the setback requirements of 62-701.300(2)(b) and (e), FAC, as well as those listed in 62-701.300(12), FAC. Yard waste that has been mixed with Class I waste will be managed as Class I waste and disposed in the Class I landfill.

#### C.2.d Tanks

No changes are proposed related to tanks. Rule 62-701.300(13), FAC applies to tanks and offsets from wells. Tanks used to treat or store solid waste (leachate) are to be offset at least 500-feet from community water supply systems, or non-transient, non-community water supply system. In addition, per Rule 62-701.300(13), FAC tanks are to be offset at least 100-feet from other existing potable water supply wells.

#### C.2.e Indoor Storage

Rule 62-701.300(16), FAC applies to waste stored indoors. This provision does not apply to the Lena Road Landfill; the County does not store waste indoors.

#### C.2.f Storage in Vehicles or Containers

Rule 62-701.300(17), FAC applies to storage in vehicles or containers. This provision does not apply to the Lena Road Landfill; the County does not store waste in vehicles or containers.

#### C.2.g Existing Facilities

Rule 62-701.300(18), FAC relates to existing facilities. The Lena Road Landfill was permitted prior to May 27, 2001 and remains subject to the prohibitions that were in effect at the time the construction permit was issued.

### C.3 BURNING

Burning of solid waste is not proposed at the Lena Road Landfill in accordance with Rule 62-701.300(3), FAC. The County does not burn waste at the landfill and takes active steps to prevent the burning of waste, including load inspections and stockpiling cover soil to smother any fire that might break out in the in-place waste.

# C.4 HAZARDOUS WASTE

Hazardous waste is not knowingly accepted for disposal at the Lena Road Landfill in accordance with Rule 62-701.300(4), FAC.

# C.5 PCB DISPOSAL

Polychlorinated biphenyls (PCB's) or liquids containing a PCB concentration of 50 parts per million or greater, or non-liquid PCB's at concentrations of 50 parts per million or greater in the form of contaminated soil, rags, or other debris are not knowingly accepted for disposal in the Lena Road Landfill in accordance with Rule 62-701.300(5), FAC.

# C.6 BIOMEDICAL WASTE

In accordance with Rule 62-701.300(6), FAC biomedical wastes are not knowingly accepted for disposal in the Lena Road Landfill.

# C.7 CLASS I SURFACE WATER

In accordance with Rule 62-701.300(7), FAC the Lena Road Landfill is not within 3,000 feet of a Class I surface water.

# C.8 SPECIAL WASTE

Per Rule 62-701.300(8) FAC, special wastes will not be accepted for disposal within the Lena Road Landfill. Special wastes include lead-acid batteries, used oil, yard trash, white goods, and whole waste tires.

# C.9 LIQUIDS

Liquid wastes will be handled in accordance with FDEP Rule 62-701.300(10), FAC. Per Rule 62-701.300(10)(a) noncontainerized liquid waste will not be placed in the Lena Road Landfill unless the waste is household waste other than septic waste. Containers holding liquid waste will not be placed in the landfill unless per Rule 62-701.300(10)(b) the container is small, similar in size to that normally found in household waste, the container is designed to hold liquids for use other than storage; or the waste is household waste. Containers or tanks twenty gallons or larger in capacity shall either have one end removed or cut open, or have a series of punctures around the bottom to ensure the container is empty and free of residue and the empty container or tank shall be compacted to its smallest practical volume for disposal.

# C.10 USED OIL

Per Rule 62-701.300(11), FAC used oil, either commingled or mixed with solid waste, will not be accepted for disposal within the Lena Road Landfill. Used oil will also not be directly disposed within the landfill. Only oily wastes, sorbents, or other materials used for maintenance or to clean up or contain leaks, spills, or accidental releases of oil may be disposed in the landfill.

# C.11 CCA TREATED WOOD

In accordance with Rule 62-701.300(14), FAC, Chromated Copper Arsenate (CCA) / Pressured Treated (PT) wood will not be incorporated into compost or made into mulch, decorative landscape chips, or any other wood product that is applied as a ground cover, soil, or soil amendment. CCA wood waste materials shall be routed to the Class I disposal area. CCA wood waste that is co-mingled with other types of waste shall be sorted to remove the CCA waste if possible, if not, the entire load will be routed to the Class I disposal area.

# C.12 DUST CONTROL RESTRICTIONS

In accordance with Rule 62-701.300(15), FAC, the owner or operator of the Lena Road Landfill will not allow the unconfined emissions of particulate matter in violation of Paragraph 62-296.320(4)(c), FAC.

# SECTION D

# SOLID WASTE FACILITY PERMITTING REQUIREMENTS, GENERAL

#### D.1 APPLICATION FORM AND SUPPORTING DOCUMENTS

Rule 62-701.320(5)(a), FAC, requires one electronic copy of the application, engineering plans and reports, and supporting information. One complete dated and signed electronic application Form 62-701.900(1) and other supporting documents is included at the beginning of this Report.

#### D.2 ENGINEERING CERTIFICATION

This Report has been signed and sealed by Shane R. Fischer, PE, a Licensed Professional Engineer in the State of Florida (License No. 58026).

#### D.3 TRANSMITTAL LETTER

A transmittal letter is included at the beginning of this Report and Application as required by Rule 62-701.320(7)(a), FAC.

### D.4 APPLICATION FORM

Part S of the State of Florida Department of Environmental Protection Application for a Permit to Construct, Operate, Modify or Close a Solid Waste Management Facility Application Form 62-701.900(1), effective date of February 15, 2015, has been signed and sealed by Shane R. Fischer, PE, a licensed Professional Engineer in the State of Florida (License No. 58026) as required by Rule 62-701.320(7)(b), FAC and is attached at the beginning of this Report. In addition, the Form has been signed and dated by Robert Shankle, Solid Waste Division Manager.

### D.5 PERMIT FEE

Enclosed with this application is a check in the amount of 10,250.00 made payable to Florida Department of Environmental Protection. The check includes 10,000.00 for the 20-year payment installment in accordance with Permit 39884-021-S0-01 Specific Condition A.6. and the fee schedule listed in Rule 62-701.315(13), FAC. Additionally, a permit application fee of 250 is included, in accordance with Rule 62-4.050(4)(s)5, FAC, to address the request for a minor permit modification.

#### D.6 ENGINEERING REPORT

This Report is submitted in the format specified by 62-701.320(7)(d), FAC and meets the requirements of an Engineering Report.

### D.7 OPERATION PLAN AND CLOSURE PLAN

Per Rule 62-701.320(7)(e)1, FAC please refer to the Operation Plan in Appendix B which has been updated as required. The updates include the option to directly dispose of yard waste within the Class I Landfill, an updated description of the stormwater management system, and minor administrative modifications to better align with current site conditions. Additionally, the Household Hazardous Waste (HHW) Operation Plan has been updated in Appendix B.

Note, both a mark-up copy and clean copy of the Operation Plan are provided. The mark-up copy indicates changes as <del>cross out</del> for deletions and <u>underline</u> for additions to the previously-approved *Operations Plan*, dated September 2017, prepared by SCS. The clean copy is created by accepting all deletions and additions. The attachments to the Operation Plan have been included in the clean copy only. Lena Road Landfill's Operation Plan is considered a working document. As manpower, equipment, or work environment changes the Operation Plan will be updated to reflect the new conditions as needed.

Please refer to Section 0 for updates to the Closure Plan. Updated Waste Filling Sequence Drawings are provided in Appendix C.

# D.8 CONTINGENCY PLAN

Per Rule 62-701.320(7)(e)2, FAC an updated Contingency Plan is incorporated within the Operation Plan located in Appendix B. The updates are minor administrative modifications to better align with current site conditions. Note that both a mark-up copy and a clean copy of the Contingency Plan are provided. The mark-up copy indicates changes as <del>cross out</del> for deletions and <u>underline</u> for additions to the previously-approved Contingency Plan. The clean copy is created by accepting all deletions and additions.

### D.9 DRAWINGS

Refer to Appendix C for the updated Operation Drawings detailing proposed modifications to the landfill terraces and bottom swale in areas yet to be filled and constructed. Specifically, the swale at the toe of slope will be constructed with a larger cross-section for improved stormwater flow. 30-ft wide terraces are currently permitted at elevations 60, 80, 95 and 105-ft NGVD29. Within the application for permit renewal, dated November 2009, the terraces were 20-feet wide at elevations 55, 75, 95 and 110-ft NGVD. The County proposes to return the terraces back to widths and elevations shown the Plans approved in 2009 for landfill slopes yet to be constructed. This modification will allow for more waste airspace within the permitted footprint, while providing adequate stability (see Appendix E) and sufficient room for the secondary stormwater management system (see Appendix F).

#### D.9.a Regional Map or Plan

Per Rule 62-701.320(7)(f), FAC the Lena Road Landfill location was previously submitted with the *Lena Road Landfill Operation Permit Renewal Application*, dated October 17, 2015, prepared by Atkins North America, Inc. and is on file with the Department.

#### D.9.b Vicinity Map or Aerial Photograph

An aerial photograph, dated January 28, 2020, is included on Sheet 02 of Appendix C.

#### D.9.c Site Plan

Sheet 03 of the Operation Drawings in Appendix C depicts the limits of the property owned by the County. As referenced in the aforementioned October 27, 2015 permit renewal application, a boundary survey was submitted to FDEP within the 2010 permit renewal application within Tab D. The property boundary for the facility remains unchanged and is not expected to change as a result of this Report.

#### D.9.d Supporting Details

Engineering details necessary to support this Report are shown in Appendix C. The elevations shown on the Drawings are based on the National Geodetic Vertical Datum 1929 (NGVD29) and any horizontal coordinates shown are referenced to the West Zone of the Florida State Plane Coordinate System, North American Datum (NAD) 1983, 1990 adjustment.

#### D.10 PROOF OF PROPERTY OWNERSHIP

Ownership of the Lena Road Landfill is not expected to change as a result of this Report.

# D.11 WASTE REDUCTION AND RECYCLING GOALS

Manatee County has worked to advance waste reduction and recycling efforts over the years. Based on the most recent FDEP reporting for Calendar Year 2019, the County achieved an unadjusted recycling rate of 62% and an adjusted recycling rate of 63%. The latter rate places the County in 7<sup>th</sup> place among Florida's 67 counties.

### D.12 HISTORY AND DESCRIPTION OF ENFORCEMENT HISTORY

Below is a summary of enforcement history for the applicant for the Lena Road Landfill. Any errors or omissions are not to be construed as a misrepresentation of the facts. Should FDEP have additional information in their files, the County will defer to FDEP's data.

• On July 9, 2020, the County and FDEP executed a short form consent order (OGC File No 20-1009) related to its Title V Permit and resulting in a fine of \$1,000 for civil penalties and FDEP costs and expenses. The order was initiated upon review of the facility NSPS report for the 2<sup>nd</sup> Semi-annual monitoring period of 2019 and finding that oxygen exceedances were not addressed in accordance with the timeline required in 60.755(a)(5) of the Code of Federal Regulations. Oxygen levels are back in compliance and it is understood that FDEP is satisfied with the County's response to this situation.

### D.13 PROOF OF PUBLICATION OF NOTICE OF APPLICATION

No alterations are proposed to the horizontal or vertical extents of the disposal area, nor any substantial modifications, as a result of this Report. Therefore, a Notice of Application is not required.

### D.14 AIRPORT SAFETY REQUIREMENTS

Based on project files and the County's knowledge of the area, there are no licensed and operating airport runways within a five-mile radius of the Lena Road Landfill. This information was supplied to the Department as Figure D-1 within the October 27, 2015 application for permit renewal, prepared by Atkins North American, Inc. As there are no proposed alterations to the horizontal or vertical extents of the disposal area, information required by subsection 62-701.320(13), FAC, is not included as part of this Report.

# D.15 OPERATOR AND SPOTTER TRAINING REQUIREMENTS

No changes are proposed to the training program through this Report and no changes were required as a result of COVID. In accordance with Rule 62-701.320(15), FAC key supervisory staff at the Lena Road Landfill have received Landfill Operator Certification Training. As required by Rule 62-701.320(15), FAC a trained operator will be onsite at all times when waste is received at the Lena Road Landfill and a trained spotter will be onsite during all times when solid waste is deposited at the working face. In addition, equipment operators shall have sufficient training and knowledge to move waste and soil and to develop the site in accordance with the design and operational standards described in this Report. Records of all training for operators and spotters (course completions and certifications obtained) are kept at the Lena Road Landfill and are available for Department inspection.

In order to be considered trained; Operators of the Lena Road Landfill shall complete 24 hours of initial training, and shall pass an examination as part of that training. Within three years after passing the examination, and every three years thereafter, operators shall complete an additional 16 hours of continued training.

In order to be considered trained; spotters shall complete 8 hours of initial training. Within three years after attending the initial training, and every three years thereafter, spotters shall complete an additional 4 hours of continued training.

Operator and spotter training courses will be attended as offered by the University of Florida Center for Training, Research and Education for Environmental Occupations (TREEO) and through other FDEP approved sources. Copies of updated training records have been included in Appendix B.

# SECTION E LANDFILL PERMIT REQUIREMENTS

### E.1 REGIONAL MAP

The Lena Road Landfill location is shown in Appendix A.

# E.2 PLOT PLANS

Plot plans showing the proposed fill sequence modifications in Stage II are included in Appendix C. As shown on Sheet 3, waste filling is currently in Sequence 3. Prior to completion of filling in Sequence 3, Subsequence 4A will be excavated and graded as shown on Sheet 4. As waste filling occurs from south to north in Subsequence 4A, the next Subsequence 4B, will be excavated and graded and so forth. The currently permitted sequence drawings illustrated waste filling elevations in Sequence 4 being filled to pre-excavation grades, then excavating Subsequences 5A and 5B. As proposed in the revised Operation Drawings in Appendix C, the County proposes to fill waste at least one lift higher in Sequence 4 prior to excavation in the Sequence 5 area. This change will be consistent throughout the remainder of the Sequences wherein waste filling in the current Sequence will bring elevations to at least 50 feet, NGVD29, prior to excavation of the next Sequence.

Additionally, the plan views and details illustrate a wider cross section of the perimeter ditch as well as the terrace changes discussed in Section D.9 of this Report.

# E.3 TOPOGRAPHIC MAPS

Engineering details necessary to support this Report are shown on the Operation Drawings included in Appendix C. The elevations shown on the Drawings are based on the National Geodetic Vertical Datum 1929 (NGVD29), and the coordinates shown are referenced to the West Zone of the Florida State Plane Coordinate System, North American Datum (NAD) 1983, 1990 adjustment.

# E.4 REPORT

#### E.4.a Current and Projected Population and Area to be Served

SCS used the projected population estimates provided in the University of Florida Bureau of Economic and Business Research, Florida Population Studies, Volume 53, Bulletin 186, January 2020 medium county projections which estimate Manatee County population at 395,800 in 2020 and 434,600 in 2025.

#### E.4.b Waste Type, Quantity, and Source

The Lena Road Landfill accepts waste types as identified in Part B - Disposal Facility General Information of the State of Florida Department of Environmental Protection Application for a Permit to Construct, Operate, Modify or Close a Solid Waste Management Facility Application Form 62-701.900(1) attached at the beginning of this Report. The Lena Road Landfill facility accepts municipal solid wastes (MSW), construction & demolition (C&D) debris, yard waste, and special wastes. MSW includes residential wastes, commercial wastes, and agricultural wastes. Special wastes accepted by the facility include used oil (from residents only), waste tires, white goods, household hazardous wastes, lead-acid batteries, scrap metal, lawn mowers, appliances other than white goods, and electronics. Waste tires are stored on site until a contractor hauls the tires offsite. Yard waste is processed onsite and used for erosion control. As proposed in this application for minor modification, the County may also dispose of yard waste directly in the landfill. These waste types will continue to be received.

#### E.4.c Anticipated Facility Life

As provided in the April 23, 2020 Life Expectancy Report prepared by SCS, it was estimated at that time that the Lena Road Landfill had 21.8 years of remaining disposal capacity, or 10,622,986 CY. Through the end of October 2020, the calendar year waste acceptance for the landfill was approximately 270 thousand tons. At this rate, approximately 325 thousand waste tons would be disposed in 2020, which is slightly higher than the 5-year running average of 318 thousand tons from the aforementioned life expectancy report. However, life expectancy projections were based on an in-place waste density of 1,308 lb/CY and annual volumetric consumption of 486,967 CY. The 2020 waste acceptance rates aren't expected to significantly affect those projections. However, the updated final contours in Appendix C provide 10,166,086 CY of disposal capacity (from the January 28, 2020 topography). Using the aforementioned volumetric consumption rate, the landfill is expected to reach capacity in December of 2040, or approximately 20 years remaining.

#### E.4.d Source and Type of Cover Material

Manatee County utilizes soils excavated onsite from subsequence preparation and maintain an open purchase order to supplement its soil stockpile from offsite sources. The County typically maintains a stockpile adequate to address cover needs for about one year. Additionally, the County utilizes a tarp for daily cover to reduce the soil demand for the landfill.

#### E.5 APPROVED LABORATORY

Per Rule 62-701.330(3)(g), FAC water quality monitoring will be performed by an approved laboratory in accordance with Rule 62-160, FAC. All water quality sampling and testing shall be conducted in accordance with the Department's Standard Operating Procedures and all sample analyses will be conducted by a firm that is certified by the Florida Department of Health's Environmental Laboratory Certification Program.

### E.6 FINANCIAL RESPONSIBILITY

Financial responsibility requirements are discussed in Section R of this Report in accordance with Rule 62-701.330(3)(h). The County established a financial test to ensure proper closing and long-term care for the Lena Road Landfill.

### SECTION F GENERAL CRITERIA FOR LANDFILLS

No changes are proposed to the horizontal or vertical extents of the Lena Road Landfill disposal areas as part of this Report.

#### F.1 100-YEAR FLOODPLAIN

The documentation required by paragraph 62-701.340(3)(b), FAC, with respect to the 100-year flood plain was previously addressed in Part F within the October 27, 2015 application for permit renewal prepared by Atkins North America, Inc. and on file with the Department. No proposed alterations to the horizontal extents of the disposal areas are proposed with this Report, therefore, the documentation previously submitted is still valid and is not resubmitted.

#### F.2 MINIMUM HORIZONTAL SEPARATION

Part F within the October 27, 2015 application for permit renewal prepared by Atkins North America, Inc. and on file with the Department provided an analysis of minimal horizontal separation of the final cover slope and property boundary. As demonstrated, the horizontal separation between waste placed in the proposed landfill and the landfill property boundary exceeds the 100-foot setback requirement of paragraph 62-701.340(3)(c), FAC. No proposed alterations to the horizontal extents of the final cover system are proposed with this Report, therefore, the documentation previously submitted is still valid and is not resubmitted.

# SECTION G LANDFILL CONSTRUCTION REQUIREMENTS

No changes are proposed to the horizontal or vertical extents of the Lena Road Landfill disposal areas as part of this Report.

#### G.1 PLANNED CONSTRUCTION AND CLOSURE

No changes are proposed to the requirements of this Part through this Report.

#### G.2 LANDFILL LINER REQUIREMENTS

No changes are proposed to the requirements of this Part through this Report.

### G.3 LEACHATE COLLECTION AND REMOVAL SYSTEM (LCRS)

No changes are proposed to the requirements of this Part through this Report.

# G.4 LEACHATE RECIRCULATION

No changes are proposed to the requirements of this Part through this Report.

#### G.5 LEACHATE STORAGE TANK AND SURFACE IMPOUNDMENTS

No changes are proposed to the requirements of this Part through this Report.

### G.6 LINER SYSTEMS CQA

No changes are proposed to the requirements of this Part through this Report.

### G.7 SOIL LINER CQA

No changes are proposed to the requirements of this Part through this Report.

#### G.8 SURFACE WATER MANAGEMENT SYSTEMS

As previously described, this application proposes to construct the remaining landfill terraces with the previously permitted configuration of 20-foot wide terraces at elevations 55, 75, 95 and 110-feet NGVD29.

### G.9 GAS CONTROL SYSTEMS

No changes are proposed to the requirements of this Part through this Report.

#### G.10 LANDFILLS DESIGNED IN GROUNDWATER

### SECTION H HYDROGEOLOGICAL INVESTIGATION REQUIREMENTS

No changes are proposed to the horizontal or vertical extents of the Lena Road Landfill disposal areas as part of this Report.

#### H.1 HYDROGEOLOGICAL INVESTIGATION AND SITE REPORT

No changes are proposed to the requirements of this Part through this Report.

### H.2 REPORT SIGNED, SEALED AND DATED BY PE/PG

#### SECTION I GEOTECHNICAL INVESTIGATION REQUIREMENTS

No changes are proposed to the horizontal or vertical extents of the Lena Road Landfill disposal areas as part of this Report.

In accordance with Rule 62-701.410(2), previous geotechnical evaluations were conducted for the design of the Stage II disposal area. Those reports have been submitted to the Southwest District Office of the FDEP. As indicated in the geotechnical reports, the bearing capacity for the foundation of Stage II was addressed and found to be adequate for the anticipated waste loading conditions. In addition, the reports provided in-depth analysis of foundation settlement and slope stability.

For additional information refer to Part I, Geotechnical Investigation Requirements, submitted as part of the Operations Permit Renewal Application, dated October 27, 2015, and subsequent responses dated December 18, 2015, prepared by Atkins. Additionally, this application proposes to construct the waste side slopes in Phase II at 4:1 with 20-foot wide terraces as was the permitted condition in 2010. Please refer to Appendix E for a copy of the 2010 geotechnical report with slope stability analysis, prepared by Andreyev Engineering, Inc. in support of the permit issued 1/5/2011 (39884-018-S0/01).

#### I.1 GEOTECHNICAL SITE INVESTIGATION REPORT

No changes are proposed to the requirements of this Part through this Report.

#### I.2 REPORT SIGNED, SEALED AND DATED BY PE/PG

# SECTION J VERTICAL EXPANSION OF LANDFILLS

This Report is not intended to request a vertical expansion of the Lena Road Landfill.

#### J.1 EFFECT ON THE CLOSURE DESIGN OF THE EXISTING LANDFILL

No changes are proposed to the requirements of this Part through this Report.

#### J.2 VERTICAL EXPANSION OVER UNLINED LANDFILLS

No changes are proposed to the requirements of this Part through this Report.

#### J.3 FOUNDATION AND SETTLEMENT ANALYSIS

No changes are proposed to the requirements of this Part through this Report.

#### J.4 TOTAL SETTLEMENT CALCULATIONS

No changes are proposed to the requirements of this Part through this Report.

#### J.5 SLOPE STABILITY

No changes are proposed to the requirements of this Part through this Report.

### J.6 SURFACE WATER MANAGEMENT (RULE 62-701.430(2)(C), FAC)

No changes are proposed to the requirements of this Part through this Report.

# J.7 GAS CONTROL (RULE 62-701.430(2)(D), FAC)

### SECTION K LANDFILL OPERATION REQUIREMENTS

Refer to the Operation Plan in Appendix B updated as required by FAC 62-701.500. The updates include minor administrative modifications to better align with current site conditions and operational practices. Also, the revised Operation Plan proposes the option of direct disposal of yard waste as described in Section C.2.c of this Report. At this time, the County proposes this change mainly for the operational flexibility to respond to changing business conditions, whether they be seasonal increases in yard waste, an operational expense reduction, or a short-term backup plan if the contracted yard waste processing contractor is unable to process waste for any reason. The change is not intended to be the primary disposal option for all yard waste received at the facility.

Also included in Appendix B is an updated HHW Operation Plan.

Note that both a mark-up copy and clean copy of the Operations Plan are provided. The mark-up copy indicates changes as <del>cross out</del> for deletions and <u>underline</u> for additions to the previously-approved Operations Plan. The clean copy is created by accepting all deletions and additions.

### K.1 TRAINED OPERATOR

In accordance with Rule 62-701.500(1), FAC key supervisory staff has received Landfill Operator Certification training. As required by Rule 62-701.500(6), FAC a State-certified Landfill Operator will be on site at all times when waste is received for disposal. Additionally, a trained spotter will be on site during all times when waste is deposited at the landfill working face to detect any unacceptable wastes. In addition, the equipment operators have sufficient training and knowledge to move waste and soil, and to develop the site in accordance with the design and operational standards. The equipment operators shall have sufficient training and knowledge to move waste and soil, and to develop the site.

In order to be considered trained; Operators of Class I and Class III landfills shall complete 24 hours of initial training, and shall pass an examination as part of that training. Within three years after passing the examination, and every three years thereafter, operators shall complete an additional 16 hours of continued training. In order to be considered trained; spotters shall complete 8 hours of initial training. Within three years after attending the initial training, and every three years thereafter, spotters shall complete an additional 4 hours of continued training.

# K.2 LANDFILL OPERATION PLAN

In accordance with Rule 62-701.500(2), FAC refer to Appendix B for the Lena Road Landfill updated Operation Plan as required.

#### K.2.a Designation of Responsible Operating and Maintenance Personnel

In accordance with Rule 62-701.500(2)a, FAC the Operation Plan designates responsible operating and maintenance personnel. Please refer to the updated Operation Plan in Appendix B.

#### K.2.b Emergency Preparedness and Response

In accordance with Rule 62-701.500(2)b, FAC the Operation Plan in Appendix B identifies emergency preparedness and response as required in Subsection 62-701.320(16), FAC.

#### K.2.c Controlling Types of Waste Received

In accordance with Rule 62-701.500(2)c, FAC the Operation Plan identifies controlling the types of waste received at the landfill. The landfill operators and scalehouse personnel are responsible for inspecting loads received at the landfill to detect and discourage attempts to dispose of unacceptable wastes. Each vehicle entering the landfill must stop at the scalehouse and have its load weighed in and classified in one of the following categories:

- Residential
- Commercial
- Yard trash and clean wood
- Appliances/scrap metal
- Construction and demolition debris
- Mixed loads and garbage
- Special handling (including asbestos)
- Pre-tested contaminated soil
- Domestic sludge
- Agricultural Waste
- Tires

After classification, the loads are assigned one of the following destinations:

- Class I Landfill
- Construction and demolition debris sent to the Class I Landfill
- Yard trash processing area
- Scrap metals and white goods storage area
- Waste tire facility
- Household Hazardous Waste Collection Center (HHWCC)

Procedures are described in more detail within the Operation Plan in Appendix B.

#### K.2.d Weighing Incoming Waste

In accordance with Rule 62-701.500(2)d, FAC the Operation Plan describes weighing incoming waste received at the landfill. All waste hauling vehicles entering and exiting the landfill are required to pass over the scales located at the facility entrance. Upon entering the facility, the scale house attendant weighs the vehicle and classifies each load.

#### K.2.e Vehicle Traffic Control and Unloading

In accordance with Rule 62-701.500(2)e, FAC the Operation Plan identifies the vehicle traffic control at the landfill. Signs are posted that indicate name of the operating authority, traffic flow, hours of operation, and restrictions or conditions of disposal. Signs posted at the gate state hours of operation and types of waste restrictions. Upon entering the site, all vehicles are required to stop at the scalehouse for weighing. The scalehouse attendant directs the driver to the appropriate on-site facility for unloading. All site roads are adequate for two-way traffic, and the speed limits are clearly marked. At each on-site facility, landfill personnel direct traffic to unload at the proper area.

#### K.2.f Method and Sequence of Filling Waste

In accordance with Rule 62-701.500(2)f, FAC the Operation Plan identifies the method and sequence of filling waste. As previously described, this Report proposes minor changes to the waste filling sequences. Appendix B provides an updated Operation Plan that provides descriptions of waste filling and compaction methods and Appendix C provides updated Operation Drawings that illustrate waste areas and filling elevations.

#### K.2.g Waste Compaction and Application of Cover

In accordance with Rule 62-701.500(2)g, FAC the Operation Plan in Appendix B describes waste compaction and application of cover procedures.

#### K.2.h Operations of Gas, Leachate, and Stormwater Controls

In accordance with Rule 62-701.500(2)h, FAC the Operation Plan in Appendix B identifies the operations of gas, leachate, and stormwater controls.

#### K.2.i Water Quality Monitoring

In accordance with Rule 62-701.500(2)i, FAC the Operation Plan identifies the groundwater quality monitoring at the landfill. Water quality monitoring for site-specific test parameters, locations, frequencies, and reports will be conducted as required by the permitted Monitoring Plan Implementation Schedule. No Changes are proposed to the Water Quality Monitoring Plan (Appendix 3 of Permit 39884-021-S0-01) through the Report.

#### K.2.j Maintaining and Cleaning the Leachate Collection System

In accordance with Rule 62-701.500(2)j, FAC the Operation Plan in Appendix B describes maintaining and cleaning the leachate collection system at the landfill. The leachate collection lateral system is cleaned and maintained, as necessary, through the manholes and cleanouts. In preparation for this Report and as required Permit Specific Condition 5.c, and Rule 62-

701.500(8)(h), FAC, Florida Jet Clean was contracted to pressure clean all of the leachate collection pipes in August 2020, approximately 38,633 LF, serving Stages I-III. Please refer to Appendix D for a copy of the report from Florida Jet Clean.

# K.3 OPERATING RECORD

In accordance with Rule 62-701.500(3), FAC copies of all operating records, reports, engineering drawings, training records, etc. are kept on file at the landfill. Upon request, the records will be made available for FDEP inspection. All records pertaining to the operation of the facility will be retained throughout the design life of the landfill. All monitoring records, calibration and maintenance records, and reports required by the operating permit will be retained for at least ten years.

#### K.4 WASTE RECORDS

In accordance with Rule 62-701.500(4), FAC waste reports that include waste type and quantity are compiled monthly and submitted quarterly to FDEP and provided to the Department annually. The waste is categorized and the tonnages are annotated in the appropriate category in the Waste Quantity Form located in the Operation Plan. Reports include: (a) types of solid waste received, and (b) quantities of solid waste received by category. The landfill operator also estimates the amount of the following waste categories:

Residential	Scrap Metals White Goods	Used Oil
Commercial	Asbestos	
C&D Debris	Battery	
Clean Wood and Yard Trash	Tires	

Additionally, the County maintains all manifests provided by the contractors for the special wastes on file. These manifests are available for FDEP inspection upon request.

# K.5 ACCESS CONTROLS

No changes are proposed to the landfill access. In accordance with Rule 62-701.500(5), FAC to prevent unauthorized waste disposal and unauthorized access to and use of the landfill, the entire landfill site is surrounded by a fence with locked, or controlled gates. The entrance/exit to the landfill is controlled by the scalehouse attendant. All vehicles entering the landfill must pass by the scalehouse. All visitors or customers must stop at the scalehouse either to have their vehicle weighed or to notify the scalehouse attendant of their presence. When the facility is closed the gates are locked.

# K.6 LOAD CHECKING PROGRAM

In accordance with Rule 62-701.500(6), FAC the Operation Plan in Appendix B describes the load checking program implemented at the landfill to discourage disposal of unauthorized wastes. The Operation Plan lists the waste materials and their proper disposal or storage locations and also lists waste materials that are prohibited from entering or being disposed of in the landfill.

# K.7 WASTE SPREADING, COMPACTION, AND PROCEDURES

In accordance with Rule 62-701.500(7)a through k, FAC the Operation Plan in Appendix B identifies the procedures for waste layer thickness and compaction frequencies at the landfill. The equipment operator at the facility will spread the waste unloaded by trucks. Compaction will be achieved during the spreading and shaping operation and by incoming vehicles driving over the in-place waste.

#### K.7.a Waste Layer Thickness and Compaction Frequencies

In accordance with Rule 62-701.500(7)a, FAC the Operation Plan in Appendix B describes the waste layer thickness and compaction frequencies. No changes are proposed to these procedures.

#### K.7.b First Layer Thickness

In accordance with Rule 62-701.500(7)b, FAC, the Operation Plan in Appendix B describes the procedure for filling and compacting the first layer of waste to protect the integrity of the leachate collection system. An initial lift of select waste, free from large rigid objects that could damage the leachate collection system, will be placed with a minimum compacted thickness of four feet. No changes are proposed to this procedure.

#### K.7.c Slopes of Cell Working Face, Side Grades, and Lift Depths

In accordance with Rule 62-701.500(7)c, FAC the Operation Plan in Appendix B describes the slopes of the cell working face and side grades above land surface, and the planned waste lift depth during operation. The exterior sideslopes shall not exceed four horizontal to one vertical (4:1) while interior waste slopes, those that are not at final waste elevations, may be constructed at 3:1.

#### K.7.d Maximum Width of Working Face

In accordance with Rule 62-701.500(7)d, FAC the Operation Plan describes the working face as approximately 150-feet wide. The direction of waste placement may vary from time to time depending on site-specific conditions. No changes are proposed to the management at the working face.

#### K.7.e Initial Cover Controls

In accordance with Rule 62-701.500(7)e.1 through 62-701.500(7)e.4, FAC initial cover is used to control disease vector/animal attraction, fires, odors, blowing litter, and moisture infiltration. As approved by FDEP, the initial cover will consist of soil obtained from on-site and off-site borrow sources, street sweepings, ditch cleanings, crushed glass, and/or a tarp as an alternative daily cover (ADC), soil with up to 25% fines from the yard processing area, and recovered screen material (RSM) from FDEP permitted facilities.

#### K.7.f Initial Cover Application Procedures and Frequency

In accordance with Rule 62-701.500(7)f, FAC the Operation Plan in Appendix B describes the procedures for applying initial cover including minimum cover frequencies. No changes are proposed to these procedures.

#### K.7.g Intermediate Cover Application Procedures

In accordance with Rule 62-701.500(7)g, FAC the Operation Plan in Appendix B describes the procedures for applying intermediate cover including minimum cover frequencies. Intermediate cover, an additional 12-inch thick layer of compacted soil on top of the 6-inch thick layer of compacted initial soil cover, will be applied within seven days over areas that will not receive additional waste within 180 days as required by Rule 62-701.500(7)(f), FAC. No changes are proposed to these procedures.

#### K.7.h Final Cover Application Time Frame

In accordance with Rule 62-701.500(7)h, FAC the Operation Plan in Appendix B describes the time frames for applying final cover.

#### K.7.i Scavenging and Salvaging Control

In accordance with Rule 62-701.500(7)i, FAC the Operation Plan in Appendix B confirms that scavenging and/or salvaging is not permitted at the Lena Road Landfill. The facility has a fence around the entire perimeter to minimize unauthorized access.

#### K.7.j Litter Policing

In accordance with Rule 62-701.500(7)j, FAC the Operation Plan in Appendix B describes litter control. On a daily basis, landfill personnel collect litter along the entrance and access roads, at buildings, in the parking areas, and in the vicinity of the working face. Litter control fences are used near the working face to lessen the amount of wind-blown litter.

#### K.7.k Erosion Control Procedures

In accordance with Rule 62-701.500(7)k, FAC the Operation Plan in Appendix B describes the erosion control and repair procedures. The establishment and maintenance of a good stand of grass on the finished slopes is important to maintaining erosion control. In addition, other materials and devices such as processed yard trash, silt fences, straw bales, or berms may be utilized to help prevent erosion. The landfill operator will take appropriate measures to prevent and correct erosion problems on the site.

# K.8 OPERATIONAL PROCEDURES FOR LEACHATE MANAGEMENT

#### K.8.a Leachate Level Monitoring, Sampling, Analysis, and Data Results

In accordance with Rule 62-701.500(8)a, the landfill operator is responsible for maintenance and monitoring of the leachate collection system. The Operation Plan in Appendix B provides a description of the leachate collection system and monitoring procedures.

# K.8.b Operation and Maintenance of the Leachate Collection and Removal System

In accordance with Rule 62-701.500(8)b, the landfill operator is responsible for the operation of the leachate collection and removal system and for maintaining the system as designed for the design period. The leachate collection system shown in the Operation Plan in Appendix B. No changes to the system, or its operations and maintenance are proposed within this Report. Maintenance of the
leachate collection system includes pressure washing and/or video inspection at least every five years. Please refer to Appendix D for verification that the most recent pressure washing event occurred in August 2020.

#### K.8.c Procedures for Managing Leachate upon Regulation Changes

In accordance with Rule 62-701.500(8)c, leachate is discharged to an off-site treatment plant on adjacent property, also owned and operated by Manatee County. No changes are proposed in this Report to the collection, conveyance, or treatment of landfill leachate. If at any time the leachate is determined to be a hazardous waste, it will be managed in accordance with Rule 62-730, FAC.

#### K.8.d On-site Treatment of Leachate

In accordance with Rule 62-701.500(8)d, on-site leachate treatment or pretreatment systems are not utilized at Lena Road Landfill. Collected leachate is pumped to an adjacent treatment plant where it is treated with domestic sewage. No changes are proposed.

#### K.8.e Contingency Plan

In accordance with Rule 62-701.500(8)e, the landfill operator shall have a prepared contingency plan to handle leachate collection, removal, and treatment problems such as interruptions of discharges to a treatment plant. The Operation Plan in Appendix B describes the measures for responding to interruptions with the normal leachate management procedures.

#### K.8.f Procedures for Recording Quantities of Leachate Generation

In accordance with Rule 62-701.500(8)f, the quantities of leachate collected by the leachate collection and removal system are recorded in gallons per day before offsite disposal and are included with the operating record. Please refer to the Operation Plan in Appendix B for copies of forms used for leachate generation recording.

#### K.8.g Precipitation and Leachate Generation Comparison

In accordance with Rule 62-701.500(8)g, a rain gauge is located onsite, operated, and maintained to record precipitation at the Lena Road Landfill. Precipitation records are included with the operating record and are maintained and used by the County to compare with leachate generation rates.

#### K.8.h Procedures for Cleaning and Inspecting the Leachate Collection System

In accordance with Rule 62-701.500(8)(h), FAC, and Permit Specific Condition 5.c, the existing leachate collection pipes are pressure cleaned and/or video inspected at least every five years. Appendix D provides a report from Florida Jet Clean for the August 2020 pressure cleaning event. No blockages or other system malfunctions were noted during the event, and the leachate collection system appears to be functioning as designed and permitted.

# K.9 GAS MONITORING PROGRAM

In accordance with Rule 62-701.500(9), FAC the Operation Plan provided in Appendix B identifies the operational procedures for landfill gas management. No changes are proposed to the

procedures, but the descriptions of the gas collection system have been updated as appropriate.

# K.10 OPERATING AND MAINTAINING THE STORMWATER MANAGEMENT SYSTEM

In accordance with Rule 62-701.500(10), FAC, the Operation Plan in Appendix B describes the stormwater management system and its maintenance. Please note the descriptions of the stormwater management system have been updated based on the changes authorized in ERP #41-00224996-004, issued November 4, 2020. A copy of the permit is provided in Appendix G.

# K.11 EQUIPMENT AND OPERATION FEATURE REQUIREMENTS

### K.11.a Sufficient Equipment

In accordance with Rule 62-701.500(11)a, FAC the Operation Plan in Appendix B confirms the site will have sufficient equipment to ensure proper operation of the facility for excavating, spreading, compacting and covering waste. No changes are proposed.

#### K.11.b Reserve Equipment

In accordance with Rule 62-701.500(11)b, FAC the Operation Plan in Appendix B identifies reserve equipment measures. No changes are proposed.

#### K.11.c Communications Equipment

In accordance with Rule 62-701.500(11)c, FAC the Operation Plan in Appendix B identifies communications equipment for emergency and routine communications onsite. No changes are proposed.

#### K.11.d Dust Control Methods

In accordance with Rule 62-701.500(11)d, FAC the Operation Plan in Appendix B identifies dust control methods. No changes are proposed.

#### K.11.e Fire Protection and Emergencies

In accordance with Rule 62-701.500(11)e, FAC the Operation Plan in Appendix B identifies fire protection and fire-fighting capabilities adequate to control accidental burning of solid waste at the Lena Road Landfill. No changes are proposed.

#### K.11.f Litter Control Devices

In accordance with Rule 62-701.500(11)f, FAC the Operation Plan in Appendix B identifies litter control devices and litter policing. No changes are proposed.

#### K.11.g Signs

In accordance with Rule 62-701.500(11)g, FAC the Operation Plan in Appendix B describes facility signage. Signs are updated as appropriate, but no changes are proposed to this section of the Operation Plan.

# K.12 ALL-WEATHER ACCESS ROAD, INSIDE PERIMETER ROAD, AND OTHER ROADS

In accordance with Rule 62-701.500(12), FAC the Operation Plan in Appendix B describes the access roads at the landfill. No changes are proposed.

# K.13 ADDITIONAL RECORDKEEPING

Operating records, such as permits, plans, inspections and other records are maintained on site.

#### K.13.a Permit Application Development

In accordance with Rule 62-701.500(13)a, FAC the Operation Plan in Appendix B indicates the County shall keep records of information used to develop or support the permit applications and supplemental information submitted to comply with Chapter 62-701, FAC. No changes are proposed to these procedures.

#### K.13.b Monitoring Information, calibration, and maintenance records

In accordance with Rule 62-701.500(13)b, FAC the Operation Plan in Appendix B describes the County shall retain records of monitoring information, including calibration and maintenance records, original chart recordings for continuous monitoring instrumentation, and copies of reports required by permit, for at least ten years. Background water quality records are maintained throughout the design period of the landfill. No changes are proposed.

#### K.13.c Annual Site Life Estimates

In accordance with Rule 62-701.500(13)c, FAC the Operation Plan in Appendix B indicates the County will prepare and submit an annual estimate of the remaining landfill life. No changes are proposed.

#### K.13.d Archiving and Retrieving Records

In accordance with Rule 62-701.500(13)d, FAC the Operation Plan in Appendix B identifies record maintenance archiving and retrieval requirements. No changes are proposed.

# SECTION L WATER QUALITY MONITORING REQUIREMENTS

## L.1 WATER QUALITY MONITORING PLAN

No changes are proposed to the requirements of this Part through this Report.

# SECTION M SPECIAL WASTE HANDLING REQUIREMENTS

No changes are proposed to the requirements of this Part through this Report. Section K.14 of the Operations Plan in Appendix B provides descriptions and procedures for special wastes.

## M.1 MOTOR VEHICLES MANAGEMENT PROCEDURES

The Lena Road Landfill does not accept motor vehicles for disposal.

# M.2 LANDFILLING SHREDDED WASTE PROCEDURES

The Lena Road Landfill does not shred waste, or accept shredded waste for disposal. However, it may accept shredded waste tires if not recycled.

# M.3 PROCEDURES FOR ASBESTOS WASTE DISPOSAL

The Operation Plan in Appendix B provides procedures for asbestos waste acceptance and disposal. No changes are proposed.

## M.4 PROCEDURES FOR CONTAMINATED SOIL DISPOSAL

The Operation Plan in Appendix B provides procedures for acceptance of non-hazardous, contaminated soils. No changes are proposed.

# M.5 BIOLOGICAL WASTE PROCEDURES

In accordance with Rule 62-701.520(5), FAC the Operation Plan in Appendix B addresses biological waste. Please note that updates are provided that comply with Chapter 62-701, FAC.

# SECTION N GAS MANAGEMENT SYSTEM REQUIREMENTS

No changes are proposed to the landfill gas (LFG) management system, or the monitoring of LFG through this Report. For additional information refer to the Operations Permit Renewal Application, dated October 27, 2015, and subsequent responses dated December 18, 2015, prepared by Atkins. Additionally, an expansion of the landfill gas collection system was completed in June 2020 and a separate Certification of Construction Completion has been submitted to FDEP.

# N.1 GAS MANAGEMENT SYSTEM DESIGN

No changes are proposed to the permitted LFG management system, or the requirements for monitoring of LFG through this Report. An expansion of the LFG collection system was completed in 2020 and the additional LFG extraction wells are being monitored.

#### N.1.a Preventing High Combustible Gas Concentrations

In accordance with the Operation Permit, the County conducts LFG monitoring in onsite structures on a quarterly basis as required by Rule 62-701.530(2)(c), FAC and submits the results to FDEP. No changes are proposed.

#### N.1.b Designed for Site Specific Conditions

The design of the LFG system is consistent with industry standards and include considerations for site-specific conditions. No changes are proposed.

#### N.1.c Reduction of Gas Pressures Within the Interior of the Landfill

The LFG system has been designed to reduce gas pressure in the interior of the landfill. No changes are proposed.

# N.1.d Non-Interference with the Liner, Leachate Control System, or Final Cover

The active LFG gas collection system for the Lena Road Landfill has been designed and permitted not to interfere with the leachate collection system. No changes are proposed.

# N.2 LANDFILL GAS MONITORING

On a quarterly basis, LFG monitoring of ambient points and soil probes occurs in order to comply with the LEL limits set forth in Rule 62-701.530(1)(a)1, FAC and the interior gas pressure reduction rule stated in Rule 62-701.530(1)(a)3, FAC. No changes are proposed.

# N.3 GAS AND ODOR REMEDIATION PLANS

The gas management system is operated in accordance with FDEP permits. No changes are proposed.

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# N.4 LANDFILL GAS RECOVERY FACILITIES

Title V Permit 0810055-015-AV authorizes the operation of landfill gas recovery equipment. No changes are proposed.

# SECTION O LANDFILL FINAL CLOSURE REQUIREMENTS

In accordance with Rule 62-701.600(2), FAC, Lena Road will obtain authorization from FDEP before initiating closure of all or part of the Lena Road Landfill. The County may request a closure permit or may request a modification of the permit to address substantive changes in the Closure Plan. No changes are proposed to the requirements of this Part through this Report.

# O.1 CLOSURE PERMIT REQUIREMENTS

In accordance with Rule 62-701.600(2), FAC, the County will submit to FDEP an application for final closure of all, or part of the landfill prior to initiating closure activities. The Closure Plan submitted with the Closure Permit application will include the following:

- Closure design plan;
- Closure operation plan;
- Plan for long-term care; and
- A demonstration of proof of financial responsibility for long-term care

#### O.1.a Application Submitted to Department

In accordance with Rule 62-701.600(2), FAC, prior to initiating closure activities, the County will submit to FDEP an application for final closure of all, or part of the landfill. The application will include a Closure Plan consisting of the items listed in Item 0.1.b Closure Plan below.

#### O.1.b Closure Plan

The Closure Plan submitted at that time will be in accordance with current solid waste regulations and will address only the areas not closed under previous closure permits. In accordance with Rule 62-701.600(2), FAC the Closure Plan submitted with the Closure Permit application will include the following.

- (1) Closure Design Plan;
- (2) Closure Operation Plan;
- (3) Plan for long-term care; and
- (4) A demonstration of proof of financial responsibility for long-term care.

# O.2 CLOSURE DESIGN PLAN

In accordance with Rule 62-701.600(3), FAC the Closure Design Plan consisting of engineering plans and a report on closing procedures that apply to the final closing of the waste disposal units will be submitted at least 90 days before the date when wastes will no longer be accepted. The design will include the information listed below.

#### O.2.a Closure Phases

Plan drawing showing detailed closure phasing of site closing. The updated Operation Drawings are provided in Appendix C.

#### O.2.b Existing Topography and Proposed Final Grades

Drawings showing the existing topography and the proposed final grading are provided in Appendix C.

#### O.2.c Closure Provisions

Solid waste disposal units will be finally closed upon reaching approved design dimensions and elevations in accordance with the requirements of Rule 62-701.600, FAC.

#### O.2.d Final Elevations Before Settlement

The proposed final elevations will not exceed the existing permitted final elevations as shown on the Operation Drawings in Appendix C.

#### O.2.e Sideslope Design

The sideslopes of the final cover design are shown to include benches, terraces, downslope drainage ways, and energy dissipaters. As shown in the Operation Drawings in Appendix C, the final sideslopes will not be steeper than 4: 1. Detailed information regarding the closure design of the Lena Road Landfill will be submitted in the future with the closure permit application. A discussion of precipitation effects will be provided as part of the closure report at the time of closure permit application. Also as part of the closure report, veneer slope stability analysis of the proposed cover system will be performed to estimate the factor of safety against veneer slope failure for the cover system components. The analysis will be based on the laboratory measurements of the interface friction angles of the cover system components.

#### O.2.f Final Cover Installation Plan

Final cover installation plans will be submitted as part of the closure permit application, including the following:

- 1. Construction Quality Assurance (CQA) Plan for installing and testing final cover.
- 2. Schedule for installing final cover after final receipt of waste.
- 3. Description of drought-resistant species to be used in the vegetative cover.
- 4. Top gradient design to maximize runoff and minimize erosion.
- 5. Provisions for cover material to be used for final cover maintenance.

### O.2.g Final Cover Design Requirements

The conceptual final cover design is provided in the Operation Drawings in Appendix C. The conceptual design provides for closure of the entire landfill. Drawings illustrate the top of the final closure. The final closure includes a 12-inch intermediate cover layer, a geomembrane cap system, a geocomposite drainage layer, a protective soil cover, and a vegetative soil layer. The final cover design will comply with Rule 62-701.600(3)(g). The design will address the following:

- 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.

#### O.2.h Method of Stormwater Control

The proposed stormwater management and control system is shown in the Operation Drawings in Appendix C. The design provides perimeter drainage ditches before construction of the closure as part of the construction of the landfill. This stormwater system will be maintained throughout active operations at the landfill and will serve as the stormwater management system after closure. While 20-foot wide terraces had previously been permitted at the Lena Road Landfill, SCS verified the proposed changes to the secondary stormwater management system in Phase II will provide adequate drainage for the design storm event. Please refer to Appendix F for the stormwater analysis.

#### O.2.i Proposed Method of Access Control

Access to the Lena Road Landfill is controlled with the use of the entrance gate. The accessible portion of the landfill property boundary is fenced and control will be maintained after closure. A detailed description of the access control will be provided in the closure plan that will be submitted as part of the closure permit application.

#### O.2.j Gas Management System

The gas management system currently includes 285 vertical gas collection wells and 8 horizontal collectors as well as a landfill gas powered generator and candlestick flare. As part of the closure permit application, system updates will be proposed for closure construction as needed at that time.

# O.3 CLOSURE OPERATION PLAN

A closure operation plan will be provided as part of the closure permit application. The closure operation plan will include the following:

a. Detailed description of actions that will be taken to close the facility.

- b. Time schedule for completion of closing and long-term care.
- c. Description of method for demonstrating financial assurance for long-term care.
- d. Operation of the Water Quality Monitoring Plan required Rule 62-701.510, FAC.
- e. Development and implementation of a gas management system required in Rule 62-701.530, FAC.

# O.4 CERTIFICATION OF CONSTRUCTION COMPLETION

In accordance with Rule 62-701.610(4), FAC, a signed, dated, and sealed certificate of closure construction by the engineer of record will be submitted to the FDEP upon completion of closure construction. This submittal will indicate any deviations from the permitted closure plans.

### O.4.a Survey Monuments

Upon closure of the landfill, a description of permanent bench marks outside the landfill cells, survey monuments, and marker posts that identify the waste filling limits will be provided. The description will also include details of any new monuments that may be necessary for closure construction.

## O.4.b Final Survey Report

A final survey report of the constructed closure will be prepared in compliance with Rule 62-701.610(3), FAC. The final survey report will be prepared by a licensed land surveyor and will be submitted to the FDEP to verify that the final contours and elevations are in accordance with the plans and approved in the closure permit. The contours in the final survey will be shown at no greater than 5-foot intervals.

## O.4.c Closure Construction Quality Assurance Report

A certification of closure construction completion will be prepared in compliance with Rule 62-701.400(7), FAC, consistent with the requirements of the CQA Plan for the project, signed, dated and sealed by a Professional Engineer in the State of Florida will be provided to FDEP upon completion of closure.

# O.5 DECLARATION TO THE PUBLIC

The Declaration to the Public required by Rule 62-701.600(7), FAC will be prepared and filed in the deed records of the County Clerk's office. The declaration will include a legal description of the property and a site plan specifying the area actually filled with solid waste.

# O.6 OFFICIAL DATE OF CLOSING

The requirements identified above in Parts 0.2 through 0.4 will be submitted to FDEP before initiating closure of all or part of the Lena Road Landfill. Upon receipt, FDEP will notify the County in writing that the notice of termination of operations and closure of the facility has been received. The official date of landfill closing will be the date of the FDEP letter.

# O.7 TEMPORARY CLOSURE PROCEDURES

If an area of the landfill will not receive waste for more than 180 days, a 12-inch intermediate soil cover will be placed on the area and sodded to prevent erosion and stormwater intrusion. If temporary closure is proposed, the closure will be conducted in accordance with the requirements of Rule 62-701.600(9), FAC.

# SECTION P OTHER CLOSURE PROCEDURES

Information presented in this Report is intended to provide the general intent of the closure procedures of the Lena Road Landfill. Detailed closure procedures will be provided later with the closure application.

# P.1 USE OF CLOSED LANDFILL AREAS

Consultation with FDEP is required prior to conducting activities at closed landfills in accordance with Rule 62-701.610(1), FAC. At this time, the County has no plans to use the closed landfill area post-closure.

# P.2 RELOCATION OF WASTES

Once the Lena Road Landfill is closed, no relocation of waste within the footprint of the landfill will be allowed without a modification to the closure permit in accordance with Rule 62-701.610(2), FAC.

# SECTION Q LONG-TERM CARE

Long-term care will be provided for the Lena Road Landfill pursuant to Rule 62-701.620, FAC. The County will continue to monitor and maintain the facility in accordance with the approved Closure Plan for 30 years from the date of closing, or as otherwise approved by FDEP. The surface water management system, gas control system, and vegetative cover will be maintained during the long-term care period. The leachate collection, transmission, and disposal system will be operated during the long-term care period. No changes are proposed to the long-term care requirements and procedures in this Report. General provisions the County will conduct for long-term care will consist of:

- Maintenance of cover soils to assure positive drainage, minimize erosion and filling areas of subsidence or other depressions.
- Maintenance of vegetative cover.
- Maintenance of the stormwater management system.
- Maintenance of groundwater monitoring wells and monitoring at existing monitoring wells.
- Maintenance and management of the leachate collection system.
- Maintenance and management of the groundwater collection system.
- Maintenance and management of the landfill gas management system.
- Maintaining provisions and anticipated source of cover material and vegetation.
- General maintenance and periodic inspection of the facility.

## Q.1 GAS COLLECTION AND MONITORING SYSTEM

The gas collection system and the existing gas monitoring system will be maintained for the duration of the long-term care period as required by Rule 62-701.620(5), FAC. No changes are proposed.

# Q.2 STABILIZATION REPORTS

In accordance with Rule 62-701.620(6), FAC every five years after issuance of a permit for long-term care, the County shall submit a report to the Department that addresses stabilization of the Lena Road Landfill. The submittal shall include the technical report required in Rule 62-701.510(9)(b), FAC and shall also address subsidence, barrier layer effectiveness, and stormwater management. For lined landfills, the submittal shall also address leachate collection and removal system effectiveness, leachate quality, and leachate quantity. No changes are proposed.

# Q.3 RIGHT OF ACCESS

There is no current plan for use of the landfill after closure. In accordance with Rule 62-701.620(7), FAC after termination of solid waste operations, the County will retain the right of entry to the landfill property for the long-term care period, after termination of solid waste operations, for inspection, monitoring, and maintenance purposes for the duration of the long-term care period. No changes are proposed.

# Q.4 REPLACEMENT OF MONITORING DEVICES

In accordance with Rule 62-701.620(8), FAC if a monitoring well or other device required by the approved Monitoring Plan is destroyed or becomes inoperable, the County will notify FDEP in writing immediately upon discovery. Inoperative monitoring devices will be replaced with functioning devices within 60 days of the discovery, or as proposed in the Owner's notification to FDEP, or as required by Rule 62-701.620(8), FAC. No changes are proposed.

# Q.5 COMPLETION OF LONG-TERM CARE

In accordance with Rule 62-701.620(9), FAC after FDEP acknowledges that the facility has been closed the County will continue to monitor and maintain the facility for at least 30 years, unless specific release from all or part of these requirements is granted by the FDEP. No changes are proposed.

# SECTION R FINANCIAL ASSURANCE

Please refer to Appendix H including FDEP Form #62-701-900(28) for updated estimates of costs for closure construction and long-term care.

## R.1 COST ESTIMATES

The financial assurance cost estimate has been updated as part of this Report. These cost estimates were prepared by a Professional Engineer for a third party performing the work on a per-unit basis, with the source of the estimates indicated in accordance with Rule 62-701.630(3), FAC.

## **R.2 PROCEDURES FOR PROVIDING ANNUAL COST ADJUSTMENTS**

An annual cost adjustment will be provided by the County to FDEP in accordance with Rule 62-701.630(4), and (8), FAC on an annual basis that adjusts the closure and long-term care cost estimates by using an inflation factor on previously-estimated costs. The estimate will address closure and long-term care costs, as well as corrective action costs, if required.

## R.3 FUNDING MECHANISMS

The County uses the Financial Test to demonstrate compliance with financial responsibility requirements. The County submits annual adjustments to FDEP for the cost estimates for the closure and long term-care of the Lena Road Landfill.

Appendix A Site Location Map Lena Road Landfill



\\tam-fs01\Tampa\Files\PROJECT\09217088.10\Task 1 - Groundwater\Lena Road\Surfer\contour maps.dwg Mar 01, 2019 - 12:57pm Layout Name: 1-1 site location map By: 4455aba

LENA ROAD LANDFILL MANATEE COUNTY, FLORIDA Appendix B Updated Operation Plan

# SCS ENGINEERS



# Lena Road Class I Landfill

# **Operations Plan**

# Attachment K

Presented to:



Utilities Department, Solid Waste Division 3333 Lena Road Bradenton, FL 34211 (941) 748-5543

Presented by:

SCS ENGINEERS 3922 Coconut Palm Drive, Suite 102 Tampa, FL 33619 (813) 621-0080

Revised <u>September 2017March 2021</u> File No. 09217088.<u>18</u>01

> Offices Nationwide www.scsengineers.com

#### Lena Road Class I Landfill Operations Plan

#### **Prepared for:**

Manatee County Utilities Department Solid Waste Division 3333 Lena Road Bradenton, FL 34211 FDEP Permit No. 39884-021-SO-01 WACS ID No. 44795

#### Prepared by:

SCS Engineers 3922 Coconut Palm Drive, Suite 102 Tampa, FL 33619 (813) 621-0080

Revised <u>September 2017March 2021</u> File No. 09217088.<u>1801</u>

> <u>Shane R. Fischer-Carlos A.</u> Restrepo, P.E. No. <u>5802670208</u>

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# K.1 TRAINED OPERATORS

Manatee County government personnel operate the Lena Road Landfill. The County requires at least one trained landfill operator certified in accordance with F.A.C., Chapter 62-701.500 (1) and one spotter at the working face at all times during waste disposal operations. The spotter is responsible for guiding vehicles and for assisting <u>with control of the code enforcement with</u> enforcing provisions for controlling the waste received. An example of a typical workweek staff schedule is shown in Figure K-1.

Time	Activity
7:00 am	Landfill Operations Supervisors, Solid Waste Disposal Chiefs and/or the Solid Waste Maintenance Chief (all certified, trained operators) arrive; distribute daily assignments, checks attendance, and equipment sheets. The equipment moves to the working area to prepare the roads and sites for that working day. At least one trained spotter is <u>present assuming spotter responsibility</u> assigned to <u>at</u> the working face each time waste is received to inspect each load <u>ensuring prohibited waste is removed.</u>
8:00 am	The Scalehouse opens and traffic is routed to the appropriate disposal area.
9:00 am	Personnel begin the morning break times
11:30 pm	Personnel begin the lunch break times
2:00 pm	Personnel begin the afternoon break times
5:00 pm	Operators <u>clean up the designated tipping area, cover the compacted</u> garbage with dirt and/or alternate daily cover as required by FDEP, and then staff clean their assigned equipment <del>leave work sites and cleanup</del> equipment
6:00 pm	Equipment and buildings are secured; alarm set; gates locked; and personnel depart

General daily operations are as follows:

# K.l.a Training Plan

Each landfill operator or spotter for Manatee County is required to participate in the County's landfill operator and spotter training plan. The County provides operator and spotter training each year through an approved training company to provide the required initial and/or continuing training. A list of each employee's training status and continuing training requirements is maintained by TREEO and is provided as Attachment K-4.

#### Figure K-1. Landfill Operations - Typical Workweek Staff Schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Anthony Detweiler Landfill Operations SupervisorRobert Bennett	Anthony Detweiler Landfill Operations SupervisorRobert Bennett	Anthony Detweiler Landfill Operations SupervisorRobert Bennett	Anthony Detweiler Landfill Operations SupervisorRobert Bennett	Anthony Detweiler Landfill Operations Supervisor Bennett	
Landfill Operations Supervisor	<del>Landfill Operations</del> <del>Supervisor</del>	<del>Landfill Operations</del> <del>Supervisor</del>	Landfill Operations Supervisor	Landfill Operations Supervisor	
Keith Jones Disposal Chief	<del>Keith Jones</del> <del>Disposal Chief</del>	Keith Jones Disposal ChiefKeith Jones Disposal Chief	Keith Jones Disposal Chief Jones - Disposal Chief	<u>Keith Jones</u> Disposal Chief	<u>Keith Jones</u> <u>Disposal Chief</u>
<u>{vacant}Devin Wilson</u> Landfill OperatorArmando Ayala Landfill Attendant	( <del>vacant)</del> Devin Wilson Landfill OperatorArmando Ayala Landfill Attendant	<del>Armando Ayala</del> <del>Landfill Attendant</del>	Armando Ayala Landfill Attendant	( <u>vacant)Devin</u> Wilson Landfill OperatorArmando Ayala Landfill Attendant	( <del>vacant)</del> Devin Wilson Landfill Operator
<u>Juan Garza</u> <u>Landfill</u> <u>Operator<del>Juan Garza</del> Landfill Operator</u>	<u>Juan Garza</u> <u>Landfill Operator</u> <del>Juan Garza</del> <del>Landfill Operator</del>	<u>Juan Garza</u> <u>Landfill</u> <u>Operator<del>Juan Garza</del> Landfill Operator</u>	<u>Juan Garza</u> <u>Landfill</u> <u>Operator<del>Juan</del> <del>Garza</del> Landfill Operator</u>		
<del>Darrel Seegmiller</del> <del>Landfill Operator</del>	Darrel Seegmiller Landfill Operator <del>Darrel</del> Seegmiller Landfill Operator	Darrel Seegmiller Landfill Operator	Darrel Seegmiller Landfill Operator	Darrel Seegmiller Landfill Operator <del>Darrel</del> Seegmiller Landfill Operator	<del>Darrel Scegmiller</del> Landfill Operator
<u>Clayton Mathis</u> <u>Landfill</u> <u>Operator<del>Clayton</del> <del>Mathis</del> Landfill Operator</u>	<u>Clayton Mathis</u> <u>Landfill</u> <u>OperatorClayton</u> <del>Mathis</del> Landfill Operator	<u>Clayton Mathis</u> <u>Landfill</u> <u>Operator<del>Clayton</del> <del>Mathis</del> Landfill Operator</u>	<u>Clayton Mathis</u> <u>Landfill</u> <u>OperatorClayton</u> <del>Mathis</del> Landfill Operator	<u>Clayton Mathis</u> <u>Landfill</u> <u>OperatorClayton</u> <del>Mathis</del> Landfill Operator	
<u>Evan Wolfe</u> Landfill Operator <del>Evan Wolfe</del> Landfill Operator	Evan Wolfe Landfill OperatorEvan Wolfe Landfill Operator		<u>Evan Wolfe</u> Landfill Operator	Evan Wolfe Landfill Operator <del>Evan</del> <del>Wolfe</del> Landfill Operator	<del>Evan Wolfe</del> <del>Landfill Operator</del>
<u>Ray Collins</u> Landfill Operator <del>Jack</del> <del>Manning</del> Landfill Operator	<u>Ray Collins</u> <u>Landfill</u> <u>Operator<del>Jack</del> <del>Manning</del> <del>Landfill Operator</del></u>			<u>Ray Collins</u> Landfill Operator <del>Jack</del> <del>Manning</del> Landfill Operator	<u>Ray Collins</u> Landfill Operator <del>Jack</del> <del>Manning</del> Landfill Operator
<u>Eric Siegfried(vacant)</u> Disposal Chief	E <del>ric</del> Siegfried(vacant) Disposal Chief	<u>Eric Siegfried(vacant)</u> Disposal Chief <del>Eric</del> <del>Siegfried</del> <del>Disposal Chief</del>	<u>Eric</u> <u>Siegfried(vacant)</u> <u>Disposal ChiefEric</u> <del>Siegfried</del> <del>Disposal Chief</del>	<del>Eric Siegfried</del> <del>Disposal Chief</del>	<del>Eric Siegfried</del> <del>Disposal Chief</del>
<u>Riley Stephens</u> <u>Landfill Operator</u> <del>Don</del> <del>Lusby</del> <del>Landfill Operator</del>	<u>Riley Stephens</u> Landfill Operator <del>Don Lusby</del> Landfill Operator		<u>Riley Stephens</u> Landfill Operator <del>Don Lusby</del> Landfill Operator	<u>Riley Stephens</u> Landfill Operator <del>Don Lusby</del> Landfill Operator	
		<u>Woodrow Hockaday</u> <u>Landfill Operator<sup>Tim</sup></u> <del>Harper</del> <del>Landfill Operator</del>	<u>Woodrow</u> <u>Hockaday</u> <u>Landfill</u> <u>Operator<del>Tim</del></u> <del>Harper</del> <del>Landfill Operator</del>	<u>Woodrow</u> <u>Hockaday</u> Landfill <u>OperatorTim</u> <del>Harper</del> Landfill Operator	<u>Woodrow</u> <u>Hockaday</u> <u>Landfill</u> <u>Operator<sup>Tim</sup> <del>Harper</del> Landfill Operator</u>
		<u>Rusty Blakely<del>(vacant)</del> Landfill Operator<del>James</del> Horton Landfill Operator</u>	<u>Rusty Blakely</u> ( <del>vacant)</del> Landfill Operator <del>James</del> Horton Landfill Operator	Rusty Blakely ( <del>vacant)</del> Landfill Operator <del>James</del> Horton Landfill Operator	Rusty Blakely ( <del>vacant)</del> Landfill Operator <del>James</del> Horton Landfill Operator
<u>Danny Newman</u> Landfill Operator <del>Danny</del> Newman Landfill Operator	<u>Danny Newman</u> <u>Landfill</u> <u>Operator<del>Danny</del> <del>Newman</del> <del>Landfill Operator</del></u>	<u>Danny Newman</u> <u>Landfill</u> <u>Operator<del>Danny</del> Newman Landfill Operator</u>	<u>Danny Newman</u> <u>Landfill</u> <u>Operator<del>Danny</del> <del>Newman</del> <del>Landfill Operator</del></u>		
Anthony Gigliotti	Anthony Gigliotti	Anthony Gigliotti	Anthony Gigliotti	Anthony Gigliotti Landfill	

#### Lena Road Class I Landfill Operations <u>Plan</u>Minor Modification Permit Application

SCS ENGINEERS

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Landfill	Landfill	Landfill	<u>Landfill</u>	Operator Anthony	
Operator Anthony	Operator Anthony	Operator Anthony	Operator Anthony	Detweiler	
<del>Detweiler</del>	Detweiler	Detweiler	Detweiler	Landfill Operations	
Landfill Operations	Landfill Operations	Landfill Operations	Landfill Operations	Supervisor	
Supervisor	- Supervisor	Supervisor	- Supervisor		
Richard Jones	Richard Jones	Richard Jones	Richard Jones	Richard Jones	
<u>Maintenance</u>	Maintenance	Maintenance	Maintenance	Maintenance	
<u>Chief</u> Richard Jones	ChiefRichard Jones	ChiefRichard Jones	ChiefRichard Jones	ChiefRichard Jones	
Maintenance Chief	Maintenance Chief	Maintenance Chief	Maintenance Chief	Maintenance Chief	
Michael Guy	Michael Guy	Michael Guy	Michael Guy	Michael Guy	
Landfill	<u>Landfill</u>	Landfill	<u>Landfill</u>	<u>Landfill</u>	
<u>Operator</u> Michael	Operator Michael	Operator Michael	Operator Michael	Operator Michael	
<del>Guy</del>	<del>Guy</del>	<del>Guy</del>	<del>Guy</del>	<del>Guy</del>	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Arron Von Keitz	Arron Von Keitz	Arron Von Keitz	Arron Von Keitz	Arron Von Keitz	
<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	
<u>Operator</u> Mike	Operator Mike	<u>Operator</u> <del>Mike</del>	Operator Mike	Operator Mike	
<del>Blomberg</del>	Blomberg	Blomberg	Blomberg	Blomberg	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
<u>Brett Walker</u>	<u>Brett Walker</u>	Brett Walker	<u>Brett Walker</u>	<u>Brett Walker</u>	
<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	
<u>Operator</u> Josh Brown	<u>Operator</u> Josh	<u>Operator</u> Josh Brown	<u>Operator</u> Josh	<u>Operator</u> Josh	
Landfill Operator	Brown	Landfill Operator	Brown	Brown	
	Landfill Operator		Landfill Operator	Landfill Operator	
Steven Petty	Steven Petty	Steven Petty	Steven Petty	Steven Petty	
<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	<u>Landfill</u>	
<u>Operator</u> <del>Darren</del>	Operator Darren	<u>Operator</u> <del>Darren</del>	Operator Darren	Operator Darren	
Smith	Smith	Smith	Smith	Smith	
Landtill Operator	Landtill Operator	Landfill Operator	Landtill Operator	Landtill Operator	
Doug Karpenko	Doug Karpenko	Doug Karpenko	Doug Karpenko	Doug Karpenko	
Landfill	Landfill	Landfill	Landfill	Landfill	
<u>Operator</u> Richard	Operator Richard	Operator Richard	Operator Richard	Operator Richard	
Beaulieu	Beaulieu	Beaulieu	Beaulieu	Beaulieu	
Landtill Operator	Landtill Operator	Landtill Operator	Landtill Operator	Landtill Operator	
Jett Hassen	Jett Hassen	Jett Hassen	Jett Hassen	Jett Hassen	
Landfill Operator	Landtill Operator	Landfill Operator	Landtill Operator	Landfill Operator	
Kopert Bennett	Kopert Bennett	Kopert Bennett	Kopert Bennett	Kopert Bennett	
	Lanatili Operations			Lanatili Operations	
<u>Supervisor</u>	Supervisor	Supervisor	<u>Supervisor</u>	Supervisor	

# K.2 OPERATIONS PLAN

# K.2.a Designation of Responsible Operating and Maintenance Personnel

The Manatee County Solid Waste Management Facility (Landfill) is owned by Manatee County Government and operated under the direction of the Utilities Department, Solid Waste Division. An After Hours Contact List is provided in Table K-1, and a list of landfill positions is given below:

- Solid Waste Division Manager
- Landfill Operation Supervisor (2)\*
- Fiscal Specialist \*
- Solid Waste Maintenance Chief \*
- Solid Waste Disposal Chief (2)\*
- Landfill Operator (1<u>7</u>4)\*
- Landfill Superintendent \*
- Household Hazardous Waste Technician (2)

- Landfill Scalehouse Operator (3)\*
- Senior Scalehouse Operator (2)\*
- Solid Waste Collection Supervisor (2)\*
- Recycling Special Waste Collection Supervisor (1)\*
- Recycling Coordinator
- Solid Waste Enforcement Superintendent\*
- Solid Waste Enforcement Officer (4)\*

Administrative Assistant

Landfill Attendant \*

\*Trained Spotters

#### Table K-1. Emergency and After Hours Contacts Lena Road Landfill/Solid Waste Division

Person/Agency	Telephone Number		
Fire Department	911 or Non-Emergency 941-751-5611		
Battalion Captain Stacey BaileyBattalion			
Captain Stacey Bailey			
Chief Byron Teates			
Manatee County Fire Rescue Administration			
Office: 3200 Lakewood Ranch Blvd.			
Bradenton, FL 34211			
First Responder: Station 2			
803 60 <sup>th</sup> Street Court East			
Bradenton, FL 34202			
Ambulance	911		
Sheriff	911		
Bomb Squad	911 or Non-Emergency 941-747-3011		
Public Safety Hazardous	911		
VacaRobert Shanklent, Solid Waste Division	H:		
Manager	C: <u>941-448-3635</u>		
	Office: 941-748-5543792-8811		
Bryan White, Landfill Superintendent	C: 941-812-2455		
Bob Bennett, Landfill Operations Supervisor	H: 941-758-1741		
	C: 941-704-7855		
Anthony Detweiler Landfill Operations Supervisor	C: <del>941-812-8796</del> 941-465-8630		
Eric Siegfried Vacant, Solid Waste Disposal Chief	H: <del>941-756-3507</del>		
	C: <del>941-730-6554</del>		
Keith Jones, Solid Waste Disposal Chief	C: 941-704-6640		
Richard Jones, Solid Waste Maintenance Chief	C: 941-322-4104		
Scott WoodTeresa Chaffee, Recycling and	C: <del>941-348-7123</del> 941-713-3507		
Special Waste Collection Su <del>p</del> pervisor			
Jeanne Detweiler, Superintendent Solid Waste	C: 941-812-4301		
Enforcement			
Debora Braziel-Jones, Solid Waste Collections	H: 941-350-9399		
Supervisor	<u>C: 941-900-7604</u>		
Angela DuntonBarb Grunas, Solid Waste	C: 941-405-9817941-666-0188		
Collections Supervisor			
Department of Environmental Protection	Office: 813-470-5700		
<u>Kaitlyn Newsome</u> <del>Melissa Madden</del>	Direct: 813-470-5 <u>877</u> 795		

# K.2.b Contingency Operations for Emergencies

In the event of an emergency, the County may close the landfill during the emergency event, but will maintain open access to the landfill after the emergency condition passes or the threat level drops. For example, the landfill will be closed during a hurricane, but opened after the hurricane has passed. On-site equipment may not be sufficient to maintain the excess volume of waste generated as a result of an emergency. If so, back-up landfill equipment will be rented within 24 hours from the County's approved bid list. Additionally, back-up equipment will be provided for equipment breakdowns and down time for routine maintenance. In the case of equipment failure or emergencies, rental equipment or equipment from other County agencies will be delivered to the site within 24 hours.

Emergency conditions at the landfill may occur as a result of natural weather events (tornado, flooding, hurricane, etc.) or fire. Staff is currently equipped to mobilize to alternative sites that will be designated as such in conjunction with the Manatee County Emergency Management Department. In the event that emergency conditions interrupt operations at the landfill, a contingency plan will be developed and implemented to establish temporary operations on a case-by-case basis, dependent on conditions at alternative sites such as the closed Erie Road Landfill. Such temporary operations will accept storm debris only, and will be terminated and disposal operations resumed at Lena Road Landfill as soon as practical. If the Lena Road Landfill cannot operate during an emergency, solid waste collection trucks will be diverted to the closest landfill that will accept waste.

When an emergency condition threatens the landfill operation, the following actions will be taken:

- 1. Daily Cover shall be applied to all exposed refuse before a major storm arrives, if possible.
- 2. All landfill equipment shall be parked near any natural windscreens such as earthen mounds and berms.
- 3. All lightweight signs and equipment shall be secured.
- 4. When operation resumes, work shall commence in dry areas only (up from the active face).
- 5. Refuse shall not be disposed of in standing water.

#### K.2.b.1 Fire Event

Small fires on the working face will be controlled by a water wagon, bulldozer or landfill compactor and ample water and cover material to extinguish the fire. On-site stockpiles of soil cover material are available for suppressing fires. In the event an uncontrollable fire does occur at the landfill site, the East Manatee Fire Rescue District (941-751-5611) is the responding Department and will be called immediately. The East Manatee Fire Rescue District presently maintains a fire station approximately 3.5 miles west of the facility. In the event of a fire or other emergency, the landfill operator will notify the FDEP within twenty-four (24) hours by telephone and within seven (7) days a written report will be submitted describing the origins of the emergency, actions taken, result of the actions taken, and an analysis of the success or failure of the actions.

A hot load area is provided in a location away from the working face to allow vehicles arriving at the landfill with a fire in their load to dump quickly in an area where the material can be spread out and quickly sprayed by the water wagon. All water sprayed on hot loads will be managed as leachate. The location of the hot load area will change from time to time with the changing working face locations. Hot loads will not be dumped on the working face until sufficiently cool to avoid combustion.

The landfill has accommodations for wet weather solid waste disposal for the residential or small business patrons. The location of the wet weather operations area changes depending upon progression of the fill sequence. The area is bermed and a stabilized tipping surface is provided.

The solid waste disposed of in the wet weather area is loaded into dump trucks and transported to the working face for proper disposal. The wet weather area is also cleaned at the end of each day in order to provide proper litter and vector control.

#### K.2.c Control of Types of Materials Received

Procedures for observing waste as it is brought to the landfill and unloaded are provided in Section K.2.e. The load-checking program is described in Section K.6. The landfill may dispose of Class I solid waste as defined in 62-701.200 (13).

- 1. Lead-Acid Battery Collection Area (HHW Drop-off Facility)
- 2. Household Hazardous Waste Collection Site (HHW Drop-off Facility)
- 3. White Goods/Scrap Metal Storage Area
- 4. Yard Waste <u>Facility</u>Processing Area
- 5. Tire Storage Area
- 6. Freon Containing Staging Area
- 7. E-Scrap

Special wastes such as white goods, tires, and yard wastes, require special handling and management. The locations for the Waste Tire Facility, White Goods/Scrap Metals Facility, Household Hazardous Waste Drop-off Facility and Yard Waste Facility are shown on Drawing Sheet C-2 of the Fill Sequence Plan. The County temporarily stores white goods and whole tires prior to processing. The white goods are stored in an upright position until such time as the

contracted commercial recyclers remove them. Waste tires are stored in the permitted waste tire site prior to removal by the <u>contractor recycler</u>. Tires mixed in loads are removed from the active face. Yard wastes <u>that</u> are processed on site by a contracted vendor a<u>rend typically</u> removed from the site for re-use in land applications, <u>but may also be used to assist with working face access during wet weather or waste-to-energy plants as fuel</u>. <u>Yard waste may also be directly disposed in the landfill without processing</u>. Waste types not accepted for landfilling include all hazardous wastes, all infectious wastes, pesticides and unexpended pesticide containers, free liquids, flammable and volatile wastes, and radioactive wastes.

#### K.2.c.1 Asbestos

Asbestos waste haulers are required to notify the landfill operator in advance and provide information on the estimated volume and delivery date of friable asbestos. All incoming asbestos material is required to comply with all applicable permit conditions and to be wet down and double bagged. Asbestos will not be accepted during adverse weather conditions. Asbestos is covered with non-asbestos containing waste or soil and the location will be recorded. Additional procedures for handling asbestos are given in Section K.14.c Special Waste Handling – Asbestos.

#### K.2.c.2 Hazardous Waste

If hazardous wastes are located at any area of the landfill, the area must be isolated and management notified immediately. Management/Supervisory staff must notify the below listed agencies dependent on the type of material brought to the landfill.

Management/Supervisory staff must notify the following offices for handling and proper disposal of hazardous wastes:

1.	Environmental Management Department	(941) 742-5980
2.	Sheriff's Department/HazMat Section	(941) 721-2693
3.	Utilities Department Director	(941) 792-8811, Extension 5323
4.	Recycling and Special Waste Collection	(941) 782-8811, Extension 8049
	Supervisor	
5.	SWE Supervisor	(941) 748-5543, Extension 8013

All events regarding receipt of non-household hazardous waste material are kept at the landfill office.

A brief outline of the following materials/programs is given below.

Typical household hazardous wastes (HHW) are as follows:

Paint	Pesticides	Used motor oil	Ammunition
Herbicides	Aerosol cans	Propane tanks	Flares

Gasoline

Mercury Containing Cleaning Supplies Devices

The Recycling and Special Waste Collection Supervisor responsible for operation of the Household Hazardous Waste Collection and Storage Facility must be notified if HHW material is to be disposed. The Supervisor will arrange for removal and proper disposal. The maximum onsite storage and frequency for removing these recyclables from the site is as follows:

- Used oil (up to 43.000 gallons) is to be removed quarterly
- Paints (up to <u>1620</u>,6000 gallons) are to be removed quarterly
- Batteries (up to 31,000 batteries including lead-acid, Ni-Cad and lithium) are to be removed quarterly
- Light bulbs (up to  $\frac{85,000}{2}$ ) are to be removed at least quarterly
- Electronic devices (up to  $\underline{80 \text{ tons or }} \underline{5160},000 \text{ pounds}$ ) are to be removed quarterly
- Household Hazardous Waste (up to <u>75 tons or 2,5150,0</u>00 pounds) are to be removed quarterly

A detailed Operations Plan for the HHW facility in provided in Attachment K-2.

#### K.2.c.3 White Goods

All white goods containing Freon (e.g., refrigerators, air conditioners) are segregated from the waste stream and placed upright in the staging area. Freon is removed by a certified operator, and the item marked as being Freon free. The compressors are removed and oils drained off-site for collection by a licensed hazardous waste transporter under the direction of the scrap metal processor. <u>PCB capacitors are removed by County staff.</u> The white goods are then moved to the general white goods/scrap metal area for collection by the scrap metal contractor at the location indicated on Sheet C-2 of the Drawings.

All white goods, as defined in 62-701.200 (141), entering the landfill in separated loads are sent directly to the designated white goods/scrap metal storage area to be collected <u>and hauled by</u> <u>County staff toby</u> a private scrap metal contractor for recycling purposes.

Up to 400 tons of scrap metal and white goods (a maximum of 600 pieces of white goods) can be stored in this area. The minimum frequency for removal is every six months.

#### K.2.c.4 Yard Waste

All iIncoming yard waste is typically directed to the designated area to be processed on site by a contracted vendor and removed from the site for re-use in land applications or waste-to-energy plants as fuel. Mulch is also used for the wet weather area during rainy season to assure access to the tipping area during rain events. The minimum frequency for processing yard trash is once every six months or when 3,000 tons (12,000 cubic yards) are accumulated. The contracted vendor then removes the shredded material for resale to various outlets for land applications or

waste-to-energy plants for fuel. The fines generated are also utilized at the landfill and mixed with soil for use as initial cover.

Alternately, loads of yard waste may be directly disposed in the landfill as the gas from decomposition is beneficially reused. This disposal option is not intended to be the primary method of yard waste management, but may supplement management options as deemed appropriate by the Landfill Superintendent and/or Operations Supervisor.

#### K.2.c.5 Tires

Tires entering the landfill are directed to the permitted storage area. Large agricultural equipment tires and large or solid forklift tires that cannot be processed for recycling are sent to the landfill disposal area for disposal in the landfill. The contracted vendor removes the tires to a permitted waste tire processing facility-to-energy facility for processing and use as a fuel additive. Removal by the vendors is conducted on an on-call basis.

#### K.2.c.6 Batteries

State regulations prohibit disposal of lead-acid batteries in a landfill. The County prohibits collection of batteries by its franchised waste haulers. The Solid Waste Management Act aids in providing for proper disposal by requiring that all entities that sell batteries at retail shall accept used batteries as trade-ins for new batteries.

The County accepts <u>lead-acid</u>, <u>Ni-Cad and lithium</u> batteries at no cost to its residents who bring them to the landfill facility. Upon entering the scales, the transporter is advised to place all batteries in the storage shed located in the Community Drop Off area on weekends and holidays. In addition, batteries are accepted at the HHW Facility during its collection events and Monday through Friday (except holidays).

The Household Hazardous Waste Technician conducts frequent inspections of the storage shed and HHW Facility to monitor the number of batteries on site. When the on-site count reaches 31.000, the contracted battery vendor is called to remove them for recycling and/or proper disposal.

The contracted vendor collects the batteries on an on-call basis. When the vendor arrives on site, they are met by the Household Hazardous Waste Technician who observes the transfer of batteries from the collection shed to the vendor's vehicle. The vendor must sign a battery log before the batteries are removed from the facility. The log is also signed by the Household Hazardous Waste Technician verifying the count of batteries removed. The collection agreement is renewed or updated on an annual basis.

# K.2.d Weighing Incoming Waste

The Scalehouse operations are supervised and operated by the Manatee County Utilities Department, Solid Waste <u>DivisionSection</u>. Three scales are located at the entrance to the landfill. Two are inbound and one is outbound. The weighing of waste is required prior to entering the landfill and weight records are reported to the Department monthly. Vehicles that enter the electronic scales are recorded on an information management system. This system records the date, type of vehicle, weight, material to be disposed, daily transaction number, and any other information available pertaining to account name or status. The driver is directed to the appropriate disposal area by the scale attendant.

# K.2.e Vehicle Traffic Control and Unloading

The landfill facility is surrounded by fencing and other natural barriers that limit vehicle access to the landfill. Directional signs have been placed to safely direct vehicles to the current waste disposal area. These signs have large legible letters and are cleaned, refurbished and moved as necessary. The signs are strategically placed so that the route is clear to the drivers. In addition, verbal instruction is issued by the Scalehouse attendant as required. Fencing or temporary barricades are employed as additional traffic control features. Speed limit, safety, and prohibitive practice signs are also placed as necessary in order to encourage a safe, clean operating area.

The Disposal Chiefs direct disposal operations. The landfill operatorattendant acts as the spotter at the active face. Unloading is permitted only at the designated tipping area next to the working face. At the fill areas, temporary signs and at least one spotter direct vehicles to the proper tipping areas. The spotter directs those persons requiring additional assistance. Haulers are responsible for unloading their own vehicles. Wastes requiring special handling are coordinated with and unloaded under the direct supervision of landfill personnel. Spotters shall be trained and stationed per 62-701.320 (15) (d) Spotter location. The trained spotter, located safely in heavy equipment or a vehicle, isshall be stationed where they can inspect each shipment of waste for unauthorized waste prior to compaction. If spotters are located on heavy equipment spreading the waste at the working face, the heavy equipment operator shall be trained as a spotter and as a heavy equipment operator. When unauthorized waste is discovered, the operator must either move the unauthorized waste away from the active area for later removal and proper management, or must stop operation and notify another person on the ground or on other equipment who will come to the active area and remove the unauthorized waste before operations are resumed. Also, each load of waste must be visually inspected for unauthorized waste prior to being compacted. The spotters may move about the working face in equipmenton foot or on a vehicle as needed to properly direct the positioning of vehicles for unloading and to observe waste as it is unloaded.

Any suspicious loads or vehicles are stopped by the Scalehouse staff for inspection. The County also has a random load inspection program in place as discussed in Section K-6. Spot checking also occurs at the active face. If the spotter detects prohibited, special or hazardous waste while the hauler is still present, the waste is reloaded into the vehicle and is removed from the site. If the hauler cannot be identified, it is the County's responsibility to remove the waste from the landfill for proper disposal.

# K.2.f Method and Sequence of Filling Waste

The Fill Sequence Plan <u>through closure</u> from 2016 to 2036 is bound separately and included in Appendix <u>CB</u> with the permit application.

Prior to excavation of cover soil and placement of solid waste, the excavated base gradesion will be surveyed and a signed/sealed construction certification report and survey of base grades for each new disposal area will be submitted to the Department for review and approval prior to placement of solid waste. The certification report will include a drawing displaying the post-excavation clearance between the top of the sand protective layer and the previously installed leachate collection system piping after accounting for the modified fill sequence.

# K.2.g Waste Compaction and Application of Cover

Waste is typically dumped at the toe of the active face and is spread over the face in a maximum two-foot lift with dozers. Upon completion of waste spreading, compactors typically roll the waste with six passes prior to spreading of additional waste. To achieve the optimum compaction, while minimizing initial cover usage, the active face slopes are maintained at approximately 5:1 (H:V). The flatter the slope, the greater is the compaction rate and greater amount of soil to cover the waste. The 5:1 face slope provides a good compromise between compaction and soil usage. The compaction with the given equipment and working conditions is approximately 1,200 lb/cy.

Cover material for daily operations of the landfill is obtained from a designated stockpile area. The location for the Cover Material Stockpile is located in the footprint of the Stage II Landfill and moves as future Stages are built. The County <u>manages cover soil supply and purchases soil</u> <u>when has an open purchase order to buy cover soil as</u> needed to supplement the on-site stockpiles. To minimize soil usage, Manatee County has purchased mechanically operated tarp-type alternate daily cover system (ADC). Tarps are laid across the working face and taken up the next day. Tarps are loaded to minimize the effects of wind uplift. If waste is not deposited on the working face within 24 hours, then soil is used as the cover material. The areas of the working face not covered by the tarps are covered with soil.

### K.2.h Operations of Gas, Leachate, and Storm Water Controls

Leachate management is described in K-8, gas monitoring in K-9 and storm water controls in K-10.

## K.2.i Water Quality Monitoring

See Part L of this permit application.

## K.2.j Maintaining and Cleaning the Leachate Collection System

The entire LCRS was jetted and pressure cleaned in <u>August 2020June and July 2015</u>. The report on the pressure cleaning is provided in Appendix <u>D</u>A to the permit application.

# K.3 LANDFILL RECORDS AND RECORD LOCATIONS

The operating records consist of all records, reports, analytical results, demonstrations, and notifications required by Chapter 62-701, F.A.C., all permits and permit modifications, and training records. The operating records are maintained within the filing system at the landfill facility.

Operating records denoting events are maintained by the landfill staff in accordance with the Operational Permit. Some examples of daily operations of the landfill are:

- Operation and maintenance of the facility
- Special wastes monitoring
- Manpower and equipment usage
- Storm water and leachate issues
- Compliance with permits, applicable rules, regulations, and laws
- Fill sequence plan adherence

# K.4 WASTE RECORDS

Monthly waste records are kept on site and submitted to the FDEP quarterly. A sample report is included as Figure K-2.
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Figure K-2. Manatee County Class | Landfill Waste Records 20<u>20</u><del>16</del>

#### Lena Road Class | Landfill Operations <u>Plan</u>Minor Modification Permit <u>Application</u>

MANATEE COUNTY CLASS I LANDFILL WASTE RECORDS YEAR 2020 TOTAL WASTE RECEIVED SOLID WASTE RECEIVED MONTHLY REPORTED IN TONS TOTAL AND WASTE TYPE FIRST QUARTER SECOND QUARTER THIRD QUARTER FOURTH QUARTER FOR YEAR (SEE NOTEs BELOW) \* January February March July August September October November December April May June TOTAL WASTE RECEIVED Manatee County Class I Waste Sarasota County Class I Waste Duval County Class I Waste Hillsborugh County Class I Waste Manatee County Class III Waste Sarasota County Class III Waste Pinellas County Class III Waste Hillsborugh County Class III Waste Polk County Class III Waste Hernando County Class III Waste Pasco County Class III Waste ee County Class III Waste Collier County Class III Waste Charlotte County Class III Waste Manatee County Other Waste/Sludge Manatee County Other Waste/Agricultural \* The Landfill Operator shall: 1) Weigh all solid waste as it is received; 2) Record, in tons per day, the amount of solid waste received; 3) Estimate the amount received by waste type as listed in this table; and, 4) Compile the reports monthly, and send copies to the Department quarterly. 5) The first line for each waste type represents the waste amount from Manatee County. 6) Waste from other counties shall be identified by county of origin and amounts received on the lines below each waste type.

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#### MANATEE COUNTY CLASS I LANDFILL WASTE RECORDS

#### **YEAR 2016**

TOTAL WASTE RECEIVED MONTHLY REPORTED IN TONS							TOTAL						
AND WASTE TYPE	FIR	ST QUAR	TER	SECO	OND QUA	RTER	THI	RD QUAF	RTER	FOU	RTH QUA	RTER	FOR
(SEE NOTES BELOW) *	January	February	March	April	May	June	July	August	September	October	November	December	YEAR
TOTAL WASTE RECEIVED													
Household Waste	18.7	11.7	30.3	10.9	7.1	27.7							
Commercial Waste	12740.43	11234.2	12694.7	12360.78	12160	11889.6							
Ash Residue	D	0	D	D	D	D				4			
Incinerator by-pass Waste	D	0	٥	D	D	D.							
Construction & Demolition Debris	916	831.5	1243.5	998 2	724.1	964.7							
Trasted Dispedies Warts													
								-		1 1			
Agricultural Waste	64.8	141	50.8	215.1	32.0	467 £							
Industrial Waste	D	D	D	D	D	D							
Yard Trash	2241.5	23.09.9	3378.5	3924.2	2485	2484.8				4 4			
Sewage Sludge	226	131 2	176 7	890.8	588.1	430.7				-			
Industrial Sludge	D	0	D	D	0	D							

The Landfill Operator shall:

1) Weigh all solid waste as it is received;

2) Record, in tons per day, the amount of solid waste received;

3) Estimate the amount received by waste type as listed in this table; and,

4) Compile the reports monthly, and send copies to the Department quarterly.

5) First line for each waste type represents waste from Manatee County.

6) Waste from other counties shall be identified by County of origin and amounts received on the lines below each waste type.

# K.5 ACCESS CONTROLS

Access to the landfill is controlled by a six-foot high chain link fence along the west side of the landfill and a barbed-wire and/or field fence around the remainder of the site. The <u>landfill</u> access gates are locked at the close of each business day. Signs indicating hours of operation, operating and permitting authorities, and directions for persons delivering waste are posted at the entrance. Additional signs are used along the site access roads and at the working face to direct traffic to the proper disposal areas. An attendant will be on duty at the scalehouse during all periods of public access.

# K.6 LOAD CHECKS

The County has a random load inspection program in accordance with F.A.C. Chapter 62.701 and inspects at least three loads per week. Drivers with loads selected for random inspection are instructed to dump their loads at a designated location near the working face but segregated from other waste. The selected load is inspected to determine if the load contains any unauthorized waste. Spot-checking also occurs at the active face. The Load Inspection Form is included as Figure K-3.

If the spotter detects a load of unauthorized waste while the hauler is still present, the waste is reloaded into the vehicle and is removed from the site. If the hauler has left the site, attempts will be made to identify the generator, hauler, or other party responsible for shipping the waste. Identified responsible parties will be contacted and asked to remove the unauthorized waste. If the generator, hauler, or other party responsible for shipping the waste. If the generator, hauler, or other party responsible for shipping the waste cannot be identified, or if they will not remove the waste, the County will remove the waste from the landfill for proper disposal.

If any regulated hazardous wastes are identified by random load inspection, or are otherwise discovered to be improperly deposited at Lena Road Landfill, the landfill operator shall notify the FDEP, the person responsible for shipping the wastes to the landfill and the generator of the wastes, if known. The area where the wastes are deposited shall be immediately cordoned off from public access. If the generator or hauler cannot be identified, the landfill operator shall assure the cleanup, transportation, and disposal of the waste at a permitted hazardous waste management facility.

A small quantity of unauthorized waste which must be stored on-site while awaiting removal for disposal will be stored in the household hazardous waste collection area until it can be removed by contractor for proper disposal. Waste quantities too large to store in the household hazardous waste collection area, will be isolated at the landfill face with temporary berms constructed around the waste to ensure containment of any surface runoff. The area will be properly marked with signs, and temporary fencing will be used to prevent unauthorized access to the material until it can be shipped off-site for proper disposal.

Sources found or suspected to be previously responsible for shipping regulated hazardous waste will be informed of landfill requirements and referred to FDEP for hazardous waste information. Subsequent shipments from such sources will be scrutinized for unauthorized or hazardous

waste. Inspection results, information, and observations resulting from each random inspection will be recorded and retained at the landfill for at least three years.

Supervisors, landfill operators, and spotters are trained to identify unauthorized wastes or potential sources of regulated hazardous wastes. This training emphasizes familiarity with containers and labels typically used for hazardous wastes and hazardous materials. Controlling types of waste received is discussed in Section K.2.e.

#### Figure K-3. Load Inspection Form

LOAD INSPECTION FORM

DATE:	TIME:	INSPECTOR:					
LOCATION:							
DRIVER NAME:							
COMPANY NAME:		DECAL #:					
TAG #:	TRUCK DESCRIPT	ΓΙΟΝ:					
ORIGIN OF WASTE:							
WASTE COMPOSITIO	N:						
NOTE QUANTITY OF	THE FOLLOWING, IF	APPLICABLE:					
FLUORESCENT LAMPS (10 or more)							
MERCURY CONTAINING DEVICES							
BIO-HAZARD N	MATERIALS FOUND						
OTHER HAZAR	DOUS MATERIALS F	OUND					
TIRES, LEAD A	CID BATTERIES						
OIL BASED PA	INT						
IF YES, EXPLA	IN CIRCUMSTANCES	OF COLLECTION:					
IF YES, MANAGEMEN	T INFORMED: Yes	No					
NAME AND TITLE:							

#### K.7.a Waste Layer Thickness

Waste is typically dumped at the toe of the working face and is spread over the face in a maximum of two-foot lifts prior to compaction. This procedure continues throughout the day for a typical lift thickness of no more than 10-feet.

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#### K.7.b First Waste Layer

K.7

The area to be filled has been completely covered by waste during previous permit periods. The first layer of waste placed above the leachate collection system in Stage II will be a minimum of four feet in compacted thickness and shall consist of selected wastes containing no large rigid objects that may damage the leachate collection system. Special care shall be exercised when filling around pump stations to prevent damage.

# K.7.c Slopes and Lift Depths

The exterior landfill side slope is constructed at 4:1 (H:V) or slightly steeper because settlement of the side slope causes a lesser slope to result in a final slope of no more than 4:1. Interior waste slopes (that will received additional waste in the future) may be constructed with slopes no steeper than 3:1. Also, -Aany temporary slopes for such structures as storm water diversion dikes, roads, excavations, etc. are constructed with slopes no steeper than 3:1. The lift depths shall be 10-feet or less. The typical minimum top slopes to promote drainage are generally one percent within the bermed working face, and two percent on the intermediate cover areas.

#### K.7.d Working Face

The active face width is no greater than necessary to accommodate the peak number of disposal vehicles at one time. The wider the active face, the more cover soil is used. The County uses an active face of 150 feet in width. The working area of the active face has a slope of approximately 5 horizontal to 1 vertical. The objective for the dimensions of the active face is to maximize the volume to face surface ratio.

# K.7.e Initial Cover Controls

Materials used as initial cover include street sweepings, ditch cleanings, crushed glass, and/or a tarp as an alternative daily cover (ADC), soil, soil with up to 25% fines from the yard processing area, and recovered screen material (RSM) from FDEP permitted facilities. The tarp, when used, covers the working face with a weighted tarp. Currently, 100' x 40' tarps are used to cover the working face. Initial cover is applied daily at a minimum thickness of six inches. Soil with up to 25% fines (by volume) from yard trash processing, may be used for initial cover.

#### K.7.f Initial Cover Applications

The tarp alternative daily cover system is the primary method of daily cover. Soil is used to supplement ADC and when conditions prohibit use of ADC. For those times when conditions prohibit the use of ADC, initial cover will be stockpiled near the active face for use at the end of each day. Dozers used for spreading waste will spread cover soil, when used or authorized equipment for tarp cover application will be utilized to cover the exposed refuse when ADC is used.

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# K.7.g Intermediate Cover

An additional 12 inches of compacted cover soil (intermediate cover) is placed over six inches of initial cover, within seven days of cell completion, on areas that are not scheduled to receive wastes within 180 days. The top of the intermediate soil cover is graded at a minimum of two percent. These areas have sod to reduce erosion. Prior to placement of additional wastes in these areas, the intermediate cover is removed and stockpiled adjacent to the active face for use as initial cover.

# K.7.h Final Cover Timing

Final cover is placed after the landfill is closed in accordance with the approved Closure Plan.-

# K.7.i Scavenging

Scavenging is prohibited.

# K.7.j Litter Policing

Litter fences are installed near the active face to capture wind-blown litter. Manatee County contracts a temporary labor employer to police the landfill property daily to ensure that litter outside the working area is picked up within 24 hours. Litter fences are also installed along the top of the banks, parallel with interior storm water ditches to minimize litter from entering the storm water management system.

# K.7.k Erosion Control

Erosion is controlled with sod and terraces. Manatee County has implemented an aggressive sod plan to protect intermediately covered side slopes from erosion. Temporary piping is used to remove runoff from the sod covered terraces. This temporary piping drains collected runoff for discharge into the perimeter storm water ditch system.

The landfill is inspected daily for signs of erosion and exposed solid waste. Erosion control measures are employed to correct any erosion which exposes waste or causes malfunction of the storm water management system. Such measures are implemented within three days of occurrence. Typically this requires replacing the eroded cover soil with clean cover soil, and covering the soil with sod, or removing debris from the storm water inlets, pipes and outlet

structures. If the erosion cannot be corrected within seven days of occurrence, the landfill operator shall notify the Department and propose a correction schedule.

#### K.8 LEACHATE MANAGEMENT

#### K.8.a Leachate Level Monitoring

#### K.8.a.1 Leachate Collection and Removal System Overview

#### K.8.a.2 Stage | System

The Stage I Leachate Collection and Removal System (LCRS) as shown on Figure K-4 is a perimeter underdrain around Stage I. The underdrain is approximately 10 feet inside the perimeter slurry wall and approximately 12 feet below grade. The underdrain is an 8-inch, perforated pipe surrounded by aggregate. The pipe and aggregate are wrapped in a geotextile. Manholes and cleanouts are constructed to provide access for cleaning and repairs.

The slurry wall and underlying clay-confining unit is the containment/barrier system designed to prevent leachate movement to the outside surficial aquifer. The slurry wall and LCRS is the FDEP-approved method designed and constructed to minimize impacts, due to landfill operations, to the surrounding environment. The slurry wall is keyed into the underlying natural clay unit. The depth of the slurry wall varies, depending on depth to the clay unit.

Two lift stations are used to pump collected leachate to the wastewater treatment plant (WWTP). Lift Station No. 1 is located in the northwest corner of Stage I. Lift Station No. 2 is located at the southeast corner. Collected leachate enters the underdrain system and gravity flows back to either lift station. Both lift stations operate in the similar manner. Two submersible pumps pump collected leachate from the lift station. The first pump is activated when the low-level float senses leachate entering the lift station. The pump will operate until the float sensor deactivates. If leachate enters the lift station at a faster rate than the first pump can draw it down, the high-level float will activate the second pump to turn on. Upon deactivation of the high-level float, the second pump will shut off. Lift stations can operate in the hand or automatic setting. Both lift stations are set to operate in the automatic mode. Both pumps are 10HP 230/60 1735 RPM. From the lift stations, leachate is pumped through a 6-inch pipe to the adjacent WWTP storage tank. The flow in each forcemain will be individually metered. After the meters, the individual forcemains will be manifolded into a single 12-inch forcemain and connected to the waste treatment plant piping.

#### K.8.a.3 Stage II

The Stage II LCRS has a perimeter leachate collection trench and an underdrain to collect leachate which flows to Lift Station (Pump Station) 4. The location for the leachate collection system and pump station is shown on Figure K-4 and on the Fill Sequence Plan drawings. The slurry wall is keyed into the underlying clay unit to prevent movement of leachate to the outside surficial aquifer. Unlike Stages I and III, Stage II has collection laterals which run the entire width of Stage II, spaced on 200 foot centers. As shown in the Filling Sequence Drawings (Appendix C of permit application), leachate is collected in waste filled areas that are separated

with berms from sub-sequences that have not yet received waste. This enables ponded stormwater and runoff from areas without waste to be managed as stormwater. However, until refuse is buried in Stage II, no leachate is produced so the inward gradient requirement around Stage II is not required or maintained. Ground water and rain water collected in the underdrain system is pumped into the Stage II perimeter storm water ditch. As Stage II contains solid waste, water that percolates into the ground drainage sand is collected by the leachate collection system and When solid waste is placed in Stage II, the associated pump station will-pumps the leachate to the wastewater treatment plant.

Figure K-4. Leachate Collection System Plan

#### Lena Road Class I Landfill Operations <u>Plan</u>Minor Modification Permit Application





The Stage III LCRS is similar in design to Stage I and Stage II LCRS. The underdrain runs along the north, south, east, and west sides of Stage III, approximately 10 feet inside the slurry wall. The slurry wall ties into the west side of the Stage I slurry wall. The alignment of the slurry wall defines the footprint for Stage III. Leachate entering the underdrain gravity flows back to the lift station. One lift station, Lift Station 3, is located in the northwest corner of Stage III. Collected leachate is pumped to the WWTP. The lift station is similar in design and operation to the lift

stations described for Stage I. Storm water runoff from Stage III drains from the surface through a sand trench into an underdrain. This runoff adds significantly to the total volume of leachate produced from Stage III. When above grade filling begins, top slopes will be graded to drain storm water to the perimeter storm water ditches.

#### K.8.a.5 Operational Performance Objectives

It is the County's intent to maintain an inward gradient by collection and removal of leachate, with subsequent discharge to the WWTP. Staff will evaluate the following conditions in an effort to maintain water levels lower inside the slurry wall compared to levels outside the slurry wall, or to recover the inward gradient within thirty days.

- Water Levels
- WWTP Availability
- Pumping Rates
- Seasonal Variations
- Unexpected or Scheduled Downtime

#### K.8.a.6 Compliance Monitoring and Evaluation

#### Monitoring Reports

Figure K-5A is the typical Water Balance Report format used for the Lena Road Landfill. This report is used to quantify the volume of leachate generated on a daily and per month basis from Stages I<u>. II</u>, and III and for when the Stage II Landfill becomes the active landfill.

Additional information includes:

- The volume of leachate pumped to the WWTP
- The volume of leachate pumped from Stages I, II, and III
- Rainfall in gallons and inches

The content and format of the report are approved by the FDEP. Figure K-6A (will be used when the Stage II Landfill is active) is a typical Monthly Leachate Summary Report. This report is used to summarize the following information:

- Total leachate
- Total rainfall
- Total leachate treated by the WWTP

#### Figure K-5A. Monthly Water Balance Report

MANATEE COUNTY SOLID WASTE MANAGEMENT FACILITY

LENA ROAD LANDFILL MONTHLY WATER BALANCE REPORT **APRIL**, 2010

A	В	С	D		E	F	G	н
	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	TOTAL		
DATE	STAGE	STAGE	STAGE	STAGE II	STAGE III	LEACHATE	RAINFALL	RAINFALL
			TOTAL	TOTAL	TOTAL			
	LIT Station 1	Lift Station 2	TOTAL	TOTAL	TOTAL	POWPED		
	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	(inches)	(gallons)
01-Apr-10								
02-Apr-10								
03-Apr-10								
04-Apr-10								
05-Apr-10								
06-Apr-10								
07-Apr-10								
08-Apr-10								
09-Apr-10								
10-Apr-10								
11-Apr-10								
12-Apr-10								
13-Apr-10								
14-Apr-10								
15-Apr-10								
16-Apr-10								
17-Apr-10								
18-Apr-10								
19-Apr-10								
20-Apr-10								
21-Apr-10								
22-Apr-10								
23-Apr-10								
24-Apr-10								
25-Apr-10								
26-Apr-10								
27-Apr-10								
28-Apr-10								
29-Apr-10								
30-Apr-10								
01-May-10								
TOTAL	0	0	0		0	0	0.00	0
Leachate Pumper	d as Percentage	e of Rainfall	#DIV/0!		#DIV/0!			

#### Column Notes:

A - Date of reading.		Stage I
B - Leachate pumped (gallons) from Stage I by lift station 1.		(acres)
C - Leachate pumped (gallons) from Stage I by lift station 2.	Initial Cover	
D - Total Stage I leachate pumpage (B+C).	Intermediate Cover	102.0
E - Leschate numbed (gallons) from Stage III	Closed	30.0

E - Leachate pumped (gallons) from Stage III. F - Total leachate pumped to WWTP storage tank (D+E).

G - Rainfall (inches) recorded on this date.

H - Rainfall (gallons) calculated based on open area (G x Area x 27,156 gal/acre-in).

#### Comments

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"0" = no data recorded

Figure K-5A.xls:jlm/PBS

Stage III

(acres)

66.0

---

66.0

66.0

30.0

132.0

102.0

TOTAL

**Open Area** 

TOTAL

(acres)

66.0

102.0

30.0

198.0

168.0

#### EXHIBIT A

#### MANATEE COUNTY SOLID WASTE MANAGEMENT FACILITY LENA ROAD LANDFILL MONTHLY WATER BALANCE REPORT September 2020

А	В	С	D	E	F	G	Н	1
DATE	LEACHATE STAGE I Lift Station 1	LEACHATE STAGE I Lift Station 2	LEACHATE Stage I Total	LEACHATE Stage II Total	LEACHATE Stage III Total	TOTAL LEACHATE PUMPED	RAINFALL	RAINFALL
	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	(inches)	(gallons)
1-Sep-20	33,096	11,391	44,487	233,936	149,528	427,951	0.39	3,028,980
2-Sep-20	41,136	11,896	53,032	205,824	116,644	375,500	0.26	2,019,320
3-Sep-20	32,028	10,987	43,015	62,896	92,332	198,243	0.00	0
4-Sep-20	33,944	11,811	45,755	235,568	93,004	374,327	0.00	0
5-Sep-20	0	0	0	0	0	0	0.02	155,332
6-Sep-20	0	0	0	0	0	0	0.19	1,475,657
7-Sep-20	0	0	0	0	0	0	0.01	77,666
8-Sep-20	127,848	45,260	173,108	681,168	301,912	1,156,188	0.32	2,485,317
9-Sep-20	2,472	11,289	13,761	151,072	64,244	229,077	0.59	4,582,303
10-Sep-20	1,044	11,102	12,146	164,224	65,088	241,458	0.57	4,426,971
11-Sep-20	1,184	10,907	12,091	155,858	59,813	227,762	0.21	1,630,989
12-Sep-20	0	0	0	0	0	0	0.13	1,009,660
13-Sep-20	0	0	0	0	0	0	1.22	9,475,272
14-Sep-20	15,776	39,395	55,171	464,638	188,015	707,824	0.17	1,320,325
15-Sep-20	94,634	567	95,201	152,264	75,312	322,777	0.17	1,320,325
16-Sep-20	51,090	131	51,221	158,903	79,356	289,480	0.07	543,663
17-Sep-20	47,376	143	47,519	171,681	80,212	299,412	0.00	0
18-Sep-20	51,300	158	51,458	167,424	79,640	298,522	0.43	3,339,645
19-Sep-20	0	0	0	0	0	0	0.00	0
20-Sep-20	0	0	0	0	0	0	0.00	0
21-Sep-20	131,556	415	131,971	485,208	198,376	815,555	0.00	0
22-Sep-20	9,076	26	9,102	146,632	59,160	214,894	0.00	0
23-Sep-20	71,085	235	71,320	158,090	58,176	287,586	0.00	0
24-Sep-20	42,731	128	42,859	146,374	57,716	246,949	0.00	0
25-Sep-20	41,480	128	41,608	153,632	54,648	249,888	0.00	0
26-Sep-20	0	0	0	0	0	0	0.00	0
27-Sep-20	0	0	0	0	0	0	0.29	2,252,319
28-Sep-20	125,220	377	125,597	498,360	162,096	786,053	0.00	0
29-Sep-20	40,984	123	41,107	91,320	49,164	181,591	0.70	5,436,631
30-Sep-20	39,028	114	39,142	115,820	45,812	200,774	0.00	0
	0	0	0	0	0	0	0.00	0
TOTAL	1,034,088	166,583	1,200,671	4,800,892	2,130,248	8,131,811	5.74	44,580,376
Leachate Pumpe	ed as Percentage	of Rainfall		7.6%	26.1%	20.7%		

#### Column Notes:

A - Date of reading.		Stage I	Stage II	Stage III	TOTAL
B - Leachate pumped (gallons) from Stage I by lift station 1.		(acres)	(acres)	(acres)	(acres)
C - Leachate pumped (gallons) from Stage I by lift station 2.	Initial Cover	102.0	113.0	66.0	281.0
D - Total Stage I leachate pumpage (B+C).	Interm. Cover	0.0	5.0	1000	5.0
E - Leachate pumped (gallons) from Stage II.	Closed	30.0	0.0	(55)	30.0
F - Leachate pumped (gallons) from Stage III.	TOTAL	132.0	118.0	66.0	316.0
G - Total leachate pumped to WWTP storage tank (D+E+F).	Open Area	102.0	118.0	66.0	286.0
H - Rainfall (inches) recorded on this date.					

I - Rainfall (gallons) calculated based on open area (H x Area x 27,156 gal/acre-in).

**Comments** 

"0" = no data recorded

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Figure K-6A. Monthly Leachate Tracking Summary

EXHIBIT B

# MANATEE COUNTY SOLID WASTE MANAGEMENT FACILITY LENA ROAD LANDFILL **MONTHLY LEACHATE TRACKING SUMMARY -- 2020**

	8	υ	٥	Е	н	5	н	U.	ĩ
	STAGE I	STAGE II	STAGE III	TOTAL			STAGE I LEACHATE/	STAGE II LEACHATE/	STAGE III LEACHATE/
HINOM	LEACHATE (gallons)	LEACHATE (gallons)	LEACHATE (gallons)	LEACHATE (gallons)	RAINFALL (inches)	RAINFALL (gallons)	RAINFALL (%)	RAINFALL (%)	RAINFALL (%)
JANUARY	227,433	11,377,632	954,028	12,559,093	1.14	8,853,942	7.2%	311.5%	46.7%
FEBRUARY	1,281,599	5,749,824	723,184	7,754,607	1.96	15,222,567	23.6%	91.5%	20.6%
MARCH	1,002,110	4,283,984	737,112	6,023,206	0.00	0	0.0%	0.0%	0.0%
APRIL	814,608	3,218,320	731,000	4,763,928	5.66	43,959,047	5.2%	17.7%	7.2%
MAY	1,058,495	3,103,328	942,856	5,104,679	3.24	25,163,836	11.8%	29.9%	16.2%
JUNE	1,279,207	4,585,126	1,850,808	7,715,141	10.07	78,225,356	4.6%	14.2%	10.3%
JULY	1,187,339	3,547,514	1,143,156	5,878,009	7.92	61,511,599	5.4%	14.0%	8.1%
AUGUST	1,689,650	3,642,640	442,776	5,775,066	8.81	68,423,887	6.9%	12.9%	2.8%
SEPTEMBER	1,200,671	4,800,892	2,130,248	8,131,811	5.74	44,580,376	7.6%	26.1%	20.7%
OCTOBER									
NOVEMBER									
DECEMBER									
TOTAL	9,741,112	44,309,260	9,655,168	63,705,540	44.54	345,940,610	7.9%	35.9%	7.8%

Notes:

1. (B) Total leachate pumped from Stage I.

C) Total leachate pumped from Stage II
 (D) Total leachate pumped from Stage III

(H) Stage I leachate as a percentage of rainfall.
 (I) Stage II leachate pumped as a percentage of rainfall.
 (J) Stage III leachate pumped as a percentage of rainfall.

4. (E) Total leachate (Column B+C+D) pumped to WWTP storage tank.

(F) Total rainfail in inches.
 (G) Total rainfail in gallons (Stage 1, II, and III Open Area of 286-acres x Rainfail)

# Landfill Stage Land Area

	Stage I	Stage II	Stage III	TOTAL	
	(acres)	(acres)	(acres)	(acres)	
Cover	102.0	113.0	66.0	281.0	
red. Cover	0.0	5.0	1	5.0	
	30.0	0.0		30.0	
TOTAL	132.0	118.0	66.0	316.0	
Area	102.0	118.0	66.0	286.0	

#### MANATEE COUNTY SOLID WASTE MANAGEMENT FACILITY LENA ROAD LANDFILL MONTHLY LEACHATE TRACKING SUMMARY -- \_\_\_\_\_ Year

	В		С	D	E	F	G	Н
MONTH	STAGE I LEACHATE (gallons)	STAGE II LEACHATE (gallons)	STAGE III LEACHATE (gallons)	TOTAL LEACHATE (gallons)	RAINFALL (inches)	RAINFALL (gallons)	STAGE I LEACHATE/ RAINFALL (%)	STAGE III LEACHATE /RAINFALL (%)
JANUARY								
FEBRUARY								
MARCH								
APRIL								
MAY								
JUNE								
JULY								
AUGUST								
SEPTEMBER								
OCTOBER								
NOVEMBER								
DECEMBER								
TOTAL	0		0	0	0.00	0	#DIV/0!	#DIV/0!

Notes:

1. (B) Total leachate pumped from Stage I.

2. (C) Total leachate pumped from Stage III.

3. (D) Total leachate (Column B+C) pumped to the WWTP storage tank.

4. (E) Total rainfall in inches.

5. (F) Total rainfall in gallons (Stage I and III Open Area of 168-acres x Rainfall)

6. (G) Stage I leachate pumped as a percentage of rainfall.

7. (H) Stage III leachate pumped as a percentage of rainfall.

#### Landfill Stage Land Areas

Stage I		Stage III	TOTAL
	(acres)	(acres)	(acres)
Initial Cover		66.0	66.0
Intermediate Cov	102.0		102.0
Closed	30.0		30.0
TOTAL	132.0	66.0	198.0
Open Area	102.0	66.0	168.0

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Figure K-6A.xls;jlm/PBS

Figure K-7A is a typical Ground Water Gradient Monitoring Report. Twenty-five ground water monitoring wells are installed around the perimeter of the landfill, outside the slurry wall to monitor the shallow aquifer. Twenty-five piezometers are installed around the perimeter of the landfill inside the slurry wall to measure depth to ground water of the shallow aquifer only. No ground water samples are collected from the piezometers. This report presents ground water elevations recorded at selected monitoring wells and compares them to the ground water elevations recorded at the piezometers. These locations are shown on Figure 1 in Attachment L-1, the Water Quality Monitoring Plan. The monitoring wells are located outside the slurry wall. The piezometers are located inside the slurry wall are higher than elevations recorded inside the slurry wall.

#### Groundwater Monitoring Wells Outside Piezometers Inside Slurry Wall Slurry Wall Piezometer Riser Leachate Gradient Monitoring Riser Groundwater Elevation Elevation Elevation Flow Well Elevation P-3 40.36 GW-3 39.40 outward P-4 40.78 GW-4 40.53 outward P-5 40.73 GW-5 39.90 outward P-6 40.74 GW-6 38.95 outward P-7 40.60 GW-7 39.49 outward P-8 40.21 GW-8 39.75 outward P-9 39.97 GW-9 39.65 outward P-10 39.86 GW-10 38.34 outward P-11 40.52 GW-11 38.26 outward P-12 43.28 GW-12 42.09 outward P-13 44.78 GW-13 44.79 outward P-14 45.09 39.63 GW-14 outward P-15 45.57 GW-15 42.33 outward P-16 44.67 outward GW-16 44.41 P-17 44.28 GW-17 42.19 outward P-18 43.16 outward GW-18 41.76 41.20 P-19 42.91 outward GW-19 41.00 P-20 42.54 GW-20 outward P-21 42.23 GW-21 40.94 outward P-22 42.06 GW-22 41.53 outward P-23 42.08 GW-23 40.91 outward P-24 42.03 41.37 GW-24 outward P-25 42.16 outward GW-25 41.11 P-26 42.50 GW-26 41.44 outward P-27R 42.73 outward GW-27R 40.90

#### Figure K-7A. Monthly Groundwater Gradient Report Month and Year:

#### Lena Road Class I Landfill Operations <u>PlanMinor Modification Permit</u> Application \_\_\_\_

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Piezometers Inside Slurry Wall			Groundwater Monitoring Wells Outside Slurry Wall			
Piezometer	Riser	Leachate	Gradient	Monitoring	Riser	Groundwater
	Elevation	Elevation	Flow	Well	Elevation	Elevation
P-1	42.68	NA	NA	GW-1	38.68	NA
P-2	42.32	NA	NA	GW-2	40.92	NA
P-3	40.36	24.76	inward	GW-3	39.40	32.56
P-4	40.78	22.18	inward	GW-4	40.53	32.63
P-5	40.73	20.87	inward	GW-5	39.90	32.15
P-6	40.74	19.93	inward	GW-6	38.95	31.35
P-7	40.60	19.06	inward	GW-7	39.49	29.42
P-8	40.21	18.99	inward	GW-8	39.75	28.32
P-9	NA	NA	NA	NA	NA	NA
P-9A	39.83	22.77	inward	GW-9	39.65	30.55
P-10	39.86	25.82	inward	GW-10	38.34	28.84
P-11	40.52	22.12	inward	GW-11	38.26	30.03
P-12	43.28	29.44	inward	GW-12	42.09	31.89
P-13	44.78	30.21	inward	GW-13	44.79	32.29
P-14	45.09	29.79	inward	GW-14	39.63	33.78
P-15	45.57	30.77	inward	GW-15	42.33	34.13
P-16	44.67	30.87	inward	GW-16	44.41	32.79
P-17	44.28	30.16	inward	GW-17	42.19	33.37
P-18	43.16	24.16	inward	GW-18	41.76	32.87
P-19	42.91	23.11	inward	GW-19	41.20	32.40
P-20	42.54	25.57	inward	GW-20	41.00	30.73
P-21	42.23	24.88	inward	GW-21	40.94	26.80
P-22	42.06	23.86	inward	GW-22	41.53	27.18
P-23	42.08	22.41	inward	GW-23	40.91	28.70
P-24	42.03	19.93	inward	GW-24	41.37	29.78
P-25	42.16	19.20	inward	GW-25	41.11	31.59
P-26	42.50	19.20	inward	GW-26	41.44	32.69
P-27R	42.73	19.63	inward	GW-27R	40.90	32.70

#### K.8.b Operation and Maintenance of Leachate Collection System

Quantities from Lift Station Nos. 1, 2, 3 and 4 and 3 are recorded and submitted to FDEP on a monthly basis using the forms on Figures K-5A and K-6A. When the Stage II Landfill becomes active, Pump Station 4 will be included. Flow rates are checked and confirmed semi-annually and kept at the Lena Road Landfill. If a failure in the underdrain system is suspected, the system is videoed. Every five years, or if a problem is suspected, the underdrain is cleaned by hydro jetting. Manholes are visually inspected on a monthly basis. When necessary, the manholes are cleaned to promote drainage towards the lift station.

#### K.8.c Leachate as Hazardous Waste

Based on years of analysis, leachate from the landfill is not a hazardous waste. If at any time the leachate is determined to be hazardous, it will be managed in accordance with Rule 62-730, F.A.C. If the leachate analysis indicates a contaminate listed in 40 CFR Part 261.24 exceeds the regulatory level, a monthly sampling of leachate will begin and FDEP notified. If in any three consecutive months no listed contaminant is found to exceed the regulatory limit, the monthly sampling will be discontinued and the routine sampling schedule implemented.

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# K.8.d Off-Site Discharge Agreements

All collected leachate is pumped to an equalization tank at the WWTP for treatment and disposal. Due to the common ownership of the landfill and the WWTP, the Utilities Department Director has issued a letter stating leachate will be accepted at this facility or at another off-site treatment plant as required.

# K.8.e Leachate Management Contingency Plan

In the event of short duration system failure, the landfill can store leachate. The County intends to maintain a one-foot inward gradient across the slurry wall so leachate would have to rise a foot before the facility was out of compliance with the permit condition to maintain an inward gradient. In the event of an extended power outage at the landfill (i.e., more than 7 days), the County will rent a portable generator to provide power to the lift stations.

Any treatment plant operational or power problems will be addressed by the treatment plant as a part of its permitting procedures. Generators are available to provide emergency power at the treatment plant.

Leachate will be trucked to the County's Southwest Treatment Plant or North Wastewater Treatment Plant, if necessary.

#### K.8.f Leachate Generation Recording

Leachate generation records are reported on the forms in Figures K-6A and K-7A.

# K.8.g Precipitation/Leachate Comparison

Precipitation is comparted to leachate collected using the form in Figures K-6A and K-7A.

#### K.8.h Procedures for Water Pressure Cleaning or Video Inspecting Leachate Collection System

Every five years, or if a problem is suspected, the leachate collection pipes are pressure cleaned.

Video inspection is not used unless there is a suspected problem or blockage.

#### K.9 GAS MONITORING

Gas monitoring is performed on a monthly and quarterly basis by a qualified solid waste engineer or consultant. The gas monitoring at the site is divided into three separate tasks: Quarterly monitoring of the gas well and points; quarterly monitoring of surface emissions on the closed portions of the landfill; and monthly monitoring of the landfill gas extraction system. Each task will be discussed in detail below.

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#### K.9.a Gas Well and Point Monitoring

On a quarterly basis, the solid waste engineer monitors landfill gas emissions at eleven gas wells located on the site as shown on Figure K-8. The gas monitoring wells are located along the perimeter of the landfill, and are constructed of 1<sup>1</sup>/<sub>4</sub> to 2-inch diameter PVC, encased in locking aluminum stand-boxes.

The monitoring is performed using the CES Landtec Gas Extraction Monitor Model 2000 (GEM 2000). According to Chapter 62-701.530(1) of the Florida Administrative Code, methane gas levels are required to be less than the maximum level of 25% of the Lower Explosive Limit (LEL) for the interior of structures (gas points) and less than 100% of the LEL for points at or beyond the landfill property boundary.

The gas well samples are collected by removing the PVC cap of the well and inserting the intake tube of the GEM 2000 into the casing, or attaching it to the sampling port on the top of the well cap. The sample points are monitored by walking the area of interest while exposing the GEM 2000 intake tube to the atmosphere. The monitoring event typically takes one workday. The results are reported using a typical form as shown on Figure K-9.





#### Figure K-9. Gas Monitoring Report

# MANATEE COUNTY LENA ROAD LANDFILL GAS MONITORING REPORT

#### METHANE GAS READINGS

Date of Readings:\_\_\_\_\_

Gas Well	Reading % LEL	NOTES
Well 1	0.0	
Well 2	0.0	
Well 3	0.0	
Well 4	0.0	
Well 5	0.0	
Well 6	0.0	
Well 7	0.0	
Well 8	0.0	
Well 9A	0.0	
Well 10	0.0	
Well 11A	0.0	

#### K.9.b Surface Emission Monitoring

The solid waste engineer performs surface-emission monitoring event on a quarterly basis on the Stage I and III Landfills in compliance with Section 60.753 of the Title V Permit No. 0810055-015004-AV. Quarterly monitoring will begin at the Stage II Landfill five years after solid waste is placed in the Stage II Landfill. During this event, the solid waste engineer performs surface gas sampling with Thermo Environmental Instruments Model 680 Hydrocarbon Vapormeter (HVM). The monitoring path followed the same grid system as in previous events as approved for the permit. The sensor of the HVM was maintained at approximately 5 centimeters above the Landfill surface during monitoring. The perimeter of the Landfill was checked. All landfill penetrations for gas wells, pipes, etc., areas with distressed vegetation and cracks in the soil cover were also checked for landfill gas emissions.

Locations at which a methane concentration of 500 parts per million (ppm) or greater as observed will be noted on a site map and the appropriate changes to the landfill gas system will be made. The location of interest should be rechecked within a week to verify that the problem has been rectified. This event takes approximately one day to perform. However, depending on the number of locations (if any) that are observed to be in violation, additional monitoring time may be necessary.

# K.9.c Landfill Gas Extraction System Monitoring

The solid waste engineer performs monthly monitoring of the landfill gas extraction system. There are currently 285 vertical wells and 8 horizontal collectors 31 wells and 15 sample points in the system. The sample points include locations in the extraction system pipes leading into the flare and a point at the flare itself. The gas composition, static pressure, differential pressure, flow and temperatures at each of the well locations and points are recorded using the GEM 2000. The flare temperature and total gas flow at the flare reported by the flare computer are recorded by hand. In order to minimize the amount of air pulled into the system, it may be necessary to close some of the extraction wells. As a result, not all of the wells will be sampled on a monthly basis.

The data recorded using the GEM 2000 is reported in tabular form on a monthly basis. A sample data table is shown on Figure K-10. The table indicates which wells or point locations that are not in compliance with the landfill's Title V Air Operation Permit. Compliance at a gas well or point is achieved when the concentration of oxygen is less than 5%, the concentration of nitrogen or balance gas is less than 20%, the static pressure is less than 0 inches of water (i.e., the well is under vacuum) and the temperature is less than 131° F. Shaded boxes on the data table indicate out-of-compliance parameters.

When wells are encountered with out-of-compliance parameters, changes can be made to the valve setting that may improve or eliminate the problem. If the gas composition indicates high levels of oxygen or nitrogen in the gas, the valve should be turned down. This would lower the flow at the well and lessen the amount of air that may be drawn into the system. If the static pressure at the well is positive, then the valve setting should be turned up, effectively increasing the flow at the well. The valve settings should be adjusted in small increments in order to

decrease the possibility of improving gas composition while causing the pressure to become positive, or vice versa.

# Figure K-10. Gas Extraction Well Monthly Monitoring



#### LFG Wellhead Monitoring Summary Lena Road Landfill, Manatee County, Florida July 2017

Oxygen exceedance above 5% by vol.
 Stafic Presure exceedance above 0°-H<sub>2</sub>O
 Temperature exceedance above 131 °F

Wellip		CT1 (11)				Init. Static	Adj. Statik	Initial Temp	System Press. (in H2O)	
	Date/Time	CH4 (%)	CO2 (%)	0, (%)	Balance (%)	Press.	Press.	(Deg F)	(in H2O)	Comments
GW6-1	7/94/17 3.49	59.7	37.5	0.4	3.4	-0.15	-0.19	79.8	-11.60	
GW-2	7/26/17 7.45	58.2	36.8	0.6	44	-0.07	-0.12	79.3	-11.79	
GW-3	7/26/17 7.57	56.8	36.0	0.6	6.6	-0.10	-0.14	79.6	-11.65	
GW-4	7/36/17 600	53.5	35.4	0.6	10.5	-0.06	-0.09	82.2	-11.70	
GW- 5	7/26/17 803	520	33.1	1.0	13.9	-0.08	-0.11	80.6	-11.38	
GW-7	7/36/17 806	54.9	36.0	1.5	8.9	-0.06	-0.10	81.9	-11.49	
GW-8	7/26/17 611	546	38.0	0.2	7.2	-0.03	-0.04	82.1	-11.58	
GW-9	7/26/17 814	521	36.8	6.3	10.8	-0.05	-0.07	82.2	-11.42	
GW-10	7/26/17 616	50.1	31.6	2.3	16.0	-0.02	-0.02	82.2	-10.99	
GW- 11	7/26/17 618	447	27.8	4.5	23.0	-0.06	-0.05	86.3	-11.27	
GW-12	7/26/17 6/20	42.5	28.8	10	24.0	-6.41	-0.40	89.5	-11.24	
GW-14	7/26/17 625	31.9	25.1	47	39.3	-2.08	-2.08	83.5	-11.37	
GW-15	7/26/17 6/29	18.6	21.9	3.8	55.7	-1.69	-1.70	82.5	-11.37	
GW-16	7/26/17 630	21.0	24.2	2.2	52.6	-0.63	-0.62	84.2	-11.34	
GW-18	7/26/17 845	6.4	3.7	17.8	72.0	-5.49	-5.50	843	-11.27	Exceeder/Reading
GW- 18	8/7/17 12:25	53.3	36.4	1.9	8.4	-3.11	-4.11	97.3	-11.10	Redeck - In Compliance
GW-19	7/26/17 935	42.5	28.1	3.9	25.5	+1.06	-1.06	88.4	-11.04	
GW- 20	7/26/17 9/36	45.8	32.2	1.4	20.6	-1.02	-1.03	90.1	-11.47	
GW- 22	7/26/17 939	51.3	27.4	0.2	11.1	-0.66	-0.66	91.4	-11.25	
GW- 23	7/26/17 941	48.4	34.2	2.2	15.2	+1.84	-1.73	94.0	41.19	
GW- 24	7/36/17 943	50.0	32.8	3.3	13.9	-1.71	-1.68	92.8	-9.78	
GW- 25	7/26/17 944	50.4	35.4	0.5	13.7	-0.30	-0.49	106.7	-437	
GW- 27	7/26/17 942	57.8	37.2	0.2	48	-6.07	-0.08	97.2	-11.38	
GW- 28	7/26/17 945	60.1	35.6	0.1	43	-0.04	-0.05	100.7	-11.27	
GW- 29	7/26/17 10/01	58.7	33.2	0.5	7.6	-0.17	-0.18	100.3	-11.18	
GW- 30	7/26/17 10/02	541	36.1	0.5	81	-6.63	-0.05	95.3	-11.04	
GW- 32	7/26/17 10/08	52.3	34.7	0.1	12.9	-0.04	-0.06	107.1	-10.84	
GW- 33	7/26/17 10-11	52.7	35.3	0.6	11.4	-6.05	-0.07	1137	-11.15	
GW- 34	7/26/17 10:13	54.4	36.2	1.1	83	-1.63	-2.82	108.8	-11.04	
GW- 37	7/26/17 10/26	56.5	34.7	1.8	7.0	-0.05	-0.05	92.3	-10.85	
GW- 38	7/26/17 10:28	55.4	35.9	0.6	8.1	-0.24	-0.24	101.1	-10.91	
GW- 39	7/26/17 10:31	55.4	35.3	0.8	7.5	-0.64	-0.68	99.8	-11.11	
GW- 40	7/26/17 10:33	58.5	36.7	0.2	46	-0.91	-0.98	95.3	-10.67	
GW- 41	7/26/17 10:35	37.9	30.1	0.5	43	-0.19	-0.19	91.9	-10.76	Formation Reading
GW- 42	7/28/17 9/10	45.9	32.2	2.9	19.0	-9.24	-9.36	95.9	-9.34	Rectands - In Compliance
GW- 43	7/26/17 10-42	10.0	9.0	127	68.3	-0.64	-0.64	95.1	-8.38	Exceedort Reading
GW- 43	8/7/17 12/27	50.0	32.3	3.0	142	-3.48	-3.48	98.2	-10.91	Redeck - In Compliance
GW- 44	7/26/17 10-43	23.4	22.1	1.9	52.6	-2.95	-2.90	99.0	-3.52	
GW- 45	7/26/17 10-48	48.5	28.0	2.6	17.8	-644	-6.50	92.1	-10.91	
GW- 47	7/26/17 10:50	51.0	34.2	1.6	12.9	-0.33	-1.11	90.4	-11.06	
GW-48	7/26/17 11:49	547	34.0	1.4	9.9	-0.52	-0.63	99.4	-6.90	
GW- 49	7/26/17 11-45	50.0	32.3	1.8	15.9	-10.64	-10.64	92.5	-10.63	
GW- 51	7/26/17 11:43	49.8	30.7	12	17.8	-8.96	-8.90	93.0	-9.07	
GW- 52	7/26/17 11:39	55.8	33.2	1.1	9.9	-10.55	-10.59	92.2	-10.63	
GW- 53	7/26/17 11:35	41.8	25.8	5.8	26.6	-10.58	-10.59	93.9	-10.62	Exceedant Reading
GW- 53	7/28/17 9/13	58.7	38.4	0.2	2.7	-10.70	-10.67	99.3	-10.66	Recheck - In Compiliance
GW- 54	7/26/17 11:32	43.8	27.6	4.8	23.8	-10.82	-10.83	93.5	-10.83	
GW- 56	7/26/17 12/04				34.8			94.1	-11.00	Exception Results: Adaptment Marks - In Conscharge
GW- 57		45.6	31.2	2.4	20.8	-10.05	-10.06	94.1	-11.00	Exceedant Reading, Adjustment Hade - In Compliance
	7/26/17 12/05	45.6	31.2 29.3	0.3 2.4 2.5	20.8 22.5	-10.05	-10.06	94.1 102.6 95.0	-11.00 -10.08 -9.57	Exceedor: Recifing, Adjustment Hade - In Compliance
GW- 58	7/26/17 12:05 7/26/17 12:09	45.6 45.7 33.6	31.2 29.3 23.3	0.3 2.4 2.5 7.4	20.8 20.8 22.5 35.7	-10.05 -9.37 -11.09	-10.06 -9.35 -11.09	94.1 102.6 95.0 89.0	-11.00 -10.08 -9.57 -11.09	Econolost Resulty, Adjustment Hade - In Compliance Econolost Resulty
GW- 58 GW- 58 GW- 59	7/26/17 12/05 7/26/17 12/09 7/28/17 8/49 7/26/17 12/15	454 457 334 517	31.2 29.3 23.3 38.4 31.0	0.3 2.4 2.5 7.4 2.4	34.8 20.8 22.5 35.7 7.5	-10.05 -9.37 -11.09 -0.70	-10.06 -9.35 -11.09 -0.61	94.1 102.6 95.0 89.0 84.2	-11.00 -10.08 -9.57 -11.09 -11.40	Exampler Reading Adjustment Hade - in Complexes Examples Reading Reading - in Complexes
GW- 58 GW- 58 GW- 59 GW- 59	7/26/17 12:05 7/26/17 12:09 7/28/17 8:49 7/26/17 12:15 7/26/17 12:15	454 457 334 517 494 494	31.2 29.3 28.4 31.0 31.0	0.3 2.4 2.5 7.4 2.4 1.2 1.2	34.8 20.8 22.5 35.7 7.5 18.4 18.4	-10.05 -4.37 -11.09 -6.70 -6.73 -6.73	-10.06 -9.35 -11.09 -0.61 -4.21 -4.21	94.1 102.6 95.0 89.0 84.2 101.4 101.4	-11.00 -10.09 -9.57 -11.09 -11.40 -10.97 -10.97	Examplest Reading, Adjustment Haule - in Compliance Examplest Reading Readmak - in Compliance
GW- 58 GW- 58 GW- 59 GW- 59 GW- 60	7/26/17 1245 7/26/17 1249 7/28/17 849 7/26/17 1245 7/26/17 1245 7/26/17 1245	45.6 45.7 33.6 51.7 49.4 49.4 50.6	31.2 28.3 38.4 31.0 31.0 31.0 31.3	0.3 2.4 2.5 7.4 1.2 1.2 1.2 0.9	34.8 20.8 22.5 35.7 7.3 18.4 18.4 18.4 17.2	-10.05 +3.37 -11.09 -4.273 -4.273 -4.273 -4.277	-10.06 9-35 -11.09 -0.61 -0.61 -0.61 -0.71 -0.71 -0.76	94.1 102.6 95.0 84.2 101.4 101.4 109.0	-11.00 -10.08 -4.57 -11.09 -11.40 -10.97 -10.97 -10.97 -10.99	Exampler Realing, Adjustment Haule - in Complexies Exampler Realing Realmed - in Complexies
GW- 58 GW- 58 GW- 59 GW- 59 GW- 60 GW- 61	7/26/17 12:05 7/26/17 12:09 7/28/17 6:49 7/26/17 12:15 7/26/17 12:15 7/26/17 12:15 7/26/17 12:16 7/26/17 12:18	454 457 334 517 494 494 494 504 425	31.2 29.3 38.4 31.0 31.0 31.3 28.8	0.3 2.4 2.5 7.4 1.2 1.2 1.2 0.9 4.5	34.8 20.8 22.5 35.7 7.3 18.4 18.4 17.2 24.2 24.2	-10.05 -10.05 -4.37 -11.09 -6.70 -6.70 -6.73 -6.73 -6.73 -6.73 -6.77 -6.82	-10.06 -8.35 -11.09 -0.61 -0.71 -0.71 -0.71 -0.75 -0.80	941 102.6 95.0 84.2 101.4 101.4 109.0 97.0	-11.00 -10.08 -9.57 -11.09 -11.40 -10.97 -10.97 -10.99 -10.99	Exampler Reading, Adjustment Hade - in Complexes Examples - in Complexes Examples - in Complexes
GW-58 GW-59 GW-59 GW-60 GW-61 GW-90 GW-91	7/26/17 12/65 7/26/17 12/09 7/26/17 12/15 7/26/17 12/15 7/26/17 12/15 7/26/17 12/16 7/26/17 12/16 7/26/17 12/18 7/26/17 11/26	454 457 314 517 494 494 494 494 494 495 405 459 554	31.2 29.3 38.4 31.0 31.0 31.3 29.8 29.3 34.4	0.3 2.4 2.5 7.4 1.2 1.2 1.2 0.9 4.5 4.5	34.8 20.8 22.5 35.7 7.5 18.4 18.4 17.2 24.2 24.2 20.3 4.5	-10.05 -10.05 -4.37 -11.09 -6.70 -6.70 -6.73 -6.73 -6.73 -6.77 -6.77 -6.82 -6.77 -6.82 -6.77 -6.82 -6.77 -6.82 -6.92 -6.82 -6.	-10.06 -8.35 -11.09 -0.61 -0.71 -0.71 -0.76 -0.76 -0.80 -11.05 -2.51	94.1 102.6 95.0 84.2 101.4 101.4 109.0 97.0 102.6 87.1	-11.00 -10.08 -9.57 -11.09 -11.40 -10.97 -10.97 -10.97 -10.95 -10.95 -11.00 -10.95	Excendent Receiling, Adjustment Heads - in Compilance Excendent Receiling Recherch - is Compilance
GW-58 GW-58 GW-59 GW-59 GW-60 GW-61 GW-90 GW-91 GW-92	7/36/17 13:05 7/36/17 13:09 7/38/17 13:09 7/38/17 13:15 7/36/17 13:15 7/36/17 13:15 7/36/17 13:16 7/36/17 11:16 7/36/17 11:26 7/36/17 11:26	45.6 45.7 31.6 51.7 49.4 49.4 50.6 42.5 45.9 56.6 57.3	31.2 29.3 38.4 31.0 31.3 31.3 28.8 29.3 36.6 36.9	0.3 2.4 2.5 7.4 2.4 1.2 1.2 1.2 1.2 6.9 4.5 4.5 4.5 0.6 0.8	34.8 20.8 22.5 35.7 7.5 18.4 18.4 17.2 24.2 24.2 20.3 6.2 5.0	-10.05 -10.05 -4.37 -11.09 -6.76 -6.76 -6.73 -6.73 -6.73 -6.73 -6.75 -6.75 -6.75 -7.51 -7.51 -7.51	-10.06 -9.35 -11.09 -0.41 -0.71 -0.71 -0.75 -0.80 -11.05 -7.51 -0.42	94.1 102.6 95.0 89.0 89.0 101.4 101.4 109.0 97.0 102.6 92.1 92.6	-11.00 -10.08 -9.57 -11.09 -11.40 -11.40 -10.97 -10.97 -10.97 -10.97 -10.97 -10.99 -11.05 -11.05	Exampler Realing, Adjustment Realing Exampler Realing Realing's in Compliance
GW-58 GW-58 GW-59 GW-59 GW-60 GW-61 GW-61 GW-91 GW-92 GW-92	7/24/17 1268 7/24/17 1269 7/24/17 1269 7/24/17 1215 7/24/17 1215 7/24/17 1215 7/24/17 1216 7/24/17 1218 7/24/17 1128 7/24/17 1129 7/24/17 1129	454 457 314 513 484 484 484 484 484 484 485 459 564 573 310	31.2 29.3 38.4 31.0 31.0 31.0 28.8 29.3 36.6 36.9 20.9	03 24 25 7.4 24 1.2 1.2 1.2 0.9 45 45 45 0.6 0.8 45	20.8 20.8 22.5 7.5 18.4 18.4 17.2 24.2 24.2 20.3 6.2 5.0 38.6	437 -10.05 -11.09 -4.37 -4.37 -4.37 -4.37 -4.37 -3.82 -11.07 -7.31 -2.41 -10.74	-10.06 -10.06 -9.35 -11.09 -0.51 -0.51 -0.75 -11.05 -7.51 -2.40 -10.73	94.1 102.6 95.0 84.2 101.4 101.4 109.0 97.0 102.6 92.1 92.5	-11.00 -10.08 -4.57 -11.09 -11.40 -10.97 -10.97 -10.97 -10.97 -10.95 -11.09 -10.95 -11.09 -10.09 -11.04 -10.22	Examples Reading, Adjustment Haule - in Complexes Examples - in Complexes Readed - in Complexes
GW- 58 GW- 59 GW- 59 GW- 61 GW- 61 GW- 90 GW- 91 GW- 92 GW- 93	7/34/17 1348 7/36/17 1529 7/26/17 1545 7/26/17 1545 7/26/17 1545 7/26/17 1545 7/26/17 1545 7/26/17 1545 7/26/17 1148 7/26/17 1148 7/26/17 1148 7/26/17 1148	454 457 334 517 494 494 494 494 459 564 555 555 310 459 310 440	31.2 29.3 38.4 31.0 31.0 31.0 31.3 28.8 29.3 36.6 36.6 36.9 23.9 31.0	03 24 25 24 25 1.2 1.2 1.2 1.2 1.2 1.2 0.9 4.5 4.5 0.6 0.8 4.5 4.4	34.8 20.8 22.5 35.7 7.5 18.4 18.4 18.4 18.4 20.3 6.2 20.3 6.3 38.6 20.6	-10.05 -10.05 -4.37 -11.09 -4.73 -4.73 -4.73 -4.73 -4.73 -4.77 -3.82 -11.07 -7.31 -10.74 -10.74 -2.87	-1120 -11206 -4235 -421 -4271 -4271 -4274 -4276 -420 -4276 -	94.1 102.6 95.0 84.2 101.4 101.4 109.0 97.0 102.6 92.1 92.1 92.1 92.2 93.2 99.2	-11.00 -10.08 -9.57 -11.09 -11.40 -10.97 -10.97 -10.69 -10.69 -11.02 -10.69 -11.05 -11.05 -10.65 -10.67 -10.85	Excendent Receiling, Adjustment Houde - in Compilance Excendent Receiling Receiled - in Compilance
GW- 58 GW- 59 GW- 59 GW- 59 GW- 60 GW- 61 GW- 90 GW- 91 GW- 92 GW- 93 GW- 93 GW- 95	7/26/17/1268 7/26/17/1269 7/26/17/1269 7/26/17/1269 7/26/17/1269 7/26/17/1261 7/26/17/1261 7/26/17/1261 7/26/17/1261 7/26/17/1166 7/26/17/1166	454 457 224 517 484 484 504 425 564 554 554 554 554 400 440 440	31.2 29.3 38.4 31.0 31.3 38.8 29.3 38.6 29.3 38.6 29.3 38.6 38.9 20.9 31.0 31.0 20.9 31.0 31.0 20.9 31.0 31.0 20.9 31.0 20.9 31.0 20.9 31.0 20.9 31.0 20.3 30.0 20.3 30.0 20.3 20.3 20.3 20	03 24 25 7.4 25 1.2 1.2 1.2 1.2 1.2 1.2 1.2 4.5 4.5 4.5 4.5 4.6 4.5 4.4 1.7 0.7	34.8 20.8 22.5 35.7 7.5 18.4 18.4 17.2 24.2 20.3 4.5 20.3 38.6 20.6 38.6 20.6 12.6 12.6	-10.05 -10.05 -11.09 -11.09 -0.30 -0	-110.06 -10.06 -4.35 -41.09 -4.21 -4.21 -4.21 -4.25 -3.80 -11.05 -7.51 -2.40 -10.23 -2.48 -4.23 -4.24 -4.23 -4.24 -4.23 -4.24 -4.25	941 102.6 99.0 89.0 84.2 101.4 101.4 109.0 97.0 92.1 92.6 92.1 92.6 93.2 107.1 89.2	-11.00 -10.08 -9.57 -11.09 -11.40 -10.97 -10.97 -10.97 -10.97 -10.95 -11.00 -10.95 -11.05 -10.65 -9.85 -9.85	Exampler Brookly, Adjustment Musin - in Complexes
GW- 58 GW- 59 GW- 59 GW- 60 GW- 61 GW- 92 GW- 92 GW- 92 GW- 93 GW- 95 GW- 95 GW- 95	7/34/17/1045 7/36/17/1049 7/36/17/1049 7/26/17/1045 7/26/17/1045 7/26/17/1045 7/26/17/1045 7/26/17/1045 7/26/17/1045 7/26/17/1045 7/26/17/1045 7/26/17/1045	454 457 324 517 484 484 484 484 485 555 555 555 310 440 484 481 493	31.2 29.3 38.4 31.0 31.3 29.3 36.6 29.3 36.6 36.9 22.9 31.0 23.3 36.9 23.9 31.0 23.3 37.6	03 24 25 24 12 12 12 12 09 45 45 45 66 08 45 45 45 45 45 45 45 45 45 45 45 45 45	34.8 20.8 22.5 33.7 7.5 18.4 18.4 18.4 17.2 24.2 24.2 24.2 24.2 20.3 6.2 5.0 38.6 20.6 13.6 13.6 13.6 13.6 14.6 14.6 14.6 14.6 14.6 14.6 14.6 14	-10.05 -10.05 -11.09 -4.37 -4.37 -4.32 -4.32 -4.32 -4.32 -4.32 -3.82 -3.05 -3.82 -3.	-10.06 -10.06 -4.35 -4.35 -4.31 -4.71 -4.71 -4.71 -4.71 -4.71 -4.75 -7.51 -7.5	94.1 102.6 95.0 89.0 84.2 101.4 101.4 109.0 97.0 92.1 92.6 92.1 92.6 92.1 92.6 92.1 93.6 93.2 107.1 94.0 94.0	-11.00 -10.09 -9.57 -11.09 -11.40 -10.97 -10.97 -10.95 -11.00 -10.95 -11.00 -10.72 -10.45 -9.35 -11.09 -11.04 -10.72 -10.45 -9.35 -11.04 -11.04 -10.75 -11.04 -11.04 -10.97 -10.95 -	Examples Reading Adjustment Hode - in Complexes Economics Resulting Readmont - In Complexes
GW- 58 GW- 58 GW- 59 GW- 59 GW- 61 GW- 61 GW- 92 GW- 92 GW- 92 GW- 92 GW- 92 GW- 93 GW- 95 GW- 95 GW- 95	7/34/17/1048 7/34/17/1049 7/24/17/1049 7/24/17/1049 7/24/17/1048 7/24/17/1048 7/24/17/1048 7/24/17/1048 7/24/17/1049 7/24/17/1048 7/24/17/1048 7/24/17/1049 7/24/17/1049 7/24/17/1049 7/24/17/1049	454 437 334 51.7 49.4 49.4 49.4 50.6 42.9 55.6 55.6 55.6 55.6 57.3 332.0 44.0 44.0 44.0 44.1 47.3 51.3	31.2 20.3 38.4 31.0 31.0 31.0 31.0 31.0 31.0 31.0 30.4 20.3 30.6 30.9 31.0 30.6 35.3 30.6 35.5	03 24 25 24 24 24 24 24 12 24 12 24 24 24 24 24 24 24 24 24 24 24 24 24	34.8 20.8 22.5 35.7 7.3 18.4 17.2 24.2 20.3 6.2 38.6 20.6 38.6 20.6 12.6 12.6 14.6 18.5 12.1	-10.05 -10.05 -11.09 -11.09 -0.70 -0.73 -0.73 -0.74 -11.07 -7.31 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.75 -0.74 -0.75 -0.7	-110.06 -10.06 -11.09 -0.61 -4.21 -4.21 -4.27 -4.26 -11.05 -7.51 -2.40 -10.57 -2.88 -4.89 -4.89 -4.89 -4.89 -4.89	941 102.6 98.0 89.0 101.4 101.4 101.4 102.6 92.1 92.6 92.1 92.6 93.2 89.2 107.1 98.0 98.0 103.2	-11.00 -10.09 -9.57 -11.09 -11.40 -10.97 -10.97 -10.97 -10.95 -11.02 -10.49 -11.04 -10.27 -10.85 -4.85 -11.08 -11.04 -10.21	Excendent Receiling, Adjustment Rocks - in Compliance Eccendent Receiling Receiled - in Compliance
GW- 58 GW- 59 GW- 59 GW- 60 GW- 61 GW- 61 GW- 92 GW- 92 GW- 93 GW- 95 GW- 95 GW- 95 GW- 95 GW- 99	7/24/17/24/8 7/24/17/24/9 7/24/17/24/9 7/24/17/24/5 7/24/17/24/5 7/24/17/24/6 7/24/17/24/6 7/24/17/14/6 7/24/17/14/6 7/24/17/14/6 7/24/17/14/6 7/24/17/14/6 7/24/17/14/6 7/24/17/14/6 7/24/17/24/9 7/24/17/24/9 7/24/17/24/9 7/24/17/24/9	454 437 334 517 494 494 425 564 425 564 425 565 573 330 440 440 440 441 463 573 313 693	31.2 20.3 38.4 31.0 31.3 36.8 20.9 36.9 20.9 31.0 36.9 20.9 31.0 36.9 20.9 31.0 36.9 20.9 31.0 36.5 30.6 30.5 30.5	03 24 25 24 24 24 24 24 24 24 24 24 24 24 24 24	34.8 20.8 23.5 7.5 18.4 18.4 17.2 24.2 24.3 20.3 6.3 38.6 20.6 38.6 20.6 13.6 14.6 18.5 12.6 13.6	-10.05 -10.05 -10.05 -11.09 -0.70 -0.73 -0.73 -0.73 -11.07 -7.31 -0.74 -10.74 -0.74 -0.74 -0.74 -0.74 -0.74 -0.287 -0.287 -0.241 -0.245 -0.241	-112.06 -112.06 -4.35 -4.35 -4.21 -4.21 -4.21 -4.24 -11.05 -7.31 -2.40 -10.27 -4.88 -4.83 -4.89 -5.16 -10.21 -10.67	94.1 102.4 85.0 99.0 101.4 101.4 109.4 97.5 102.4 92.5 102.4 92.5 102.4 92.5 102.4 92.5 102.4 91.5 102.4 91.5 102.4 91.5 102.4 91.5 102.4 91.5 102.4 91.5 102.4 91.5 102.4 91.5 102.4 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5	-11.00 -10.08 -9.57 -11.09 -11.09 -11.40 -10.97 -10.97 -10.97 -10.97 -10.97 -10.97 -10.97 -11.09 -10.97 -10.09 -10	Exampler Booking, Adjustment Mucle - in Complexes
0/W- 58 0/W- 59 0/W- 59 0/W- 60 0/W- 61 0/W- 61 0/W- 92 0/W- 92 0/W- 92 0/W- 93 0/W- 95 0/W- 95 0/W	7/34/17/1245 7/34/17/1249 7/34/17/1249 7/34/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1249 7/24/17/1245 7/24/17/1245 7/24/17/1245	454 457 336 874 494 494 494 435 458 459 573 330 440 494 481 473 513 495 493	31.2 29.3 38.4 31.0 31.3 29.3 36.6 29.3 36.6 36.6 36.6 36.6 36.6 36.6 36.6 3	0.3 24 25 24 25 24 1.2 1.2 0.9 45 45 45 45 45 45 45 45 45 45 45 45 45	34.8 20.8 22.5 23.5 7.5 18.4 18.4 17.2 24.2 20.3 6.3 20.4 20.4 20.4 20.4 20.4 20.4 20.4 20.4	-10.05 -10.05 -10.05 -4.37 -4.37 -4.37 -4.33 -4.33 -4.33 -4.33 -4.33 -4.33 -4.33 -4.33 -4.33 -4.33 -4.41 -10.74 -4.84 -4.84 -4.84 -10.21 -10.2	-112.06 -112.06 -42.5 -42.7 -42.7 -42.7 -42.7 -42.7 -42.7 -42.7 -42.7 -42.7 -42.7 -42.8 -11.05 -7.51 -2.40 -110.73 -2.40 -10.73 -42.8 -42.9 -42.8 -42.9 -42.8 -42.9 -42.8 -42.9 -42.8 -42.9 -42.8 -42.9 -42.5 -42.	94.1 102.6 85.0 84.2 101.4 101.4 109.0 97.0 97.0 97.0 97.0 97.1 98.4 94.5 107.1 94.5 94.5 107.1 94.5 107.1 94.5 107.1 94.5 94.5 107.1 94.5 94.5 94.5 94.5 94.5 94.5 94.5 94.5	-11.00 -10.08 -0.09 -7.57 -11.09 -11.40 -10.97 -10.97 -10.97 -10.97 -10.09 -11.00 -10.09 -11.00 -10.04 -11.05 -11.08 -11.08 -11.08 -11.08 -11.08 -11.08 -11.08 -11.08 -10.27 -10.04 -10.04 -10.07 -10.04 -10.	Exceeded Reading Adjustment Hade - in Complexes
GWN - 58 GWN - 59 GWN - 59 GWN - 60 GWN - 60 GWN - 61 GWN - 61 GWN - 92 GWN - 92 GWN - 92 GWN - 93 GWN	7/24/17/1248 7/24/17/1249 7/24/17/1249 7/24/17/12418 7/24/17/12418 7/24/17/12418 7/24/17/12418 7/24/17/12418 7/24/17/12418 7/24/17/1148 7/24/17/1148 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240	45.4 45.7 33.4 47.4 47.4 47.4 47.4 47.4 47.4 47.4 47.3 33.0 47.4 47.3 33.0 47.4 48.1 47.3 47.3 47.3 47.4 47.3 47.4 47.5	31.2 290.3 22.3 38.4 31.0 31.0 31.0 31.0 31.0 31.0 31.0 31.0	0.3 24 25 24 1.2 1.2 0.9 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	34.8 20.8 20.5 20.5 7.5 18.4 18.4 17.2 24.9 20.3 6.3 20.4 20.4 18.4 18.5 12.1 18.5 12.1 13.5 13.0 13.0	2.0.0 -10.05 -10.05 -4.37 -4.37 -4.37 -4.73 -4.74 -4.74 -4.74 -4.74 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.82 -4.107 -4.83 -4.107 -4.83 -4.107 -4.83 -4.107 -4.83 -4.107 -4.83 -4.107 -4.83 -4.14 -4.83 	-112.06 -112.06 -11.09 -4.35 -4.37 -4.71 -4.71 -4.74 -4.74 -4.75 -4.85 -4.75 -4.75 -4.75 -4.85 -4.75 	94.1 1024 65.0 86.2 86.2 101.4 101.4 101.4 104.0 92.1 102.4 92.1 102.4 92.1 102.4 92.1 102.4 92.1 102.4 92.1 102.4 93.0 94.0 94.0 94.0 95.0 95.0 95.0 95.0 95.0 95.0 95.0 95	-11.00 -10.08 -10.08 -11.40 -11.40 -10.87 -10.87 -10.87 -10.87 -10.87 -10.87 -10.87 -10.87 -10.84 -11.02 -10.27 -10.85 -10.21 -10.21 -10.21 -10.21 -10.21 -10.20 -10.20 -10.20	Exceeded Reading Adjustment Roads - in Complexes Eccendent Reading Readed - in Complexes Readed - in Complexes
GW- 58 GW- 59 GW- 59 GW- 59 GW- 61 GW- 61 GW- 91 GW- 92 GW- 93 GW- 93 GW- 93 GW- 95 GW- 95 GW- 96 GW- 98 GW- 99 GW- 98 GW- 99 GW- 101 GW- 101	7/24/17/1245 7/24/17/1249 7/24/17/1249 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1246 7/24/17/1246 7/24/17/1246 7/24/17/1246 7/24/17/1246 7/24/17/1246 7/24/17/1246 7/24/17/1246 7/24/17/1245 7/24/17/1245 7/24/17/1245	454 455 457 474 474 474 474 474 474 475 475	31.2 29.3 21.3 38.4 31.0 31.0 20.8 20.8 20.8 20.8 35.5 35.5 20.4 31.0 20.8 35.5 20.4 31.0 20.4 31.0 20.4 35.5 20.4 20.4 20.5 20.5 20.5 20.5 20.5 20.5 20.5 20.5	0.3 2.4 2.4 2.4 2.4 1.2 1.2 1.2 1.2 4.5 4.5 6.6 0.8 4.5 4.4 1.2 2.7 2.6 0.8 1.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1	20.8 20.8 22.5 22.5 7.5 18.4 17.2 24.2 20.3 6.3 5.0 12.4 18.4 20.6 12.4 18.4 12.4 18.5 12.4 18.5 12.4 18.5 12.5 13.6 13.6 13.6 13.5 2.6 13.5 2.5 5.7		-1120 -1200 -235 -235 -1109 -251 -251 -251 -251 -251 -251 -251 -251	94.1 102.6 85.0 86.2 101.4 101.4 101.4 107.0 87.5 102.6 42.1 102.6 42.1 102.6 42.1 102.6 40.5 102.6 40.5 102.7 102.7 102.7 102.6 40.5 40.5 102.6 102.5 102.6 102.6 102.5 102.6 102.5 102.6 102.5 102.5 102.6 102.5 102.5 102.5 102.6 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 102.5 100.5 1	-11.00 -10.08 -9.07 -11.09 -11.00 -11.00 -10.09 -10.09 -10.09 -10.09 -10.09 -10.09 -10.09 -10.09 -10.09 -10.00 -10	Exceeded Reading Adjustment Made - in Complexes
GWF - 58 GWF - 59 GWF - 50 GWF - 60 GWF - 60 GWF - 60 GWF - 60 GWF - 62 GWF - 62 GWF - 62 GWF - 65 GWF - 65 GWF - 65 GWF - 65 GWF - 65 GWF - 60 GWF - 60 GWF - 60 GWF - 60 GWF - 60 GWF - 100 GWF - 100 GWF - 100 GWF - 100	7/34/17/1245 7/34/17/1249 7/34/17/1249 7/34/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245	454 455 315 315 484 484 484 484 484 485 566 573 210 484 483 873 210 484 484 483 873 313 483 883 483 483 483 483	31.2 29.3 21.3 38.4 31.0 31.0 31.0 31.0 31.0 31.0 35.6 25.9 25.9 25.9 35.6 35.6 35.6 35.6 35.6 35.6 35.6 35.6	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	2028 2028 2028 2028 2027 2028 2027 2029 2029 2029 2029 2029 2029 2029		11206 1206 433 4109 421 421 421 421 421 421 421 421 423 428 428 428 428 428 428 428 428 428 428	94.1 102.4 45.0 46.0 46.2 101.4 101.4 101.4 102.6 49.0 49.0 49.0 49.0 49.0 49.0 49.0 49.0	-11.00 -10.08 -90.08 -90.97 -11.09 -11.09 -11.00 -10.997 -90.997 -	Examples Provideg, Adjustment Mode - in Complexes Examples - in Complexes Recheck - in Complexes Jame Recheck - in Complexes
GWN - 58 GWN - 59 GWN - 59 GWN - 60 GWN - 61 GWN - 61 GWN - 61 GWN - 92 GWN - 92 GWN - 93 GWN - 103 GWN	7/24/17/1245 7/24/17/1249 7/24/17/1249 7/24/17/12415 7/24/17/12415 7/24/17/12415 7/24/17/12416 7/24/17/12416 7/24/17/1140 7/24/17/1140 7/24/17/1145 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1241 7/24/17/1241 7/24/17/1241	444 457 457 157 157 484 484 484 453 553 350 459 459 450 459 450 450 451 553 553 554 459 451 554 554 554	31.2 99.3 22.3 38.4 31.0 31.0 31.2 99.3 36.4 99.3 31.0 99.3 36.4 36.5 36.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.4 35.5 32.5 32.5 32.5 32.5 32.5 32.5 32.5	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	20.3 20.3 20.3 20.3 20.3 20.3 20.3 20.4 20.4 20.3 20.4 20.3 20.4 20.3 20.4 20.3 20.4 20.3 20.4 20.3 20.4 20.4 20.4 20.4 20.4 20.4 20.4 20.4	- 10.03 - 10.03 - 11.09 - 4.73 - 4.73 - 4.73 - 4.77 - 4.23 - 4.77 - 4.23 - 4.77 - 4.23 - 4.27 - 4.23 - 4.24 - 4.25 - 4.25 4.25 - 4.25 -	11206 1206 1207 1207 1207 127 127 127 127 127 127 127 12	94.1 102.6 45.0 99.0 101.4 101.4 109.0 99.1 102.6 99.2 102.6 99.2 102.6 99.2 102.6 99.2 102.6 99.2 102.7 102.7 99.2 102.7 99.2 102.7 99.2 102.7 99.2 102.7 99.5 102.7 99.5 102.7 99.5 102.7 99.5 102.6 99.5 102.6 99.5 102.6 99.5 102.6 99.5 102.6 99.5 102.6 99.5 102.6 99.5 102.6 99.5 102.6 99.5 102.6 99.5 101.4 101.4 102.6 99.5 102.7 99.5 102.7 10.7 10.7 10.7 10.7 10.7 10.7 10.7 10	-11.00 -10.08 -10.08 -11.09 -11.09 -11.00 -10.07 -10.09 -1	Exceeder Receiling, Adjustment Mode - in Compliance Eccender Receiling Reclear - it Compliance
GW- 58 GW- 59 GW- 59 GW- 60 GW- 61 GW- 61 GW- 61 GW- 92 GW- 93 GW- 93 GW- 93 GW- 95 GW- 95 GW- 95 GW- 96 GW- 96 GW- 97 GW- 90 GW- 101 GW- 101 GW- 102 GW- 104	7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/14/2 7/24/17/14/2 7/24/17/14/2 7/24/17/14/2 7/24/17/14/2 7/24/17/14/2 7/24/17/14/2 7/24/17/14/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2	444 445 445 315 317 444 444 444 444 454 455 455 455 451 453 453 453 453 453 453 453 453 453 453	31.2 99.3 38.4 31.0 31.0 31.0 31.0 31.0 31.0 31.0 31.0	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	34.3 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.4	- 1003 - 403 - 403 - 407 - 403 - 403 - 403 - 404 -	11200 1200 423 427 427 427 427 427 427 427 428 428 428 428 428 428 428 428	94.1 102.4 45.0 46.0 46.0 46.0 46.0 46.2 101.4 101.4 109.0 47.5 102.4 42.4 42.5 46.2 102.4 42.5 46.0 40.0	11.00 10.00 4.02 4.07 11.09 10.97 10.9	Exceeder Boorling, Adjustment Made - in Complexes Economic Resultsy Restant - in Complexes Same Restant - in Complexes
GWV - 58 GWV - 59 GWV - 59 GWV - 60 GWV - 60 GWV - 61 GWV - 62 GWV - 62 GWV - 62 GWV - 62 GWV - 64 GWV - 64 GWV - 64 GWV - 64 GWV - 64 GWV - 66 GWV - 60 GWV - 60 GWV - 100 GWV	7/34/17/1245 7/34/17/1249 7/34/17/1249 7/34/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245 7/24/17/1245	443 443 453 515 515 464 464 464 464 464 464 464 464 461 463 513 463 513 464 513 513 464 513 513 464 513 513 464 513 513 643 513 643 644 644 644 644 644 644 644 644 64	31.2 29.3 21.3 31.0 31.0 31.0 31.0 31.0 29.3 36.4 36.5 36.5 36.5 36.5 36.5 36.5 36.5 36.5	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	2028 2028 2028 2027 2337 73 284 184 184 2003 2003 2003 2003 2003 2003 2003 200		11206 1206 1207 1209 1207 1007	94.1 102.6 96.0 96.0 101.4 101.4 104.4 104.9 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 96.0 102.4 102.4 96.0 102.4 102.	-11.00 -11.00 -11.09 -11.09 -11.09 -11.00 -11.00 -10.997 -10.9	Examples Rectes i - is Complexes
GWK - 58 GWK - 59 GWK - 59 GWK - 60 GWK - 61 GWK - 61 GWK - 61 GWK - 61 GWK - 62 GWK - 62 GWK - 63 GWK - 63 GWK - 65 GWK - 65 GWK - 60 GWK - 100 GWK - 100	7/24/17/2405 7/24/17/2407 7/24/17/2405 7/24/17/2415 7/24/17/2415 7/24/17/2415 7/24/17/2416 7/24/17/1416 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1146 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1241 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240 7/24/17/1240	444 457 515 515 644 644 645 645 645 753 753 753 753 753 753 753 753 753 75	31.2 29.3 21.2 31.0 31.0 31.3 31.3 34.4 36.4 36.4 36.4 36.5 36.4 36.5 36.5 36.5 36.5 36.5 36.5 36.5 36.5	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	20.3 20.3 20.3 20.3 20.3 20.3 20.4 16.4 16.4 17.2 20.3 20.4 20.4 20.4 20.4 20.4 20.4 20.4 20.4	1005 437 4129 477 427 427 427 427 427 427 427 427 427	11.006 12.006 11.00 11.00 11.00 11.00 1.007 11.00	94.1 102.6 94.0 94.0 94.0 101.4 104.4 104.4 104.4 104.4 94.1 94.1 94.1 94.2 94.2 102.2 94.2 102.2 94.5 102.2 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 94.5 102.4 102.	-11.00 -10.04 -10.04 -11.09 -11.09 -11.00 -11.00 -10.097 -	Exceedent Receiling, Adjustment Mache - in Complexes Exceedent Receiling Recteols - in Complexes Jame Recteols - in Complexes
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GW- 38 GW- 39 GW- 39 GW- 40 GW- 10 GW- 100 GW- 110 GW-	7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/16/2 7/24/17/16/2 7/24/17/16/2 7/24/17/16/2 7/24/17/16/2 7/24/17/16/2 7/24/17/16/2 7/24/17/16/2 7/24/17/24/2 7/24/2	443           447           447           447           517           517           64	31.2 29.3 22.3 38.4 31.0 31.0 31.3 26.8 29.0 31.3 29.4 31.0 29.3 36.4 31.0 29.3 36.4 31.0 29.4 31.0 29.4 31.0 29.4 31.0 29.4 32.4 32.4 32.4 32.4 32.4 32.7 33.2 33.4 33.4 33.4 33.4 33.5 33.5 33.5 33.5	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	34.8 30.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.9		11:00 12:06 13:07 14:07 15	94.1 192.4 94.9 94.9 94.9 101.4 101.4 104.0 102.1 94.9 102.4 94.9 102.4 94.9 102.4 94.9 102.4 94.9 102.9 94	-11.00 -11.00 -10.04 -10.04 -11.09 -11.09 -10.97 -1	Exceedent Receiling Exceedent Receiling Recherk - In Compliance
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GW- 58 GW- 59 GW- 59 GW- 60 GW- 61 GW- 61 GW- 61 GW- 61 GW- 61 GW- 62 GW- 62 GW- 63 GW- 63 GW- 65 GW- 65 GW	7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/24/2 7/24/17/14/2	444 445 445 311 317 317 484 484 484 484 484 484 484 484 484 48	31.2 29.3 21.2 21.3 21.4 21.0 21.0 21.0 21.0 21.0 20.3 20.4 20.3 20.4 20.4 20.4 20.4 20.4 20.4 20.4 20.4	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	34.3 20.4 20.3 20.5		1120 1206 1207	94.1 102.4 96.0 96.0 96.0 101.4 101.4 101.4 100.4 97.0 97.0 102.4 1	-11.00 -11.00 -10.00 -10.00 -11.00 -11.00 -11.00 -10.07 -10.07 -10.07 -10.07 -10.07 -10.07 -10.07 -10.07 -10.07 -10.07 -10.0 -	Exceeded Reading Adjustment Made - in Complexes
GW- 38 GW- 39 GW- 59 GW- 50 GW- 60 GW- 60 GW- 60 GW- 60 GW- 62 GW- 62 GW- 64 GW- 62 GW- 64 GW- 65 GW- 64 GW- 65 GW- 64 GW- 65 GW- 64 GW- 65 GW- 75 GW- 75 GW	7/24/17/24/8 7/24/17/24/8 7/24/17/24/8 7/24/17/24/8 7/24/17/24/8 7/24/17/24/8 7/24/17/24/8 7/24/17/24/8 7/24/17/24/8 7/24/17/14/8 7/24/17/14/8 7/24/17/24/8	443           443           444           455           517           517           517           517           517           517           517           517           517           517           517           517           512           513           513           514           643           643           643           643           643           644           645           646           647           648	31.2 29.3 29.3 38.4 31.0 31.3 29.3 29.3 29.3 29.3 29.3 29.3 29.4 30.0 29.3 29.4 30.0 29.3 29.4 30.0 29.4 30.5 30.7 30.2 30.7 30.4 30.4 30.4 30.4 30.5 30.7 30.4 30.4 30.5 30.7 30.4 30.4 30.4 30.4 30.4 30.4 30.4 30.4	0.3 24 24 24 24 24 24 24 24 24 24 24 24 24	34.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.8 20.9	2000 2000 2000 2000 2000 2000 2000 200	1120 1120 1206 1207	94.1 192.4 94.9 94.9 101.4 101.4 104.9 102.4 107.4 107.4 107.4 107.4 107.5 102.4 102.4 102.4 102.5	-11.00 -11.00 -10.04 -11.04 -11.04 -11.05 -10.97 -1	Exceeded Reading Adjustment Hade - in Complexes
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This task typically takes between two and three days to perform, depending on the number of valve setting adjustments. A site map displaying the locations of the landfill gas collection wells is included as Attachment K-1.

# K.10 STORM WATER MANAGEMENT

# K.10.a Introduction

The purpose of this Storm Water Management Plan (SWMP) is to describe the system, operation and maintenance of the Storm Water Management System (SWMS) for the Lena Road Landfill.

The Manatee County Lena Road Landfill is located in Bradenton Florida on approximately 1,200 acres owned by Manatee County. 316 acres are designated for landfill. The rest of the property is used for wetlands mitigation, buffer, administration facilities, storm water management and the Manatee County regional wastewater treatment plant.

The Lena Road Landfill is divided into three stages which are listed below with the acreage and status for each stage:

- Stage I 131 acres filled and inactive
- Stage II 110 acres partly filled and active
- Stage III 75 acres partly filled and inactive

Figure K-11 is a site map of the Lena Road Landfill Storm Water Management System. The map shows the landfill stages, storm water swales, storm water pond and outfall structures. The landfill waste areas have a storm water drainage system. The details for the drainage system on the Stage I, II and III Landfills are shown on the Fill Sequence Plan drawings.

# K.10.b Storm Water Management System overview

The purpose of the storm water management system is to collect clean storm water run-off from the landfill in terrace swales located on the landfill side slopes and convey the storm water to the detention areas for treatment and disposal to Cypress Strand Creek or Gates Creek. Any storm water that comes in contact with solid waste or is contaminated by leachate makes the storm water leachate, and requires discharge of the storm water to the leachate collection system for treatment at the wastewater treatment plant.

There are four permits that relate to storm water. As detailed below, there are two Environmental Resource Permits, with successors and modifications, an NPDES permit and a Solid Waste Operations Permit.

#### 1. Environmental Resource Standard General Permits #41-0224996 and #41-0177559

<u>General</u> Permit 41-0224996<u>-001</u> was issued on February 25, 2005 and remains in the operational phase. <u>The stormwater management system and associated operation and maintenance</u> requirements were modified in Permits 41-0224996-002 through 004, the most recent of which

was issued on November 4, 2020 to modify Ponds #1 and #2. There are 26 specific conditions. The most important specific conditions are:

#### Figure K-11. Site Map Lean Road Landfill

#### Lena Road Class | Landfill Operations <u>Plan</u>Minor Modification Permit Application







• <u>20.</u> For retention and dry detention ponds only: The retention and/or dry detention pond is intended to become dry within 72 hours after a rainfall event. A system that is regularly wet will be considered as not in compliance with this permit and possible modification to the system may be required.

• 24. The Operation and Maintenance Entity shall provide for the inspection of the permitted project after conversion of the permit to the operation and maintenance phase. For systems utilizing retention or wet detention, the inspections shall be performed five (5) years after operation is authorized and every five (5) years thereafter. Facility shall submit inspection reports in the form required by the Department, FDEP Form #62-343.900(6), Inspection Certification, for effluent filtration or exfiltration: 18 months after operation is authorized and every 189 months thereafter.

Permit 41-0177559 was recently modified to allow for construction of modifications to the Stage II area storm water management system. Upon completion of construction this permit will remain in the operational phase.

#### 2. NPDES Multi-Sector Generic Permit (MSGP)

This permit was effective January 17, 2019 December 22, 2013 with an expiration date of January 16, 2024 December 21, 2018. The facility ID is FLR05F797-0053. The requirements for this permit are included in the "Storm Water Pollution Prevention Plan for the Lena Road Landfill" which is periodically updated, with the most recent update dated December 2018 January 21, 2015.

#### 3. Lean Road Class I Landfill Operation Permit #39884-021-SO/01

This permit was issued March 24, 2016 with an expiration date of March 24, 2036. Specific Condition 9 of the permit describes the surface water sampling requirement.

#### K.10.b.1 Stage | System

The Stage I storm water perimeter swale was created by constructing two berms. The inner berm, called the landfill berm, is constructed around the area filled with solid waste, and the outer berm, called the storm water berm, was constructed around the inner berm to hold storm water runoff from the landfill in the swale until the storm water could be treated prior tofiltered and discharge to Cypress Strand. The storm water swale drains to either an 108 acre, 40 acre feet storm water wet r<del>d</del>etention pond (Pond #2), or a 1.5 acre dry detention pond (Pond #1). The ponds areis located at the southwest corner of the Stage I Landfill. Storm water enters the perimeter swale via direct rainfall, sheet flow down the outside slopes of the landfill, and from storm water discharge structures. Storm water collected in terrace swales on the landfill is diverted to inlets on the terrace swales which are connected to storm water pipes. The storm water pipes discharge storm water at the bottom of the landfill into the perimeter swale through the discharge structures. The Stage I system consists of a channel-wet pond detention system with in-line turbo disk sand effluent filtration system. The filter system was manufactured by Miller Leaman and consists of two skid units (Model 2SV) with 22 pods on each unit with a capacity of 500 gallons per minute, or 1000 gallons per minute total. The treatment volume for Pond #2 provides for the first inch of runoff over the 115.38-AC contributing area. 9.61 ac-ft is required while 24.04 ac-ft is required and the discharge is routed to Pond #1. The treatment volume for Pond #1 provides for the first half inch of runoff over the 39.0-AC contributing area. 1.62 ac-ft is required while 3.52 ac-ft is required. Pond #1 includes an underdrain system to

provide additional filtration of the stormwater prior to discharge to a perimeter ditch that drains westward to The channel-wet pond detention system is designed to provide for the first one inch of runoff over the 154-acre contributing project area. The water quality treatment volume for Stage I is 558,875 cubic feet (12.83 ac-ft), and the system provides for 975,105 cubic feet (22.39 ac-ft). Two pumps located at the northwest corner of the pond provide the treatment volume for the wet pond in Stage I. The water quality treatment is provided between the lead pump (elevation 32.77 feet) and the all pumps off elevation of 30.77 feet. The pumps discharge through a 12" ductile iron pipe to parallel filtration system. The treated water leaves the filtration system through a 12" HDPE pipe to a junction manhole. A 24" HDPE pipe leaves the manhole and discharges via a mitered end section in the southwest corner of Stage III, to the Outfall 001/Cypress Strand. Attenuation for the 100-year/24 hour storm event is provided by a weir housed in the pump station. When the water in the pond reaches elevation 34.3 feet, the water will discharge through the 24-inch HDPE pipe that is connected to the junction manhole.

#### K.10.b.2 Stage II System

The Stage II storm water management system is independent of Stages I and III. The system consists of a perimeter swale constructed with under drains and drop inlets for the discharge of storm water from the swale. Emergency Outfall Weirs 005 and 006 discharge storm water from the Stage II storm water swale to Gates Creek. The storm water swale was created by constructing two berms. The inner berm, called the landfill berm, is constructed around the area designated to be filled with solid waste, and the outer berm, called the storm water berm, was constructed around the inner berm to hold storm water runoff from the landfill in the swale until the storm water could be filter by the under drain and discharged to Gates Creek.

Runoff from Stage II areas that have not been developed for waste disposal is directed into the perimeter swale. The Stage II area is graded to allow runoff until new fill sequences are built and filled with solid waste. If the storm water does not run off or evaporate fast enough, Manatee County pumps the storm water over the landfill berm into the storm water swale. Storm water entering the storm water swale due to direct rainfall, run off or from pumping accumulated storm water inside the Stage II landfill, is filter<u>ed</u> through the under drain system and discharged to Gates Creek.

All rainfall that falls within waste disposal areas will be contained and treated as leachate and pumped to the wastewater plant for treatment and disposal. As with the Stage I and III Landfills, as thewaste fill increases in height, the outer slopes that are covered with intermediate soil cover will be drained to the perimeter storm water swale. Storm water that comes in contact with solid waste will be treated as leachate. Other aAreas of Stage II that do not contain waste will be allowed to drain storm water runoff to the storm water management system. Details of the filling sequence and storm water drainage are shown on the Fill Sequence Plans included in Appendix BC to the permit application package.

#### K.10.b.3 Stage III System

The Stage III system consists of a perimeter channel-pond dry detention with effluent filtration system, which will receive runoff from 74 acres of project area. The pond is designed to provide for the first one-half inch of runoff over the contributing area. The water quality treatment

#### Lena Road Class I Landfill Operations <u>Plan</u>Minor Modification Permit Application

volume required for Stage III is 134,310 cubic feet (3.08 ac-ft) and the system provides for 146,573 cubic feet (3.36 ac-ft). The water quality treatment is provided between the pond bottom (elevation 31.0 feet) and the weir elevation of 32.4 feet. The water will drain through an under drain located in the northwest corner of Stage III and will recover in 72 hours. Attenuation for the 100-year, 24 hour storm event is provided by twohree outfall structures, D-001 and, D-004 and D-004A. OutfallD-001 consists of two identical modified FDOT Type "E" inlets. Two sides of the inlets have weirs set at elevation 32.4 feet and the front of the structure has a weir set at elevation 33.4 feet. The inlets discharge through two 42" RCPs to a double mitered end section at the southwest corner of Stage III. Outfall **D**-004 consists of two FDOT Type "E" inlets in the northwest corner of Stage III and has the same weir set up as Outfall **D**-001. The inlets discharge through two 27" x 42" HERCP to Cypress Strand CreekOutfall D-004. Outfall D-004A is an existing inlet structure with the gate constructed at elevation 35.5. D-004A discharges through a 24" RCP to Outfall D-004. The existing storm water pond in the southeast corner of Stage III was excavated to elevation 31.0 feet. The top of bank was constructed to elevation 41.0 feet. The weir at the east end of the southern east-west ditch (southeast corner of Stage III) was modified and the top of the bank constructed to elevation 40.0 feet to disconnect Stage I and Stage III storm water. Forty-five linear feet of 54" inch RCP at the southwest corner of Stage III connects the north and west ditch to the south ditch.

# K.10.c Maintenance Plan

This maintenance plan applies to the storm water management system for the Stage I, II and III Landfills. The storm water management system consists of a series of swales, inlets and pipes that divert storm water from the non-working areas of the landfill to the storm water pond. The swales discharge into pipes and/or other swales, or directly into the storm water pond. Runoff from the detention pond ultimately discharges into the Cypress Strand Creek or the Gates Creek via the on-site wetlands.

Storm water perimeter ditches and the filter facility are inspected daily for sediment, wash outs, litter, vegetation and non-performance. In the event of a side-slope wash out, the slope is repaired within 3 working days. Litter fences are installed along the top bank of each swale around the active landfill to minimize litter. Excessive vegetation is removed from the swale system and storm water pond. Sediment is removed from the swale and hauled to the working face.

Storm water runoff from the areas that have at least a 6-inch compacted soil cover (free of waste) over the waste materials can be directed to flow into the storm water management system. Storm water runoff that has been in contact with waste materials is classified as leachate and cannot be diverted into the storm water management system. Storm water runoff from the upper portion of the landfill travels via sheet flow into collection terraces located along the side slopes of the landfill. Storm water runoff flows within the collection terraces and is conveyed, via storm water structures, and as shown on the Fill Sequence Drawings, down the landfill and into swales that are located along the perimeter of the landfill. The perimeter swales convey storm water runoff to a storm water management pond. Storm water runoff collected in the pond is allowed to percolate. As the water in the pond rises, it is pumped to the automatic disc filter system.

The following procedures have been implemented at the landfill to minimize maintenance requirements and to ensure efficient performance of the storm water system operation:

- No excavated cover material is stockpiled in such a manner as to direct sedimentladen runoff outside the project site property limits or into any adjacent storm water collection facility.
- All drainage ditches are inspected periodically for erosion and reshaped and resodded as required.
- Erosion and siltation control devices are cleaned and repaired when clogged or damaged.
- Temporary erosion control features such as silt fencing or hay bales are removed after installation of permanent erosion controls have been completed and any permanent erosion control features damaged by such removal are repaired.
- After vegetation has been established, all swales, channels, and detention ponds are mowed regularly; minimum-mowing frequency is once per year.
- The plant types in the littoral zone are checked periodically and any intruding vegetation is removed if required.
- Drainage sumps are cleaned out at least once per year and the storm sewer lines checked for plugging.
- The area in front of the control structure is checked at least quarterly to remove any excess plants or debris that could cause the structure to plug.

# K.11 EQUIPMENT/OPERATION FEATURES

# K.11.a Sufficient Equipment

The County has sufficient equipment to provide flexible landfill operations. Attachment K-3 provides a list of the current landfill heavy equipment for daily operations.

All landfill equipment that will be in operation on that day is serviced with special attention to any maintenance or minor repair needs. If the repair work required is more than minor in nature, it is sent to the landfill garage. The equipment is primarily serviced by Manatee County Fleet Services that operates a repair center at the Landfill Facility.

The following procedures are used in fueling equipment each day:

- 1. Check the following fluids to ensure they are at the manufacturer's recommended level:
  - Pivot shaft oil
  - Engine oil
  - Hydraulic oil

- Fuel
- Transmission oil
- Radiator water
- Battery water level
- 2. Check and clean the following filters:
  - Air clean
  - Interior/exterior air conditioner filters
- 3. Pressure wash with water and/or air:
  - Radiator core
  - Transmission oil coolers
  - Hydraulic oil coolers
- 4. Clean all air intake openings such as door panels, steps, hood, and air-breather intake.
- 5. Visually check for water, fuel and oil leaks in the final drive, radiator hoses, hydraulic hoses, fuel lines, injector pumps, fuel filters, etc.
- 6. Check tire inflation and/or track adjustment, chain tension and alignment on scrapers.
- 7. Grease all fittings at recommended intervals.
- 8. Complete the Daily Equipment Maintenance Report.

Fuel for the landfill equipment is pumped from a fuel tank, located as shown on Figure 5. The tank is an above ground, double walled, steel tank with a total capacity of 20,000 gallons, and is split into two compartments. One 5,000-gallon compartment is for gasoline, and a 15,000-gallon compartment for diesel fuel. The tank is on a concrete slab, and protected by bollards. The tank is inspected weekly. Fuel and fluids (engine oil, transmission oil, hydraulic oil, or radiator fluid) are added to the equipment in the maintenance building as needed. If repairs on the equipment are necessary, the equipment is sent to the County's central maintenance shop, located off-site, or to the dealer's authorized maintenance facility.

#### K.11.b Reserve Equipment

Attachment K-3 indicates the County possesses sufficient equipment to operate the landfill. In the event the dozer is out of service, the compactors can be used to spread refuse over the active face. In addition, the County can rent backup equipment from its approved Bid List or from County sources within 24 hours if necessary.

#### K.11.c Communication Equipment

All equipment operators and traffic controllers are equipped with hand-held radios. This radio transmission service links the field personnel to the office and management. Telephones are available in the office, maintenance garage and Scalehouse.

#### K.11.d Dust Control

Internal access roads are sprayed with water to control dust. Vegetation on filled areas assists in controlling dust from this area.

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#### K.11.e Fire Protection

Further details regarding the fire protection can be found in Section K.2.b.

# K.11.f Litter Control Devices

See Section K.7.j.

# K.11.g Signs

Signs are used around the site to direct traffic to the active face, white goods area, tire area, leadacid battery drop-off, clean debris, yard waste, mulch site, speed limits, disposal rates and hours of operation, and prohibitions.

# K.11.h Shelter/Sanitation/First Aid Features

Shelter and sanitation facilities for the landfill staff are provided at the scale house,<u>and</u> landfill office and public restroom facility. First aid kits are provided in the cab of all heavy equipment and in vehicles.

<u>An AED (Automated External Defibrillator) is available in the scale house.</u> First aid kits<u>, are</u> located in the Landfill Administration Office and <u>the scale house</u>, are maintained and inspected regularly. The kits will contain, at a minimum, the following:

sterile gauze pads	band aids (regular and non-stick)	eye wash
rolls of gauze bandage	adhesive tape	
bandage scissors	peroxide	
roll of sterile cotton gauze	safety pins	
tweezers	rubbing alcohol	
CPR mouth barrier	gloves	

In the case of accidental poisoning:

Step 1: Carefully remove poison from contact with person.

Eyes: Flush with lukewarm water, NOT HOT WATER, in a gentle stream for 10-15 minutes with eyelids open. Pour water from a container held 2-4 inches above the eye. **DO NOT RUB THE EYES.** 

Skin: REMOVE any clothing that has come in contact with the poison. Flush poison off with large amounts of water poured from a container held 2-4 inches above the affected skin area for 10-15 minutes.

Mouth: REMOVE any poison from the mouth. Rinse the mouth out with water. If unable to rinse, gently rub out mouth with a clean cloth. Check mouth for any burns, cuts, unusual coloring, swelling or irritations.

Lungs: Get to fresh air as soon as possible. Loosen clothing if exposed to gases or fumes. Initiate mouth-to-mouth resuscitation if necessary.

- Step 2: Give water when potential poisons have been swallowed. DO NOT give water if the person is unconscious, having convulsions or cannot swallow.
- Step 3: **NEVER** make the person vomit **unless** the poison center or a physician directs you to do so.

#### Step 4: KEEP CALM. DO NOT DELAY IN SEEKING HELP!

#### K.12 ALL-WEATHER ACCESS ROADS

The main haul road in the landfill is paved. Vehicles leaving the main haul road in route to the working face travel across an interior road. The interior road base is constructed of construction and demolition (C&D) material and covered with a sand-shell mixture. The road is routinely maintained to provide waste hauler access to the work face. As discussed in K.2.b, during severe wet weather, small vehicles are directed to the wet weather disposal area for tipping.

#### K.13 ADDITIONAL RECORD KEEPING

Required landfill records are reported to the Department on a monthly, quarterly, semi-annually, annual, biennial basis. All records are maintained at the landfill for a minimum of ten years or for the design period as specified below. The design period is projected to end in the year 2071 (unless long-term care is decreased).

# K.13.a Permit Application Development

All reports used to develop permit applications and operation records will be maintained for the design period. Records such as geotechnical investigations, foundation analyses, demonstration reports, and previous permits and regulations are examples of records to be maintained.

# K.13.b Monitoring Records

All water quality, gas, and leachate monitoring records are required to be maintained for at least ten years. <u>Background water quality records shall be maintained for the design period of the landfill.</u>
In accordance with various Environmental Protection Agency (EPA), Southwest Florida Water Management District (SWFWMD), and the Florida Department of Environmental Protection (FDEP) rules, regulations and permits, the Landfill must conduct various field monitoring /maintenance activities and submit reports on a scheduled basis. The following information is intended as an overview of required activities and reports and is also addressed in individual subsections regarding the activity or program.

#### K.13.b.1 Groundwater

The County contracted laboratory inspects and samples one background monitoring well, BGW-1 and 25 groundwater monitoring wells, which includes 15 wells (GW-3 trough GW-17) for the Stage I and III Landfills, and 10 wells (GW-18 trough GW-27R) for Stage II Landfill. The results are submitted semi-annually to the Department.

A review of the analyses, comparisons of the data, and comments on any substantial differences in parameters is to be submitted to the FDEP every two and one-half years or as required in the permit.

#### K.13.b.2 Leachate

Flow meters which record leachate directed to the Southeast Waste Water Treatment Plant are inspected daily. The leachate quantity is reported monthly.

#### K.13.b.3 Department of Environmental Protection Reports

- Prepare monthly groundwater report.
- Prepare annual compaction and fill volumes.
- Prepare groundwater report semi-annually.
- Prepare leachate analysis report annual.
- Prepare monthly water balance reports.
- Prepare monthly report on the landfill gas readings taken at each landfill gas wellhead and flare.
- Prepare quarterly report of the landfill gas readings at gas monitoring probes and ambient points.
- Prepare quarterly report of the landfill gas surface emissions monitoring.

## K.13.c Annual Estimate of the Remaining Life of Constructed Landfill

Manatee County will annually estimate the remaining solid waste disposal capacity in cubic yards and the remaining landfill life in years. The estimate will be based on the geometry of the filled landfill, final contours, scale house records for waste received and the filling rate of the landfill. The estimate will be submitted annually to FDEP by the date specified in the permit.

## K.13.d Archiving and Retrieving Records

All records pertaining to the operation of the facility will be retained throughout the design life of the landfill. All monitoring records, calibration and maintenance records and reports required by the landfill operation permit will be retained for at least ten years. <u>Records may be archived after five years provided they can be retrieved within seven days.</u>

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# K.14 SPECIAL WASTE HANDLING

## K.14.a Motor Vehicles

Motor vehicles are not presently accepted for disposal or temporary storage at the Lena Road Landfill.

## K.14.b Shredded Waste

Shredded municipal waste is not accepted for disposal at the Lend Road Landfill. Shredded tires may be accepted if not recycled.

## K.14.c Asbestos

Asbestos containing materials from sources covered under the National Emission Standards for Asbestos, 40 CFR Part 61, Subpart M are accepted at the Lena Road Landfill, with prior approval of the County. These materials will be placed in the landfill by appointment only, covered with a minimum of one foot of non-asbestos containing material, and the location will be recorded in accordance with 40 CFR Part 61.154. A record of the location of asbestos-containing waste will be maintained.

# K.14.d Contaminated Soil

Soils contaminated with non-hazardous waste and petroleum-contaminated soil, which has been treated pursuant to Chapter 62-713, F.A.C., will be accepted at the discretion of the County.

## K.14.e Biological Waste

Biological waste is <u>generally</u> not accepted. <u>However</u>, carcasses of domestic animals that have died due to disease may be accepted and disposed, provided they are buried at least two feet below the surface of the ground in accordance with 823.041(1), Florida Statutes. Captive wildlife, fish or marine animals, and domestic animals that died from causes other than disease may also be accepted and disposed at least two feet below the surface of the ground and above the water table.

The landfill may also accept and dispose of dead poultry and hatchery residue. and treated biomedical waste may also be accepted and disposed as waste that is not biomedical provided such waste is in containers clearly labeled as "Treated Biomedical Waste."

# K.14.f Oily Waste

Materials as defined in Chapter 62-701.300 (11)(b), F.A.C., may be accepted for disposal at the discretion of the County.

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# Lena Road Class I Landfill

## **Operations Plan**

Presented to:



Utilities Department, Solid Waste Division 3333 Lena Road Bradenton, FL 34211 (941) 748-5543

Presented by:

SCS ENGINEERS 3922 Coconut Palm Drive, Suite 102 Tampa, FL 33619 (813) 621-0080

> Revised March 2021 File No. 09217088.18

Offices Nationwide www.scsengineers.com

#### Lena Road Class I Landfill Operations Plan

#### **Prepared for:**

Manatee County Utilities Department Solid Waste Division 3333 Lena Road Bradenton, FL 34211 FDEP Permit No. 39884-021-SO-01 WACS ID No. 44795

#### Prepared by:

SCS Engineers 3922 Coconut Palm Drive, Suite 102 Tampa, FL 33619 (813) 621-0080

> Revised March 2021 File No. 09217088.18

Shane R. Fischer, P.E. No. 58026 2/2021

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## K.1 TRAINED OPERATORS

Manatee County government personnel operate the Lena Road Landfill. The County requires at least one trained landfill operator certified in accordance with F.A.C., Chapter 62-701.500 (1) and one spotter at the working face at all times during waste disposal operations. The spotter is responsible for guiding vehicles and for assisting with control of the waste received. An example of a typical workweek staff schedule is shown in Figure K-1.

General daily operations are as follows:

Time	Activity
7:00 am	Landfill Operations Supervisors, Solid Waste Disposal Chiefs and/or the Solid Waste Maintenance Chief (all certified, trained operators) arrive; distribute daily assignments, checks attendance, and equipment sheets. The equipment moves to the working area to prepare the roads and sites for that working day. At least one trained spotter is present assuming spotter responsibility at the working face each time waste is received to inspect each load ensuring prohibited waste is removed.
8:00 am	The Scalehouse opens and traffic is routed to the appropriate disposal area.
9:00 am	Personnel begin the morning break times
11:30 pm	Personnel begin the lunch break times
2:00 pm	Personnel begin the afternoon break times
5:00 pm	Operators clean up the designated tipping area, cover the compacted garbage with dirt and/or alternate daily cover as required by FDEP, and then staff clean their assigned equipment
6:00 pm	Equipment and buildings are secured; alarm set; gates locked; and personnel depart

## K.l.a Training Plan

Each landfill operator or spotter for Manatee County is required to participate in the County's landfill operator and spotter training plan. The County provides operator and spotter training each year through an approved training company to provide the required initial and/or continuing training. A list of each employee's training status and continuing training requirements is maintained by TREEO and is provided as Attachment K-4.

#### Figure K-1. Landfill Operations - Typical Workweek Staff Schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Anthony Detweiler	Anthony Detweiler	Anthony Detweiler	Anthony Detweiler	Anthony Detweiler	
Landfill Operations	Landfill Operations	Landfill Operations	Landfill Operations	Landfill Operations	
Supervisor	Supervisor	Keith Iones	Keith Jones	Keith lones	Keith lones
		Disposal Chief	Disposal Chief	Disposal Chief	Disposal Chief
Devin Wilson	Devin Wilson			Devin Wilson	Devin Wilson
Landfill Operator	Landfill Operator			Landfill Operator	Landfill Operator
Juan Garza	Juan Garza	Juan Garza	Juan Garza		
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator		
	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Clayton Mathis	Clayton Mathis	Clayton Mathis	Clayton Mathis	Clayton Mathis	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Evan Wolfe Landfill Operator	Evan Wolfe Landfill Operator		Evan Wolfe Landfill Operator	Evan Wolfe Landfill Operator	
Ray Collins	Ray Collins			Ray Collins	Ray Collins
Landtill Operator	Landtill Operator		, , ,	Landtill Operator	Landfill Operator
(vacant) Disposal Chief	(vacant) Disposal Chief	(vacant) Disposal Chief	(vacant) Disposal Chief		
Riley Stephens	Riley Stephens		Riley Stephens	Riley Stephens	
Landfill Operator	Landfill Operator		Landfill Operator	Landfill Operator	
		Woodrow Hockaday	Woodrow	Woodrow	Woodrow
		Landtill Operator	Hockaday	Hockaday	Hockaday
		Rusty Blakely Landfill	Rusty Blakely	Rusty Blakely	Rusty Blakely
		Operator	Landfill Operator	Landfill Operator	Landfill Operator
Danny Newman	Danny Newman	Danny Newman	Danny Newman	·	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator		
Anthony Gigliotti	Anthony Gigliotti	Anthony Gigliotti	Anthony Gigliotti	Anthony Gigliotti	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Richard Jones	Richard Jones	Richard Jones	Richard Jones	Richard Jones	
Maintenance Chief	Maintenance Chief	Maintenance Chief	Maintenance Chief	Maintenance Chief	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Arron Von Keitz	Arron Von Keitz	Arron Von Keitz	Arron Von Keitz	Arron Von Keitz	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Brett Walker	Brett Walker	Brett Walker	Brett Walker	Brett Walker	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Steven Petty	Steven Petty	Steven Petty	Steven Petty	Steven Petty	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Doug Karpenko	Doug Karpenko	Doug Karpenko	Doug Karpenko	Doug Karpenko	
Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	Landfill Operator	
Jett Hassen	Jett Hassen	Jett Hassen	Jett Hassen	Jett Hassen	
Robert Bennett	Robert Bennett	Robert Bennett	Robert Bennett	Robert Bennett	
Landfill Operations	Landfill Operations	Landfill Operations	Landfill Operations	Landfill Operations	
Supervisor	Supervisor	Supervisor	Supervisor	Supervisor	

## K.2 OPERATIONS PLAN

## K.2.a Designation of Responsible Operating and Maintenance Personnel

The Manatee County Solid Waste Management Facility (Landfill) is owned by Manatee County Government and operated under the direction of the Utilities Department, Solid Waste Division. An After Hours Contact List is provided in Table K-1, and a list of landfill positions is given below:

- Solid Waste Division Manager
- Landfill Operation Supervisor (2)\*
- Landfill Scalehouse Operator (3)\*
- Senior Scalehouse Operator (2)\*

- Solid Waste Maintenance Chief \*
- Solid Waste Disposal Chief (2)\*
- Landfill Operator (17)\*
- Landfill Superintendent \*
- Household Hazardous Waste Technician (2)
- Administrative Assistant

• Solid Waste Collection Supervisor (2)\*

SCS ENGINEERS

- Recycling Special Waste Collection Supervisor \*
- Recycling Coordinator
- Solid Waste Enforcement Superintendent\*
- Solid Waste Enforcement Officer (4)\*

\*Trained Spotters

#### Table K-1. Emergency and After Hours Contacts Lena Road Landfill/Solid Waste Division

Person/Agency	Telephone Number
Fire Department	911 or Non-Emergency 941-751-5611
Battalion Captain Stacey Bailey	
Chief Byron Teates	
Manatee County Fire Rescue Administration	
Office: 3200 Lakewood Ranch Blvd.	
Bradenton, FL 34211	
First Responder: Station 2	
803 60 <sup>th</sup> Street Court East	
Bradenton, FL 34202	
Ambulance	911
Sheriff	911
Bomb Squad	911 or Non-Emergency 941-747-3011
Public Safety Hazardous	911
Robert Shankle, Solid Waste Division Manager	C: 941-448-3635
	Office: 941-748-5543
Bryan White, Landfill Superintendent	C: 941-812-2455
Bob Bennett, Landfill Operations Supervisor	H: 941-758-1741
	C: 941-704-7855
Anthony Detweiler Landfill Operations Supervisor	C: 941-465-8630
Vacant, Solid Waste Disposal Chief	H:
	C:
Keith Jones, Solid Waste Disposal Chief	C: 941-704-6640
Richard Jones, Solid Waste Maintenance Chief	C: 941-322-4104
Teresa Chaffee, Recycling and Special Waste	C: 941-713-3507
Collection Supervisor	
Jeanne Detweiler, Superintendent Solid Waste	C: 941-812-4301
Enforcement	
Debora Braziel-Jones, Solid Waste Collections	H: 941-350-9399
Supervisor	C: 941-900-7604
Angela Dunton, Solid Waste Collections	C: 941-666-0188
Supervisor	

Department of Environmental Protection	Office: 813-470-5700
Kaitlyn Newsome	Direct: 813-470-5877

## K.2.b Contingency Operations for Emergencies

In the event of an emergency, the County may close the landfill during the emergency event, but will maintain open access to the landfill after the emergency condition passes or the threat level drops. For example, the landfill will be closed during a hurricane, but opened after the hurricane has passed. On-site equipment may not be sufficient to maintain the excess volume of waste generated as a result of an emergency. If so, back-up landfill equipment will be rented within 24 hours from the County's approved bid list. Additionally, back-up equipment will be provided for equipment breakdowns and down time for routine maintenance. In the case of equipment failure or emergencies, rental equipment or equipment from other County agencies will be delivered to the site within 24 hours.

Emergency conditions at the landfill may occur as a result of natural weather events (tornado, flooding, hurricane, etc.) or fire. Staff is currently equipped to mobilize to alternative sites that will be designated as such in conjunction with the Manatee County Emergency Management Department. In the event that emergency conditions interrupt operations at the landfill, a contingency plan will be developed and implemented to establish temporary operations on a case-by-case basis, dependent on conditions at alternative sites. Such temporary operations will accept storm debris only, and will be terminated and disposal operations resumed at Lena Road Landfill as soon as practical. If the Lena Road Landfill cannot operate during an emergency, solid waste collection trucks will be diverted to the closest landfill that will accept waste.

When an emergency condition threatens the landfill operation, the following actions will be taken:

- 1. Daily Cover shall be applied to all exposed refuse before a major storm arrives, if possible.
- 2. All landfill equipment shall be parked near any natural windscreens such as earthen mounds and berms.
- 3. All lightweight signs and equipment shall be secured.
- 4. When operation resumes, work shall commence in dry areas only (up from the active face).
- 5. Refuse shall not be disposed of in standing water.

#### K.2.b.1 Fire Event

Small fires on the working face will be controlled by a water wagon, bulldozer or landfill compactor and ample water and cover material to extinguish the fire. On-site stockpiles of soil cover material are available for suppressing fires. In the event an uncontrollable fire does occur at the landfill site, the East Manatee Fire Rescue District (941-751-5611) is the responding Department and will be called immediately. The East Manatee Fire Rescue District presently maintains a fire station approximately 3.5 miles west of the facility. In the event of a fire or other emergency, the landfill operator will notify the FDEP within twenty-four (24) hours by telephone and within seven (7) days a written report will be submitted describing the origins of the emergency, actions taken, result of the actions taken, and an analysis of the success or failure of the actions.

A hot load area is provided in a location away from the working face to allow vehicles arriving at the landfill with a fire in their load to dump quickly in an area where the material can be spread out and quickly sprayed by the water wagon. All water sprayed on hot loads will be managed as leachate. The location of the hot load area will change from time to time with the changing working face locations. Hot loads will not be dumped on the working face until sufficiently cool to avoid combustion.

The landfill has accommodations for wet weather solid waste disposal for the residential or small business patrons. The location of the wet weather operations area changes depending upon progression of the fill sequence. The area is bermed and a stabilized tipping surface is provided.

The solid waste disposed of in the wet weather area is loaded into dump trucks and transported to the working face for proper disposal. The wet weather area is also cleaned at the end of each day in order to provide proper litter and vector control.

## K.2.c Control of Types of Materials Received

Procedures for observing waste as it is brought to the landfill and unloaded are provided in Section K.2.e. The load-checking program is described in Section K.6. The landfill may dispose of Class I solid waste as defined in 62-701.200 (13).

- 1. Lead-Acid Battery Collection Area (HHW Drop-off Facility)
- 2. Household Hazardous Waste Collection Site (HHW Drop-off Facility)
- 3. White Goods/Scrap Metal Storage Area
- 4. Yard Waste Facility
- 5. Tire Storage Area
- 6. Freon Containing Staging Area
- 7. E-Scrap

Special wastes such as white goods, tires, and yard wastes, require special handling and management. The locations for the Waste Tire Facility, White Goods/Scrap Metals Facility, Household Hazardous Waste Drop-off Facility and Yard Waste Facility are shown on Drawing 2 of the Fill Sequence Plan. The County temporarily stores white goods and whole tires prior to processing. The white goods are stored in an upright position until such time as the contracted

commercial recyclers remove them. Waste tires are stored in the permitted waste tire site prior to removal by the contractor. Tires mixed in loads are removed from the active face. Yard wastes that are processed on site by a contracted vendor are typically removed from the site for re-use in land applications, but may also be used to assist with working face access during wet weather. Yard waste may also be directly disposed in the landfill without processing. Waste types not accepted for landfilling include all hazardous wastes, all infectious wastes, pesticides and unexpended pesticide containers, free liquids, flammable and volatile wastes, and radioactive wastes.

#### K.2.c.1 Asbestos

Asbestos waste haulers are required to notify the landfill operator in advance and provide information on the estimated volume and delivery date of friable asbestos. All incoming asbestos material is required to comply with all applicable permit conditions and to be wet down and double bagged. Asbestos will not be accepted during adverse weather conditions. Asbestos is covered with non-asbestos containing waste or soil and the location will be recorded. Additional procedures for handling asbestos are given in Section K.14.c Special Waste Handling – Asbestos.

#### K.2.c.2 Hazardous Waste

If hazardous wastes are located at any area of the landfill, the area must be isolated and management notified immediately. Management/Supervisory staff must notify the below listed agencies dependent on the type of material brought to the landfill.

Management/Supervisory staff must notify the following offices for handling and proper disposal of hazardous wastes:

1.	Environmental Management Department	(941) 742-5980
2.	Sheriff's Department/HazMat Section	(941) 721-2693
3.	Utilities Department Director	(941) 792-8811, Extension 5323
4.	Recycling and Special Waste Collection	(941) 782-8811, Extension 8049
	Supervisor	
5.	SWE Supervisor	(941) 748-5543, Extension 8013

All events regarding receipt of non-household hazardous waste material are kept at the landfill office.

A brief outline of the following materials/programs is given below.

Typical household hazardous wastes (HHW) are as follows:

Paint	Pesticides	Used motor oil	Ammunition
Herbicides	Aerosol cans	Propane tanks	Flares

Gasoline Mercury Containing Cleaning Supplies Devices

The Recycling and Special Waste Collection Supervisor responsible for operation of the Household Hazardous Waste Collection and Storage Facility must be notified if HHW material is to be disposed. The Supervisor will arrange for removal and proper disposal. The maximum onsite storage and frequency for removing these recyclables from the site is as follows:

- Used oil (up to 3.000 gallons) is to be removed quarterly
- Paints (up to 20,000 gallons) are to be removed quarterly
- Batteries (up to 1,000 batteries including lead-acid, Ni-Cad and lithium) are to be removed quarterly
- Light bulbs (up to 5,000) are to be removed at least quarterly
- Electronic devices (up to 80 tons or 160,000 pounds) are to be removed quarterly
- Household Hazardous Waste (up to 75 tons or 150,000 pounds) are to be removed quarterly

A detailed Operations Plan for the HHW facility in provided in Attachment K-2.

#### K.2.c.3 White Goods

All white goods containing Freon (e.g., refrigerators, air conditioners) are segregated from the waste stream and placed upright in the staging area. Freon is removed by a certified operator, and the item marked as being Freon free. The compressors are removed and oils drained off-site for collection by a licensed hazardous waste transporter under the direction of the scrap metal processor. PCB capacitors are removed by County staff. The white goods are then moved to the general white goods/scrap metal area for collection at the location indicated on Sheet C-2 of the Drawings.

All white goods, as defined in 62-701.200 (141), entering the landfill in separated loads are sent directly to the designated white goods/scrap metal storage area to be collected and hauled by County staff to a scrap metal contractor for recycling purposes.

Up to 400 tons of scrap metal and white goods (a maximum of 600 pieces of white goods) can be stored in this area. The minimum frequency for removal is every six months.

#### K.2.c.4 Yard Waste

Incoming yard waste is typically directed to the designated area to be processed on site by a contracted vendor and removed from the site for re-use in land applications or waste-to-energy plants as fuel. Mulch is also used for the wet weather area during rainy season to assure access to the tipping area during rain events. The minimum frequency for processing yard trash is once every six months or when 3,000 tons (12,000 cubic yards) are accumulated. The contracted vendor then removes the shredded material for resale to various outlets for land applications or waste-to-energy plants for fuel. The fines generated are also utilized at the landfill and mixed with soil for use as initial cover.

Alternately, loads of yard waste may be directly disposed in the landfill as the gas from decomposition is beneficially reused. This disposal option is not intended to be the primary method of yard waste management, but may supplement management options as deemed appropriate by the Landfill Superintendent and/or Operations Supervisor.

#### K.2.c.5 Tires

Tires entering the landfill are directed to the permitted storage area. Large agricultural equipment tires and large or solid forklift tires are sent to the landfill for disposal. The contracted vendor removes the tires to a permitted waste tire processing facility. Removal by the vendors is conducted on an on-call basis.

#### K.2.c.6 Batteries

State regulations prohibit disposal of lead-acid batteries in a landfill. The County prohibits collection of batteries by its franchised waste haulers. The Solid Waste Management Act aids in providing for proper disposal by requiring that all entities that sell batteries at retail shall accept used batteries as trade-ins for new batteries.

The County accepts lead-acid, Ni-Cad and lithium batteries at no cost to its residents who bring them to the landfill facility. Upon entering the scales, the transporter is advised to place all batteries in the storage shed located in the Community Drop Off area on weekends and holidays. In addition, batteries are accepted at the HHW Facility during its collection events and Monday through Friday (except holidays).

The Household Hazardous Waste Technician conducts frequent inspections of the storage shed and HHW Facility to monitor the number of batteries on site. When the on-site count reaches 1,000, the contracted battery vendor is called to remove them for recycling and/or proper disposal.

The contracted vendor collects the batteries on an on-call basis. When the vendor arrives on site, they are met by the Household Hazardous Waste Technician who observes the transfer of batteries from the collection shed to the vendor's vehicle. The vendor must sign a battery log before the batteries are removed from the facility. The log is also signed by the Household Hazardous Waste Technician verifying the count of batteries removed. The collection agreement is renewed or updated on an annual basis.

## K.2.d Weighing Incoming Waste

The Scalehouse operations are supervised and operated by the Manatee County Utilities Department, Solid Waste Division. Three scales are located at the entrance to the landfill. Two are inbound and one is outbound. The weighing of waste is required prior to entering the landfill and weight records are reported to the Department monthly. Vehicles that enter the electronic scales are recorded on an information management system. This system records the date, type of vehicle, weight, material to be disposed, daily transaction number, and any other information available pertaining to account name or status. The driver is directed to the appropriate disposal area by the scale attendant.

# K.2.e Vehicle Traffic Control and Unloading

The landfill facility is surrounded by fencing and other natural barriers that limit vehicle access to the landfill. Directional signs have been placed to safely direct vehicles to the current waste disposal area. These signs have large legible letters and are cleaned, refurbished and moved as necessary. The signs are strategically placed so that the route is clear to the drivers. In addition, verbal instruction is issued by the Scalehouse attendant as required. Fencing or temporary barricades are employed as additional traffic control features. Speed limit, safety, and prohibitive practice signs are also placed as necessary in order to encourage a safe, clean operating area.

The Disposal Chiefs direct disposal operations. The landfill operator acts as the spotter at the active face. Unloading is permitted only at the designated tipping area next to the working face. At the fill areas, temporary signs and at least one spotter direct vehicles to the proper tipping areas. Haulers are responsible for unloading their own vehicles. Wastes requiring special handling are coordinated with and unloaded under the direct supervision of landfill personnel. The trained spotter, located safely in heavy equipment or a vehicle, is stationed where they can inspect each shipment of waste for unauthorized waste prior to compaction. If spotters are located on heavy equipment spreading the waste at the working face, the heavy equipment operator shall be trained as a spotter and as a heavy equipment operator. When unauthorized waste is discovered, the operator must either move the unauthorized waste away from the active area for later removal and proper management, or must stop operation and notify another person on the ground or on other equipment who will come to the active area and remove the unauthorized waste before operations are resumed. The spotters may move about the working face in equipment or a vehicle as needed to properly direct the positioning of vehicles for unloading and to observe waste as it is unloaded.

Any suspicious loads or vehicles are stopped by the Scalehouse staff for inspection. The County also has a random load inspection program in place as discussed in Section K-6. If the spotter detects prohibited, special or hazardous waste while the hauler is still present, the waste is reloaded into the vehicle and is removed from the site. If the hauler cannot be identified, it is the County's responsibility to remove the waste from the landfill for proper disposal.

# K.2.f Method and Sequence of Filling Waste

The Fill Sequence Plan through closure is bound separately and included in Appendix C with the permit application.

Prior to placement of solid waste, the excavated base grades will be surveyed and a signed/sealed construction certification report and survey of base grades for each new disposal area will be submitted to the Department for review and approval. The certification report will include a drawing displaying the post-excavation clearance between the top of the sand protective layer and the previously installed leachate collection system piping after accounting for the modified fill sequence.

## K.2.g Waste Compaction and Application of Cover

Waste is typically dumped at the toe of the active face and is spread over the face in a maximum two-foot lift with dozers. Upon completion of waste spreading, compactors typically roll the waste with six passes prior to spreading of additional waste. To achieve the optimum compaction, while minimizing initial cover usage, the active face slopes are maintained at approximately 5:1 (H:V). The flatter the slope, the greater is the compaction rate and greater amount of soil to cover the waste. The 5:1 face slope provides a good compromise between compaction and soil usage. The compaction with the given equipment and working conditions is approximately 1,200 lb/cy.

Cover material for daily operations of the landfill is obtained from a designated stockpile area. The location for the Cover Material Stockpile is located in the footprint of the Stage II Landfill and moves as future Stages are built. The County manages cover soil supply and purchases soil when needed to supplement the on-site stockpiles. To minimize soil usage, Manatee County has purchased mechanically operated tarp-type alternate daily cover system (ADC). Tarps are laid across the working face and taken up the next day. Tarps are loaded to minimize the effects of wind uplift. If waste is not deposited on the working face within 24 hours, then soil is used as the cover material. The areas of the working face not covered by the tarps are covered with soil.

### K.2.h Operations of Gas, Leachate, and Storm Water Controls

Leachate management is described in K-8, gas monitoring in K-9 and storm water controls in K-10.

## K.2.i Water Quality Monitoring

See Part L of this permit application.

## K.2.j Maintaining and Cleaning the Leachate Collection System

The entire LCRS was jetted and pressure cleaned in August 2020. The report on the pressure cleaning is provided in Appendix D to the permit application.

## K.3 LANDFILL RECORDS AND RECORD LOCATIONS

The operating records consist of all records, reports, analytical results, demonstrations, and notifications required by Chapter 62-701, F.A.C., all permits and permit modifications, and training records. The operating records are maintained within the filing system at the landfill facility.

Operating records denoting events are maintained by the landfill staff in accordance with the Operational Permit. Some examples of daily operations of the landfill are:

- Operation and maintenance of the facility
- Special wastes monitoring
- Manpower and equipment usage
- Storm water and leachate issues
- Compliance with permits, applicable rules, regulations, and laws
- Fill sequence plan adherence

## K.4 WASTE RECORDS

Monthly waste records are kept on site and submitted to the FDEP quarterly. A sample report is included as Figure K-2.

#### MANATEE COUNTY CLASS I LANDFILL WASTE RECORDS YEAR 2020 SOLID WASTE RECEIVED MONTHLY REPORTED IN TONS TOTAL WASTE RECEIVED TOTAL AND WASTE TYPE FIRST QUARTER SECOND QUARTER THIRD QUARTER FOURTH QUARTER FOR YEAR (SEE NOTEs BELOW) \* January February March April May June July August September October November December TOTAL WASTE RECEIVED Manatee County Class I Waste Sarasota County Class I Waste Duval County Class I Waste Hillsborugh County Class I Waste Manatee County Class III Waste Sarasota County Class III Waste nellas County Class III Waste Hillsborugh County Class III Waste Polk County Class III Waste Hernando County Class III Waste sco County Class III Waste ee County Class III Wast Collier County Class III Waste Charlotte County Class III Waste fanatee County Other Waste/Sludge Manatee County Other Waste/Agricultural \* The Landfill Operator shall: 1) Weigh all solid waste as it is received; 2) Record, in tons per day, the amount of solid waste received; 3) Estimate the amount received by waste type as listed in this table; and, 4) Compile the reports monthly, and send copies to the Department quarterly. 5) The first line for each waste type represents the waste amount from Manatee County. 6) Waste from other counties shall be identified by county of origin and amounts received on the lines below each waste type.

#### Figure K-2. Manatee County Class I Landfill Waste Records 2020

# K.5 ACCESS CONTROLS

Access to the landfill is controlled by a six-foot high chain link fence along the west side of the landfill and a barbed-wire and/or field fence around the remainder of the site. The landfill access gates are locked at the close of each business day. Signs indicating hours of operation, operating and permitting authorities, and directions for persons delivering waste are posted at the entrance. Additional signs are used along the site access roads and at the working face to direct traffic to the proper disposal areas. An attendant will be on duty at the scalehouse during all periods of public access.

# K.6 LOAD CHECKS

The County has a random load inspection program in accordance with F.A.C. Chapter 62.701 and inspects at least three loads per week. Drivers with loads selected for random inspection are instructed to dump their loads at a designated location near the working face but segregated from other waste. The selected load is inspected to determine if the load contains any unauthorized waste. Spot-checking also occurs at the active face. The Load Inspection Form is included as Figure K-3.

If the spotter detects a load of unauthorized waste while the hauler is still present, the waste is reloaded into the vehicle and is removed from the site. If the hauler has left the site, attempts will be made to identify the generator, hauler, or other party responsible for shipping the waste. Identified responsible parties will be contacted and asked to remove the unauthorized waste. If the generator, hauler, or other party responsible for shipping the waste. If the generator, hauler, or other party responsible for shipping the waste cannot be identified, or if they will not remove the waste, the County will remove the waste from the landfill for proper disposal.

If any regulated hazardous wastes are identified by random load inspection, or are otherwise discovered to be improperly deposited at Lena Road Landfill, the landfill operator shall notify the FDEP, the person responsible for shipping the wastes to the landfill and the generator of the wastes, if known. The area where the wastes are deposited shall be immediately cordoned off from public access. If the generator or hauler cannot be identified, the landfill operator shall assure the cleanup, transportation, and disposal of the waste at a permitted hazardous waste management facility.

A small quantity of unauthorized waste which must be stored on-site while awaiting removal for disposal will be stored in the household hazardous waste collection area until it can be removed by contractor for proper disposal. Waste quantities too large to store in the household hazardous waste collection area, will be isolated at the landfill face with temporary berms constructed around the waste to ensure containment of any surface runoff. The area will be properly marked with signs, and temporary fencing will be used to prevent unauthorized access to the material until it can be shipped off-site for proper disposal.

Sources found or suspected to be previously responsible for shipping regulated hazardous waste will be informed of landfill requirements and referred to FDEP for hazardous waste information. Subsequent shipments from such sources will be scrutinized for unauthorized or hazardous

waste. Inspection results, information, and observations resulting from each random inspection will be recorded and retained at the landfill for at least three years.

Supervisors, landfill operators, and spotters are trained to identify unauthorized wastes or potential sources of regulated hazardous wastes. This training emphasizes familiarity with containers and labels typically used for hazardous wastes and hazardous materials. Controlling types of waste received is discussed in Section K.2.e.

Figure	К-З.	Load	Inspection	Form
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LOAD INSPECTION FORM

DATE:	TIME:	INSPECTOR:	
LOCATION:			
DRIVER NAME:			
COMPANY NAME:		DECAL #:	
TAG #:	TRUCK DESCRIPTI	ON:	
ORIGIN OF WASTE:			
WASTE COMPOSITIO	N:		
NOTE QUANTITY OF	THE FOLLOWING, IF A	PPLICABLE:	
FLUORESCENT	LAMPS (10 or more)		
MERCURY CON	NTAINING DEVICES		
BIO-HAZARD N	MATERIALS FOUND _		
OTHER HAZAR	DOUS MATERIALS FO	UND	
TIRES, LEAD A	CID BATTERIES		
OIL BASED PA	INT		
IF YES, EXPLA	IN CIRCUMSTANCES C	OF COLLECTION:	
IF YES, MANAGEMEN	T INFORMED: Yes	No	
NAME AND TITLE:			

# K.7 WASTE COMPACTION

## K.7.a Waste Layer Thickness

Waste is typically dumped at the toe of the working face and is spread over the face in a maximum of two-foot lifts prior to compaction. This procedure continues throughout the day for a typical lift thickness of no more than 10-feet.

## K.7.b First Waste Layer

The area to be filled has been completely covered by waste during previous permit periods. The first layer of waste placed above the leachate collection system in Stage II will be a minimum of four feet in compacted thickness and shall consist of selected wastes containing no large rigid objects that may damage the leachate collection system. Special care shall be exercised when filling around pump stations to prevent damage.

## K.7.c Slopes and Lift Depths

The exterior landfill side slope is constructed at 4:1 (H:V) or slightly steeper because settlement of the side slope causes a lesser slope to result in a final slope of no more than 4:1. Interior waste slopes (that will received additional waste in the future) may be constructed with slopes no steeper than 3:1. Also, any temporary slopes for such structures as storm water diversion dikes, roads, excavations, etc. are constructed with slopes no steeper than 3:1. The lift depths shall be 10-feet or less. The typical minimum top slopes to promote drainage are generally one percent within the bermed working face, and two percent on the intermediate cover areas.

## K.7.d Working Face

The active face width is no greater than necessary to accommodate the peak number of disposal vehicles at one time. The wider the active face, the more cover soil is used. The County uses an active face of 150 feet in width. The working area of the active face has a slope of approximately 5 horizontal to 1 vertical. The objective for the dimensions of the active face is to maximize the volume to face surface ratio.

# K.7.e Initial Cover Controls

Materials used as initial cover include street sweepings, ditch cleanings, crushed glass, and/or a tarp as an alternative daily cover (ADC), soil, soil with up to 25% fines from the yard processing area, and recovered screen material (RSM) from FDEP permitted facilities. The tarp, when used, covers the working face with a weighted tarp. Currently, 100' x 40' tarps are used to cover the working face. Initial cover is applied daily at a minimum thickness of six inches. Soil with up to 25% fines (by volume) from yard trash processing, may be used for initial cover.

# K.7.f Initial Cover Applications

The tarp alternative daily cover system is the primary method of daily cover. Soil is used to supplement ADC and when conditions prohibit use of ADC. For those times when conditions prohibit the use of ADC, initial cover will be stockpiled near the active face for use at the end of each day. Dozers used for spreading waste will spread cover soil, when used or authorized equipment for tarp cover application will be utilized to cover the exposed refuse when ADC is used.

# K.7.g Intermediate Cover

An additional 12 inches of compacted cover soil (intermediate cover) is placed over six inches of initial cover, within seven days of cell completion, on areas that are not scheduled to receive wastes within 180 days. The top of the intermediate soil cover is graded at a minimum of two percent. These areas have sod to reduce erosion. Prior to placement of additional wastes in these areas, the intermediate cover is removed and stockpiled adjacent to the active face for use as initial cover.

# K.7.h Final Cover Timing

Final cover is placed after the landfill is closed in accordance with the approved Closure Plan.

# K.7.i Scavenging

Scavenging is prohibited.

# K.7.j Litter Policing

Litter fences are installed near the active face to capture wind-blown litter. Manatee County contracts a temporary labor employer to police the landfill property daily to ensure that litter outside the working area is picked up within 24 hours. Litter fences are also installed along the top of the banks, parallel with interior storm water ditches to minimize litter from entering the storm water management system.

# K.7.k Erosion Control

Erosion is controlled with sod and terraces. Manatee County has implemented an aggressive sod plan to protect intermediately covered side slopes from erosion. Temporary piping is used to remove runoff from the sod covered terraces. This temporary piping drains collected runoff for discharge into the perimeter storm water ditch system.

The landfill is inspected daily for signs of erosion and exposed solid waste. Erosion control measures are employed to correct any erosion which exposes waste or causes malfunction of the storm water management system. Such measures are implemented within three days of occurrence. Typically this requires replacing the eroded cover soil with clean cover soil, and covering the soil with sod, or removing debris from the storm water inlets, pipes and outlet

structures. If the erosion cannot be corrected within seven days of occurrence, the landfill operator shall notify the Department and propose a correction schedule.

#### K.8 LEACHATE MANAGEMENT

## K.8.a Leachate Level Monitoring

#### K.8.a.1 Leachate Collection and Removal System Overview

#### K.8.a.2 Stage | System

The Stage I Leachate Collection and Removal System (LCRS) as shown on Figure K-4 is a perimeter underdrain around Stage I. The underdrain is approximately 10 feet inside the perimeter slurry wall and approximately 12 feet below grade. The underdrain is an 8-inch, perforated pipe surrounded by aggregate. The pipe and aggregate are wrapped in a geotextile. Manholes and cleanouts are constructed to provide access for cleaning and repairs.

The slurry wall and underlying clay-confining unit is the containment/barrier system designed to prevent leachate movement to the outside surficial aquifer. The slurry wall and LCRS is the FDEP-approved method designed and constructed to minimize impacts, due to landfill operations, to the surrounding environment. The slurry wall is keyed into the underlying natural clay unit. The depth of the slurry wall varies, depending on depth to the clay unit.

Two lift stations are used to pump collected leachate to the wastewater treatment plant (WWTP). Lift Station No. 1 is located in the northwest corner of Stage I. Lift Station No. 2 is located at the southeast corner. Collected leachate enters the underdrain system and gravity flows back to either lift station. Both lift stations operate in the similar manner. Two submersible pumps pump collected leachate from the lift station. The first pump is activated when the low-level float senses leachate entering the lift station. The pump will operate until the float sensor deactivates. If leachate enters the lift station at a faster rate than the first pump can draw it down, the high-level float will activate the second pump to turn on. Upon deactivation of the high-level float, the second pump will shut off. Lift stations can operate in the hand or automatic setting. Both lift stations are set to operate in the automatic mode. Both pumps are 10HP 230/60 1735 RPM. From the lift stations, leachate is pumped through a 6-inch pipe to the adjacent WWTP storage tank. The flow in each forcemain will be individually metered. After the meters, the individual forcemains will be manifolded into a single 12-inch forcemain and connected to the waste treatment plant piping.

#### K.8.a.3 Stage II

The Stage II LCRS has a perimeter leachate collection trench and an underdrain to collect leachate which flows to Lift Station (Pump Station) 4. The location for the leachate collection system and pump station is shown on Figure K-4 and on the Fill Sequence Plan drawings. The slurry wall is keyed into the underlying clay unit to prevent movement of leachate to the outside surficial aquifer. Unlike Stages I and III, Stage II has collection laterals which run the entire width of Stage II, spaced on 200 foot centers. As shown in the Filling Sequence Drawings (Appendix C of permit application), leachate is collected in waste filled areas that are separated

with berms from sub-sequences that have not yet received waste. This enables ponded stormwater and runoff from areas without waste to be managed as stormwater. As Stage II contains solid waste, water that percolates into the ground drainage sand is collected by the leachate collection system and the associated pump station pumps the leachate to the wastewater treatment plant.





#### K.8.a.4 Stage III

The Stage III LCRS is similar in design to Stage I and Stage II LCRS. The underdrain runs along the north, south, east, and west sides of Stage III, approximately 10 feet inside the slurry wall. The slurry wall ties into the west side of the Stage I slurry wall. The alignment of the slurry wall defines the footprint for Stage III. Leachate entering the underdrain gravity flows back to the lift station. One lift station, Lift Station 3, is located in the northwest corner of Stage III. Collected leachate is pumped to the WWTP. The lift station is similar in design and operation to the lift stations described for Stage I. Storm water runoff from Stage III drains from the surface through a sand trench into an underdrain. This runoff adds significantly to the total volume of leachate produced from Stage III. When above grade filling begins, top slopes will be graded to drain storm water to the perimeter storm water ditches.

#### K.8.a.5 Operational Performance Objectives

It is the County's intent to maintain an inward gradient by collection and removal of leachate, with subsequent discharge to the WWTP. Staff will evaluate the following conditions in an effort to maintain water levels lower inside the slurry wall compared to levels outside the slurry wall, or to recover the inward gradient within thirty days.

- Water Levels
- WWTP Availability
- Pumping Rates
- Seasonal Variations
- Unexpected or Scheduled Downtime

#### K.8.a.6 Compliance Monitoring and Evaluation

#### Monitoring Reports

Figure K-5A is the typical Water Balance Report format used for the Lena Road Landfill. This report is used to quantify the volume of leachate generated on a daily and per month basis from Stages I, II, and III.

Additional information includes:

- The volume of leachate pumped to the WWTP
- The volume of leachate pumped from Stages I, II, and III
- Rainfall in gallons and inches

The content and format of the report are approved by the FDEP. Figure K-6A ( is a typical Monthly Leachate Summary Report. This report is used to summarize the following information:

- Total leachate
- Total rainfall
- Total leachate treated by the WWTP

#### Figure K-5A. Monthly Water Balance Report

#### EXHIBIT A

#### MANATEE COUNTY SOLID WASTE MANAGEMENT FACILITY LENA ROAD LANDFILL MONTHLY WATER BALANCE REPORT

September 2020

A	В	С	D	E	F	G	Н	1
DATE	LEACHATE STAGE I Lift Station 1	LEACHATE STAGE I Lift Station 2	LEACHATE STAGE I TOTAL	LEACHATE Stage II Total	LEACHATE Stage III Total	TOTAL LEACHATE PUMPED	RAINFALL	RAINFALL
	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	(gallons)	(inches)	(gallons)
1-Sep-20	33,096	11,391	44,487	233,936	149,528	427,951	0.39	3,028,980
2-Sep-20	41,136	11,896	53,032	205,824	116,644	375,500	0.26	2,019,320
3-Sep-20	32,028	10,987	43,015	62,896	92,332	198,243	0.00	0
4-Sep-20	33,944	11,811	45,755	235,568	93,004	374,327	0.00	0
5-Sep-20	0	0	0	0	0	0	0.02	155,332
6-Sep-20	0	0	0	0	0	0	0.19	1,475,657
7-Sep-20	0	0	0	0	0	0	0.01	77,666
8-Sep-20	127,848	45,260	173,108	681,168	301,912	1,156,188	0.32	2,485,317
9-Sep-20	2,472	11,289	13,761	151,072	64,244	229,077	0.59	4,582,303
10-Sep-20	1,044	11,102	12,146	164,224	65,088	241,458	0.57	4,426,971
11-Sep-20	1,184	10,907	12,091	155,858	59,813	227,762	0.21	1,630,989
12-Sep-20	0	0	0	0	0	0	0.13	1,009,660
13-Sep-20	0	0	0	0	0	0	1.22	9,475,272
14-Sep-20	15,776	39,395	55,171	464,638	188,015	707,824	0.17	1,320,325
15-Sep-20	94,634	567	95,201	152,264	75,312	322,777	0.17	1,320,325
16-Sep-20	51,090	131	51,221	158,903	79,356	289,480	0.07	543,663
17-Sep-20	47,376	143	47,519	171,681	80,212	299,412	0.00	0
18-Sep-20	51,300	158	51,458	167,424	79,640	298,522	0.43	3,339,645
19-Sep-20	0	0	0	0	0	0	0.00	0
20-Sep-20	0	0	0	0	0	0	0.00	0
21-Sep-20	131,556	415	131,971	485,208	198,376	815,555	0.00	0
22-Sep-20	9,076	26	9,102	146,632	59,160	214,894	0.00	0
23-Sep-20	71,085	235	71,320	158,090	58,176	287,586	0.00	0
24-Sep-20	42,731	128	42,859	146,374	57,716	246,949	0.00	0
25-Sep-20	41,480	128	41,608	153,632	54,648	249,888	0.00	0
26-Sep-20	0	0	0	0	0	0	0.00	0
27-Sep-20	0	0	0	0	0	0	0.29	2,252,319
28-Sep-20	125,220	377	125,597	498,360	162,096	786,053	0.00	0
29-Sep-20	40,984	123	41,107	91,320	49,164	181,591	0.70	5,436,631
30-Sep-20	39,028	114	39,142	115,820	45,812	200,774	0.00	0
	0	0	0	0	0	0	0.00	Ō
TOTAL	1,034,088	166,583	1,200,671	4,800,892	2,130,248	8,131,811	5.74	44,580,376
Leachate Pumpe	ed as Percentage	of Rainfall		7.6%	26.1%	20.7%		

Column	Notes:	

A - Date of reading.		Stage I	Stage II	Stage III	TOTAL
B - Leachate pumped (gallons) from Stage I by lift station 1.		(acres)	(acres)	(acres)	(acres)
C - Leachate pumped (gallons) from Stage I by lift station 2.	Initial Cover	102.0	113.0	66.0	281.0
D - Total Stage I leachate pumpage (B+C).	Interm. Cover	0.0	5.0	1000	5.0
E - Leachate pumped (gallons) from Stage II.	Closed	30.0	0.0	1000	30.0
F - Leachate pumped (gallons) from Stage III.	TOTAL	132.0	118.0	66.0	316.0
G - Total leachate pumped to WWTP storage tank (D+E+F).	Open Area	102.0	118.0	66.0	286.0

H - Rainfall (inches) recorded on this date.

I - Rainfall (gallons) calculated based on open area (H x Area x 27,156 gal/acre-in).

**Comments** 

"0" = no data recorded

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# MANATEE COUNTY SOLID WASTE MANAGEMENT FACILITY **MONTHLY LEACHATE TRACKING SUMMARY -- 2020** LENA ROAD LANDFILL

	a	υ	D	Ш	н	9	н	Т	-
	STAGE I	STAGE II	STAGE III	TOTAL			STAGE I LEACHATE/	STAGE II LEACHATE/	STAGE III LEACHATE/
HINOW	LEACHATE (gallons)	LEACHATE (gallons)	LEACHATE (gallons)	LEACHATE (gallons)	RAINFALL (inches)	RAINFALL (gallons)	RAINFALL (%)	RAINFALL (%)	RAINFALL (%)
JANUARY	227,433	11,377,632	954,028	12,559,093	1.14	8,853,942	7.2%	311.5%	46.7%
FEBRUARY	1,281,599	5,749,824	723,184	7,754,607	1.96	15,222,567	23.6%	91.5%	20.6%
MARCH	1,002,110	4,283,984	737,112	6,023,206	0.00	0	0.0%	0.0%	0.0%
APRIL	814,608	3,218,320	731,000	4,763,928	5.66	43,959,047	5.2%	17.7%	7.2%
MAY	1,058,495	3,103,328	942,856	5,104,679	3.24	25,163,836	11.8%	29.9%	16.2%
JUNE	1,279,207	4,585,126	1,850,808	7,715,141	10.07	78,225,356	4.6%	14.2%	10.3%
JULY	1,187,339	3,547,514	1,143,156	5,878,009	7.92	61,511,599	5.4%	14.0%	8.1%
AUGUST	1,689,650	3,642,640	442,776	5,775,066	8.81	68,423,887	6.9%	12.9%	2.8%
SEPTEMBER	1,200,671	4,800,892	2,130,248	8,131,811	5.74	44,580,376	7.6%	26.1%	20.7%
OCTOBER									
NOVEMBER									
DECEMBER									
TOTAL	9,741,112	44,309,260	9,655,168	63,705,540	44.54	345,940,610	7.9%	35.9%	7.8%
22									

Figure K-6A. Monthly Leachate Tracking Summary

Notes:

1. (B) Total leachate pumped from Stage I.

C) Total leachate pumped from Stage II
(D) Total leachate pumped from Stage III

(H) Stage I leachate as a percentage of rainfall.
(I) Stage II leachate pumped as a percentage of rainfall.
(J) Stage III leachate pumped as a percentage of rainfall.

4. (E) Total leachate (Column B+C+D) pumped to WWTP storage tank.

(F) Total rainfal in inches.
(G) Total rainfal lin gallons (Stage I, II, and III Open Area of 286-acres x Rainfall)

# Landfill Stage Land Area

	Stage I	Stage II	Stage III	TOTAL
	(acres)	(acres)	(acres)	(acres)
In tial Cover	102.0	113.0	66.0	281.0
Intermed. Cover	0.0	5.0	1	5.0
Closed	30.0	0.0		30.0
TOTAL	132.0	118.0	66.0	316.0
Open Area	102.0	118.0	66.0	286.0

Figure K-7A is a typical Ground Water Gradient Monitoring Report. Twenty-five ground water monitoring wells are installed around the perimeter of the landfill, outside the slurry wall to monitor the shallow aquifer. Twenty-five piezometers are installed around the perimeter of the landfill inside the slurry wall to measure depth to ground water of the shallow aquifer only. No ground water samples are collected from the piezometers. This report presents ground water elevations recorded at selected monitoring wells and compares them to the ground water levations recorded at the piezometers. These locations are shown on Figure 1 in Attachment L-1, the Water Quality Monitoring Plan. The monitoring wells are located outside the slurry wall. The piezometers are located inside the slurry wall are higher than elevations recorded inside the slurry wall.

Piezomet	ters Inside Slu		Groundwater Monitoring Wells Outside Slurry Wall			
Piezometer	Riser Elevation	Leachate Elevation	Gradient Flow	Monitoring Well	Riser Elevation	Groundwater Elevation
P-1	42.68	NA	NA	GW-1	38.68	NA
P-2	42.32	NA	NA	GW-2	40.92	NA
P-3	40.36	24.76	inward	GW-3	39.40	32.56
P-4	40.78	22.18	inward	GW-4	40.53	32.63
P-5	40.73	20.87	inward	GW-5	39.90	32.15
P-6	40.74	19.93	inward	GW-6	38.95	31.35
P-7	40.60	19.06	inward	GW-7	39.49	29.42
P-8	40.21	18.99	inward	GW-8	39.75	28.32
P-9	NA	NA	NA	NA	NA	NA
P-9A	39.83	22.77	inward	GW-9	39.65	30.55
P-10	39.86	25.82	inward	GW-10	38.34	28.84
P-11	40.52	22.12	inward	GW-11	38.26	30.03
P-12	43.28	29.44	inward	GW-12	42.09	31.89
P-13	44.78	30.21	inward	GW-13	44.79	32.29
P-14	45.09	29.79	inward	GW-14	39.63	33.78
P-15	45.57	30.77	inward	GW-15	42.33	34.13
P-16	44.67	30.87	inward	GW-16	44.41	32.79
P-17	44.28	30.16	inward	GW-17	42.19	33.37
P-18	43.16	24.16	inward	GW-18	41.76	32.87
P-19	42.91	23.11	inward	GW-19	41.20	32.40
P-20	42.54	25.57	inward	GW-20	41.00	30.73
P-21	42.23	24.88	inward	GW-21	40.94	26.80
P-22	42.06	23.86	inward	GW-22	41.53	27.18
P-23	42.08	22.41	inward	GW-23	40.91	28.70
P-24	42.03	19.93	inward	GW-24	41.37	29.78
P-25	42.16	19.20	inward	GW-25	41.11	31.59
P-26	42.50	19.20	inward	GW-26	41.44	32.69
P-27R	42.73	19.63	inward	GW-27R	40.90	32.70

#### Figure K-7A. Monthly Groundwater Gradient Report Month and Year:

## K.8.b Operation and Maintenance of Leachate Collection System

Quantities from Lift Station Nos. 1, 2, 3 and 4 are recorded and submitted to FDEP on a monthly basis using the forms on Figures K-5A and K-6A. Flow rates are checked and confirmed semiannually and kept at the Lena Road Landfill. If a failure in the underdrain system is suspected, the system is videoed. Every five years, or if a problem is suspected, the underdrain is cleaned by hydro jetting. Manholes are visually inspected on a monthly basis. When necessary, the manholes are cleaned to promote drainage towards the lift station.

## K.8.c Leachate as Hazardous Waste

Based on years of analysis, leachate from the landfill is not a hazardous waste. If at any time the leachate is determined to be hazardous, it will be managed in accordance with Rule 62-730, F.A.C. If the leachate analysis indicates a contaminate listed in 40 CFR Part 261.24 exceeds the regulatory level, a monthly sampling of leachate will begin and FDEP notified. If in any three consecutive months no listed contaminant is found to exceed the regulatory limit, the monthly sampling will be discontinued and the routine sampling schedule implemented.

## K.8.d Off-Site Discharge Agreements

All collected leachate is pumped to an equalization tank at the WWTP for treatment and disposal. Due to the common ownership of the landfill and the WWTP, the Utilities Department Director has issued a letter stating leachate will be accepted at this facility or at another off-site treatment plant as required.

## K.8.e Leachate Management Contingency Plan

In the event of short duration system failure, the landfill can store leachate. The County intends to maintain a one-foot inward gradient across the slurry wall so leachate would have to rise a foot before the facility was out of compliance with the permit condition to maintain an inward gradient. In the event of an extended power outage at the landfill (i.e., more than 7 days), the County will rent a portable generator to provide power to the lift stations.

Any treatment plant operational or power problems will be addressed by the treatment plant as a part of its permitting procedures. Generators are available to provide emergency power at the treatment plant.

Leachate will be trucked to the County's Southwest Treatment Plant or North Wastewater Treatment Plant, if necessary.

## K.8.f Leachate Generation Recording

Leachate generation records are reported on the forms in Figures K-6A and K-7A.

## K.8.g Precipitation/Leachate Comparison

Precipitation is comparted to leachate collected using the form in Figures K-6A and K-7A.

## K.8.h Procedures for Water Pressure Cleaning or Video Inspecting Leachate Collection System

Every five years, or if a problem is suspected, the leachate collection pipes are pressure cleaned.

Video inspection is not used unless there is a suspected problem or blockage.

## K.9 GAS MONITORING

Gas monitoring is performed on a monthly and quarterly basis by a qualified solid waste engineer or consultant. The gas monitoring at the site is divided into three separate tasks: Quarterly monitoring of the gas well and points; quarterly monitoring of surface emissions on the closed portions of the landfill; and monthly monitoring of the landfill gas extraction system. Each task will be discussed in detail below.

## K.9.a Gas Well and Point Monitoring

On a quarterly basis, the solid waste engineer monitors landfill gas emissions at eleven gas wells located on the site as shown on Figure K-8. The gas monitoring wells are located along the perimeter of the landfill, and are constructed of 1<sup>1</sup>/<sub>4</sub> to 2-inch diameter PVC, encased in locking aluminum stand-boxes.

The monitoring is performed using the CES Landtec Gas Extraction Monitor Model 2000 (GEM 2000). According to Chapter 62-701.530(1) of the Florida Administrative Code, methane gas levels are required to be less than the maximum level of 25% of the Lower Explosive Limit (LEL) for the interior of structures (gas points) and less than 100% of the LEL for points at or beyond the landfill property boundary.

The gas well samples are collected by removing the PVC cap of the well and inserting the intake tube of the GEM 2000 into the casing, or attaching it to the sampling port on the top of the well cap. The sample points are monitored by walking the area of interest while exposing the GEM 2000 intake tube to the atmosphere. The monitoring event typically takes one workday. The results are reported using a typical form as shown on Figure K-9.



Figure K-8. Landfill Gas Migration Monitoring Locations

#### Figure K-9. Gas Monitoring Report

# MANATEE COUNTY LENA ROAD LANDFILL GAS MONITORING REPORT

#### METHANE GAS READINGS

Date of Readings:\_\_\_\_\_

Gas Well	Reading % LEL	NOTES
Well 1	0.0	
Well 2	0.0	
Well 3	0.0	
Well 4	0.0	
Well 5	0.0	
Well 6	0.0	
Well 7	0.0	
Well 8	0.0	
Well 9A	0.0	
Well 10	0.0	
Well 11A	0.0	

## K.9.b Surface Emission Monitoring

The solid waste engineer performs surface-emission monitoring event on a quarterly basis on the Stage I and III Landfills in compliance with Section 60.753 of the Title V Permit No. 0810055-015-AV. Quarterly monitoring will begin at the Stage II Landfill five years after solid waste is placed in the Stage II Landfill. During this event, the solid waste engineer performs surface gas sampling with Thermo Environmental Instruments Model 680 Hydrocarbon Vapormeter (HVM). The monitoring path followed the same grid system as in previous events as approved for the permit. The sensor of the HVM was maintained at approximately 5 centimeters above the Landfill surface during monitoring. The perimeter of the Landfill was checked. All landfill penetrations for gas wells, pipes, etc., areas with distressed vegetation and cracks in the soil cover were also checked for landfill gas emissions.

Locations at which a methane concentration of 500 parts per million (ppm) or greater as observed will be noted on a site map and the appropriate changes to the landfill gas system will be made. The location of interest should be rechecked within a week to verify that the problem has been rectified. This event takes approximately one day to perform. However, depending on the number of locations (if any) that are observed to be in violation, additional monitoring time may be necessary.

## K.9.c Landfill Gas Extraction System Monitoring

The solid waste engineer performs monthly monitoring of the landfill gas extraction system. There are currently 285 vertical wells and 8 horizontal collectors in the system. The sample points include locations in the extraction system pipes leading into the flare and a point at the flare itself. The gas composition, static pressure, differential pressure, flow and temperatures at each of the well locations and points are recorded using the GEM 2000. The flare temperature and total gas flow at the flare reported by the flare computer are recorded by hand. In order to minimize the amount of air pulled into the system, it may be necessary to close some of the extraction wells. As a result, not all of the wells will be sampled on a monthly basis.

The data recorded using the GEM 2000 is reported in tabular form on a monthly basis. A sample data table is shown on Figure K-10. The table indicates which wells or point locations that are not in compliance with the landfill's Title V Air Operation Permit. Compliance at a gas well or point is achieved when the concentration of oxygen is less than 5%, the concentration of nitrogen or balance gas is less than 20%, the static pressure is less than 0 inches of water (i.e., the well is under vacuum) and the temperature is less than 131° F. Shaded boxes on the data table indicate out-of-compliance parameters.

When wells are encountered with out-of-compliance parameters, changes can be made to the valve setting that may improve or eliminate the problem. If the gas composition indicates high levels of oxygen or nitrogen in the gas, the valve should be turned down. This would lower the flow at the well and lessen the amount of air that may be drawn into the system. If the static pressure at the well is positive, then the valve setting should be turned up, effectively increasing the flow at the well. The valve settings should be adjusted in small increments in order to decrease the possibility of improving gas composition while causing the pressure to become positive, or vice versa.

#### Figure K-10. Gas Extraction Well Monthly Monitoring

LFG Wellhead Monitoring Summary Lena Road Landfill, Manatee County, Florida July 2017

Oxygen exceedance above 5% by vol. Static Pressure exceedance above 0°-H<sub>2</sub>O Temperature exceedance above 131 °F

		-				leit. Static	Adj. Statik	Initial Temp	System Press.	
Well ID	Date/Time	CH4 (%)	CO2 (%)	0, (%)	Balance (%)	Press.	Press.	(Deg II)	(in H2O)	Comments
						(16 H2O)	(8.900)			
GW-1	7/26/17 7.52	58.7	37.5	0.4	3.4	-0.15	-0.19	79.8	-11.60	
GW-2	7/26/17 7:55	58.2	36.8	0.6	4.4	-0.07	-0.12	79.3	-11.79	
GW-4	7/26/17 600	53.5	35.4	0.6	10.5	-0.06	-0.09	82.2	-11.20	
GW- 5	7/36/17 603	52.0	33.1	1.0	13.9	-0.08	-0.11	80.6	-11.38	
GW-6	7/26/17 606	56.2	36.6	0.6	6.6	-0.06	-0.10	80.9	-11.60	
GW- 7	7/26/17 608	54.9	347	1.5	8.9	-0.16	-0.20	81.9	-11.49	
GW-8	7/26/17 611	546	38.0	0.2	7.2	-0.03	-0.04	82.1	-11.58	
OW- Y	7/26/17 814	521	36.8	0.3	10.8	-0.05	-0.07	82.2	-11.42	
GW-10	7/26/17 816	50.1	31.6	2.3	160	-0.02	-0.02	82.2	-10.99	
GW-11	7/26/17 618	44.7	27.8	4.0	24.7	-0.00	-0.05	86.5	-11.27	
GW-12	7/36/17 623	48.7	22.5	3.2	144	-8.28	.8.36	83.5	-11.92	
GW-14	7/26/17 625	33.9	25.1	4.7	39.3	-2.08	-2.08	83.5	-11.37	
GW-15	7/26/17 8:29	18.6	21.9	2.8	55.7	-1.69	+1.70	82.5	-11.27	
GW-16	7/26/17 630	21.0	24.2	2.2	\$2.6	-0.63	-0.62	84.2	-11.34	
GW- 17	7/26/17 834	24.1	21.7	4.8	49.4	-2.63	-2.64	84.3	-11.20	
GW-18	7/28/17 843 8/7/17 19/04	513	37	17.9	720	-3.49	-3.30	84.3	-11.27	Extend of Feedbag
GW-19	7/36/17 935	42.5	28.1	2.9	25.5	-1.06	-1.06	88.4	-11.04	
GW- 20	7/36/17 936	45.8	32.2	1.4	20.6	-1.02	-1.03	90.1	-11.47	
GW- 21	7/26/17 938	51.0	36.8	0.2	12.0	-1.17	-1.16	90.7	-11.30	
GW- 22	7/26/17 939	51.0	27.A	0.2	11.1	-0.66	-0.66	91.4	-11.25	
GW- 23	7/26/17 941	48.4	34.2	2.2	15.2	-1.84	-1.73	94.0	-11.19	
GW- 24	7/26/17 943	50.0	32.8	3.3	13.9	-1.71	-1.68	92.8	-4.78	
GW- 26	7/26/17 947	55.6	37.7	0.2	5.5	413	-0.22	95.1	-976	
G/W- 27	7/26/17 9.52	57.8	37.2	0.2	4.8	-6.07	-0.08	97.2	-11.38	
GW- 28	7/26/17 945	60.1	35.6	0.1	42	-6.04	-0.05	100.7	-11.37	
GW- 29	7/26/17 10/01	587	33.2	0.5	7.6	-0.17	-0.18	100.3	-11.18	
GW- 30	7/26/17 10/02	54.9	36.1	0.9	8.1	-0.63	-0.68	91.2	-11.12	
GW- 31	7/26/17 10:05	34.1	35.7	0.5	87	-0.04	-0.06	96.3	-11.04	
GW- 32	7/26/17 10/08	52.3	35.9	0.4	11.4	-604	-0.09	1197	1114	
GW- 24	7/26/17 10-12	54.4	36.2	1.1	8.3	-1.43	-2.82	108.8	-11.04	
GW- 35	7/26/17 10/23	58.8	22.0	1.9	63	-0.13	-0.16	95.8	-11.10	
G/W- 37	7/26/17 10/26	56.5	34.7	1.8	7.0	-0.05	-0.05	92.3	-10.85	
GW- 38	7/26/17 10/28	55.4	35.9	0.6	8.1	-6.24	-0.24	101.1	-10.91	
GW- 39	7/26/17 10/31	56.4	35.3	0.8	7.5	-0.64	-0.68	99.8	-11.11	
GW- 40	7/26/17 10:33	58.5	36.7	0.2	4.6	-0.91	-0.98	95.3	-10.67	
GW- 41	7/26/17 10:35	57.9	30.1	0.5	43	-0.19	-0.19	91.9	-10.76	the start starts
GW- 42	7/26/17 10/39	1.5	1.4	18.7	78.4	+1.01	-1.02	95.9	-10.70	Exceedorf Kending
GW- 42	7/28/17 9/10	45.9	32.2	2.9	19.0	-9.24	-9.26	90.9	-9.34	Recheck - In Compliance
GW- 43	8/7/17 19/27	50.0	22.3	3.0	147	-3.48	-3.48	99.2	-10.91	Redeck - In Considerer
GW- 44	7/36/17 10-43	23.4	22.1	1.9	52.6	-2.95	-0.90	99.0	3.52	
GW- 45	7/26/17 10-07	44.9	28.6	2.8	23.7	-6.44	-6.50	99.3	-10.52	
GW- 46	7/26/17 10-48	48.5	32.3	1.4	17.8	-1.11	4.11	92.1	-10.91	
GW- 47	7/26/17 10-50	51.0	34.2	1.6	12.9	-4.43	4.11	90.4	-11.06	
GW-48	7/26/17 11:49	547	34.0	1.4	9.9	-0.52	-0.63	99.4	-6.90	
G/W - 49	7/26/17 11:45	50.0	32.3	1.8	15.9	-10.64	-10.64	92.5	-10.63	
GW- 50	7/26/17 11:43	52.2	34.7	1.8	11.3	-9.87	-9.85	92.4	-8.75	
GW- 52	7/36/17 11/39	55.0	33.2	11		-10.55	-10.59	93.5	-10.63	
GW-53	7/26/17 11:35	41.8	25.8	5.8	26.6	-10.58	-10.59	93.9	-10.62	Exception Results
GW- 53	7/28/17 9/13	58.7	38.4	0.2	27	-10.70	-10.67	99.3	-10.66	Recheck - In Compiliance
GW- 54	7/26/17 11:32	43.8	27.6	4.8	23.8	-10.82	-10.83	93.5	-10.83	
GW- 55	7/26/17 12/01	34.1	30.8	0.3	34.8	6.04	-11.01	94.1	-11.00	Exceedort Reciting, Adjustment Hade - In Comphance
GW- 56	7/26/17 12/04	45.6	31.2	2.4	20.8	-10.05	-10.06	102.6	-10.08	
GW- 57	7/26/17 12/05	45.7	29.3	2.5	22.5	437	-4.35	95.0	-4.57	
GW- 58	7/26/17 12/04	336	23.3	7.4	357	-11.09	-11.09	84.0	-11.09	Exceedure Recolleg
GW- 59	7/36/17 12/15	49.4	31.0	1.2	18.4	-473	-471	101.4	-30.97	
GW- 59	7/26/17 12-15	49.4	31.0	1.2	18.4	-4.73	-471	101.4	-10.97	
GW-60	7/26/17 12/16	50.6	31.3	0.9	17.2	-4.27	-476	109.0	-10.69	
GW-61	7/26/17 12-18	42.5	28.8	4.5	24.2	-3.82	-3.80	97.0	-10.95	
GW-90	7/26/17 11/24	45.9	29.3	4.5	20.3	-11.07	-11.05	102.6	-11.02	
GW-91	7/26/17 11/26	36.6	30.0	0.6	6.2	-731	331	92.1	-10.69	
GW- 92	7/26/17 11/28	57.3	36.9	0.8	50	-241	-2.40	93.6	-11.06	
GW-94	7/26/17 11:54	440	21.0	44	204	-2.87	-2.99	89.9	-10.85	
GW-95	7/26/17 11.58	49.4	25.9	17	124	-9.93	.9.93	107.1	-9.95	
GW-96	7/26/17 12:00	48.1	32.6	27	166	-4.89	-4.89	98.0	-11.08	
GW- 97	7/26/17 12/39	47.3	30.6	3.6	18.5	-5.17	-5.16	96.0	-11.14	
GW- 98	7/26/17 12/36	51.0	35.5	1.1	12.1	-10.21	-10.21	103.2	-10.21	
GW- 99	7/26/17 12:35	49.5	32.8	21	15.6	-10.65	-10.67	110.9	-10.68	
GW-100	7/26/17 12/33	49.1	32.4	2.2	16.3	-8.14	-8.14	107.0	-9.57	have been as a second second
GW-101	7/3/171142	58.3	38.5	0.2	2.0	-1.63	-1.79	940	-10.20	June Kecheck - In Compliance
GW 101	7/20/17 12/31	33.4	30.4	0.5	14.0	-6.21	-6.24	103.4	114.98	
GW-101	7/26/17 12/26	49.3	29.2	27	149	-615	-616	117.4	-30.55	
GW-104	7/26/17 12-10	45.9	23.7	2.6	17.8	-3.00	-3.01	99.0	-10.83	
GW-105	7/26/17 13/08	47.4	348	2.5	15.3	-6.97	-6.95	99.0	-11.19	
GW-106	7/26/17 13/06	43.5	30.7	43	21.5	-10.05	-10.06	99.0	-10.06	
GW-107	7/26/17 13/05	45.9	31.1	3.6	18.4	-9.98	-9.97	99.0	-10.77	
GrW- 108	7/26/17 13/03	48.6	341	2.4	14.9	-10.55	-10.55	99.0	-10.54	
GW-110	7/26/17 12/57	51.9	22.0	14	12.9	-5.43	-5.43	99.0	-11-14	
GW-111	7/26/17 13:30	56.1	22.6	1.4	8.9	-8.45	-8.44	99.0	-11.00	
G/W- 112	7/26/17 13/28	44.8	31.4	3.5	20.3	-9.16	-9.15	99.0	-10.93	
GW-113	7/26/17 13/25	49.1	35.4	1.4	14.1	-6.43	-6.43	99.0	-10.76	
G/W- 114	7/26/17 13/23	51.6	37.3	0.3	10.8	-4.40	-4.38	99.0	-10.72	
GW-115	7/26/17 13/20	48.0	35.8	0.2	16.0	-1.65	-1.65	99.0	-11.15	
GW-112	7/26/17 1347	58.0	35.3	0.9	24	-2.49	-3.50	98.0	-30.66	
GW-118	7/26/17 13-43	55.3	38.2	1.0	5.5	8.99	-9.02	99.0	-11.00	
GW-119	7/26/17 1341	54.1	36.1	0.6	9.2	-6.34	-6.37	99.0	-11.12	
G/W- 120	7/26/17 13:39	48.5	343	0.6	16.6	-10.83	-10.83	99.0	-10.83	
GW-121	7/26/17 13:37	49.8	33.5	1.2	15.5	-4.85	-4.84	99.0	-11.07	
G/W- 122	7/26/17 1407	39.5	28.2	3.8	28.5	-0.08	-0.08	105.6	-11.09	Encoder Sector
GrW-122	7/28/17 844	d.6	618	20.0	78.6	-11.34	-11.33	87.6	-11.32	Exceeded Reading
G/W- 199	8/7/37 19:00	45.4								

This task typically takes between two and three days to perform, depending on the number of valve setting adjustments. A site map displaying the locations of the landfill gas collection wells is included as Attachment K-1.

## K.10 STORM WATER MANAGEMENT

## K.10.a Introduction

The purpose of this Storm Water Management Plan (SWMP) is to describe the system, operation and maintenance of the Storm Water Management System (SWMS) for the Lena Road Landfill.

The Manatee County Lena Road Landfill is located in Bradenton Florida on approximately 1,200 acres owned by Manatee County. 316 acres are designated for landfill. The rest of the property is used for wetlands mitigation, buffer, administration facilities, storm water management and the Manatee County regional wastewater treatment plant.

The Lena Road Landfill is divided into three stages which are listed below with the acreage and status for each stage:

- Stage I 131 acres filled and inactive
- Stage II 110 acres partly filled and active
- Stage III 75 acres partly filled and inactive

Figure K-11 is a site map of the Lena Road Landfill Storm Water Management System. The map shows the landfill stages, storm water swales, storm water pond and outfall structures. The landfill waste areas have a storm water drainage system. The details for the drainage system on the Stage I, II and III Landfills are shown on the Fill Sequence Plan drawings.

## K.10.b Storm Water Management System overview

The purpose of the storm water management system is to collect clean storm water run-off from the landfill in terrace swales located on the landfill side slopes and convey the storm water to the detention areas for treatment and disposal to Cypress Strand Creek or Gates Creek. Any storm water that comes in contact with solid waste or is contaminated by leachate makes the storm water leachate, and requires discharge of the storm water to the leachate collection system for treatment at the wastewater treatment plant.

There are four permits that relate to storm water. As detailed below, there are two Environmental Resource Permits, with successors and modifications, an NPDES permit and a Solid Waste Operations Permit.

#### 1. Environmental Resource Permits #41-0224996 and #41-0177559

General Permit 41-0224996-001 was issued on February 25, 2005 and remains in the operational phase. The stormwater management system and associated operation and maintenance requirements were modified in Permits 41-0224996-002 through 004, the most recent of which
was issued on November 4, 2020 to modify Ponds #1 and #2. The most important specific conditions are:





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- For retention and dry detention ponds only: The retention and/or dry detention pond is intended to become dry within 72 hours after a rainfall event. A system that is regularly wet will be considered as not in compliance with this permit and possible modification to the system may be required.
- The Operation and Maintenance Entity shall provide for the inspection of the permitted project after conversion of the permit to the operation and maintenance phase. For systems utilizing retention or wet detention, the inspections shall be performed five (5) years after operation is authorized and every five (5) years thereafter. Facility shall submit inspection reports in the form required by the Department, FDEP Form #62-343.900(6), Inspection Certification, for effluent filtration or exfiltration: 18 months after operation is authorized and every 18 months thereafter.

#### 2. NPDES Multi-Sector Generic Permit (MSGP)

This permit was effective January 17, 2019 with an expiration date of January 16, 2024. The facility ID is FLR05F797-005. The requirements for this permit are included in the "Storm Water Pollution Prevention Plan for the Lena Road Landfill" which is periodically updated, with the most recent update dated December 2018.

#### 3. Lean Road Class I Landfill Operation Permit #39884-021-SO/01

This permit was issued March 24, 2016 with an expiration date of March 24, 2036. Specific Condition 9 of the permit describes the surface water sampling requirement.

#### K.10.b.1 Stage | System

The Stage I storm water perimeter swale was created by constructing two berms. The inner berm, called the landfill berm, is constructed around the area filled with solid waste, and the outer berm, called the storm water berm, was constructed around the inner berm to hold storm water runoff from the landfill in the swale until the storm water could be treated prior to discharge to Cypress Strand. The storm water swale drains to either a 10 acre storm water wet retention pond (Pond #2), or a 1.5 acre dry detention pond (Pond #1). The ponds are located at the southwest corner of the Stage I Landfill. Storm water enters the perimeter swale via direct rainfall, sheet flow down the outside slopes of the landfill, and from storm water discharge structures. Storm water collected in terrace swales on the landfill is diverted to inlets on the terrace swales which are connected to storm water pipes. The storm water pipes discharge storm water at the bottom of the landfill into the perimeter swale through the discharge structures. The treatment volume for Pond #2 provides for the first inch of runoff over the 115.38-AC contributing area. 9.61 ac-ft is required while 24.04 ac-ft is required and the discharge is routed to Pond #1. The treatment volume for Pond #1 provides for the first half inch of runoff over the 39.0-AC contributing area. 1.62 ac-ft is required while 3.52 ac-ft is required. Pond #1 includes an underdrain system to provide additional filtration of the stormwater prior to discharge to a perimeter ditch that drains westward to the southwest corner of Stage III, to the Outfall 001/Cypress Strand.

#### K.10.b.2 Stage II System

The Stage II storm water management system is independent of Stages I and III. The system consists of a perimeter swale constructed with under drains and drop inlets for the discharge of storm water from the swale. Emergency Outfall Weirs 005 and 006 discharge storm water from the Stage II storm water swale to Gates Creek. The storm water swale was created by constructing two berms. The inner berm, called the landfill berm, is constructed around the area designated to be filled with solid waste, and the outer berm, called the storm water berm, was constructed around the inner berm to hold storm water runoff from the landfill in the swale until the storm water could be filter by the under drain and discharged to Gates Creek.

Runoff from Stage II areas that have not been developed for waste disposal is directed into the perimeter swale. The Stage II area is graded to allow runoff until new fill sequences are built and filled with solid waste. If the storm water does not run off or evaporate fast enough, Manatee County pumps the storm water over the landfill berm into the storm water swale. Storm water entering the storm water swale due to direct rainfall, run off or from pumping accumulated storm water inside the Stage II landfill, is filtered through the under drain system and discharged to Gates Creek.

All rainfall that falls within waste disposal areas will be contained and treated as leachate and pumped to the wastewater plant for treatment and disposal. As waste fill increases in height, the outer slopes that are covered with intermediate soil cover will be drained to the perimeter storm water swale. Storm water that comes in contact with solid waste will be treated as leachate. Areas of Stage II that do not contain waste will be allowed to drain storm water runoff to the storm water management system. Details of the filling sequence and storm water drainage are shown on the Fill Sequence Plans included in Appendix C to the permit application package.

#### K.10.b.3 Stage III System

The Stage III system consists of a perimeter channel-pond dry detention with effluent filtration system, which will receive runoff from 74 acres of project area. The pond is designed to provide for the first one-half inch of runoff over the contributing area. The water quality treatment volume required for Stage III is 134,310 cubic feet (3.08 ac-ft) and the system provides for 146,573 cubic feet (3.36 ac-ft). The water quality treatment is provided between the pond bottom (elevation 31.0 feet) and the weir elevation of 32.4 feet. The water will drain through an under drain located in the northwest corner of Stage III and will recover in 72 hours. Attenuation for the 100-year, 24 hour storm event is provided by two outfall structures, 001 and 004. Outfall 001 consists of two identical modified FDOT Type "E" inlets. Two sides of the inlets have weirs set at elevation 32.4 feet and the front of the structure has a weir set at elevation 33.4 feet. The inlets discharge through two 42" RCPs to a double mitered end section at the southwest corner of Stage III. Outfall 004 consists of two FDOT Type "E" inlets in the northwest corner of Stage III and has the same weir set up as Outfall 001. The inlets discharge through two 27" x 42" HERCP to Cypress Strand Creek.

# K.10.c Maintenance Plan

This maintenance plan applies to the storm water management system for the Stage I, II and III Landfills. The storm water management system consists of a series of swales, inlets and pipes that divert storm water from the non-working areas of the landfill to the storm water pond. The swales discharge into pipes and/or other swales, or directly into the storm water pond. Runoff from the detention pond ultimately discharges into the Cypress Strand Creek or the Gates Creek via the on-site wetlands.

Storm water perimeter ditches and the filter facility are inspected daily for sediment, wash outs, litter, vegetation and non-performance. In the event of a side-slope wash out, the slope is repaired within 3 working days. Litter fences are installed along the top bank of each swale around the active landfill to minimize litter. Excessive vegetation is removed from the swale system and storm water pond. Sediment is removed from the swale and hauled to the working face.

Storm water runoff from the areas that have at least a 6-inch compacted soil cover (free of waste) over the waste materials can be directed to flow into the storm water management system. Storm water runoff that has been in contact with waste materials is classified as leachate and cannot be diverted into the storm water management system. Storm water runoff from the upper portion of the landfill travels via sheet flow into collection terraces located along the side slopes of the landfill. Storm water runoff flows within the collection terraces and is conveyed, via storm water structures, and as shown on the Fill Sequence Drawings, down the landfill and into swales that are located along the perimeter of the landfill. The perimeter swales convey storm water runoff to a storm water management pond. Storm water runoff collected in the pond is allowed to percolate. As the water in the pond rises, it is pumped to the automatic disc filter system.

The following procedures have been implemented at the landfill to minimize maintenance requirements and to ensure efficient performance of the storm water system operation:

- No excavated cover material is stockpiled in such a manner as to direct sedimentladen runoff outside the project site property limits or into any adjacent storm water collection facility.
- All drainage ditches are inspected periodically for erosion and reshaped and resodded as required.
- Erosion and siltation control devices are cleaned and repaired when clogged or damaged.
- Temporary erosion control features such as silt fencing or hay bales are removed after installation of permanent erosion controls have been completed and any permanent erosion control features damaged by such removal are repaired.
- After vegetation has been established, all swales, channels, and detention ponds are mowed regularly; minimum-mowing frequency is once per year.

- The plant types in the littoral zone are checked periodically and any intruding vegetation is removed if required.
- Drainage sumps are cleaned out at least once per year and the storm sewer lines checked for plugging.
- The area in front of the control structure is checked at least quarterly to remove any excess plants or debris that could cause the structure to plug.

# K.11 EQUIPMENT/OPERATION FEATURES

# K.11.a Sufficient Equipment

The County has sufficient equipment to provide flexible landfill operations. Attachment K-3 provides a list of the current landfill heavy equipment for daily operations.

All landfill equipment that will be in operation on that day is serviced with special attention to any maintenance or minor repair needs. If the repair work required is more than minor in nature, it is sent to the landfill garage. The equipment is primarily serviced by Manatee County Fleet Services that operates a repair center at the Landfill Facility.

The following procedures are used in fueling equipment each day:

- 1. Check the following fluids to ensure they are at the manufacturer's recommended level:
  - Pivot shaft oil
  - Engine oil
  - Hydraulic oil
  - Fuel
  - Transmission oil
  - Radiator water
  - Battery water level
- 2. Check and clean the following filters:
  - Air clean
  - Interior/exterior air conditioner filters
- 3. Pressure wash with water and/or air:
  - Radiator core
  - Transmission oil coolers
  - Hydraulic oil coolers
- 4. Clean all air intake openings such as door panels, steps, hood, and air-breather intake.
- 5. Visually check for water, fuel and oil leaks in the final drive, radiator hoses, hydraulic hoses, fuel lines, injector pumps, fuel filters, etc.

- 6. Check tire inflation and/or track adjustment, chain tension and alignment on scrapers.
- 7. Grease all fittings at recommended intervals.
- 8. Complete the Daily Equipment Maintenance Report.

Fuel for the landfill equipment is pumped from a fuel tank, located as shown on Figure 5. The tank is an above ground, double walled, steel tank with a total capacity of 20,000 gallons, and is split into two compartments. One 5,000-gallon compartment is for gasoline, and a 15,000-gallon compartment for diesel fuel. The tank is on a concrete slab, and protected by bollards. The tank is inspected weekly. Fuel and fluids (engine oil, transmission oil, hydraulic oil, or radiator fluid) are added to the equipment in the maintenance building as needed. If repairs on the equipment are necessary, the equipment is sent to the County's central maintenance shop, located off-site, or to the dealer's authorized maintenance facility.

### K.11.b Reserve Equipment

Attachment K-3 indicates the County possesses sufficient equipment to operate the landfill. In the event the dozer is out of service, the compactors can be used to spread refuse over the active face. In addition, the County can rent backup equipment from its approved Bid List or from County sources within 24 hours if necessary.

### K.11.c Communication Equipment

All equipment operators and traffic controllers are equipped with hand-held radios. This radio transmission service links the field personnel to the office and management. Telephones are available in the office, maintenance garage and Scalehouse.

### K.11.d Dust Control

Internal access roads are sprayed with water to control dust. Vegetation on filled areas assists in controlling dust from this area.

### K.11.e Fire Protection

Further details regarding the fire protection can be found in Section K.2.b.

## K.11.f Litter Control Devices

See Section K.7.j.

### K.11.g Signs

Signs are used around the site to direct traffic to the active face, white goods area, tire area, leadacid battery drop-off, clean debris, yard waste, mulch site, speed limits, disposal rates and hours of operation, and prohibitions.

# K.11.h Shelter/Sanitation/First Aid Features

Shelter and sanitation facilities for the landfill staff are provided at the scale house, landfill office and public restroom facility. First aid kits are provided in the cab of all heavy equipment and in vehicles.

An AED (Automated External Defibrillator) is available in the scale house. First aid kits, located in the Landfill Administration Office and the scale house, are maintained and inspected regularly. The kits will contain, at a minimum, the following:

sterile gauze pads	band aids (regular and non-stick)	eye wash
rolls of gauze bandage	adhesive tape	
bandage scissors	peroxide	
roll of sterile cotton gauze	safety pins	
tweezers	rubbing alcohol	
CPR mouth barrier	gloves	

In the case of accidental poisoning:

Step 1: Carefully remove poison from contact with person.

Eyes: Flush with lukewarm water, NOT HOT WATER, in a gentle stream for 10-15 minutes with eyelids open. Pour water from a container held 2-4 inches above the eye. **DO NOT RUB THE EYES.** 

Skin: REMOVE any clothing that has come in contact with the poison. Flush poison off with large amounts of water poured from a container held 2-4 inches above the affected skin area for 10-15 minutes.

Mouth: REMOVE any poison from the mouth. Rinse the mouth out with water. If unable to rinse, gently rub out mouth with a clean cloth. Check mouth for any burns, cuts, unusual coloring, swelling or irritations.

Lungs: Get to fresh air as soon as possible. Loosen clothing if exposed to gases or fumes. Initiate mouth-to-mouth resuscitation if necessary.

- Step 2: Give water when potential poisons have been swallowed. DO NOT give water if the person is unconscious, having convulsions or cannot swallow.
- Step 3: **NEVER** make the person vomit **unless** the poison center or a physician directs you to do so.

#### Step 4: KEEP CALM. DO NOT DELAY IN SEEKING HELP!

# K.12 ALL-WEATHER ACCESS ROADS

The main haul road in the landfill is paved. Vehicles leaving the main haul road in route to the working face travel across an interior road. The interior road base is constructed of construction and demolition (C&D) material and covered with a sand-shell mixture. The road is routinely maintained to provide waste hauler access to the work face. As discussed in K.2.b, during severe wet weather, small vehicles are directed to the wet weather disposal area for tipping.

# K.13 ADDITIONAL RECORD KEEPING

Required landfill records are reported to the Department on a monthly, quarterly, semi-annually, annual, biennial basis. All records are maintained at the landfill for a minimum of ten years or for the design period as specified below. The design period is projected to end in the year 2071 (unless long-term care is decreased).

# K.13.a Permit Application Development

All reports used to develop permit applications and operation records will be maintained for the design period. Records such as geotechnical investigations, foundation analyses, demonstration reports, and previous permits and regulations are examples of records to be maintained.

# K.13.b Monitoring Records

All water quality, gas, and leachate monitoring records are required to be maintained for at least ten years. Background water quality records shall be maintained for the design period of the landfill.

In accordance with various Environmental Protection Agency (EPA), Southwest Florida Water Management District (SWFWMD), and the Florida Department of Environmental Protection (FDEP) rules, regulations and permits, the Landfill must conduct various field monitoring /maintenance activities and submit reports on a scheduled basis. The following information is intended as an overview of required activities and reports and is also addressed in individual subsections regarding the activity or program.

### K.13.b.1 Groundwater

The County contracted laboratory inspects and samples one background monitoring well, BGW-1 and 25 groundwater monitoring wells, which includes 15 wells (GW-3 trough GW-17) for the Stage I and III Landfills, and 10 wells (GW-18 trough GW-27R) for Stage II Landfill. The results are submitted semi-annually to the Department.

A review of the analyses, comparisons of the data, and comments on any substantial differences in parameters is to be submitted to the FDEP every two and one-half years or as required in the permit.

#### K.13.b.2 Leachate

Flow meters which record leachate directed to the Southeast Waste Water Treatment Plant are inspected daily. The leachate quantity is reported monthly.

#### K.13.b.3 Department of Environmental Protection Reports

- Prepare monthly groundwater report.
- Prepare annual compaction and fill volumes.
- Prepare groundwater report semi-annually.
- Prepare leachate analysis report annual.
- Prepare monthly water balance reports.
- Prepare monthly report on the landfill gas readings taken at each landfill gas wellhead and flare.
- Prepare quarterly report of the landfill gas readings at gas monitoring probes and ambient points.
- Prepare quarterly report of the landfill gas surface emissions monitoring.

## K.13.c Annual Estimate of the Remaining Life of Constructed Landfill

Manatee County will annually estimate the remaining solid waste disposal capacity in cubic yards and the remaining landfill life in years. The estimate will be based on the geometry of the filled landfill, final contours, scale house records for waste received and the filling rate of the landfill. The estimate will be submitted annually to FDEP by the date specified in the permit.

## K.13.d Archiving and Retrieving Records

All records pertaining to the operation of the facility will be retained throughout the design life of the landfill. All monitoring records, calibration and maintenance records and reports required by the landfill operation permit will be retained for at least ten years. Records may be archived after five years provided they can be retrieved within seven days.

## K.14 SPECIAL WASTE HANDLING

## K.14.a Motor Vehicles

Motor vehicles are not presently accepted for disposal or temporary storage at the Lena Road Landfill.

## K.14.b Shredded Waste

Shredded municipal waste is not accepted for disposal at the Lend Road Landfill. Shredded tires may be accepted if not recycled.

# K.14.c Asbestos

Asbestos containing materials from sources covered under the National Emission Standards for Asbestos, 40 CFR Part 61, Subpart M are accepted at the Lena Road Landfill, with prior approval of the County. These materials will be placed in the landfill by appointment only, covered with a minimum of one foot of non-asbestos containing material, and the location will be recorded in accordance with 40 CFR Part 61.154. A record of the location of asbestos-containing waste will be maintained.

# K.14.d Contaminated Soil

Soils contaminated with non-hazardous waste and petroleum-contaminated soil, which has been treated pursuant to Chapter 62-713, F.A.C., will be accepted at the discretion of the County.

## K.14.e Biological Waste

Biological waste is generally not accepted. However, carcasses of domestic animals that have died due to disease may be accepted and disposed, provided they are buried at least two feet below the surface of the ground in accordance with 823.041(1), Florida Statutes. Captive wildlife, fish or marine animals, and domestic animals that died from causes other than disease may also be accepted and disposed at least two feet below the surface of the ground and above the water table.

The landfill may also accept and dispose of dead poultry and hatchery residue. and treated biomedical waste may also be accepted and disposed as waste that is not biomedical provided such waste is in containers clearly labeled as "Treated Biomedical Waste."

## K.14.f Oily Waste

Materials as defined in Chapter 62-701.300 (11)(b), F.A.C., may be accepted for disposal at the discretion of the County.

Attachment K-1

Landfill Gas Collection System





	-9
	MH-E1 O
N	
	LIFT STATION NO. 4
0 50 100 200	
1" = 100'	
LEGEND:	
18" DRODOSED 18" HEADER	
PROPOSED LATERAL PIPE	MH-D1 O
PROPOSED AIR SUPPLY LINE	
PROPOSED DEWATERING DISCHARGE	
PROPOSED CONDENSATE SUMP	
PROPOSED PIPE STUB-UP FOR AIR	
<ul> <li>AND/OR DEWATERING DISCHARGE LINES</li> </ul>	
AR-4     PROPOSED ACCESS RISER	
-JI PROPOSED BLIND FLANGE	MH-C1 O
PROPOSED DEWATERING DISCHARGE LINE CLEANOUT	
PROPOSED SINGLE DEWATERING     DISCHARGE LINE CLEANOUT	
V-12 PROPOSED HEADER ISOLATION VALVE	
HC-01 PROPOSED HORIZONTAL COLLECTOR WELL HEAD	40
GW-200 PROPOSED VERTICAL EXTRACTION	
PROPOSED ROAD CROSSING	
PROPOSED VERTICAL EXTRACTION WELL ABANDONMENT	MH-B1
GW-119 PROPOSED PUMP IN VERTICAL	
GW-119 EXISTING VERTICAL EXTRACTION WELL	
8" EXISTING BELOW GRADE HEADER/LATERAL PIPE	=
V-4 EXISTING HEADER ISOLATION VALVE	
OMH-20 EXISTING MANHOLE	
EXISTING CONDENSATE SUMP	
EXISTING LEACHATE COLLECTION PIPE	MH-AI
EXISTING SOLID HORIZONTAL	MH 11
EXISTING PERFORATED HORIZONTAL	(2)
NOTES:	0914
1. AERIAL PHOTOGRAPHY PERFORMED BY PICKETT AND ASSOCIATES, DATED FEBRARY 14, 2019.	LIFT STATION NO. 1 18"
<ol> <li>NORTH, THE GRID, AND THE COORDINATES SHOWN HEREON ARE REFERENCED TO THE WEST ZONE OF THE FLORIDA STATE PLANE COORDINATE SYSTEM, NAD 83, 1990 ADJUSTMENT.</li> </ol>	MH-30 MH-12 MH-10 V-10 ROAD CROSS
3. AS-BUILT GAS SYSTEM INFORMATION PROVIDED BY PBS&J DRAWING ENTITLED: "RECORD	18" GW-3B
DRAWINGS, STAGE III PHASE II LANDFILL GAS COLLECTION SYSTEM, DECEMBER 5, 2011" AND	>
LANDFILL GAS COLLECTION SYSTEM, MARCH 16, 2009" BY SURVTECH SOLUTIONS.	GW-326 GW-329 8"
4. AS-BUILT STAGE III GAS SYSTEM INFORMATION PROVIDED BY HYATT SURVE'Y SERVICES DRAWING ENTITLED: "AS-BUILT SURVEY 2018 PHASE III GCCS EXPANSION STAGE III" DATED AUGUST 14, 2018	SL GW-328 8"
5. STAGE II HORIZONTAL COLLECTORS INSTALLED DURING OCTOBER 2019 HORIZONTAL COLLECTOR	GW-334 8" GW-333
GCCS EXPANSION.	
8" 5 DUAL DE	AIL
GW-359 GW-360A	GW-369 GW-370
man ast	W-1/9R
3 0914 SEE DETAIL	AIR LINE ISOLATION AND BLOWOFF VALVE (TYP.)



Attachment K-2

Operations Plan Household Hazardous Waste Collection and Storage Facility Attachment K-2

Household Hazardous Waste Collection And Storage Facility Operations Plan

Lena Road Class I Landfill



#### Manatee County

Utilities Department Solid Waste Division 3333 Lena Road Bradenton, FL 34211

Revised March 2021September 2017

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Figure K.2.1 HHW Building Floor Plan

## DEFINITIONS

<u>Conditionally Exempt Small Quantity Generators (CESQG)</u>: (40 CFR 261.5) A generator who produces no more than 100 kg (220 lbs) of hazardous waste or no more than 1 kg of acutely hazardous waste per month.

Contingency Plan: A document setting out an organized, planned, and coordinated course of action.

<u>Hazardous Material</u>: A substance or material including a hazardous substance, which has been determined by the Secretary of Transportation capable of posing an unreasonable risk to health, safety, and property during transportation.

<u>Household Hazardous Waste Collection and Storage Facility</u>: A facility established by the Manatee County Board of County Commissioners to provide hazardous waste disposal services to households.

Household: Single and multiple dwellings and other residential sources within Manatee County.

<u>Personal Protective Equipment</u>: Equipment used to protect individuals from chemical, physical and biological hazards.

<u>Training</u>: Instruction in the use of equipment, personal protective equipment, site safety and handling.

## HISTORY

The Manatee County Household Hazardous Waste Collection and Storage Facility (HHW Facility) opened in May 1993 within the Stage III Landfill. This facility was removed as solid waste filled the Stage III Landfill.

The Administration Facilities includes a household hazardous waste collection and storage facility. The facility floor plan is shown on Figure K.2.1. The building includes forced air ventilation, dry chemical fire suppression system, and storage for hazardous waste. The building is engineered to comply with EPA, NAPA, and OSHA standards and regulations for storing hazardous chemicals and wastes. –The building is also corrosion resistant and features secondary containment for the prevention of spills or leaks. The facility has a concrete slab and is under a roof as shown on the figures. The materials processed and the method of processing remains the same.

## FACILITY PROGRAM

The Manatee County HHW Facility is located at 3333 Lena Road, Bradenton, Florida. The Facility has a secured storage building specifically designed for the storage of hazardous materials and/or wastes. The major components of the HHW Facility are as follows:

- Security System: The entire site is fenced with a six (6) foot high chain link fence. <u>SixFive</u> gates provide ingress and egress to the facility. When not in use, the facility is locked and secured. A double security exists in that the main access road into the County Landfill has a gate and is secured when the Landfill is not in operation.
- Containment and Storage System: The storage building is specifically designed for hazardous materials featuring secondary containment in the event of a spill. The building is equipped with forced air ventilation and dry chemical fire suppression systems. The building has separate storage bays. A heavy-duty locked aluminum storage cabinet anchored to a concrete slab serves as the ammunition locker and does not have a dry chemical fire suppression system.
- The hazardous materials storage is under roof along with covered containment areas for storage of fluorescent bulb closed storage rack, and the waste oil tank. The containment areas are submerged and surrounded by cement reinforced containment<u>Other hazardous</u> materials storage is under roof along with covered containment areas for storage of fluorescent bulbs in a closed rack system, surrounded by a concrete curbing and waste oil tanks that are in submerged containment area surrounded by cement reinforced containment reinforced containment.
- The storage buildings sit flush with an impervious, slightly sloped, reinforced containment area. The Facility is located inside the confines of the Manatee County Solid Waste Management Landfill Facility.

The facility is open to Manatee County residents <u>Monday through Friday from 8:00 a.m. to 5:00</u> <u>p.m. and</u> on the third Saturday of each month from 9:00 a.m. to 3:00 p.m. Wastes that are classified as medical or radioactive are not accepted. There is not a disposal weight limit during the collections and disposal is provided free of charge to County residents. The cost of the program is funded by landfill disposal tipping fees.

A semi-annual eEvents are is held at several sites throughout Manatee County in the spring and fall of the year. Siting Llocations of the event are at the HHW Lena Road Landfill Facility and at the Utilities Department Complex, 4501 4410 66<sup>th</sup> Street West, Bradenton, Florida, Palmetto Fairgrounds, 1303 17<sup>th</sup> St. W. Palmetto, Florida and various other County locations. –Commercial HHW collection information is provided to the commercial generator categories under the same rate schedule as that of Manatee County.

Monthly collections/events are operated by the certified Recycling Supervisor in the HHW Facility located at the Landfill. The <u>contracted collection/disposal vendorHazardous Waste contractor</u> is on site at the collection to assist with unloading. The contractor bulks and lab packs any of the waste material received during the collection. Partial containers are stored in the HHW Facility until the following monthly collection. The Recycling Supervisor reviews all paperwork and has the responsibility of approving and signing outgoing manifests.

Materials are accepted from County residents during non-operating hours by appointment or as determined by the Recycling Supervisor. In addition, collection services at the residence are available for those persons who are unable to attend the event due to circumstance of health, physically disabled or age.

Manatee County has a permanent Household Hazardous Waste program for the collection of materials at the facility. Monthly collections are conducted for the residential citizens and annual or semi-annual events for the CESQGs. These monthly and occasional events described in the previous paragraphs are advertised in the County's utility billing and the local radio addsnewspapers. General Household Hazardous Waste program information is available on the County's website at www.mymanatee.org/hhw.

# CONTAINMENT

#### 4.1. CONTAINMENT

- Containers of paint adjacent to the outside containment areas on concrete slabs covered with plastic sheeting prior to removal by the contracted vendor.
- <u>Propane tanks and electronic waste (e-scrap) are stored in designated areas on the concrete</u> <u>slab inside the HHW building.</u>
- Other wastes such as small flammables and pesticides are contained in the storage building.
- Storm water shall be prevented from accumulating within in-service containment structures.

## WASTE ACCEPTANCE CRITERIA

#### 5.1. HOUSEHOLD WASTE

Household Hazardous Wastes are accepted Monday through Friday from 8:00 a.m. to 5:00 p.m. and on the third Saturday of each month from 9:00 a.m. to 3:00 p.m. Household waste is accepted only during the monthly collection events *unless* circumstances of the generator prohibit such a collection time. The waste must fall within the categories permitted by the contracted collection/disposal vendor and not be of a radioactive, bio-hazardous or medical nature. A residential disposer must also have generated the waste.

### 5.2. CESQG WASTE

CESQG waste is collected by arrangement directly between the contracted collection/disposal vendor and the generator.

## PERSONNEL

#### 6.1. TRAINING

Facility personnel must successfully complete a 240-hour OSHA training program that teaches performance of duties in a way that ensures the facility is operated in a manner that protects them and the public from potential health and safety hazards at the site and is protective of the environment.

The instructor providing the training includes appropriate aspects of hazardous waste/material management including selection of protective clothing and equipment and emergency response. At a minimum, the training program is designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems, including where applicable:

- Contact Llist for departments to respond to fire and/or explosions, discharges to the land surface; incidents
- Shutdown of operations

Facility personnel shall take part in annual eight (8) hour refresher training.

Facility personnel has on staff at least one person who has no less than <u>240</u> hours training in appropriate aspects of hazardous waste/material management whenever waste is being received and whenever any hazardous material is being bulked or otherwise treated.

# RECORDS

The following documents and records shall be maintained at the Facility offices:

- A record of all personnel engaged in work, either full-time or temporary.
- Facility personnel who have completed a record of training.

## PERSONNEL TRAINING REQUIREMENTS

All County personnel participating in the HHW collection programs shall be trained to the appropriate level for their participation. All trained County personnel are specifically trained as Hazardous Waste Collection Staff. The Recycling Supervisor is responsible for enforcing all safety policies. The following guidelines outline the training requirements to be completed by personnel so they may safely work with hazardous materials during the collection programs. This training will, therefore, reduce the potential for hazardous material-related accidents.

### 8.1. UNLOADERS/PAINT SORTERS

Training for this level is limited to on-the-job instruction. Personnel trained will have minimal contact with the waste, but will work under the direction of the Recycling Supervisor. After initial screening of the waste, personnel will unload the waste from the vehicles into carts. Collected paint containers are placed in containers for collection by <u>contracted collection/disposal vendorpaint</u> recycling vendor.

### 8.2. FACILITY STAFF

Training for this level of participation includes both classroom instruction and on-the-job training. Staff assists with opening and closing the Facility, screening incoming materials, and assisting with spills, releases, or any other emergency. Specific training includes, but is not limited to:

HAZWOPER Operational Level (29 CFR 1910.120) On-the-job training in accepting, identifying, segregating, and sorting waste Hazardous waste rules and regulations

### 8.3. HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (29 CFR.1910.120)

The objective of this training is to provide personnel with the knowledge and skills necessary to safely and successfully respond to any on-site spills and/or releases. A five level classification system is used to provide appropriate training to indicate the scope of their authorized response activities:

First Responder Awareness Level First Responder Operations Level Hazardous Materials Technician <u>Hazardous Materials Specialist</u> <u>On-Scene Incident Commander</u>

Personnel trained in accordance with this Section shall receive annual refresher training of sufficient content and duration to maintain their competency.

## PERSONNEL PROTECTION EQUIPMENT

Personal Protective Equipment (PPE) is used to limit exposure to various hazardous materials and wastes at the Hazardous Waste Collection and Storage Facility. PPE is necessary when handling hazardous materials to prevent skin contact with harmful substances. Whenever removing and/or working with hazardous materials or waste, personnel are required to wear, at a minimum, the following protective equipment.

### 9.1. UNLOADERS/PAINT SORTERS

- Safety glasses
- Protective gloves
- \_\_\_\_Protective apron (optional)
- <u>Steel-toed boots or safety shoes</u>

#### 9.2. FACILITY STAFF

- Safety glasses
- Protective gloves
- Respirator with organic vapor cartridge on high efficiency particulate air filter (HEPA), if necessary, as determined by the waste material being handled.
- Steel-toed boot or safety shoes
- Protective apron

In the event of a spill or release of a hazardous material or waste, the following protective equipment is on site:

• Full-faced air purifying respirators

When specialized training is required to properly utilize personal protective equipment, this training must be provided to the employee prior to its use.

# SPILL/RELEASE PROCEDURES

The Recycling Supervisor shall be properly trained in hazardous material emergency response to efficiently mitigate, contain, and clean up any accidental spill/release that might occur at the HHW Facility. At all times, the safety of personnel and program participants are the primary concern.

The following will be considered emergencies at the Facility:

- Fire or smoke is noticed
- An explosion occurs
- A leak or spill is discovered
- Medical emergencies, including heat induced injuries
- Discovery of explosive devices

When a spill/release or any other emergency occurs, the following guidelines will be followed:

- Cease operations/perform initial size up
- Make mental note of nature, extent, source, and amount of any released product
- Evaluate potential harm to human health and the environment
- Scene control. Keep all unauthorized persons away from the scene
- Protect individuals directing them, if not contaminated, away from the scene
- If flammable materials are involved, check for all ignition sources
- Take measures to contain release or fire from spreading to other hazardous areas as quickly as possible
- Notify 911 if warranted
- Notify <u>Superintendent of Solid Waste EnforcementFacility Manager/Director of the Solid</u> Waste Management Facility, if necessary
- Notify State Warning Point if reportable quantity
- Perform basic first aid to stabilize any victims until EMS arrives
- Clean up any spills using compatible materials
- Place waste in proper container for disposal through the County's Hazardous Waste Transporter

Under no circumstances will the health and safety of County staff be placed in harm's way in the attempt to handle suspected explosives. If explosives are discovered, evacuate the immediate area, cease traffic flow, and notify the Manatee County Sheriff's Department Haz-Mat Team.

If a reportable quantity of a hazardous material has been spilled or released, a follow-up written report must follow within fifteen working days and be filed with the State Emergency Response Center.

An eyewash station and shower is permanently installed on site. In the event of materials being splashed into staff's eyes, minimum eyewash of fifteen minutes shall take place.

## EQUIPMENT

Following is a partial list of the equipment on site:

Forklift with drum grabber Fire extinguishers Funnels Shovels and brooms 3 and 5 gallon buckets Absorbent Neutralizing agents Eyewash station and shower

Assorted tools Utility carts 55-gallon drums Traffic cones Assorted tape Two-way radio communication

## SAFETY

Safety is the primary concern of all personnel participating at the HHW Facility. Appropriate staff is instructed in how to handle emergencies as well as site safety. The collection program is maintained in a neat and organized manner at all times. Good housekeeping practices are followed. The unloading area will be kept clean and free of excess materials. It is the responsibility of all HHW Facility staff to follow these guidelines. No smoking signs are posted. Smoking is prohibited at the HHW Facility.

HHW Facility staff will assist participants by unloading vehicles, answering questions about proper disposal methods and handing out informational literature as necessary. Only hazardous waste generated by residential customers will be accepted during the HHW disposal programs. In the event a participant arrives to dispose of waste generated from a business, the CESQG hazardous waste disposal program will be explained and contractor contact information provided.

Following are guidelines to follow in processing the participants' waste.

### 12.1. SAFETY PROCEDURES

HHW Facility staff will, at all times, act in a safe manner. Work practices are carried out to minimize or eliminate the possibility of an injury-related accident. Proper ergonomics are followed. All personnel use correct lifting techniques in order to prevent injury to the body. Containers are removed from vehicles one at a time into the utility carts.

Appropriate Personal Protective Equipment (PPE) is worn when handling hazardous waste. Close attention is given to staff during the summer months to reduce the risk of heat related injuries. All Facility staff monitor themselves for any signs or symptoms of heat stress and act accordingly.

### 12.2. REMOVAL FROM VEHICLES

Traffic is directed from the scale house and/or by signs on the entrance road of the Landfill to the HHW Facility site. Signs to a stopping point direct all incoming cars where participants will be greeted by trained County staff. An initial spotting of the chemicals is performed before removal of chemicals from the vehicle. The participants are questioned on the contents of any unknown materials or unmarked containers. If any unacceptable or unknowns are spotted, personnel will immediately notify the Recycling Supervisor.

The waste from the vehicles will then be unloaded into carts by the HHW Facility staff. Participants remain in or at their vehicles. This reduces the risks of spills or injuries. HHW Facility staff evaluates the contents as they unload. If any leaking containers are spotted, the container will be placed into an additional container. The participant will be informed of the leak. It is not the responsibility of contractor or facility staff to clean up the leak or spill in the participant's vehicle beyond the initial containment.

## WASTE SEGREGATION

County and contractor personnel transport the waste from the vehicles to the preliminary sorting areas. Cardboard boxes are flattened then placed in a dumpster designated for cardboard recycling. Any packaging, similar debris, and/or household trash will be removed and placed in the dumpsters designated for trash. The HHW technician and contractors examine all materials received. The waste is then sorted, bulked and lab packed into the appropriate shipping containers for removal. Usually used motor oil, pesticides, paints, and flammables represent the majority of the waste received.

### 13.1.LOCKER STORAGE

Each chemical storage unit is clearly labeled with DOT placards.

Wastes are stored according to their primary hazard. The basic categories of wastes are as follows:

- Flammables
- Pesticides
- Poisons
- Corrosives

The Recycling Supervisor shall have the final decision on what wastes to accept or not accept, classification, and any other decision regarding the waste.

#### 13.2. WASTE BULKING

Only the HHW technician and/or Recycling Supervisor, along with the contracted <u>collection/disposal vendorHazardous Waste vendor</u>, determines which wastes should be bulked. All labels are read before bulking any wastes together to ensure compatibility. Safety is the major factor in bulking. No bulking shall take place in inclement weather.

Containers of compatible waste are opened and drained directly into fifty-five gallon drums. When the drum is full or bulking is discontinued for the work period, the lid shall be securely replaced. A small space for vapor expansion shall be left at the drumhead space.

Drums are required to have the proper markings adhered to them. The markings are placed so that they are clearly visible. The HHW marking contains the following information:

- The material contents
- The accumulation start date

The proper marking procedure is applied at the beginning of the bulking procedure.

Bulking of any material takes place when needed. Items to be bulked may include the following:

- Latex based paints
- Oil based paints
- Antifreeze
- Motor oil and transmission fluid

The wastes are compatible for bulking, and are only bulked if clearly identified by sight, smell, container, label and source. Any wastes that are not clearly identifiable are not bulked, and the unknown wastes are sent with contractor.

Paint is placed in a lined, roll-off container provided by the collection/disposal vendor. is bulked into a 55-gallon steel drum when needed, and generally removed the same day or within 24-hours. If paint is spilled, it is contained on the plastic sheet by absorbent pads or absorbent. All paint is currently collected and placed in containers which are stored on Visqueen. All paint is sent <u>out for disposal by the collection/disposal vendor</u> to a paint company to be recycled at this time.

Antifreeze is bulked into a 55-gallon drum. If antifreeze is spilled it is contained on the plastic sheet by absorbent pads or absorbent.

Motor oil<u>s</u> and transmission fluid<u>s areis being</u> poured into a 20 gallon tank then pumped (or poured using a funnel) into a 500-gallon storage tank<u>s</u> or in 375 or 275 gallon portable tanks. The bulking is done outside, under a main roof of the Hazardous Waste Facility.

### 13.3. UNKNOWNS

Unknowns are accepted. These items are materials that cannot be identified by either original labels or by participant knowledge. The following procedures are adhered to:

- Unknowns will be sent out with the contractor.
- Place material into appropriate storage building according to suspected hazards.

### 13.4. ELECTRONIC WASTE

Electronic waste such as TVs, computer monitors, microwave ovens, telephones, keyboards, VCRs, radios, etc. are received at the Household Hazardous Waste Collection. The materials are sorted, palletized, shrink wrapped or put in Gaylord boxes . The pallets of materials and/or Gaylord boxes are stored under the roof of the HHW Facility until the contractor comes to pick them up. The contracted e-scrap recycler removes the e-scrap for processing and recycling. Broken glass and components from broken units is swept up and properly disposed.

Electronic waste is also collected curbside by the contracted waste haulers. The hauler brings the materials to the landfill to be stored in the designated area which is the SW corner of the white goods/scrap metal concrete pad or within the HHW Facility. Additionally, residents may drop off electronic waste Monday through Saturday during landfill hours. This material is stored in the SW

corner of the white goods/scrap metal area or within the HHW Facility also. Materials are removed by a private recycling contractor for proper recycling.

## CONTINGENCY PLAN AND EMERGENCY PROCEDURES

The following procedures serve as the Facility's guideline for Contingency Plan. Specific information may be located in the Manatee County Solid Waste Division All Hazard Plan

### 14.1. PURPOSE AND IMPLEMENTATION OF CONTINGENCY PLAN

The contingency plan should be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

The provision of the plan should be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents that could threaten human health or the environment.

### 14.2. CONTENT OF CONTINGENCY PLAN

The contingency plan describes the actions facility personnel should take to protect the public from potential health and safety hazards in response to fire, explosion or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility.

The plan lists names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator (as described later). This list should be kept up to date. Where more than one person is listed, one should be named as primary emergency coordinator and others should be listed in the order in which they will assume responsibility as alternates.

The plan includes a list of all emergency equipment at the facility (i.e., fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), where this equipment is required. This list should be kept up to date. In addition, the plan should include the location and physical description of each item on the list, and a brief outline of its capabilities.

The plan should include an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan should describe signal(s) to begin evacuation, evacuation routes, and alternate evacuation routes in cases where the primary routes could be blocked by releases of hazardous waste or fires.

### 14.3. COPIES OF CONTINGENCY PLAN

A copy of the contingency plan and all revisions to the plan should be maintained at the HHW Facility, submitted to local police and fire departments, hospitals, and State and local emergency response teams that would be called up to provide emergency services.

### 14.4. CHANGES OF CONTINGENCY PLAN

The contingency plan should be reviewed, and immediately changed if necessary, whenever:

- The plan fails in an emergency.
- The HHW Facility changes in its design, construction, operation, maintenance, or other circumstances in a way that increases the potential for fires, explosions, or release of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency.
- The list of emergency coordinators or emergency equipment changes.

### 14.5. EMERGENCY COORDINATOR

At all times, there should be at least one employee either on the facility premises, or on call (i.e., available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator should be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the locations and characteristics of waste handled the location of all records within the facility, and the facility layout. In addition, this person should have the authority to commit the resources needed to carry out the contingency plan.

The emergency coordinator's responsibilities vary, depending on factors such as type and variety of waste(s) handled by the facility, and type and complexity of coordinator is responsible for.

#### 14.6. EMERGENCY PROCEDURES

Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his/her designee when the emergency coordinator is on call) should immediately:

- Activate internal facility alarms or communication systems, where applicable, to notify all facility alarms or communication systems.
- Notify appropriate State or local agencies with designated response roles if their help is needed.

Whenever there is a release, fire, or explosion, the emergency coordinator should immediately identify the character, exact source, amount, and the extent of any released materials. He or she may do this by observation or review of facility records, or if necessary, by chemical analysis.

Concurrently, the emergency coordinator should assess possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment should consider
both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire, or heat-induced explosions).

If the emergency coordinator determines that the facility has had a release, fire, or explosion that could threaten human health, or the environment, outside the facility, he/she should report his findings as noted below:

- If the assessment indicates that evacuation of local areas may be advisable, the proper authorities should be immediately notified. The emergency coordinator should be available to help appropriate officials decide whether local areas should be evacuated.
- The government official designated as the on-scene coordinator for the area or the State should be notified immediately. The report should include:
  - Name and telephone number of reporter.
  - Name and address of the facility.
  - Time and type of incident (e.g., release, fire, explosion).
  - Name and quantity of material(s) involved, to the extent known.
  - The possible hazards to human health, or the environment outside the facility.

During the emergency, the emergency coordinator shall take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other areas of the facility. These measures should include, where applicable, stopping processes and operations, collecting and containing release waste, and removing or isolating containers.

During an emergency, the emergency coordinator shall monitor for leaks, pressure buildup, gas generation, or ruptures in containers and/or equipment, wherever this is appropriate.

Immediately after an emergency, the emergency coordinator should provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material contaminated by a release, fire, or explosion at the facility.

# OPERATIONS

### 15.1. MAINTENANCE AND OPERATION OF THE FACILITY

The HHW Facility shall be maintained and operated to minimize the possibility of fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water that could threaten human health or the environment.

All HHW Facility communications, alarm system and spill control equipment, where required, shall be tested and maintained in accordance with manufacturer's recommendations and as necessary to assure its proper operation in time of emergency.

HHW Facility personnel shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spills control equipment, and decontamination equipment to any area of facility operation in an emergency.

Whenever hazardous waste facility is staffed, all personnel involved in the operation shall have immediate access to an emergency communication device, either directly or through visual or voice contact with another employee.

Normal operational procedures require one member of personnel on site. This member shall, while in the facility, have immediate access to a two-way radio capable of summoning external emergency assistance. Telephones and/or radios shall not be placed in areas where the atmosphere may be come explosive due to the presence of flammable vapors, dusts, or gases.

#### 15.2. ACCUMULATION TIME

The HHW Facility will be accumulating hazardous waste on site, and shall store the material as follows:

- The waste will be placed in containers. A container is a storage building or a DOT shippable drum.
- The amount of waste accumulated will not place the HHW Facility in violation of any regulations required on a Federal, State, or Local level.
- While being accumulated on-site, each container is labeled with a description of the contents and date.

The household hazardous waste collected for treatment or disposal shall not be accumulated on site for more than 210 days. Once the capacity limit is reached, all hazardous waste collected shall be shipped by a registered transporter to an authorized hazardous waste treatment or disposal facility. The operator may request FDEP approval of a longer accumulation time period for specific wastes that are accumulated slowly.

### 15.3. MANAGEMENT OF CONTAINERS

If a container is not in good condition or if it begins to leak, the operator shall pack the container and its contents in a larger container, seal the container and place it in the proper storage building bay.

The operator shall use containers made of or lined with materials that will not react with, and are otherwise compatible with the waste to be stored, so that the ability of the container to contain the waste is not impaired.

A container shall always be closed during storage except when it is necessary to add or remove waste. Also a container holding waste should not be opened, handled, or stored in a manner that may rupture the container or cause it to leak.

The operator shall inspect areas where containers are stored, at least weekly, looking for leaks and for deterioration caused by corrosion or other factors.

# 15.4. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTE

Containers holding ignitable or reactive waste shall be located within the transfer/containment slab or within the proper hazardous waste storage building bay. An overhead fire suppression system is located in the storage buildings.

The operator shall take precautions to prevent accidental ignition of ignitable waste. This waste shall be separated and protected from sources of ignition including but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. The HHW Facility is a posted no smoking area.

Reactive wastes shall receive special handling as described in this section, and storage as needed to prevent unintentional reactions.

### 15.5. HANDLING REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES

Repackaging or treatment, including bulking or neutralizing of ignitable, reactive, or incompatible waste is not done at this facility. A contracted <u>collectiontransport</u>/disposal vendor removes hazardous waste stored in the storage building.

#### 15.6. MATERIAL REDISTRIBUTION GUIDELINES

In the event Manatee County decides to establish a Material Redistribution Program in the future, the following shall serve as the basic program guideline for facility personnel.

#### 15.6.1 Selection of Materials for Redistribution to the Public

Materials selected for exchange programs should include but not be limited to meet the following minimum criteria:

- Original containers only.
- Original label with ingredients, instructions, and warnings must be present and readable.
- Contents should be visually inspected and should look like correct material in new condition.
- Containers should be at least three-quarters full.

The following items will be excluded from redistribution programs:

- Ammunition.
- Pesticides.
- Reactive materials.
- Cancelled or banned products.
- Poisons.

Each item selected for the redistribution program should be approved by the facility manager or his/her designee.

#### 15.6.2 Storage

Materials designated for redistribution should be stored in a separate area of the HHW Facility. This area will be clearly marked and secured from unauthorized access.

At a minimum, secondary containment sufficient to contain the entire contents of the largest two containers in storage should be provided.

#### 15.6.3 Customers

All customers should be at least 18 years of age and shall be allowed to stop only in the designated area.

#### 15.6.4 Documentation

The redistribution program will develop and use a waiver/inventory form, pre-approved in format by the County Attorney's Office that includes the following elements:

- Customer's printed name and signature.
- Date.
- Name and quantity of each material received.
- Liability statement ("hold harmless" statement).

The form shall be kept on file in the offices of the facility manager or his/her designee.

### PREPAREDNESS AND PREVENTION

### 16.1. ARRANGEMENTS WITH LOCAL AUTHORITIES

The Facility Manager has arrangements with the fire department and emergency response teams for assistance in an emergency. The Facility Manager has familiarized these agencies with the potential need for services, layout of the facility, properties of the facility, types and properties of hazardous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to roads inside the facility, and possible evacuation routes.

Attachment K-2

Household Hazardous Waste Collection And Storage Facility Operations Plan

Lena Road Class I Landfill



#### Manatee County

Utilities Department Solid Waste Division 3333 Lena Road Bradenton, FL 34211

Revised March 2021

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### Figures

Figure K.2.1 HHW Building Floor Plan

### DEFINITIONS

<u>Conditionally Exempt Small Quantity Generators (CESQG)</u>: (40 CFR 261.5) A generator who produces no more than 100 kg (220 lbs) of hazardous waste or no more than 1 kg of acutely hazardous waste per month.

Contingency Plan: A document setting out an organized, planned, and coordinated course of action.

<u>Hazardous Material</u>: A substance or material including a hazardous substance, which has been determined by the Secretary of Transportation capable of posing an unreasonable risk to health, safety, and property during transportation.

<u>Household Hazardous Waste Collection and Storage Facility</u>: A facility established by the Manatee County Board of County Commissioners to provide hazardous waste disposal services to households.

Household: Single and multiple dwellings and other residential sources within Manatee County.

<u>Personal Protective Equipment</u>: Equipment used to protect individuals from chemical, physical and biological hazards.

<u>Training</u>: Instruction in the use of equipment, personal protective equipment, site safety and handling.

### HISTORY

The Manatee County Household Hazardous Waste Collection and Storage Facility (HHW Facility) opened in May 1993 within the Stage III Landfill. This facility was removed as solid waste filled the Stage III Landfill.

The Administration Facilities includes a household hazardous waste collection and storage facility. The facility floor plan is shown on Figure K.2.1. The building includes forced air ventilation, dry chemical fire suppression system, and storage for hazardous waste. The building is engineered to comply with EPA, NAPA, and OSHA standards and regulations for storing hazardous chemicals and wastes. The building is also corrosion resistant and features secondary containment for the prevention of spills or leaks. The facility has a concrete slab and is under a roof as shown on the figures. The materials processed and the method of processing remains the same.

### FACILITY PROGRAM

The Manatee County HHW Facility is located at 3333 Lena Road, Bradenton, Florida. The Facility has a secured storage building specifically designed for the storage of hazardous materials and/or wastes. The major components of the HHW Facility are as follows:

- Security System: The entire site is fenced with a six (6) foot high chain link fence. Six gates provide ingress and egress to the facility. When not in use, the facility is locked and secured. A double security exists in that the main access road into the County Landfill has a gate and is secured when the Landfill is not in operation.
- Containment and Storage System: The storage building is specifically designed for hazardous materials featuring secondary containment in the event of a spill. The building is equipped with forced air ventilation and dry chemical fire suppression systems. The building has separate storage bays. A heavy-duty locked aluminum storage cabinet anchored to a concrete slab serves as the ammunition locker and does not have a dry chemical fire suppression system.
- Other hazardous materials storage is under roof along with covered containment areas for storage of fluorescent bulbs in a closed rack system, surrounded by a concrete curbing and waste oil tanks that are in submerged containment area surrounded by cement reinforced containment.
- The storage buildings sit flush with an impervious, slightly sloped, reinforced containment area. The Facility is located inside the confines of the Manatee County Solid Waste Management Landfill Facility.

The facility is open to Manatee County residents Monday through Friday from 8:00 a.m. to 5:00 p.m. and on the third Saturday of each month from 9:00 a.m. to 3:00 p.m. Wastes that are classified as medical or radioactive are not accepted. There is not a disposal weight limit during the collections and disposal is provided free of charge to County residents. The cost of the program is funded by landfill disposal tipping fees.

Events are held at several sites throughout Manatee County in the spring and fall of the year. Siting locations of the event are at the HHW Lena Road Landfill Facility and at the Utilities Department Complex, 4501 4410 66<sup>th</sup> Street West, Bradenton, Florida, Palmetto Fairgrounds, 1303 17<sup>th</sup> St. W. Palmetto, Florida and various other County locations. Commercial HHW collection information is provided to the commercial generator categories under the same rate schedule as that of Manatee County.

Monthly collections/events are operated by the certified Recycling Supervisor in the HHW Facility located at the Landfill. The contracted collection/disposal vendor is on site at the collection to assist with unloading. The contractor bulks and lab packs any of the waste material received during the

collection. Partial containers are stored in the HHW Facility until the following monthly collection. The Recycling Supervisor reviews all paperwork and has the responsibility of approving and signing outgoing manifests.

The monthly and occasional events described in the previous paragraphs are advertised in the County's utility billing and the local radio adds. General Household Hazardous Waste program information is available on the County's website at www.mymanatee.org/hhw.

### CONTAINMENT

#### 4.1. CONTAINMENT

- Containers of paint adjacent to the outside containment areas on concrete slabs covered with plastic sheeting prior to removal by the contracted vendor.
- Propane tanks and electronic waste (e-scrap) are stored in designated areas on the concrete slab inside the HHW building.
- Other wastes such as small flammables and pesticides are contained in the storage building.
- Storm water shall be prevented from accumulating within in-service containment structures.

### WASTE ACCEPTANCE CRITERIA

### 5.1. HOUSEHOLD WASTE

Household Hazardous Wastes are accepted Monday through Friday from 8:00 a.m. to 5:00 p.m. and on the third Saturday of each month from 9:00 a.m. to 3:00 p.m. The waste must fall within the categories permitted by the contracted collection/disposal vendor and not be of a radioactive, bio-hazardous or medical nature. A residential disposer must also have generated the waste.

### 5.2. CESQG WASTE

CESQG waste is collected by arrangement directly between the contracted collection/disposal vendor and the generator.

### PERSONNEL

#### 6.1. TRAINING

Facility personnel must successfully complete a 24-hour OSHA training program that teaches performance of duties in a way that ensures the facility is operated in a manner that protects them and the public from potential health and safety hazards at the site and is protective of the environment.

The instructor providing the training includes appropriate aspects of hazardous waste/material management including selection of protective clothing and equipment and emergency response. At a minimum, the training program is designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems, including where applicable:

- Contact list for departments to respond to fire and/or explosions, discharges to the land surface; incidents
- Shutdown of operations

Facility personnel shall take part in annual eight (8) hour refresher training.

Facility personnel has on staff at least one person who has no less than 24 hours training in appropriate aspects of hazardous waste/material management whenever waste is being received and whenever any hazardous material is being bulked or otherwise treated.

# RECORDS

The following documents and records shall be maintained at the Facility offices:

- A record of all personnel engaged in work, either full-time or temporary.
- Facility personnel who have completed a record of training.

### PERSONNEL TRAINING REQUIREMENTS

All County personnel participating in the HHW collection programs shall be trained to the appropriate level for their participation. All trained County personnel are specifically trained as Hazardous Waste Collection Staff. The Recycling Supervisor is responsible for enforcing all safety policies. The following guidelines outline the training requirements to be completed by personnel so they may safely work with hazardous materials during the collection programs. This training will, therefore, reduce the potential for hazardous material-related accidents.

### 8.1. UNLOADERS/PAINT SORTERS

Training for this level is limited to on-the-job instruction. Personnel trained will have minimal contact with the waste, but will work under the direction of the Recycling Supervisor. After initial screening of the waste, personnel will unload the waste from the vehicles into carts. Collected paint containers are placed in containers for collection by contracted collection/disposal vendor.

### 8.2. FACILITY STAFF

Training for this level of participation includes both classroom instruction and on-the-job training. Staff assists with opening and closing the Facility, screening incoming materials, and assisting with spills, releases, or any other emergency. Specific training includes, but is not limited to:

HAZWOPER Operational Level (29 CFR 1910.120) On-the-job training in accepting, identifying, segregating, and sorting waste Hazardous waste rules and regulations

### 8.3. HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (29 CFR.1910.120)

The objective of this training is to provide personnel with the knowledge and skills necessary to safely and successfully respond to any on-site spills and/or releases. A five level classification system is used to provide appropriate training to indicate the scope of their authorized response activities:

First Responder Awareness Level First Responder Operations Level Hazardous Materials Technician Hazardous Materials Specialist On-Scene Incident Commander

Personnel trained in accordance with this Section shall receive annual refresher training of sufficient content and duration to maintain their competency.

### PERSONNEL PROTECTION EQUIPMENT

Personal Protective Equipment (PPE) is used to limit exposure to various hazardous materials and wastes at the Hazardous Waste Collection and Storage Facility. PPE is necessary when handling hazardous materials to prevent skin contact with harmful substances. Whenever removing and/or working with hazardous materials or waste, personnel are required to wear, at a minimum, the following protective equipment.

### 9.1. UNLOADERS/PAINT SORTERS

- Safety glasses
- Protective gloves
- Protective apron (optional)
- Steel-toed boots or safety shoes

### 9.2. FACILITY STAFF

- Safety glasses
- Protective gloves
- Respirator with organic vapor cartridge on high efficiency particulate air filter (HEPA), if necessary, as determined by the waste material being handled.
- Steel-toed boot or safety shoes
- Protective apron

In the event of a spill or release of a hazardous material or waste, the following protective equipment is on site:

• Full-faced air purifying respirators

When specialized training is required to properly utilize personal protective equipment, this training must be provided to the employee prior to its use.

### SPILL/RELEASE PROCEDURES

The Recycling Supervisor shall be properly trained in hazardous material emergency response to efficiently mitigate, contain, and clean up any accidental spill/release that might occur at the HHW Facility. At all times, the safety of personnel and program participants are the primary concern.

The following will be considered emergencies at the Facility:

- Fire or smoke is noticed
- An explosion occurs
- A leak or spill is discovered
- Medical emergencies, including heat induced injuries
- Discovery of explosive devices

When a spill/release or any other emergency occurs, the following guidelines will be followed:

- Cease operations/perform initial size up
- Make mental note of nature, extent, source, and amount of any released product
- Evaluate potential harm to human health and the environment
- Scene control. Keep all unauthorized persons away from the scene
- Protect individuals directing them, if not contaminated, away from the scene
- If flammable materials are involved, check for all ignition sources
- Take measures to contain release or fire from spreading to other hazardous areas as quickly as possible
- Notify 911 if warranted
- Notify Superintendent of Solid Waste Enforcement, if necessary
- Notify State Warning Point if reportable quantity
- Perform basic first aid to stabilize any victims until EMS arrives
- Clean up any spills using compatible materials
- Place waste in proper container for disposal through the County's Hazardous Waste Transporter

Under no circumstances will the health and safety of County staff be placed in harm's way in the attempt to handle suspected explosives. If explosives are discovered, evacuate the immediate area, cease traffic flow, and notify the Manatee County Sheriff's Department Haz-Mat Team.

If a reportable quantity of a hazardous material has been spilled or released, a follow-up written report must follow within fifteen working days and be filed with the State Emergency Response Center.

An eyewash station and shower is permanently installed on site. In the event of materials being splashed into staff's eyes, minimum eyewash of fifteen minutes shall take place.

### EQUIPMENT

Following is a partial list of the equipment on site:

Forklift with drum grabber Fire extinguishers Funnels Shovels and brooms 3 and 5 gallon buckets Absorbent Neutralizing agents Eyewash station and shower

Assorted tools Utility carts 55-gallon drums Traffic cones Assorted tape Two-way radio communication

### SAFETY

Safety is the primary concern of all personnel participating at the HHW Facility. Appropriate staff is instructed in how to handle emergencies as well as site safety. The collection program is maintained in a neat and organized manner at all times. Good housekeeping practices are followed. The unloading area will be kept clean and free of excess materials. It is the responsibility of all HHW Facility staff to follow these guidelines. No smoking signs are posted. Smoking is prohibited at the HHW Facility.

HHW Facility staff will assist participants by unloading vehicles, answering questions about proper disposal methods and handing out informational literature as necessary. Only hazardous waste generated by residential customers will be accepted during the HHW disposal programs. In the event a participant arrives to dispose of waste generated from a business, the CESQG hazardous waste disposal program will be explained and contractor contact information provided.

Following are guidelines to follow in processing the participants' waste.

### 12.1. SAFETY PROCEDURES

HHW Facility staff will, at all times, act in a safe manner. Work practices are carried out to minimize or eliminate the possibility of an injury-related accident. Proper ergonomics are followed. All personnel use correct lifting techniques in order to prevent injury to the body. Containers are removed from vehicles one at a time into the utility carts.

Appropriate Personal Protective Equipment (PPE) is worn when handling hazardous waste. Close attention is given to staff during the summer months to reduce the risk of heat related injuries. All Facility staff monitor themselves for any signs or symptoms of heat stress and act accordingly.

### 12.2. REMOVAL FROM VEHICLES

Traffic is directed from the scale house and/or by signs on the entrance road of the Landfill to the HHW Facility site. Signs to a stopping point direct all incoming cars where participants will be greeted by trained County staff. An initial spotting of the chemicals is performed before removal of chemicals from the vehicle. The participants are questioned on the contents of any unknown materials or unmarked containers. If any unacceptable or unknowns are spotted, personnel will immediately notify the Recycling Supervisor.

The waste from the vehicles will then be unloaded into carts by the HHW Facility staff. Participants remain in or at their vehicles. This reduces the risks of spills or injuries. HHW Facility staff evaluates the contents as they unload. If any leaking containers are spotted, the container will be placed into an additional container. The participant will be informed of the leak. It is not the responsibility of contractor or facility staff to clean up the leak or spill in the participant's vehicle beyond the initial containment.

### WASTE SEGREGATION

County and contractor personnel transport the waste from the vehicles to the preliminary sorting areas. Cardboard boxes are flattened then placed in a dumpster designated for cardboard recycling. Any packaging, similar debris, and/or household trash will be removed and placed in the dumpsters designated for trash. The HHW technician and contractors examine all materials received. The waste is then sorted, bulked and lab packed into the appropriate shipping containers for removal. Usually used motor oil, pesticides, paints, and flammables represent the majority of the waste received.

### 13.1.LOCKER STORAGE

Each chemical storage unit is clearly labeled with DOT placards.

Wastes are stored according to their primary hazard. The basic categories of wastes are as follows:

- Flammables
- Pesticides
- Poisons
- Corrosives

The Recycling Supervisor shall have the final decision on what wastes to accept or not accept, classification, and any other decision regarding the waste.

#### 13.2. WASTE BULKING

Only the HHW technician and/or Recycling Supervisor, along with the contracted collection/disposal vendor, determines which wastes should be bulked. All labels are read before bulking any wastes together to ensure compatibility. Safety is the major factor in bulking. No bulking shall take place in inclement weather.

Containers of compatible waste are opened and drained directly into fifty-five gallon drums. When the drum is full or bulking is discontinued for the work period, the lid shall be securely replaced. A small space for vapor expansion shall be left at the drumhead space.

Drums are required to have the proper markings adhered to them. The markings are placed so that they are clearly visible. The HHW marking contains the following information:

- The material contents
- The accumulation start date

The proper marking procedure is applied at the beginning of the bulking procedure.

Bulking of any material takes place when needed. Items to be bulked may include the following:

- Latex based paints
- Oil based paints
- Antifreeze
- Motor oil and transmission fluid

The wastes are compatible for bulking, and are only bulked if clearly identified by sight, smell, container, label and source. Any wastes that are not clearly identifiable are not bulked, and the unknown wastes are sent with contractor.

Paint is placed in a lined, roll-off container provided by the collection/disposal vendor. is bulked into a 55-gallon steel drum when needed, and generally removed the same day or within 24-hours. If paint is spilled, it is contained on the plastic sheet by absorbent pads or absorbent. All paint is currently collected and placed in containers which are stored on Visqueen. All paint is sent out for disposal by the collection/disposal vendor.

Antifreeze is bulked into a 55-gallon drum. If antifreeze is spilled it is contained on the plastic sheet by absorbent pads or absorbent.

Motor oils and transmission fluids are poured into a 20 gallon tank then pumped (or poured using a funnel) into 500-gallon storage tanks or in 375 or 275 gallon portable tanks.

### 13.3. UNKNOWNS

Unknowns are accepted. These items are materials that cannot be identified by either original labels or by participant knowledge. The following procedures are adhered to:

- Unknowns will be sent out with the contractor.
- Place material into appropriate storage building according to suspected hazards.

#### 13.4. ELECTRONIC WASTE

Electronic waste such as TVs, computer monitors, microwave ovens, telephones, keyboards, VCRs, radios, etc. are received at the Household Hazardous Waste Collection. The materials are sorted, palletized, shrink wrapped or put in Gaylord boxes . The pallets of materials and/or Gaylord boxes are stored under the roof of the HHW Facility until the contractor comes to pick them up. The contracted e-scrap recycler removes the e-scrap for processing and recycling. Broken glass and components from broken units is swept up and properly disposed.

Electronic waste is also collected curbside by the contracted waste haulers. The hauler brings the materials to the landfill to be stored in the designated area which is the SW corner of the white goods/scrap metal concrete pad or within the HHW Facility. Additionally, residents may drop off electronic waste Monday through Saturday during landfill hours. This material is stored in the SW corner of the white goods/scrap metal area or within the HHW Facility also. Materials are removed by a private recycling contractor for proper recycling.

### CONTINGENCY PLAN AND EMERGENCY PROCEDURES

The following procedures serve as the Facility's guideline for Contingency Plan. Specific information may be located in the Manatee County Solid Waste Division All Hazard Plan

### 14.1. PURPOSE AND IMPLEMENTATION OF CONTINGENCY PLAN

The contingency plan should be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

The provision of the plan should be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents that could threaten human health or the environment.

### 14.2. CONTENT OF CONTINGENCY PLAN

The contingency plan describes the actions facility personnel should take to protect the public from potential health and safety hazards in response to fire, explosion or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility.

The plan lists names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator (as described later). This list should be kept up to date. Where more than one person is listed, one should be named as primary emergency coordinator and others should be listed in the order in which they will assume responsibility as alternates.

The plan includes a list of all emergency equipment at the facility (i.e., fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), where this equipment is required. This list should be kept up to date. In addition, the plan should include the location and physical description of each item on the list, and a brief outline of its capabilities.

The plan should include an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan should describe signal(s) to begin evacuation, evacuation routes, and alternate evacuation routes in cases where the primary routes could be blocked by releases of hazardous waste or fires.

### 14.3. COPIES OF CONTINGENCY PLAN

A copy of the contingency plan and all revisions to the plan should be maintained at the HHW Facility, submitted to local police and fire departments, hospitals, and State and local emergency response teams that would be called up to provide emergency services.

### 14.4. CHANGES OF CONTINGENCY PLAN

The contingency plan should be reviewed, and immediately changed if necessary, whenever:

- The plan fails in an emergency.
- The HHW Facility changes in its design, construction, operation, maintenance, or other circumstances in a way that increases the potential for fires, explosions, or release of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency.
- The list of emergency coordinators or emergency equipment changes.

### 14.5. EMERGENCY COORDINATOR

At all times, there should be at least one employee either on the facility premises, or on call (i.e., available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator should be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the locations and characteristics of waste handled the location of all records within the facility, and the facility layout. In addition, this person should have the authority to commit the resources needed to carry out the contingency plan.

The emergency coordinator's responsibilities vary, depending on factors such as type and variety of waste(s) handled by the facility, and type and complexity of coordinator is responsible for.

#### 14.6. EMERGENCY PROCEDURES

Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his/her designee when the emergency coordinator is on call) should immediately:

- Activate internal facility alarms or communication systems, where applicable, to notify all facility alarms or communication systems.
- Notify appropriate State or local agencies with designated response roles if their help is needed.

Whenever there is a release, fire, or explosion, the emergency coordinator should immediately identify the character, exact source, amount, and the extent of any released materials. He or she may do this by observation or review of facility records, or if necessary, by chemical analysis.

Concurrently, the emergency coordinator should assess possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment should consider

both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire, or heat-induced explosions).

If the emergency coordinator determines that the facility has had a release, fire, or explosion that could threaten human health, or the environment, outside the facility, he/she should report his findings as noted below:

- If the assessment indicates that evacuation of local areas may be advisable, the proper authorities should be immediately notified. The emergency coordinator should be available to help appropriate officials decide whether local areas should be evacuated.
- The government official designated as the on-scene coordinator for the area or the State should be notified immediately. The report should include:
  - Name and telephone number of reporter.
  - Name and address of the facility.
  - Time and type of incident (e.g., release, fire, explosion).
  - Name and quantity of material(s) involved, to the extent known.
  - The possible hazards to human health, or the environment outside the facility.

During the emergency, the emergency coordinator shall take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other areas of the facility. These measures should include, where applicable, stopping processes and operations, collecting and containing release waste, and removing or isolating containers.

During an emergency, the emergency coordinator shall monitor for leaks, pressure buildup, gas generation, or ruptures in containers and/or equipment, wherever this is appropriate.

Immediately after an emergency, the emergency coordinator should provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material contaminated by a release, fire, or explosion at the facility.

# OPERATIONS

### 15.1. MAINTENANCE AND OPERATION OF THE FACILITY

The HHW Facility shall be maintained and operated to minimize the possibility of fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water that could threaten human health or the environment.

All HHW Facility communications, alarm system and spill control equipment, where required, shall be tested and maintained in accordance with manufacturer's recommendations and as necessary to assure its proper operation in time of emergency.

HHW Facility personnel shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spills control equipment, and decontamination equipment to any area of facility operation in an emergency.

Whenever hazardous waste facility is staffed, all personnel involved in the operation shall have immediate access to an emergency communication device, either directly or through visual or voice contact with another employee.

Normal operational procedures require one member of personnel on site. This member shall, while in the facility, have immediate access to a two-way radio capable of summoning external emergency assistance. Telephones and/or radios shall not be placed in areas where the atmosphere may be come explosive due to the presence of flammable vapors, dusts, or gases.

#### 15.2. ACCUMULATION TIME

The HHW Facility will be accumulating hazardous waste on site, and shall store the material as follows:

- The waste will be placed in containers. A container is a storage building or a DOT shippable drum.
- The amount of waste accumulated will not place the HHW Facility in violation of any regulations required on a Federal, State, or Local level.
- While being accumulated on-site, each container is labeled with a description of the contents and date.

The household hazardous waste collected for treatment or disposal shall not be accumulated on site for more than 210 days. Once the capacity limit is reached, all hazardous waste collected shall be shipped by a registered transporter to an authorized hazardous waste treatment or disposal facility. The operator may request FDEP approval of a longer accumulation time period for specific wastes that are accumulated slowly.

### 15.3. MANAGEMENT OF CONTAINERS

If a container is not in good condition or if it begins to leak, the operator shall pack the container and its contents in a larger container, seal the container and place it in the proper storage building bay.

The operator shall use containers made of or lined with materials that will not react with, and are otherwise compatible with the waste to be stored, so that the ability of the container to contain the waste is not impaired.

A container shall always be closed during storage except when it is necessary to add or remove waste. Also a container holding waste should not be opened, handled, or stored in a manner that may rupture the container or cause it to leak.

The operator shall inspect areas where containers are stored, at least weekly, looking for leaks and for deterioration caused by corrosion or other factors.

# 15.4. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTE

Containers holding ignitable or reactive waste shall be located within the transfer/containment slab or within the proper hazardous waste storage building bay. An overhead fire suppression system is located in the storage buildings.

The operator shall take precautions to prevent accidental ignition of ignitable waste. This waste shall be separated and protected from sources of ignition including but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. The HHW Facility is a posted no smoking area.

Reactive wastes shall receive special handling as described in this section, and storage as needed to prevent unintentional reactions.

### 15.5. HANDLING REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES

Repackaging or treatment, including bulking or neutralizing of ignitable, reactive, or incompatible waste is not done at this facility. A contracted collection/disposal vendor removes hazardous waste stored in the storage building.

#### 15.6. MATERIAL REDISTRIBUTION GUIDELINES

In the event Manatee County decides to establish a Material Redistribution Program in the future, the following shall serve as the basic program guideline for facility personnel.

#### 15.6.1 Selection of Materials for Redistribution to the Public

Materials selected for exchange programs should include but not be limited to meet the following minimum criteria:

- Original containers only.
- Original label with ingredients, instructions, and warnings must be present and readable.
- Contents should be visually inspected and should look like correct material in new condition.
- Containers should be at least three-quarters full.

The following items will be excluded from redistribution programs:

- Ammunition.
- Pesticides.
- Reactive materials.
- Cancelled or banned products.
- Poisons.

Each item selected for the redistribution program should be approved by the facility manager or his/her designee.

#### 15.6.2 Storage

Materials designated for redistribution should be stored in a separate area of the HHW Facility. This area will be clearly marked and secured from unauthorized access.

At a minimum, secondary containment sufficient to contain the entire contents of the largest two containers in storage should be provided.

#### 15.6.3 Customers

All customers should be at least 18 years of age and shall be allowed to stop only in the designated area.

#### 15.6.4 Documentation

The redistribution program will develop and use a waiver/inventory form, pre-approved in format by the County Attorney's Office that includes the following elements:

- Customer's printed name and signature.
- Date.
- Name and quantity of each material received.
- Liability statement ("hold harmless" statement).

The form shall be kept on file in the offices of the facility manager or his/her designee.

### PREPAREDNESS AND PREVENTION

### 16.1. ARRANGEMENTS WITH LOCAL AUTHORITIES

The Facility Manager has arrangements with the fire department and emergency response teams for assistance in an emergency. The Facility Manager has familiarized these agencies with the potential need for services, layout of the facility, properties of the facility, types and properties of hazardous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to roads inside the facility, and possible evacuation routes.







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REVISION: DEC. 2020

STORAGE FACILITY OPERATION PLAN FLOOR PLAN

FIGURE K - 2 - 1

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FIGURE K-2-2

REVISION: DEC 2020

1 8" CMU WALLS

2 TYPICAL RIGID FRAME WITH TAPERED COLUMNS

DRAWING NOTES 🗇

- 3 STANDING SEAM METAL ROOF
- CONCRETE SLAB (SEE STRUCTURAL DRAWINGS)
- 5 8" PIPE BOLLARDS
- SEE STRUCTURAL DRAWINGS FOR FOUNDATION
- T METAL WALL PANELS
- ALUMINUM GUTTER AND DOWNSPOUT
- 9 PRE-ENGINEERED METAL BUILDING TRUSS
- RELOCATED EXISTING HAZARDOUS MATERIAL
- TI> RECESSED OIL STORAGE CONTAINMENT AREA (BEYOND)

Attachment K-3

List of Heavy Equipment

# Landfill Equipment List

	Quantity
Air Compressor, Sullair	1
Excavator, Caterpillar 308CR	1
Bulldozer, Caterpillar D6	3
Bulldozer, Caterpillar D8	2
Club Car	1
Compactor, Caterpillar 836H	2
Dump Truck, Caterpillar 740	3
Excavator, Caterpillar 349FL	1
Excavator, Caterpillar 349CL	1
Freightliner Fuel Truck	1
Forklift, Yale Veractor 60VX	1
Gator, John Deere	6
Generator - Admin & Ops Kohler	2
Generator - CDO, Caterpillar	1
Generator - Scalehouse, Ram Power	1
Grader, Caterpillar 143H	1
Loader, Caterpillar 950	3
Mowing Deck, 8' Bosh Hog	1
Mowing Deck, 20' Flex Deck	2
Pump, Thompson 6V-DPRT-1004CPU	2
Riding Lawnmower	2
Roll Off Containers	8
Roll Off Truck, International	1
Scraper, Caterpillar 623G	1
Street Sweeper, Tennant	1
Tarpomatic, 28T	2
Trailer, Tow Master T20	1
Tractor, John Deere 6175M	1
Tractor, John Deere 6120	1
Tractor, John Deere 6175M	1
Truck, International 4300 Refueler	1
Vibratory Roller, Saki	1
Water Wagon, Caterpillar 725C	1
Welder W/Plasma Cutter	1
Appendix C Operation Drawings

# MANATEE COUNTY UTILITIES DEPARTMENT LENA ROAD LANDFILL STAGE II FILL SEQUENCE OPERATION DRAWINGS MANATEE COUNTY, FLORIDA MARCH 2021



# **MANATEE COUNTY BOARD OF COUNTY COMMISSIONERS**

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SCALE FEET

SCS ENGINEERS

STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 3922 COCONUT PALM DRIVE, SUITE 102 TAMPA, FL 33619 PH. (813) 621-0080 FAX. (813) 623-6757 FIRM REGISTRATION RY 4892 WWW.SCSENGINEERS.COM SCS PROJECT NO. 09217088.18

## **Sheet List Table**

Sheet Number	Sheet Title
1	COVER SHEET
2	GENERAL SITE PLAN
3	EXISTING GRADES -1
4	<b>EXISTING GRADES - 2</b>
5	SEQUENCE 3
6	SEQUENCE 4
7	SEQUENCE 5
8	SEQUENCE 6
9	SEQUENCE 7
10	SEQUENCE 8
11	SEQUENCE 9
12	PROPOSED FINAL COVER
13	SECTIONS
14	DETAILS 1
15	DETAILS 2

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SHANE R. FISCHER, P.E. LICENSE NO. 58026

7/22 /2021





AERIAL IMAGE PROVIDED BY PICKETT AND ASSOCIATES, INC. - FLIGHT DATE JANUARY 28, 2020.







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## SURVEYOR NOTES

1. SURVEY CONDUCTED BY PICKETT AND ASSOCIATES, INC. 475 SOUTH FIRST AVENUE BARTOW, FLORIDA ON JANUARY 28, 2020 USING LIDAR AND PHOTOGRAMMETRIC METHODS.

2. THE COORDINATES ASSOCIATED WITH THE TOPOGRAPHIC SURVEY ARE REFERENCED TO THE WEST ZONE OF THE FLORIDA STATE PLANE COORDINATE SYSTEM, NAD 83, 1990 ADJUSTMENT.

3. ELEVATIONS ARE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

## LEGEND











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## LEGEND

LEACHATE FORCEMAIN LEACHATE GRAVITY LINE **PROPERTY LINE** SLURRY WALL LEACHATE MANHOLE



SHEET 4 of 15





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## LEGEND



CONTOURS - EXISTING
CONTOURS - PROPOSED
LEACHATE FORCEMAIN
LEACHATE GRAVITY LINE
STORMWATER PIPE - EXISTING
FILL DIRECTION
LEACHATE MANHOLE
LIFT STATION - EXISTING
ROAD - PAVED
ROAD - UNPAVED
SLOPE BREAK SYMBOL
SURFACE WATER FLOW





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-	FILL DIRECTION
© MH ##	LEACHATE MANHOLE
LIFT STATION	LIFT STATION - EXISTING
	ROAD - PAVED
	ROAD - UNPAVED
	SLOPE BREAK SYMBOL
	SURFACE WATER FLOW

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## NOTES:

- 1. THIS SEQUENCE INCLUDES THE EXCAVATION OF THE CENTRAL PORTION OF STAGE II NORTH OF FILL SEQUENCE 3 IN THREE DIFFERENT PHASES. EXCAVATION SHALL START ON THE WEST SIDE OF THE FILL SEQUENCE AND PROCEED EAST. EACH SUB-SEQUENCE SHALL BE FILLED STARTING FROM THE SOUTH AND PROCEEDING NORTH. WASTE SHALL BE COMPACTED IN LIFTS UP TO THE GRADES SHOWN FOR THIS SEQUENCE.
- OPERATORS WILL ACHIEVE THE ELEVATIONS SHOWN ON THIS SEQUENCE BY USING THEIR CAD AIDED EARTHWORK SYSTEM (CAES) GIS BASED EQUIPMENT MOUNTED ON THE LANDFILL COMPACTORS.
- 3. TEMPORARY BERMS MIGHT BE NEEDED TO DIVERT THE RUNOFF AWAY FROM THE FILL AREA.
- 4. INITIAL COVER CONSISTING OF 6 INCHES OF SOIL SHALL BE APPLIED AT THE END OF EACH WORKING DAY OVER EXPOSED WASTE. TEMPORARY COVER SUCH AS TARPAULINS MAY BE USED IF WASTE WILL NOT BE EXPOSED FOR MORE THAN 18 HOURS. THE FREQUENCY OF COVER APPLICATION SHALL BE INCREASED IF WIND OR RAIN IS DISPERSING WASTE.
- 5. IN AREAS THAT WILL NOT RECEIVE WASTE WITHIN 180 DAYS, OPERATORS WILL APPLY 12 INCHES OF INTERMEDIATE COVER SOIL OVER THE EXISTING 6 INCHES OF INITIAL COVER.
- 6. AREAS WITH INITIAL OR INTERMEDIATE COVER SHALL BE INSPECTED AT LEAST WEEKLY, DEPENDING ON WEATHER CONDITIONS, FOR DAMAGE. DAMAGED AREAS SHALL BE REPAIRED AS QUICKLY AS OPERATIONS PERMIT. DAMAGED AREAS SHALL BE COVERED WITH SOD, SEED, OR MULCH TO PROTECT THE AREAS FROM ADDITIONAL DAMAGE.

## LEGEND



CONTOURS - EXISTING
CONTOURS - PROPOSED
LEACHATE FORCEMAIN
LEACHATE GRAVITY LINE
STORMWATER PIPE - EXISTING
FILL DIRECTION
LEACHATE MANHOLE
LIFT STATION - EXISTING
ROAD - PAVED
ROAD - UNPAVED
SLOPE BREAK SYMBOL
SURFACE WATER FLOW











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SCS ENGINEERS		3922 COCONUT PALM DRIVE, SUITE 102, TAMPA, FL 33619	PH (813) 621-0080 FAX NO. (813) 623-6757 4410 66TH STREET WEST	FLORIDA FIRM REGISTRATION RY-4892 READENTON FLORIDA 34210	PROJ. NO. 09217088.18 KKC/ALD SRF	DSN. BY: CHK. BY: WJE APP. BY: SRF









Appendix D Jetclean Report

## **FLORIDA JETCLEAN**

HIGH PRESSURE WATER JETTING EXPLOSION PROOF VIDEO INSPECTION VACUUM TRUCK SERVICES WWW.FLORIDAJETCLEAN.COM 7538 DUNBRIDGE DRIVE ODESSA, FL 33556 T: 800-226-8013 / F: 813-926-4616 FLORIDAJETCLEAN@YAHOO.COM

# SCS Engineers Manatee County Solid Waste Lena Road Landfill – Stages I-III Existing LCS Pipe Jetclean & Inspection

## Work Performed August 2020

Conducted By: Florida Jetclean 800-226-8013

## **FLORIDA JETCLEAN**

HIGH PRESSURE WATER JETTING EXPLOSION PROOF VIDEO INSPECTION VACUUM TRUCK SERVICES WWW.FLORIDAJETCLEAN.COM 7538 DUNBRIDGE DRIVE ODESSA, FL 33556 T: 800-226-8013 / F: 813-926-4616 FLORIDAJETCLEAN@YAHOO.COM

#### **REPORT**

DATE	: 8/10/2020
ТО	: Johnny Edwards. – SCS Engineers
FROM	: Ralph Calistri (floridajetclean@yahoo.com)
SUBJECT	: Manatee County – Lena Road LF – 2020 LCS Jetclean & Video Inspection

Florida Jetclean completed the high-pressure water-jetting of the Stage I-III leachate collection piping at the above landfill on 8/5/2020. An additional mobilization was also required on 8/10/20 to conduct explosion-proof video-inspection services on selected areas of this system. The jetting log (below) documents the pipes that were addressed, as well as the jetting distances that were achieved in each pipe. The video-inspection logs are also provided below for reference, with the video-inspection footage supplied in .mp4 format on flash drive to customer on site.

#### HIGH-PRESSURE WATER-JETTING:

STAGE 1:		
MH 1 to MH 2	1,042'	Entire pipe
MH 3 to MH 2	1,025'	Entire pipe
MH 3 to MH 4	790'	Entire pipe
MH 4 to MH 5	1,090'	Entire pipe
MH 1 to MH 11	1,100'	Entire pipe (2,075') through overlap
MH 11 to MH 1	1,100'	Entire pipe (2,075') through overlap
MH 11 to MH 10	175'	Entire pipe
MH 7 to MH 6	586'	Entire pipe
MH 7 to MH 8	702'	Entire pipe
LS 2 to MH 5	28'	Entire pipe
LS 1 to MH 10	13'	Entire pipe
MH 8 to MH 10	1,313'	Entire pipe (2,071') through overlap
MH 10 to MH 8	1,100'	Entire pipe (2,071') through overlap
MH 5 to MH 6	311'	Entire pipe
STAGE 2:		
MH J to MH K	65'	Entire pipe
MH K to MH KA1	475'	Entire pipe
MH K1 to MH KA1	409'	Entire Pipe
MH K1 to MH L1	75'	Entire pipe
MH L1 to MH H1	348'	Entire pipe
MH G Lateral to MH G1 Lateral	1,100'	Entire pipe $(1,110')$ through overlap

MH G1 Lateral to MH G Lateral	200'	Entire pipe (1,110') through overlap
MH H to MH J	359'	Entire Pipe
MH G to MH H	335'	Entire pipe
MH F to MH G	335'	Entire pipe
MH F Lateral to MH F1 Lateral	1.100'	Entire pipe (2.087') through overlap
MH F1 Lateral to MH F Lateral	1,100'	Entire pipe (2.087') through overlap
MH E Lateral to MH E1 Lateral	1,100'	Entire pipe (2,117') through overlap
MH E1 Lateral to MH E Lateral	1.100'	Entire pipe (2,117') through overlap
MH F to MH E1A	171'	Entire pipe
MH E to MH E1A	160'	Entire pipe
MH D to MH E	280'	Entire pipe
MH D Lateral to MH D1 Lateral	1,100'	Entire pipe (2,117') through overlap
MH D1 Lateral to MH D Lateral	1,100'	Entire pipe (2,117') through overlap
MH C Lateral to MH C1 Lateral	1,100'	Entire pipe (2,117') through overlap
MH C1 Lateral to MH C Lateral	1,100'	Entire pipe (2,117') through overlap
MH C to MH D	324'	Entire pipe
MH B Lateral to MH B1 Lateral	1,100'	Entire pipe (2,117') through overlap
MH B1 Lateral to MH B Lateral	1,100'	Entire pipe $(2,117')$ through overlap
MH B to MH C	340'	Entire pipe
MH A Lateral to MH A1 Lateral	1,100'	Entire pipe (2,116') through overlap
MH A1 Lateral to MH A Lateral	1,100'	Entire pipe (2,116') through overlap
MH A to MH B	295'	Entire pipe
MH G1 to MH H1	395'	Entire pipe
MH G2 to MH G2A	97'	Entire pipe
MH G2 to MH G1	395'	Entire Pipe
MH G2A to MH G2B	200'	Entire pipe
MH G2B to MH G2C	164'	Entire pipe
MH G2C to G3	59'	Entire Pipe
MH F1 to E1	330'	Entire Pipe
MH D1 to MH C1	329'	Entire pipe
MH E1 to LS 4	20'	Entire Pipe
MH C1 to MH B1	329'	Entire pipe
MH B1 to MH A1	290'	Entire pipe
STAGE 3:		
MH 30 to MH 12	88'	Entire pipe
MH 30 to MH 29	455'	Entire pipe
MH 28 to MH 29	467'	Entire pipe
MH 27 to MH 28	475'	Entire Pipe
MH 26 to MH 27	462'	Entire pipe
MH 26 to MH 25	276'	Entire pipe
MH 25 to LS 3	60'	Entire Pipe
MH 24 to LS 3	105'	Entire Pipe
MH 24 to MH 23	267'	Entire pipe
MH 23 to MH 22	329'	Entire pipe
MH 22 to MH 21	355'	Entire pipe

MH 21 to MH 20 332' Entire pipe	
MH 20 to MH 19 166' Entire Pipe	
MH 19 to MH 19A 37' Entire pipe	
MH 19A to MH 18 412' Entire pipe	
MH 18 to MH 17 450' Entire Pipe	
MH 17 to MH 16 441' Entire pipe	
MH 16 to MH 15 402' Entire pipe	
MH 12 to MH 15 800' Entire pipe throu	gh overlap
MH 15 to MH 12 800' Entire pipe throu	gh overlap

**EXPLOSION-PROOF VIDEO-INSPECTION:** 

Stage 2 – MH G1 to MH G – 1,100' Pipe Clean and Free of Any Defects

All pipes were jetted in their entirety, and are clean and blockage free upon completion. The system appears to flow and drain properly, and appears to be functioning as designed.

Please call us with questions or concerns.

Thank you, Ralph Calistri

Ralph Calistri - Florida Jetclean - 800-226-8013

Appendix E Geotechnical Report Andreyev Engineering (2010)

ENVIRONMENTAL PROTECTION OCT 072010 SOUTHWEST DISTRICT

Report of Geotechnical Engineering Services Lena Road Landfill Stage 2 Manatee County, Florida

September 30, 2010





*CLERMONT OFFICE* 1170 W. Minneola Avenue Clermont, Florida 34711 352-241-0508 Fax: 352-241-0977

Groundwater

Environmental

l 🔻 Geotechnical

Construction Materials Testing

Project No. CPGT-10-0062 September 28, 2010

W

TO: PBS&J 482 South Keller Road Orlando, FL 32810 Attention: Mr. Joseph Miller, P.E.

SUBJECT: Results of Geotechnical Investigation Lena Road Landfill, Stage 2, Manatee County, Florida

Dear Mr. Miller:

Andreyev Engineering Inc. has completed a geotechnical investigation for the Stage 2 portion of the Lena Road Class 1 Landfill operated by Manatee County. This report and the information contained are intended to address geotechnical assessment related items required for landfill design and construction.

We appreciate the opportunity to provide our services on the project and trust that this report is sufficient to address the geotechnical matters related to the project. Should you have any questions regarding this report, please feel free to contact the undersigned.

Sincerely,

ANDREYEV ENGINEERING, INC.



Nicolas E. Andreyev, P.E. President

cc: Manatee County FDEP – Tampa District

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4.0	SCS SOIL SURVEY	3
5.0	PHOTOLINEAMENT STUDY AND SINKHOLE INVENTORY	3
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9.0	SUMMARY AND CONCLUSIONS	9

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- 3 Aerial Photograph
- 4 Photolineament Map
- 5 Documented Sinkhole Map
- 6 Boring Location Map
- 7 Soil Profiles
- 8 Landfill Grading Plan
- 9 Slope Stability Transects
- 8 Landfill Settlement Contours

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- A Bearing Capacity Analysis Results
- B Slope Stability Analysis Results
- C Settlement Analysis Results

#### 1.0 INTRODUCTION

This geotechnical investigation was conducted in support of renewal of the operating permit for the Lena Road Class 1 landfill in Manatee County. We understand the landfill is divided into 3 separate tracts, of which Stage 1 has been filled to capacity and Stage 3 is currently being filled. This work encompasses geotechnical assessment of the remaining stage (Stage 2). We further understand that the 3 stages contain perimeter slurry walls which are keyed into the top of the first confining layer beneath the property.

The investigation presented herein is intended to address FDEP review comments documented in the letter dated June 16, 2010 concerning renewal of the operating permit. Specifically, this investigation addresses items 3a through 3d of the letter, which request additional geotechnical and hydrogeologic information.

#### 2.0 SCOPE OF INVESTIGATION

Our scope of investigation consisted of the following:

- 1. Conducted a detailed review of all previous geotechnical reports and landfill design drawings.
- 2. Investigated the deep subsurface conditions within Stage 2 by drilling nine (9) Standard Penetration Test borings. These additional borings were conducted to provide better coverage of the landfill footprint and investigate deep subsurface conditions in areas where this information is absent. The borings were drilled to depths ranging from 60 to 100 feet. The additional borings were drilled in the areas that were not drilled previously or where previous borings were not drilled sufficiently deep to allow proper assessment for foundation support and settlement analysis.
- 3. Conducted a series of engineering index property tests on the subsurface soils, including:
  - Moisture content
  - Percent fines content
  - Atterberg Limits
- 4. Evaluated the collected field and laboratory test data, prepared location plans, soil profiles, geologic cross sections through the soil boring alignments, presenting subsurface strata in elevation (ft-NGVD).
- 5. Conducted geotechnical evaluations of foundation bearing capacity including justification of selected parameters.
- 6. Conducted circular and block failure slope stability analyses. A total of four (4) slope conditions were be evaluated
- 7. Conducted analyses of immediate and long term settlement under the landfill and developed a settlement contour map using the settlement data points.

- 8. Evaluated the sinkhole potential using available published geologic maps and reports, FAVA report, sinkhole databases, photolineament analysis, and site specific boring data.
- 9. Prepared this comprehensive geotechnical report presenting the results of the testing, assessment of conditions, and engineering evaluations in support of landfill design and response to the FDEP RAI.

#### 3.0 SITE LOCATION AND DESCRIPTION

The site is located in Section 31, Township 34 South, Range 19 East and Section 6, Township 35 South, Range 19 East, Manatee County, Florida. It is approximately 1,500 feet south of Highway 64 and 3,500 feet east of Lena Road. An existing Class 1 landfill which is owned and operated by Manatee County is located immediately south of the project area. The subject property consists of approximately 115 acres and is designated as Stage 2.

Regionally, the site is located in a relatively flat, poorly drained low recharge area. Ground surface elevations occur at approximately +34 to +35 ft-NGVD. Based on review of the USGS quadrangle map (Lorraine FL) the subject property and surrounding area contain wetlands which discharge off-site via small creeks and sloughs which drain to the Manatee River. A site vicinity map is shown superimposed on the USGS quadrangle map on the attached **Figure 1**.

The project will consist of the Stage 2 area located immediately north of the existing Stage 1 landfill. Currently the property consists of a combination of vacant property, yard waste processing area, vehicle storage area, and a borrow pit and pile. An aerial photograph showing the Stage 2 landfill area and the various current uses is shown on the attached **Figure 3**.

We understand that a bentonite slurry wall is constructed around the entire perimeter of Stage 2. The wall extends to the first competent natural clay layer below the site and is intended to be a cutoff for horizontal flow outside the landfill boundaries. In addition, we understand that a series of leachate collection pipes are installed throughout the Stage 2 property and have inverts ranging from +16 to +27 ft-NGVD. The collection piles will also serve to control groundwater level below natural levels found outside the slurry wall.

This property has been the subject of geotechnical engineering studies in the past by Ardaman and Associates, including a comprehensive geotechnical study (reports dated August 29, 1985 and October 31, 1988), and progress reports during slurry wall construction (report dates ranging from June 1989 through August 1989).

### 4.0 S.C.S. SOIL SURVEY

The "Soil Survey of Manatee County, Florida" published by the U.S. Department of Agriculture Soil Conservation Service (S.C.S.) was reviewed. The predominant shallow soil types identified at the site are as follows:

- Eaugallie fine sand (20), which is a nearly level, poorly drained sand. The seasonal high groundwater table is between 10 and 40 inches deep. Permeability is rapid in the surface layer, moderate or moderately rapid in the subsoil, and rapid in the substratum.
- Floridana-Immokalee-Okeelanta (26), which is a nearly level, poorly drained sand. The seasonal high groundwater table is between 25 and 40 inches deep. Permeability is very rapid.

A copy of the SCS Soil Survey is provided in Figure 2.

### 5.0 PHOTOLINEAMENT STUDY AND SINKHOLE INVENTORY

Lineaments are defined as physical features of the earth's surface which are oriented in linear arrangements. Photolineaments are lineaments which are identified using aerial photographs in combination with topographic maps. These surface features typically represent underlying fractures of the limestone bedrock and are represented by trough like depressions, ridges marked by significant vegetation changes or changes in soil colorations. The enhanced topographical surface characteristics of fractures in the underlying limestone are typically caused by increased surface recharge which causes solution of overlying strata.

Vertical fracturing in a carbonate aquifer system can occur from propagation of basement structures through the overlying carbonates in response to crustal flexing caused by earth tides (Blanchet, 1957). Surface lineaments have been long recognized as surface manifestations of underlying vertical to near-vertical zones of fracture concentrations (Lattman and Parizek, 1964). Surface lineaments are typically orthogonally oriented with angles between 45 and 55 degrees east and west of north. In a karst carbonate aquifer system, fracture zones can be enlarged by chemical dissolution.

In order to examine photolineaments existing within and in the vicinity of the subject property, AEI utilized an aerial photograph with a scale of 1"=2,000' and a topographic map with a scale of 1"=2,000'. The photograph was inspected for soil colorations, natural drainage features, depression areas possibly indicating karst conditions and vegetation changes. In addition to the aerial photograph, a five foot contour topographic map was used to inspect the surface topography for depressions and sinks which may indicate surface subsidence caused by past karst activity.

Based on this analysis, there are no significant physical features which appear to represent potential fractures (photolineaments) within, the subject site. A map showing the results of the photolineament analysis is provided on **Figure 4**.

The Florida Geological Survey (FGS) Subsidence Incident Report database documenting sinkhole activity was reviewed and no new sinkholes in the vicinity of the subject property were identified. Based on this survey and the observed surficial topographic setting within the project area and immediate vicinity, the area has no reported sinkhole activity. In addition, PBS&J conducted an inventory of sinkhole occurrences from the Center for Instructional Technology sinkhole database at the University of South Florida. A copy of the Center's published map with the subject landfill superimposed is provided on **Figure 5**. The results indicate no sinkhole occurrences within a radius of 5 miles.

An evaluation of sinkhole potential was conducted by Ardaman and Associates and is documented in their report dated August 29, 1985. The results of the evaluation did not reveal evidence of sinkhole activity or sinkhole potential. The Ardaman findings are therefore consistent with this report.

### 6.0 SITE SPECIFIC INVESTIGATION

A total of nine (9) SPT borings were drilled in the area of the Stage 2 property. The locations of the borings are presented on the attached **Figure 6**.

#### Natural Subsurface Conditions

Borings B-1 through B-9 were drilled in the throughout the Stage 2 landfill area to depths ranging from 60 to 100 feet below existing ground. Subsoils at the boring locations were found to be relatively consistent. The encountered soils generally consisted of fine sands and slightly silty fine sands starting at ground surface and extending to depths of approximately 20 to 25 feet, followed by silty fine sand with phosphates to depths ranging from 25 to 30 feet. Below these surficial sands and silty sands the borings encountered alternating layers of sandy clay, silty clay and clay with phosphates extending to the boring termination depths of 60 to 100 feet. Impervious clay soils were consistently found in all borings drilled for this assessment.

Based on the SPT-N values, the surficial sands and slightly silty sands were generally found to be in a loose to medium dense state. The underlying silty sands were also found to be in a loose to medium dense state. The underlying sandy to silty clays and clays were generally found to be in a stiff to hard condition. Zones of very soft to soft clay were noted in a depth of approximately 2 feet in some of the borings.

Results of the borings are presented in profile form on **Figure 7** along with the results of soil classification tests and groundwater level measurements indicated adjacent to the associated borings and at the tested depths.

Borings drilled previously by Ardaman and Associates were generally consistent with these boring results.

#### Groundwater Conditions

The groundwater table was measured in the open boreholes at the location of the borings. The groundwater table depths were found to range from 4.3 to 8.0 feet below existing grade. Based on surface elevations at the borings, these depths translate to groundwater elevations

ranging from +26.0 to +32.7 ft-NGVD. The following table provides a summary of the groundwater measurements and estimated elevations.

Well	Groundwater Depth (ft)	Groundwater Elevation (ft-NGVD)	Date of Reading
B-1	4.3	32.7	7/28/10
B-2	5.0	29.0	7/27/10
B-3	5.0	29.0	7/28/10
B-4	4.6	29.4	7/30/10
B-5	4.5	29.5	7/29/10
B-6	6.8	28.2	8/03/10
B-7	8.0	26.0	8/02/10
B-8	8.0	26.0	8/02/10
B-9	4.6	28.4	7/29/10

## 7.0 LABORATORY TESTING

A series of laboratory tests were conducted on the natural subsurface soils. The tests included natural moisture content, percent fines passing the number 200 sieve, and Atterberg Limits.

### Moisture and -200 Tests

The percent moisture content and percent of fines passing the number 200 U.S. Standard sieve were conducted on selected soil samples. A total of fourteen (14) tests were conducted on natural soils. The results of the tests are shown adjacent to the soil profiles and at the tested depths of the soil profiles on **Figure 7**. The visual soil classification was reviewed and revised after the laboratory tests were completed.

### Atterberg Limit Tests

Atterberg Limit tests were conducted on soft clay strata for the purpose of determining the liquid limit, plastic limit and plasticity index of the selected soil samples. A total of six (6) Atterberg Limit tests were conducted. The results of the tests are shown adjacent to the soil profiles and at the tested depths of the soil profiles on **Figure 7**.

#### 8.0 GEOTECHNICAL ANALYSIS

#### **Bearing Capacity**

Analysis of the foundation bearing capacity and subgrade settlement were based on a fill elevation of +135 ft-NGVD with side slopes of 4:1 (H:V), and an average fill density of 60 pounds per cubic foot. Based on ground surface elevations, the height of the landfill will be approximately 100 feet above natural grade. The bottom of the landfill will be a minimum of 3 feet below the low est adjacent grade.

The bearing capacity of the landfill is a function of the density of the soils and the depths of the landfill materials below the adjacent ground surface. Soil density was defined by the Standard Penetration Test (SPT) N-value. Based on the assumptions stated above and on the data obtained from the borings, a net allowable foundation bearing pressure of 19,583 pounds per square foot was calculated. The net foundation load is estimated to be approximately 6,000 pounds per square foot, for a worst case area, which is well below the capacity of the foundation soils. The results of the evaluation are presented in **Attachment A**.

An additional bearing capacity analysis was conducted at the top of the first encountered clay layer. The purpose of this analysis was to verify sufficient bearing capacity at the clay interface and to ensure bearing pressure of the landfill material does not impact the slurry wall. For this analysis it was assumed that the clay depth is 20 feet below existing grade. Based on the assumptions stated above and on the data obtained from the borings, a net allowable foundation bearing pressure of 28,102 pounds per square foot was calculated, which is well above the estimated net foundation load. The results of the additional evaluation are also presented in **Attachment A**.

Based on the analysis, bearing failure is not a concern for this landfill design. As such, the perimeter slurry wall will not be impacted by vertical or lateral ground movements resulting from foundation bearing instability. The more critical stability component with regard to the existing slurry wall will be vertical settlement due to consolidation of the sands and clays underling the landfill.

#### **Slope Stability**

The stability of the proposed Stage 2 landfill was evaluated along selected critical sections of the landfill profile. For each of the sections, the stability was analyzed for the end-of-construction conditions representing long term stability of the landfill. A total of four (4) landfill cross sections were evaluated. The cross section transect locations are presented on the attached **Figure 9**.

The long term stability analyses were performed using "Effective Stress Stability Analysis (ESSA)". The effective stress strength parameters for the various soil layers were assumed conservatively using the laboratory test data and empirical relationships.

The stability of the slopes was analyzed using STABL for Windows. The soft clay layer found at approximately 20 feet is the weakest layer in the soil profile and the minimum factor of safety for the slopes was analyzed using sliding block failure surfaces through the soft clay layer. A

critical failure surface searching method using a random technique for generating sliding block surfaces passing through the soft clay was used. The stability analyses were performed using Modified Janbu Method and the active and passive portions of the sliding surfaces were generated according to Rankine's theory.

The results of the stability analyses are presented in the plots and text outputs in **Attachment B**. The minimum factor of safety values for all sections are tabulated below:

Cross Section	Factor of Safety
A-A'	1.70
B-B'	1.90
C-C	1.93
D-D'	1.68

The lowest resulting factor of safety of 1.68 is greater than 1.5, the required minimum factor of safety specified in 62-701.400 FAC. Thus, the landfill slopes are considered stable.

#### Settlement

To evaluate the impact of potential total settlement due to the loads to be placed in the Stage 2 landfill, settlement calculations were conducted for the encountered subsurface conditions at individual boring locations. The total settlement of the soil column for each boring location was calculated using elastic settlement equations for the sand layers and consolidation settlement methods for cohesive material. Settlement calculations were conducted at each of the boring locations presented herein, and at two locations within the landfill footprint from the previous geotechnical studies. The total settlement calculated for each boring location is summarized below:

Settlement Calculation Results	
Boring	Settlement (ft)
B-1	0.90
B-2	1.15
В-3	0.72
B-4	0.67
B-5	0.75

B-6	0.74
B-7	0.39
B-8	0.98
B-9	0.36
TH-16	0.80
TH-17	0.77

The results of the evaluation are presented in **Attachment C** along with supporting references and additional information regarding assumptions.

### Settlement Contouring

The GMS computer model was utilized to import the coordinates of the settlement calculation points. The model allows generation of contour maps, color flood maps and 3-D surface maps using the imported data. The areas between data points are interpolated/extrapolated by the model. The model has several interpolative and smoothing methods to create the data sets for mapping. To minimize model related distortions and over-smoothing appearance of the data, we have selected a method that is relatively linear with minimal distortion or smoothing of the data.

The method used to grid the landfill area and to interpolate/extrapolate the data between the boring locations is the Natural Neighbor Method using a constant nodal function. Natural neighbor interpolation is based on the Thiessen polygon network of the scatter point set. The Thiessen polygon network can be constructed from the Delauney triangulation of a scatter point set. A Delauney triangulation is a TIN that has been constructed so that the Delauney criterion has been satisfied.

These generated contours are presented on the attached **Figure 10**, and may be used for evaluation of slurry wall impacts and/or leachate pipe slopes.

### 9.0 SUMMARY AND CONCLUSIONS

The results of the field and laboratory investigations indicate that the subsurface soils across the project area are relatively consistent from one location to the next and are in a dense and stable condition for the purposes of landfill bearing, slope stability and settlement.

Based on review of available literature, survey information, and site specific explorations the sinkhole potential at this site is classified as low.

FIGURES

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1.200 A

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<u>REFERENCE:</u> SINKHOLES OF MANATEE COUNTY, FLORIDA, 2008 FLORIDA CENTER FOR INSTRUCTIONAL TECHNOLOGY, SINKHOLES (TAMPA, FL: UNIVERSITY OF SOUTH FLORIDA, 2008) DOWINLOADED FROM MAPS ETC, ON THE: WEB AT HTTP://ETC.USF.EDU/WAPS [MAPyF11142]

ENVIRONMENTAL PRIMERT OCT 07 2010 SOUTHWEST DISTRICT Andreyev Engineering, Inc. GEOTECHNICAL INVESTIGATION LENA ROAD LANDFILL STAGE II MANATESE COUNTY, FL APPROXIMATE SCALE DATE: 09/24/10 ENGINEER SC DOCUMENTED SINKHOLE MAP 1"=5 MILESPN: CPGT-10-0062 PRAWN BY:DLS FIGURE: 5



BORING LOCATION PLAN

FIGURE: 5

APPROXIMATE SCILLE DATE: 08/27/10 ENGOLETR: SC

RN CPGT-10-0062 DRAWN BY DE

NO

1"=300'

APPROXIMATE LOCATION OF PREVIOUS SIPT BORING DRILLED BY ARDAMAN & ASSOCIATES (REFER TO REPORT DATE AUGUST 29, 1985) -



4	<u>c</u> .(	ы	<u> </u>	74	ν.	
_		-	_	-		•

(1) LIGHT GRAY TO GRAYISH-BROWN FINE SAND (SP) (SP) (3) GRAY SILTY FINE SAND WITH TRACES OF PHOSPHATES (SM) (4) LIGHT BROWN TO BROWN SANDY CLAY WITH TRACES OF PHOSPHATES (CL) 5 GREENISH-GRAY SILTY TO SANDY CLAY WITH TRACES OF PHOSPHATES (SM)(CL) (6) GREENISH-GRAY CLAY WITH TRACES OF PHOSPHATES (CL) (7) DARK REDDISH-BROWN SLIGHLTY SILTY FINE SAND, WEAKLY CEMENTED (SP-SM) (SP-SM) 8 BROWN SLIGHTLY SILTY FINE SAND (SP-SM) (9) GRAYISH-BROWN SLIGHTLY SILTY FINE SAND WITH TRACES OF SHELL & PHOSPHATES (SP-SM) (0) BROWN HIGHLY CEMENTED CLAY WITH PHOSPHATES (CL) (SP) UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL DEPTH TO GROUNDWATER, JULY, 2010 N STANDARD PENETRATION RESISTANCE. IN BLOWS PER FOOT 50/1" 50 BLOWS OF HAMMER TO ADVANCE SAMPLING TOOL ONE INCH NR NO SAMPLE RECOVERY ST SHELBY TUBE W MOISTURE CONTENT, IN PERCENT -200 PERCENT OF FINES PASSING THE U.S. No. 200 SIEVE PL PLASTIC LIMIT, IN PERCENT LL LIQUID LIMIT, IN PERCENT PI PLASTICITY INDEX, IN PERCENT

EL. GROUND ELEVATION AT BORING LOCATION (FT - STATE PLANE FLORIDA EAST ZONE NAT 83)



SOUTHWEST DISTRICT TAMPA







ATTACHMENT A

# **BEARING CAPACITY ANALYSIS RESULTS**

### **BEARING CAPACITY ANALYSIS**

Cohesion, c =	0	psf			
Friction angle, $\phi =$	29	dearees	(whole de	arees. <50.	preferably)
Unit weight, $\gamma =$	100	pcf	(	<b>.</b> ,	<b>,</b> ,,
The above entries yiel	d the follo	wing factor	rs:		
c' =	0.00				
φ' =	20.3				
*Nq' =	6.58			**Nq' =	7.5
*Nc' =	15.10			**Nc' =	18.1
*Nγ' =	5.60			**Νγ' =	5.2
*Nq =	16.44			**Nq =	20.4
*Nc =	27.86			**Nc =	33.4
*Nγ =	19.34			**Nγ =	17.8
*N facto	rs from E	qs. 10-32,3	34,36.	**N facto	ors from fig. 10.7 & 10.8
(M	lethod 1)			(Me	ethod 2)
Footing shape is:	square 				
Enter smallest lanfill B = Df =	square dimension 1000 36	on feet inches			
Enter smallest lanfill B = Df =	square dimension 1000 36	on feet inches			
Enter smallest lanfill B = Df =	square square <u>dimensia</u> 1000 36 FAILURE	on feet inches			g.' - 10.592 pcf
Enter smallest lanfill B = Df = FOR LOCAL SHEAR	square square 1000 36 FAILURE 20,650	on feet inches :: <b>psf</b>			qu' = 19,583 psf
Footing shape is: <u>Enter smallest lanfill</u> B = Df = FOR LOCAL SHEAR [qu' =	square square <u>dimensia</u> 1000 36 FAILURE 20,650 Method	on feet inches :: <b>psf</b>			<b>qu' = 19,583 psf</b> <u>Method 2</u>
Footing shape is: <u>Enter smallest lanfill</u> B = Df = FOR LOCAL SHEAR Qu' =	square square <u>dimensio</u> 1000 36 FAILURE 20,650 Method	on feet inches :: <b>psf</b>			<b>qu' = 19,583 psf</b> <u>Method 2</u>
For GENERAL SHEA	square square 1000 36 FAILURE 20,650 Method	on feet inches :: psf 1 IRE:			<b>qu' = 19,583 psf</b> <u>Method 2</u>
Footing shape is: <u>Enter smallest lanfill</u> B = Df = FOR LOCAL SHEAR [qu' = FOR GENERAL SHE/ [qu =	square square 1000 36 FAILURE 20,650 Method AR FAILU 69,393	pn feet inches psf 1 IRE: psf			qu' =   19,583   psf     Method 2   Method 2
Footing shape is: <u>Enter smallest lanfill</u> B = Df = FOR LOCAL SHEAR [qu' = FOR GENERAL SHE/ [qu =	square square 1000 36 FAILURE 20,650 Method 7 AR FAILL 69,393 Method 7	pn feet inches psf 1 IRE: psf			qu' =   19,583 psf     Method 2     qu =   65,453 psf     Method 2
Footing shape is: <u>Enter smallest lanfill</u> B = Df = FOR LOCAL SHEAR [qu' =] FOR GENERAL SHE/ [qu =]	square square dimension 1000 36 FAILURE 20,650 Method 7 AR FAILL 69,393 Method 7	pn feet inches :: <b>psf</b> 1 IRE: <b>psf</b>			$q_u' = 19,583 \text{ psf}$ <u>Method 2</u> $q_u = 65,453 \text{ psf}$ <u>Method 2</u> Method 2
For GENERAL SHEAR Qu' =	square square <u>dimensid</u> 1000 36 FAILURE 20,650 Method Method s for qu' a Na' + 0.5	Dn feet inches :: psf 1 IRE: psf	e been calcula	ated by selec	qu' =19,583 psfMethod 2Qu =65,453 psfMethod 2Sective use of the following formulae
Footing shape is: <u>Enter smallest lanfill</u> B = Df = FOR LOCAL SHEAR Qu' = FOR GENERAL SHEA Qu' = Note:The above value: Qu' = 1 3 c' Nc' + q l	square dimension 1000 36 FAILURE 20,650 Method 7 AR FAILL 69,393 Method 7 s for qu' a Nq' + 0.5 t Q Na' ±	Dn feet inches psf 1 IRE: psf	e been calcula strip ftg.)	ated by selec	qu' =   19,583 psf     Method 2     qu =   65,453 psf     Method 2     Sective use of the following formulae
Footing shape is: <u>Enter smallest lanfill</u> B = Df = FOR LOCAL SHEAR <u>qu' =</u> FOR GENERAL SHE/ <u>qu' =</u> Note:The above value: qu' = c' Nc' + q l qu' = 1.3 c' Nc' -	sq square dimension 1000 36 FAILURE 20,650 Method 7 Method 7 S for qu' a Ng' + 0.5 + q Ng' +	pn feet inches <b>psf</b> 1 IRE: psf 1 Ind qu have γ BNγ' ( 0.4 γ BNγ	e been calcula strip ftg.) ' (square ftg.)	ated by selec	qu' =   19,583 psf     Method 2     qu =   65,453 psf     Method 2     Sective use of the following formulae
For LOCAL SHEAR Gu' = FOR LOCAL SHEAR Qu' = FOR GENERAL SHEA Qu' = Note: The above value: qu' = c' Nc' + q I qu' = 1.3 c' Nc' - qu' = 1.3 c' Nc' -	s for qu' a s for qu' a Nq' + 0.5 + q Nq' +	pn feet inches  <b>psf</b> 1 I I I I I I I I I I I I I I I I I I	e been calcula strip ftg.) ' (square ftg.) (circular ftg.)	ated by selec	qu' =   19,583 psf     Method 2     qu =   65,453 psf     Method 2     state     Qu =   65,453 psf     Method 2     state     Qu =   65,453 psf     Method 2     State     65,453 psf     State     State </td

 $q_u = 1.3 \text{ c N}_c + q \text{ N}_q + 0.4 \gamma \text{ BN}_\gamma$  (square ftg.)

 $q_u = 1.3 \text{ c } N_c + q \text{ } N_q + 0.3 \text{ } \gamma \text{ } BN_\gamma \text{ (circular ftg.)}$ 

Terzaghi's Ultimate Bearing Capacity Equation Reference: Principles of Geotechnical Engineering, Das, section 10 - 2

### **BEARING CAPACITY ANALYSIS**

Cohesion, c =	1000	psf		
Friction angle, $\phi =$	22	degrees	(whole degrees, <50, p	preferably)
Unit weight, $\gamma =$	110	pcf		
The above entries yield	d the follo	wing factor	'S:	
c' =	666.67			
φ' =	15.1			
*Nq' =	3.97		**Nq' =	4.3
*Nc' =	11.02		**Nc' =	13
*Nγ' =	2.68		**Νγ' =	2.1
*Nq =	7.82		**Nq =	9.1
*Nc =	16.88		**Nc =	20.2
*Nγ =	7.13		**Nγ =	6.66
*N facto	rs from E	qs. 10-32,3	34,36. **N facto	rs from fig. 10.7 & 10.8
(M	ethod 1)	•	(Me	ethod 2)
Determine whether fo Enter <u>St</u> for strip, <u>Sq</u> Enter here Footing shape is: 	ooting is for squa sg square	a strip (lei re, <u>C</u> for ci	ngth to width ratio >= 5); ircular, or <u>R</u> for rectangu	; square; circular; or rectangul Jlar.
Determine whether fo Enter <u>St</u> for strip, <u>Sq</u> Enter here→ Footing shape is:  <u>Enter smallest landfi</u> B =	for squa sg square Il dimens	a strip (lei re, <u>C</u> for ci <u>sion</u> feet	ngth to width ratio >= 5) ircular, or <u>R</u> for rectangu	; square; circular; or rectangul
Determine whether for Enter <u>St</u> for strip, <u>Sq</u> Enter here	for squa sg square Il dimens 1000 240	a strip (lei re, <u>C</u> for ci <u>sion</u> feet inches	ngth to width ratio >= 5) ircular, or <u>R</u> for rectangu	; square; circular; or rectangul Jlar.
Determine whether for Enter <u>St</u> for strip, <u>Sq</u> Enter here	for squa sg square <u>II dimens</u> 1000 240 FAILURE	a strip (lei re, <u>C</u> for ci <u>sion</u> feet inches	ngth to width ratio >= 5); ircular, or <u>R</u> for rectangu	; square; circular; or rectangul
Determine whether for Enter <u>St</u> for strip, <u>Sq</u> Enter here> Footing shape is: 	for squa sg square <u>II dimens</u> 1000 240 FAILURE 28,102	a strip (lei re, <u>C</u> for ci <u>sion</u> feet inches	ngth to width ratio >= 5) ircular, or <u>R</u> for rectangu	; square; circular; or rectangul ular. qu' = 28,427 psf
Determine whether for Enter <u>St</u> for strip, <u>Sq</u> Enter here	for squa square square <u>II dimens</u> 1000 240 FAILURE 28,102 Method	a strip (lei re, <u>C</u> for c ion feet inches : <u>psf</u>	ngth to width ratio >= 5) ircular, or <u>R</u> for rectangu	; square; circular; or rectangul ular. <b>qu' = 28,427 psf</b> <u>Method 2</u>
Determine whether for Enter <u>St</u> for strip, <u>Sq</u> Enter here	for squa square square <u>II dimens</u> 1000 240 FAILURE 28,102 Method AR FAILL 65,290 Method	a strip (lei re, <u>C</u> for ci inches :: <u>psf</u> JRE: psf	ngth to width ratio >= 5) ircular, or <u>R</u> for rectangu	; square; circular; or rectangul ular. <u>qu' = 28,427 psf</u> <u>Method 2</u> <u>qu = 70,700 psf</u> <u>Method 2</u>

 $q_u = c N_c + q N_q + 0.5 \gamma BN_{\gamma}$  (strip ftg.)

 $q_u = 1.3 \text{ c Nc} + q \text{ Nq} + 0.4 \gamma \text{ BN}_{\gamma} \text{ (square ftg.)}$ 

 $q_u = 1.3 \text{ c } N_c + q \text{ } N_q + 0.3 \text{ } \gamma \text{ } BN_\gamma \text{ (circular ftg.)}$ 

### Terzaghi's Ultimate Bearing Capacity Equation Reference: Principles of Geotechnical Engineering, Das, section 10 - 2

ATTACHMENT B

# **SLOPE STABILITY ANALYSIS RESULTS**

## LENA ROAD LANDFILL - X-SEC A - A'





## LENA ROAD LANDFILL - X-SEC A - A' - FS Min- Janbu = 1.702



## LENA ROAD LANDFILL - X-SEC A - A' - FS Min- Janbu = 1.702

result.out \*\* STABL for WINDOWS \*\* by Geotechnical Software Solutions

--Slope Stability Analysis--Simplified Janbu, Simplified Bishop or Spencer`s Method of Slices

Run Date:9/27/10Time of Run:14:00Run By:Shawkat AliInput Data Filename:run.inOutput Filename:result.outUnit:U.S.C.Plotted Output Filename:result.plt

PROBLEM DESCRIPTION LENA ROAD LANDFILL - X-SEC A - A'

#### BOUNDARY COORDINATES

20 Top Boundaries 29 Total Boundaries

Boundary	X-Left	Y-Left	X-Right	Y-Right	Soil Type	
NO.	City	(IL)	(IL)		DETUW DAU	
1	0.00	135.00	300.00	135.00	2	
2	300.00	135.00	500.00	140.00	2	
3	500.00	140.00	560.00	155.00	ĩ	
4	560.00	155.00	580,00	155,00	1	
5	580.00	155,00	660.00	175.00	1	
6	660.00	175,00	680.00	175.00	1	
7	680.00	175.00	760.00	195.00	1	
8	760.00	195.00	780.00	195.00	1	
9	780.00	195.00	840.00	210.00	1	
10	840.00	210.00	860.00	210.00	1	
11	860.00	210.00	980.00	215.00	1	
12	980.00	215.00	1100,00	220.00	1	
13	1100,00	220.00	1220.00	225.00	1	
14	1220.00	225.00	1340.00	230.00	1	
15	1340.00	230.00	1460.00	235.00	1	
16	1460.00	235.00	1510.00	235.00	1	
17	1510.00	235.00	1630.00	230.00	1	
18	1630.00	230.00	1750.00	225.00	1	
19	1750.00	225.00	1870.00	220.00	1	
20	1870.00	220.00	1990.00	215.00	1	
21	500.10	127.00	500.20	140.00	1	
22	500.10	127.00	1990.00	127.00	2	
23	0.00	121.50	1990.00	121.50	3	
24	0.00	116.50	1990.00	116.50	4	
25	0.00	111.50	1990.00	111.50	5	
26	0.00	105.50	1990.00	105.50	6	
27	0.00	100.50	1990.00	100.50	7	
Page 1						

		resul	t.out		
28 29	0.00	90.50 85.50	1990.00 1990.00	90,50 85,50	8 9
	0.00	00100	2330100		•

#### **ISOTROPIC SOIL PARAMETERS**

9 Type(s) of Soil

1

1

1

Soil	Total	Saturated	Cohesion	Friction	Pore	Pressure	Piez.
No.	(pcf)	(pcf)	(psf)	(deg)	Param.	(psf)	No.
1	70.0	80.0	0.0	28.0	0.00	0.0	1
2	95.0	105.0	0.0	29.0	0.00	0.0	1
3	105.0	115.0	0.0	32.0	0.00	0.0	1
4	95.0	110.0	0.0	28.0	0.00	0.0	1
5	115.0	125.0	0.0	38.0	0.00	0.0	1
6	110.0	125.0	1000.0	0.0	0.00	0.0	1
7	105.0	120.0	750.0	0.0	0.00	0.0	1
8	105.0	115.0	0.0	32.0	0.00	0.0	1
ğ	115.0	130.0	0.0	1500.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Point	X-Water	Y-Water
No.	(ft)	(ft)
1	0.00	133.00
2	500.00	133.00
3	500.10	127.00
4	1990.00	127.00

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

100 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 10.0

Box X-Left Y-Left X-Right Y-Right Height Page 2

NO.	(ft)	resi (ft)	(ft)	(ft)	(ft)
1	500.00	95.00	520.00	95.00	$\begin{array}{c} 10.00\\ 10.00 \end{array}$
2	800.00	95.00	820.00	95.00	

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Modified Janbu Method \* \*

Failure Surface Specified By 28 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3 4 5 6 7 8 9 0 11 12 13 4 5 6 7 8 9 0 11 12 13 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 21 2 23 4 5 6 7 8 9 0 21 2 23 4 5 6 7 8 9 0 21 2 23 4 5 6 7 8 9 0 21 2 2 3 4 5 6 7 8 9 0 21 2 2 3 4 5 6 7 8 9 0 21 2 2 3 4 5 6 7 8 9 0 21 2 2 3 4 5 6 7 8 9 0 21 2 2 3 4 5 6 7 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 4 5 8 9 0 21 2 2 3 2 2 2 2 2 3 4 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	430.66 437.61 447.33 455.94 464.33 474.22 481.75 491.57 499.78 507.00 516.48 808.13 814.38 821.36 825.28 831.81 838.64 844.03 851.09 858.10 864.73 868.90 873.70 879.53 885.94 891.28 897.96 900.16	138.27 133.90 131.55 126.46 121.02 119.59 113.01 111.12 105.42 98.50 90.55 98.35 105.52 114.72 122.29 129.60 138.02 145.10 152.23 159.72 168.81 177.58 185.71 193.38 201.84 209.27 211.67

\*\*\* 1.702

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Individual data on the 50 slices

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Earthquake Water Water Force Force Force Force Force Surcharge Weight (1bs) Slice Width Hor Ver Load тор Bot Norm Tan (1bs) (1bs) (1bs) (lbs) NO. (ft) (1bs)(1bs) (lbs) Page 3

		res	ult.out				
6.9 1497.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.0 3652.0	0.0	279.2	0.0	0.0	0.0	0.0	0.0
8.6 8346.3	0.0	2492.2	0.0	Ŏ.Ŏ	0.0	0.0	0.0
7.6 11600.4	0.0	5131.6	0.0	0.0	0.0	0.0	0.0
0.7 1342.1	0.0	645.9	0.0	0.0	0.0	0.0	0.0
3 5 7815 3		1380 7	0.0	0.0	0.0	0.0	0.0
4.0 10344.5	0.0	6040.8	0.0	0.0	0.0	0.0	0.0
7.8 22609.3	0.0 1	0346.2	Ŏ.Ŏ	ŏ.ŏ	0.0	Ŏ.Ŏ	0.0
2.0 5915.0	0.0	2718.2	0.0	0.0	0.0	0.0	0.0
8.1 27407.9	0.01	5183.7	0.0	0.0	0.0	0.0	0.0
0.1 444.7	0.0	248.U 521 1	0.0	0.0	0.0	0.0	0.0
0.1 317.4	0.0	107.4	0.0	0.0	0.0	0.0	0.0
0.1 342.0	0.0	189.6	0.0	0.0	0.0	0.0	0.0
4.7 17676.5	0.0	9874.9	0.0	0.0	0.0	0.0	0.0
2.1 8794.0		4962.0	0.0	0.0	0.0	0.0	0.0
<b>43 5 231696 8</b>	0.0 1	5/83.U 7073 0		0.0	0.0	0.0	0.0
20.0 115325.5	0.0 4	075.0	0.0	0.0	0.0	0.0	0.0
80.0 525118.9	0.0 *	******	0.0	0.0	0.0	0.0	0.0
20.0 147233.9	0.0 4	2689.3	0.0	0.0	0.0	0.0	0.0
80.0 652752.2	0.0 *	****** 1771 0	0.0	0.0	0.0	0.0	0.0
20.0 1/9142.2	0.0 4	4/21.9 8507 1	0.0	0.0		0.0	0.0
6.3 56944.2	0.0 2	0310.1	0.0	0.0	0.0	0.0	0.0
2.1 17923.3	0.0	5150.0	0.0	0.0	0.0	0.0	0.0
4.9 39923.0	0.0 1	0447.9	0.0	0.0	0.0	0.0	0.0
0.0   16/.6   2   5   10211   2	0.0	40.6	0.0	0.0	0.0	0.0	0.0
1 4 9697 5	0.0	7497.2 3034 9	0.0	0.0	0.0	0.0	0.0
1.5 10465.8	0.0	1669.8	0.0	0.0 0.0	0.0	ŏ.ŏ	0.0
4.3 27982.3	0.0	3297.6	0.0	0.0	0.0	0.0	0.0
0.7 4230.7	0.0	332.8	0.0	0.0	0.0	0.0	0.0
$4.4 \ 2618/.8$	0.0	946.9	0.0	0.0	0.0	0.0	0.0
$2.4 \pm 37/1.4$ 1 4 7554 2	0.0	0.0	0.0		0.0	0.0	0.0
4.0 21180.3	0.0	0.0	0.0	ŏ.ŏ	0.0	0.0	0.0
7.1 33850.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.0 30073.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.9 7549.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4.7 17506.5		0.0	0.0		0.0	0.0	0.0
4.8 12533.5	0,0	0.0	0.0	0.0	0.0	0.0	0.0
5.8 11838.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.4 9604.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.3 5081.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0./ 2/34./ 2.2 177 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0		0.0	0.0

Failure Surface Specified By 25 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3 4 5 6	453.72 460.97 469.35 476.88 485.96 493.04	138.84 133.30 127.85 121.26 117.07 110.00 Page 4

7 8 9 10 11 12 13 14 15 16 17 18 20 21 22 23 22 22 22 22 22 22 22 22 22 22 22	500.81 508.06 516.26 815.85 822.39 829.13 835.55 842.56 849.29 855.06 861.92 868.72 875.40 881.15 884.74 888.24 888.24 889.10 895.03 897.34	result.out 103.71 96.82 91.10 95.51 103.07 110.46 118.13 125.26 132.66 140.82 148.10 155.43 162.88 171.05 180.39 189.75 199.72 207.77 211.56
***	1.707	***

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Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 5 6 7 8 9 10 11 12 13 14 5 6 7 8 9 10 11 12 13 14 5 6 7 8 9 10 11 12 13 14 5 6 7 8 9 20 11 12 3 4 5 6 7 8 9 20 11 12 3 4 5 6 7 8 9 20 11 12 3 4 5 6 7 8 9 20 11 12 3 4 5 6 7 8 9 20 11 12 3 4 5 6 7 8 9 20 11 12 3 14 5 6 7 8 9 20 11 12 3 14 5 16 7 7 8 9 20 11 12 3 14 5 16 17 10 11 12 2 3 4 5 16 17 10 11 12 2 3 4 5 16 17 10 11 12 2 3 4 5 10 11 12 2 3 4 5 16 17 11 2 2 3 4 5 16 17 11 2 2 3 4 5 17 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 4 5 2 2 3 2 2 3 2 2 3 2 2 2 3 2 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 2 3 2	438.25 447.00 455.48 462.69 469.80 479.79 488.43 496.83 504.26 511.39 804.09 811.14 817.97 822.01 828.75 833.83 840.49 846.14 853.21 859.11 865.05 872.12 872.78 877.46 881.20 883.66	138.46 135.30 130.01 123.07 116.04 115.77 110.74 105.30 98.61 91.61 94.58 101.66 108.97 118.12 125.51 134.12 141.58 149.83 156.91 164.98 173.02 180.09 190.07 198.91 208.18 210.99
***	1.740	***

Page 5

### result.out

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3 4 5 6 7 8 9 10 112 13 4 5 6 7 8 9 10 112 13 4 5 6 7 8 9 10 112 13 4 5 6 7 8 9 10 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 20 12 23 4 5 6 7 8 9 10 112 13 4 5 6 7 8 9 20 12 21 2 8 9 10 112 123 145 167 189 10 112 123 145 167 189 10 112 123 145 167 189 10 112 123 145 167 189 10 112 123 145 167 189 10 112 123 145 167 189 122 122 122 122 122 122 122 122 122 12	443.53 444.99 454.95 463.74 470.81 478.55 487.17 495.25 503.27 512.34 806.86 813.88 820.15 826.41 832.60 839.36 846.11 851.12 857.03 864.10 868.07 874.55 877.38 880.61 884.55 884.79	138.59 137.41 136.47 131.70 124.64 118.31 113.24 107.34 101.36 97.16 96.42 103.54 111.33 119.13 126.98 134.35 141.73 150.39 158.45 165.53 174.71 182.31 191.91 201.37 210.56 211.03

Failure Surface Specified By 26 Coordinate Points

\*\*\* 1.747 \*\*\*

1

## Failure Surface Specified By 26 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1	434.29	138.36
2	441.29	132.24
3	449.59	126.65
4	458.57	122.26
5	466.89	116.71
6	474.38	110.09
7	483.69	106.43
8	490.95	99.56
9	500.32	96.06
10	509.34	91.74
11	816.16	90.55
12	820.01	99.78
13	826.52	107.37
14	831.95	115.77

Page 6

		result.out
15	838.79	123.06
16	843.32	131.98
17	847.89	140.87
18	849.44	150.75
19	856.27	158.06
20	862.97	165.48
21	870.04	172.55
22	874.37	181.56
23	879.17	190.34
24	885.68	197.93
25	892.59	205.16
26	896.01	211.50
***	1,750	***

Failure Surface Specified By 28 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 6 7 8 9 10 11 12 13 14 15 6 7 8 9 20 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 22 22 22 22 22 22 22 22 22 22 22 22	427.36 432.74 439.86 447.37 457.26 466.08 475.14 482.78 491.54 498.63 508.57 806.03 812.49 819.53 821.22 826.75 831.87 838.87 845.85 852.11 858.64 852.28 872.08 879.15 882.28 899.37	138.18 134.16 127.14 120.54 119.03 114.31 110.07 103.63 98.81 91.75 90.72 91.14 98.77 105.88 115.73 124.06 132.66 139.79 146.96 154.75 162.33 169.86 177.13 184.20 193.70 200.97 208.15 211.64
***	1.756	***

Failure Surface Specified By 28 Coordinate Points

Page 7

1

result.out

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 2 3 4 5 6 7 8 9 0 11 2 2 3 4 5 6 7 8 9 0 11 2 2 3 4 5 8 9 0 2 1 2 2 3 4 5 8 9 0 2 1 2 2 3 4 5 8 9 0 2 1 2 2 3 4 5 8 9 0 2 1 2 2 3 4 5 8 9 0 2 1 2 2 3 4 5 8 9 0 2 1 2 2 3 4 5 8 9 0 2 1 2 2 3 4 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	411.20 417.82 426.90 436.88 444.83 453.74 463.69 471.13 479.80 488.98 497.29 505.46 816.50 821.86 828.06 835.01 838.06 844.09 850.92 855.92 862.91 867.31 873.12 879.10 886.17 892.80 898.51 900.99	137.78 135.05 130.85 130.21 124.15 119.60 118.64 111.96 106.98 103.00 97.44 91.68 96.03 104.48 112.32 119.51 129.03 137.01 144.31 152.97 160.12 169.10 177.24 185.25 192.32 199.82 208.02 211.71
***	1.760	***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 10 11 12 13 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 12 3 4 5 10 11 12 12 10 11 12 12 10 11 12 11 12 11 12 11 12 11 12 11 12 11 12 11 12 11 12 11 12 11 11	448.92 451.48 458.82 467.86 475.88 483.39 491.60 499.59 508.04 517.34 803.55 808.25 815.30 819.71 826.65 831.79 837.72	$138.72 \\ 137.33 \\ 130.54 \\ 126.27 \\ 120.30 \\ 113.69 \\ 107.98 \\ 101.97 \\ 96.62 \\ 92.95 \\ 93.01 \\ 101.84 \\ 108.94 \\ 117.91 \\ 125.11 \\ 133.69 \\ 141.74 \\ 108.94 \\ 141.74 \\ 141.$
18	843.00	120.53

Page 8

19 20 21 22 23 24 25	844.86 846.84 852.79 858.12 861.33 866.83 872.10	result.out 160.05 169.86 177.89 186.35 195.82 204.18 210.50
* * *	1.768	***

### Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 9 20 21 22 3 4 5 6 7 8 9 10 11 12 13 14 5 6 7 8 9 20 21 22 3 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 20 11 12 23 4 5 6 7 8 9 10 11 12 23 4 5 6 7 8 9 10 11 12 23 4 5 6 7 8 9 10 11 12 23 4 5 6 7 8 9 10 11 12 23 4 5 6 7 8 9 10 11 12 13 14 5 16 7 8 9 10 11 12 13 14 5 16 17 17 18 19 10 11 12 23 14 15 16 17 11 2 23 12 23 14 15 17 11 12 13 14 15 16 17 11 22 23 24 25 25 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	441.52 445.48 454.43 461.83 469.72 476.80 485.45 494.98 503.06 802.53 807.87 812.21 817.93 822.84 829.90 836.26 843.27 850.10 857.12 869.43 876.47 883.23 890.22 896.75 897.32	138.54 134.68 130.22 123.50 117.36 110.29 105.27 102.24 96.35 95.45 103.90 112.91 121.11 129.83 136.91 144.63 151.75 159.06 166.18 174.69 181.78 188.88 196.24 203.39 210.97 211.55
***	1.774	***

Failure Surface Specified By 25 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3	443.21 448.08 455.31	138,58 136,03 129,12 Page 9

	4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	462.83 470.74 479.01 487.85 495.01 502.41 802.44 806.15 809.01 816.06 821.55 827.28 834.30 837.95 844.94 850.22 855.41 862.46 869.23 875.53 882.57 886.82 1.785	12 11 11 10 9 9 9 10 11 11 12 13 14 15 16 16 16 16 17 18 19 20 20 21	result. 2.53 6.42 0.79 6.12 9.14 2.41 3.90 2.77 9.85 2.77 9.85 1.54 2.85 0.09 7.04 4.13 9.26 6.36 1.12 1.12	Dut			
	Y	,	A	x	I	S	F	т
x	0.00	).00 24 +***	18.75 -+	497.5( +	)	746.25	995.00	1243.75 +
	248.75	- - - + - *						
A	497.50	- 61 - 512 + 1** 						
x	746.25	- * - * - 1 *						
I	995.00	- 1118* 11* - 1 -	.1 *					
		-	*					

Page 10

result.out

		-		
		-		*
S	1243,75	+		
		_		*
		-		
		-		
		-		*
	1492.50	+		*
		_		
		-		
		-		*
		_		
F	1741.25	+		*
		_		
		-		
		-		*
		-		
		~		
т	1990.00	+	***	*
•				



## LENA ROAD LANDFILL - X-SEC B - B'



# LENA ROAD LANDFILL - X-SEC B - B' - FS Min- Spencer = 1,901

## LENA ROAD LANDFILL - X-SEC B - B' - FS Min- Spencer = 1.901



result.out \*\* STABL for WINDOWS \*\* by Geotechnical Software Solutions

--Slope Stability Analysis--Simplified Janbu, Simplified Bishop or Spencer`s Method of Slices

Run Date:	9/27/10
Time of Run:	13:00
Run By:	Shawkat Ali
Input Data Filename:	run.in
Output Filename:	result.out
Unit:	U.S.C.
Plotted Output Filename:	result.plt

PROBLEM DESCRIPTION LENA ROAD LANDFILL - X-SEC B - B'

#### BOUNDARY COORDINATES

12 Top Boundaries 17 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	135.00	300.00	135.00	2
2	300.00	135.00	500.00	140.00	2
3	500.00	140.00	560.00	155.00	1
4	560.00	155.00	580.00	155.00	1
5	580.00	155.00	660.00	175.00	1
6	660.00	175.00	680.00	175.00	1
7	680,00	175,00	760.00	195.00	1
8	760.00	195.00	780.00	195.00	1
9	780.00	195.00	860,00	210.00	1
10	860,00	210.00	1560.00	235,00	1
11	1560.00	235.00	1760.00	235.00	1
12	1760.00	235.00	2160.00	230.00	1
13	500.10	127.00	500.20	140.00	1
14	500.10	127.00	2160.00	127.00	2
15	0.00	116.50	2160.00	116.50	3
16	0.00	111.50	2160.00	111.50	4
17	0.00	106.50	2160.00	106.50	5

#### ISOTROPIC SOIL PARAMETERS

5 Type(s) of Soil

Soil	Total	Saturated	Cohesion Friction	Pore	Pressure	Piez.
			Page 1			

1

			7.				
Type No.	Unit Wt. (pcf)	. Unit Wt. (pcf)	result Intercept (psf)	.out Angle (deg)	Pressure Param.	Constant (psf)	Surface No.
1 2 3 4 5	70.0 100.0 95.0 105.0 115.0	80.0 110.0 105.0 120.0 130.0	0.0 0.0 0.0 750.0 1500.0	28.0 32.0 32.0 0.0 0.0	0.00 0.00 0.00 0.00 0.00	0.0 0.0 0.0 0.0 0.0	1 1 1 1
<b>1</b> PIE	ZOMETRIC	C SURFACE(	5) HAVE BEE	N SPECIF	IED		
Unit	Weight o	of Water ≃	62.40				
Piezo	ometric s	Surface No	. 1 Specif	ied by	4 Coordina	ate Point:	5
Poi NC	int ).	X-Water (ft)	Y-Water (ft)				
1 2 3 4		0.00 500.00 500.10 2160.00	133.00 133.00 127.00 127.00				
A Cri Techn	itical Fa nique For	ailure Suri r Generatii	face Search 1g Circular	ing Meth Surface	od, Using s, Has Bee	A Random en Specif	ied.
400 т	rial Sur	rfaces Have	e Been Gene	rated.			
20 Surfaces Initiate From Each Of 20 Points Equally Spaced Along The Ground Surface Between $X = 200.00$ ft. and $X = 500.00$ ft.							
Each	Surface	Terminates	s Between and	X = 860 X =1200	.00 ft. .00 ft.		
Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.							
10.00 ft. Line Segments Define Each Trial Failure Surface.							
Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.							

1

1

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\* \* Safety Factors Are Calculated By Spencer`s Method \* \*

result.out

Number of convergent trials324Number of non convergent trials76

Failure Surface Specified By 78 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
123456789011234567890122345678901233456789012344444444444495555	389.47 396.57 403.83 411.25 418.84 426.57 434.46 442.49 450.66 465.96 465.95 529.71 539.01 548.40 557.41 577.02 586.70 567.71 567.71 567.70 665.70 665.70 715.68 675.75.75 745.25 745.25 755.424 794.53 813.70 813.70 823.20 841.20 841.20 813.70 823.20 851.20 860.35 869.41	$\begin{array}{c} 137.24\\ 130.19\\ 123.31\\ 116.61\\ 110.09\\ 103.76\\ 97.61\\ 91.65\\ 85.88\\ 80.31\\ 74.94\\ 69.78\\ 64.82\\ 65.53\\ 51.21\\ 43.22\\ 20.26\\ 18.43\\ 15.49\\ 14.37\\ 13.49\\ 12.85\\ 12.48\\ 15.49\\ 14.37\\ 13.49\\ 12.85\\ 12.67\\ 13.23\\ 14.05\\ 12.67\\ 13.23\\ 14.05\\ 12.55\\ 16.32\\ 19.55\\ 23.76\\ 26.21\\ 28.88\\ 31.79\\ 23.85\\ 12.55\\ 23.76\\ 26.21\\ 28.88\\ 31.79\\ 23.85\\ 12.55\\ 23.76\\ 26.21\\ 28.88\\ 31.79\\ 23.85\\ 12.55\\ 23.76\\ 26.21\\ 28.88\\ 31.79\\ 23.85\\ 26.21\\ 28.88\\ 31.79\\ 23.86\\ 45.67\\ 49.70\\ 53.94\end{array}$

		result.out
54	878.36	58.40
55	887 20	63 08
56	805 02	67.06
57	004 52	72 05
57	904.33	75.05
20	913.01	78.34
22	921.37	83,84
60	929.59	89.54
61	937.67	95.43
62	945.61	101.51
63	953.40	107,78
64	961.04	114.23
65	968.52	120.87
66	975.84	127.68
67	982.99	134 67
68	989 98	141 82
õõ	996 79	1/0 1/
70	1002 42	156 60
70	1003.43	10.02
71	1009.88	172 05
12	1016.15	172.05
/3	1022.24	179.99
74	1028.13	188.07
75	1033.82	196.29
76	1039.32	204.64
77	1044.62	213.12
78	1046.71	216.67

Circle Center At X = 687.5; Y = 430.1 and Radius, 417.9

\*\*\* Factor of Safety = 1.901 \*\*\*

Individual data on the 95 slices

			Water	Water			Earthq	uake	
			Force	Force	Force	Force	For	ce Sur	charge
Slice	Width	Weight	Тор	Bot	Norm	Tan	Hor	Ver	Load
No.	(ft)	(1bs)	(1bs)	(1bs)	(1bs)	(1bs)	(1bs)	(1bs)	(1bs)
1	4.3	926.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	2.8	1676.3	0.0	349.7	0.0	0.0	0.0	0.0	0.0
3	7.3	8262.0	0.0	3899.0	0.0	0.0	0.0	0.0	0.0
4	7.4	14126.0	0.0	8134.5	0.0	0.0	0.0	0.0	0.0
5	0.1	303.0	0.0	179.3	0.0	0.0	0.0	0.0	0.0
6	5.8	14902.6	0.0	9091.5	0.0	0.0	0.0	0.0	0.0
7	1.6	4774.4	0.0	2988.4	0.0	0.0	0.0	0.0	0.0
8	4.4	14155.8	0.0	8741.4	0.0	0.0	0.0	0.0	0.0
9	3.3	12158.8	0.0	7529.4	0.0	0.0	0.0	0.0	0.0
10	7.9	33296.7	0.0	20166.8	0.0	0.0	0.0	0.0	0.0
11	8.0	40389.0	0.0	23945.1	0.0	0.0	0.0	0.0	0.0
12	8.2	47487.3	0.0	27603.4	0.0	0.0	0.0	0.0	0.0
13	8.3	54566.0	0.0	31139.8	0.0	0.0	0.0	0.0	0.0
14	8.4	61 <b>6</b> 00.3	0.0	34552.3	0.0	0.0	0.0	0.0	0.0
15	8.6	68565.2	0.0	37838.7	0.0	0.0	0.0	0.0	0.0
16	8.7	75436.7	0.0	40997.2	0.0	0.0	0.0	0.0	0.0
17	8.8	82191.1	0.0	44026.1	0.0	0.0	0.0	0.0	0.0
18	6.6	64775.1	0.0	34231.2	0.0	0.0	0.0	0.0	0.0
19	0.1	892.2	0.0	256.7	0.0	0.0	0.0	0.0	0.0
20	0.1	967.3	0.0	492.6	0.0	0.0	0.0	0.0	0.0
21	2.2	21077.5	0.0	10716.9	0.0	0.0	0.0	0.0	0.0
22	9.0	92128.7	0.0	45944.1	0.0	0.0	0.0	0.0	0.0

			re	sult.out				
23	9.1 99601.8	0.0	48573.9	0.0	0.0	0.0	0.0	0.0
24	9.2 106910.9	0.0	51067.5	0.0	0.0	0.0	0.0	0.0
25	9.3 114034.3	0.0	53423.8	0.0	0.0	0.0	0.0	0.0
26	9.4 120949.2	0.0	55640.9	0.0	0.0	Ő.Ő	0.0	0.0
27	9.5 127634.9	ů ů ů	57717 9	õ õ	ň ň	0.0	õ.õ	ŏ.ŏ
28	2 1 20468 3	0.0	12154 4	0.0	0.0	0.0	0.0	0.0
20	7 4 104122 0	0.0	10104.4	0.0	0.0	0.0	0.0	0.0
23	7.4 104122.0	0.0	46499.0	0.0	0.0	0.0	0.0	0.0
30	a.0 138183.8	0.0	61446.7	0.0	0.0	0.0	0.0	0.0
31	3.0 43457.7	0.0	19235.3	0.0	0.0	0.0	0.0	0.0
32	6.7 99353.1	0.0	43860.8	0.0	0.0	0.0	0.0	0.0
33	9.7 148290.0	0.0	64601.4	0.0	0.0	0.0	0.0	0.0
34	9.8 153527.3	0.0	65961 0	õ õ	õ õ	ñ ň	ňň	ňň
35	9.8 158431 5	ň ň	67174 0	0.0	0.0	Ň.Ň	0.0	0.0
36	0 0 162099 1	0.0	60242 1	0.0	0.0	0.0	0.0	0.0
27	0 0 167102 2	0.0	00242.1	0.0	0.0	0.0	0.0	0.0
37	9.9 10/102.3	0.0	09101.3	0.0	0.0	0.0	0.0	0.0
20	9.9 1/1004.9	0.0	69933.0	0.0	0.0	0.0	0.0	0.0
39	10.0 174444.3	0.0	70556.4	0.0	0.0	0.0	0.0	0.0
40	4.3 75665.7	0.0	30358.2	0.0	0.0	0.0	0.0	0.0
41	5.7 101539.9	0.0	40672.7	0.0	0.0	0.0	0.0	0.0
42	10.0 178264.2	0.0	71356.1	Õ.Õ	ñ ñ	Õ Õ	ŏ.ŏ	ŏ.ŏ
43	4 3 76860 8	ňň	30755 8	ň ň	õ õ	ň ň	Ň Ň	0.0
44	5 7 102175 7	0.0	40776 7	0.0	0.0	0.0	0.0	0.0
15	10 0 10000 2	0.0	40//0./	0.0	0.0	0.0	0.0	0.0
43	10.0 100099.3	0.0	17228.0	0.0	0.0	0.0	0.0	0.0
40	10.0 182108.4	0.0	/143/.2	0.0	0.0	0.0	0.0	0.0
4/	10.0 183100.1	0.0	71166.0	0.0	0.0	0.0	0.0	0.0
48	10.0 183671.6	0.0	70745.5	0.0	0.0	0.0	0.0	0.0
49	9.9 183822.3	0.0	70176.0	0.0	0.0	0.0	0.0	0.0
50	9.9 183554.2	0.0	69458.1	0.0	0.0	0.0	0.0	0.0
51	9.9 182868 2	ŏ`ŏ	68591 8	0.0	õ õ	0.0	ň ň	ŏ ŏ
52	4 6 85027 8	ŏ.ŏ	31722 1	0.0	0.0	0.0	0.0	0.0
52	5 2 06502 4	0.0	JT/77'T	0.0	0.0	0.0	0.0	0.0
53	J.2 30J02.4	0.0	55050.5	0.0	0.0	0.0	0.0	0.0
24	3.0 T/0353.T	0.0	66417.6	0.0	0.0	0.0	0.0	0.0
22	5.0 89207.0	0.0	33241.0	0.0	0.0	0.0	0.0	0.0
56	4.8 85899.1	0.0	31869.6	0.0	0.0	0.0	0.0	0.0
57	9.7 172248.6	0.0	63657.9	0.0	0.0	0.0	0.0	0.0
58	9.6 169176.9	0.0	62060.8	0.0	0.0	0.0	0.0	0.0
59	9.6 165738.2	0.0	60319.2	0.0	0.0	0.0	0.0	0.0
60	9.5 161948.0	0.0	58435 3	ŏŏ	ŏŎ	Ő.Ő	õ õ	ŏŏ
61	9.4 157816 8	õ õ	56409 4	0.0	ñň	ň.ň	ň ň	ŏ. ŏ
62	0 3 153350 1	0.0	51212 6	0.0	0.0	0.0	0.0	0.0
62	0 2 1/9501 6	0.0	51026 7	0.0	0.0	0.0	0.0	0.0
64	9 0 120001 0	0.0	1230.7	0.0	0.0	0.0	0.0	0.0
04	0.0 120031.0	0.0	4/039.9	0.0	0.0	0.0	0.0	0.0
65	0.4 5439.1	0.0	1852.9	0.0	0.0	0.0	0.0	0.0
66	9.1 137722.9	0.0	46912.0	0.0	0.0	0.0	0.0	0.0
67	9.0 131276.4	0.0	44196.3	0.0	0.0	0.0	0.0	0.0
68	8.8 124621.3	0.0	41346.6	0.0	0.0	0.0	0.0	0.0
69	8.7 117780.9	0.0	38365.2	0.0	0.0	0.0	0.0	0.0
70	8.6 110776.0	0.0	35253.3	Õ.Õ	Õ.Õ	ŐŐ	ŎŎ	Ŏ.Ŏ
71	8 5 103631 3	õ õ	32012 9	ň ň	ňň	õ õ	0.0	ŏ.ŏ
72	8 / 06370 2	0.0	28646 0	0.0	0.0	8.8	0.0	0.0
72	0.7 30370.2	0.0	20040.0	0.0	0.0	0.0	0.0	0.0
73	0.2 09010.1	0.0	23154.3	0.0	0.0	0.0	0.0	0.0
/4	8.1 81394.4	0.0	51238.8	0.0	0.0	0.0	0.0	0.0
/5	7.9 74129.9	0.0	17804.8	0.0	0.0	0.0	0.0	0.0
76	6.2 53573.0	0.0	11426.2	0.0	0.0	0.0	0.0	0.0
77	1.6 13085.4	0.0	2524.9	0.0	0.0	0.0	0.0	0.0
78	4.4 35033.3	0.0	6248.4	0.0	0.0	0.0	0.0	0.0
79	3.2 24553 0	0.0	3732.8	0.0	0_0	0.0	0.0	0.0
80	2.6 18771 7	ňň	2481 7	0.0	ňň	ňň	ňň	ň ň
Ří	4 9 3//19 6	0.0	3415 5	0.0	0.0 ñ.ñ	0.0	ă.ă	8.0
82	6 6 ADDEL A	0.0	1722 6	0.0	0.0	0.0	0.0	0.0
02		0.0	1/22.0	0.0	0.0	0.0	0.0	ŏ.ŏ
0.0		0.0	0.0	0.0	ŭ.ŭ	0.0	0.0	0.0
84	/.2 41619.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	7.0 37301.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

			resu	lt.out				
6.8	33042.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.6	28857.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.5	24760.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.3	20766.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6.1	16889.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.9	13142.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.7	9540.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.5	6096.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.3	2824.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2,1	254.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Failure Surface Specified By 79 Coordinate Points

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No.	X-Surf (ft)	Y-Surf (ft)			
12345678901123451678901222245678901123456789011234567890112345678901123456789011234567890112345678901123456	357.90 365.08 372.42 379.92 387.57 395.37 403.32 411.40 419.62 427.97 436.45 453.76 462.59 471.52 489.69 508.24 517.63 527.11 536.65 546.27 555.94 565.67 575.46 585.28 595.15 605.06 614.99 624.95 634.91 664.91 674.91 684.90 704.83 714.766 734.52 744.34 754.12 763.85 773.52	$\begin{array}{c} 136.45\\ 129.49\\ 122.70\\ 116.09\\ 109.65\\ 103.39\\ 97.32\\ 91.43\\ 85.74\\ 80.23\\ 74.93\\ 69.82\\ 60.22\\ 55.73\\ 51.45\\ 87.43\\ 80.23\\ 55.74\\ 80.23\\ 51.45\\ 80.23\\ 51.45\\ 80.22\\ 55.73\\ 51.45\\ 83.36\\ 83.26\\ 83.26\\ 83.26\\ 12.57\\ 12.35\\ 12.$			
		result.	out		
-------------	-----------	-------------	-------	-------------	-------
47	783.12	30.61			
48	792.66	33.61			
49	802.13	36.83			
50	811.51	40.28			
51	820.82	43 94			
52	830 04	47 82			
ร์จิ	830 16	51 02			
54	8/8 10	56 22			
55	857 11	60 74			
56	865 02	65 46			
57	874 62	70 29			
58	882 21	70.30			
50	801 67	00 04			
59	000 01	00.04			
61	900.01	00.37			
62	900.21	92,00			
62	910.20	97.99			
00	924.21	110, 26			
04 65	030 C3	110.30			
60	939.03	122.45			
67	947.11	123,43			
67	954.44	130.26			
68	961.60	137.24			
69	968.60	144.38			
70	975.43	151.68			
/1	982.09	159.14			
/2	988.57	166.76			
73	994.87	174.52			
74	1000.99	182.43			
75	1006.93	190.48			
76	1012.67	198.67			
77	1018.22	206.98			
78	1023.58	215.43			
79	1023.83	215.85			
Circle Cent	er At X =	659.4 ; Y =	440.5	and Radius,	428.1
*** Factor	of Safety	= 1.917	***		

Failure Surface Specified By 78 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1	357.90	136.45
2	365.06	129.47
3	372.39	122.67
4	379.88	116.04
5	387.52	109.59
6	395.31	103.32
7	403.25	97.25
8	411.33	91.36
9	419.55	85.66
10	427.91	80.16
11	436.39	74.86
12	444.99	69.77
13	453.71	64.88
14	462.55	60.19

		result.out
15	471.49	55.72
10	480,54	51.46
18	409.09	47.42
<b>1</b> 9	508.26	39.99
20	517.67	36.61
21	527.16	33.45
22	536.72	30.52
23	546.34	27.82
24	565 78	23,34
26	575.57	21.09
<b>2</b> 7	585.41	19.31
28	595.29	17.76
29	605.21	16.45
30 21	615.15	15.38
31	635 10	13 01
33	645.09	13.57
34	655.09	13.44
35	665.09	13.55
36	675.08	13.90
3/	685.06	14,48
30	704 98	16 36
40	714.89	17.65
41	724.77	19.18
42	734.62	20.94
43	744.42	22.93
44	754.17	25.16
45	703.80	27.62
47	783.06	33,22
48	792.55	36.36
49	801.97	39.72
50	811.30	43.31
51	820.55	47.11
52 53	838 76	55 38
54	847.71	59.84
55	856.56	64.50
56	865.29	69.38
57	873.90	74.46
58	882.39	/9./4
60	898.99	90.91
61	907.08	96.78
62	915.03	102.84
63	922.84	109.09
64	930.49	115.53
66	937.99	122.14
67	945.55	135 90
68	959.52	143.03
69	966.36	150.32
70	973.02	157.78
/1	9/9.51	165.39
73	901 07 901 07	181 07
74	997.86	189.12
75	1003.59	197.31
76	1009.13	205.64
77	1014.47	214.09

Page 8

result.out 78 1015.34 215.55 Circle Center At X = 655.5 ; Y = 434.9 and Radius, 421.5 \*\*\* Factor of Safety = 1.925 \*\*\*

Failure Surface Specified By 79 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
12345678901123456789001123456789001123456789001123456789001123456789001123456789001123456789001123456789000000000000000000000000000000000000	342.11 349.23 356.52 363.97 371.57 379.33 387.23 395.27 403.45 411.76 420.20 428.77 437.45 446.25 455.16 464.17 473.28 482.49 491.78 501.16 510.62 529.75 539.42 549.14 558.91 568.73 578.60 588.49 598.42 608.38 618.35 628.34 638.34 638.32 678.30 688.26 9717.98 727.78 737.56 747.29 756.96 766.57	$\begin{array}{c} 136.05\\ 129.04\\ 122.19\\ 115.52\\ 109.02\\ 102.71\\ 96.58\\ 90.63\\ 84.88\\ 79.32\\ 73.96\\ 68.80\\ 63.84\\ 59.09\\ 54.54\\ 50.21\\ 46.09\\ 42.18\\ 38.50\\ 35.03\\ 31.78\\ 28.76\\ 25.96\\ 23.39\\ 21.05\\ 15.40\\ 13.98\\ 12.79\\ 11.84\\ 11.12\\ 10.64\\ 10.39\\ 10.37\\ 10.60\\ 11.75\\ 12.67\\ 13.83\\ 15.23\\ 16.85\\ 18.71\\ 20.80\\ 23.12\\ 25.66\\ 28.44 \end{array}$

		result.	out		
48	776.11	31,43			
49	785.58	34.66			
50	794.97	38.10			
51	804.27	41.76			
52	813.49	45.64			
53	822.61	49.74			
54	831.63	54.05			
55	840.55	58.57			
56	849.36	63.30			
5/	858.06	68.24			
58	866.64	/3.38			
59	8/5.09	/8./2			
60	003.42 201 61	84.25			
62	800 67	09.99			
63	907 59	102 02			
64	915.36	108 31			
65	922.98	114.79			
66	930.44	121.44			
67	937.75	128,27			
68	944.90	135.27			
69	951.87	142.43			
70	958.68	149.75			
71	965.31	157.24			
72	971.77	164.87			
73	978.04	172.66			
74	984.13	180.59			
/5	990.03	188.67			
76	995.74	196.88			
//	1001,26	205.22			
70	1000.37	215.09			
79	1001.21	212.27			
Circle Cente	er At X =	643.9 ; Y =	435.5	and Radius,	425.1
*** Factor	of Safety	= 1.927	***		

Failure Surface Specified By 78 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	436.84 443.94 451.21 458.64 466.23 473.97 481.86 489.90 498.08 506.39 514.84 523.41 532.10 540.91 549.83	138.42 131.38 124.51 117.82 111.30 104.97 98.83 92.88 87.13 81.57 76.22 71.06 66.12 61.39 56.86 Page 10
		raye IV

		result.out
16	558.85	52.56
17	567.98	48.47
10	577.20	44.60
79	200.31 505 01	40.90
20	595.91 595.91	37.33
22	614 93	34.34
23	624.55	28.64
24	634.23	26.13
25	643.97	23.86
26	653.76	21.83
27	663.60	20.03
28	673.48	18.46
29	602 22	16.05
30	703 20	15 20
32	703.23	14.59
33	723.27	14.22
34	733.27	14.09
35	743.27	14.20
36	753.26	14.55
37	763.24	15.14
38	773.21	15.96
39	/83.15	17.03
40 1	795.07	10.24
42	812 79	21.66
43	822.58	23.68
44	832.32	25.93
45	842.01	28.42
46	851.63	31.13
47	861.19	34.08
48	8/0.67	37.25
49	880 10	40.05
51	898 62	48.13
52	907.76	52.20
53	916.79	56.49
54	925.72	60.99
55	934.54	65.71
56	943.24	70.63
5/	951.82	/5,//
20 50	900.20	86 65
60	976.79	92.39
<b>čí</b>	984.84	98.32
62	992.75	104,44
63	1000.50	110.76
64	1008.11	117.25
65	1015.55	123.93
67	1022.83	130.79
68	1029,94	145 01
69	1043.66	152.37
70	1050.25	159.89
71	1056.66	167.57
72	1062.88	175.40
73	1068.91	183.37
/4 75	10/4.75	191.49
76	1082 83	208 14
77	1091.07	216.66
78	1092.02	218.29
		Dago 11

#### result.out

Circle Center At X = 733.7; Y = 430.6 and Radius, 416.5

\*\*\* Factor of Safety = 1.934 \*\*\*

Failure Surface Specified By 77 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1234567890112345678901223456789012334567890123444444444444444444444444444444444444	436.84 443.94 451.21 458.65 466.24 474.00 481.90 489.95 506.48 514.98.15 532.25 541.08 550.02 559.07 568.22 673.95 683.87 693.82 703.79 713.78 743.78 743.78 743.78 743.78 743.78 743.78 743.78 753.77 763.74 773.62 793.51 803.87 813.18 822.94 832.65 842.29 851.87 803.79 793.51 803.79 793.51 803.79 793.51 803.79 793.51 803.79 793.51 803.79 783.62 793.51 803.87 813.18 822.94 851.87 861.37 870.79	$\begin{array}{c} 138.42\\ 131.38\\ 124.51\\ 117.83\\ 111.32\\ 105.01\\ 98.88\\ 92.95\\ 87.22\\ 81.69\\ 76.36\\ 71.24\\ 66.33\\ 61.64\\ 57.16\\ 457.16\\ 457.03\\ 45.06\\ 41.48\\ 35.00\\ 32.11\\ 29.45\\ 27.03\\ 24.84\\ 22.90\\ 21.19\\ 16.04\\ 16.27\\ 16.75\\ 17.48\\ 18.45\\ 19.66\\ 21.11\\ 22.87\\ 16.04\\ 16.27\\ 16.75\\ 17.48\\ 18.45\\ 19.66\\ 21.18\\ 19.66\\ 21.25\\ 19.31\\ 29.31\\ 31.96\\ 34.84\\ 37.95\\ 41.29\\ 10.25\\ 1$

40	000 11	resurch	ouc		
49	880.14	44.87			
50	889.39	48.66			
51	898.54	52.69			
52	907.59	56.93			
53	916.54	61.40			
54	925.38	66.08			
55	934.10	70.98			
56	942.70	76.08			
57	951.17	81,40			
58	959.50	86.92			
59	967.71	92.64			
60	975.77	98.56			
61	983,68	104.68			
62	991.44	110.98			
63	999.04	117.48			
64	1006.49	124.15			
65	1013.77	131.01			
66	1020.88	138.04			
67	1027.81	145.25			
68	1034.57	152.62			
69	1041.15	160.15			
70	1047 54	167 84			
71	1053.74	175.69			
72	1059 74	183 68			
73	1065 56	101 87			
74	1071 17	200 10			
75	1076 57	200.10			
76	1081 77	217 05			
70	1082 20	217.03			
	1002.29	217.34			
Circle Cer	iter At X =	729.0 ; Y =	426.0	and Radius,	410.0
*** Facto	or of Safety	= 1.936	***		

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Failure Surface Specified By 80 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 12 11 11	405.26 412.70 420.28 428.00 435.86 443.85 451.97 460.22 468.59 477.07 485.68 494.39 503.20 512.12 521.14 530.25 539.44 548.72	137.63130.94124.42118.06111.88105.87100.0394.3888.9183.6278.5273.6168.8964.3760.0455.9151.9948.26

		result.out
19	558.08	44.74
20	567.52	41.43
21	577.03	38.32
22	506.00	33.43 22 71
23 24	605 92	32.74
25	615 66	28 01
26	625.45	25.96
27	635,28	24.13
28	645.15	22.52
29	655.05	21.12
30	664.98	19.94
3T 22	6/4.93	18.97
32	694.91	17 70
34	704.89	17.40
35	714.89	17.31
36	724.89	17.44
37	734.88	17.80
38	744.86	18.37
39	754.83	19.10
40 11	704.70	20.17
42	784.60	22.84
43	794.46	24.50
44	804.28	26.37
45	814.06	28.47
46	823.79	30.77
47	833.47	33.29
48 10	843.09	30.02
49 50	862.14	42.11
51	871.56	45.47
52	880.90	49.03
53	890.17	52.80
54	899.35	56.77
55	908.43	60.94
50 57	917.43	60.87
57 58	935.12	74.63
59	943.81	79.58
60	952.39	84,72
61	960.85	90.04
62	969.20	95.55
63 64	977.42	101.25
04 65	903 A8	113 17
66	1001.31	119.39
67	1009.00	125.78
68	1016.55	132.34
<u>69</u>	1023.95	139.06
70	1031.20	145.94
/1 72	1038.31	152.98
73	1052 04	167.52
74	1058.66	175.02
75	1065.12	182.65
76	1071.40	190.43
77	1077.52	198.34
/ð 70	1085.40	200.30
80	1091.72	218.28
	1031112	210.20

result.out Circle Center At X = 713.8 ; Y = 473.1 and Radius, 455.8

\*\*\* Factor of Safety = 1.936 \*\*\*

Failure Surface Specified By 79 Coordinate Points

Point NO.	X-Surf (ft)	Y-Surf (ft)
1234567890112345678901234567890123456789012345678901234567890122222222222333333333444444444444444444	326.32 326.32 333.41 340.67 348.09 355.66 363.39 371.26 379.27 387.43 395.71 404.13 412.67 421.33 447.98 457.07 466.26 475.53 484.83 513.49 532.80 542.56 552.37 562.22 572.11 582.03 611.93 631.93 641.93 651.92 661.90 671.87 681.81 691.72 701.59 721.22 730.97 740.65 750.28	$\begin{array}{c} 135.66\\ 128.61\\ 121.73\\ 115.03\\ 102.15\\ 95.98\\ 90.00\\ 84.21\\ 78.61\\ 73.21\\ 68.01\\ 58.21\\ 53.62\\ 49.24\\ 45.08\\ 41.37\\ 30.87\\ 30.87\\ 24.66\\ 17.47\\ 15.53\\ 12.35\\ 11.11\\ 10.10\\ 9.33\\ 8.79\\ 8.48\\ 8.41\\ 8.57\\ 9.60\\ 10.47\\ 11.57\\ 12.91\\ 14.47\\ 16.20\\ 23.04\\ 25.75\\ 28.69\end{array}$
49	769.32	31.85

50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79	778.73 788.06 797.30 805.50 824.45 833.30 842.03 859.13 867.50 875.73 889.60 907.27 914.78 922.14 929.33 936.36 943.22 949.91 956.42 962.75 968.90 974.86 980.64 986.21 991.60 994.92	result. 35.23 38.84 42.66 46.69 50.94 55.41 60.08 64.95 70.03 75.31 80.79 86.47 92.33 98.39 104.63 111.05 117.65 124.42 131.37 138.48 145.76 153.19 160.78 168.52 176.41 184.43 192.60 200.90 209.33 214.82	out		
Circle Cente	er At X =	630.0 ; Y =	434.3	and Radius,	425.9
ractor	of safety	= 1,940			

Failure Surface Specified By 78 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 0 11 12 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 10 12 3 4 5 6 7 8 9 10 12 3 4 5 6 7 8 9 10 12 12 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 10 11 2 3 4 5 10 11 2 3 4 5 10 11 2 3 4 5 10 11 2 3 10 11 2 3 10 11 12 112 11 12 11 12 11 12 11 11	421.05 428.48 436.06 443.79 451.65 459.66 467.79 476.06 484.45 492.96 501.59 510.32 519.17 528.12 537.17 526.31 555.54	138.03 131.33 124.81 118.46 112.28 106.29 100.47 94.85 89.40 84.15 79.10 74.24 69.57 65.11 60.85 56.80 52.95

		result.out
18	564.85	49.31
79	583 72	45.89
21	593.26	39.67
22	602.86	36.89
23	612.53	34.32
24	622.25	31.97
25	641 84	29.85
27	651.69	26.25
28	661.58	24.79
29	671.51	23.55
30	681.46	22.54
37	091.42 701 41	21.75 21.19
33	711.40	20.84
34	721.40	20.73
35	731.40	20.84
36	741.40	21.18
3/	751.38	21.74
39	771.30	22.55
40	781.22	24.78
41	791.11	26.23
42	800.97	27.92
43 44	810.79 820 56	29.82
45	830.28	34,29
46	839.95	36.86
47	849.55	39.64
48	859.09	42.63
49 50	877 96	43.84
51	887.27	52.90
52	896.51	56.75
53	905.65	60.80
54	914.70	65.06 60.52
56	932.50	74.18
57	941.24	79.04
58	949.86	84.09
59	958,38	89.34
61	975.03	100.40
62	983.17	106.22
63	991.18	112.21
64	999.04	118.38
65	1014 35	124./3 131 25
67	1021.78	137.94
68	1029.06	144.80
69	1036.19	151,82
70 71	1043.15	159.00
72	1056.58	173.81
73	1063.04	181.45
74	1069.33	189.22
75	1075.44	197.14
70	1087 12	203.19
78	1090.37	218.23

#### result.out

\*\*\* Factor of Safety = 1.955 \*\*\*

Failure Surface Specified By 78 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
No. 12345678901123456789011234567890112334567890112232222222222222333333901423445678	(ft) 452.63 459.70 466.95 474.35 481.91 489.63 497.50 505.52 513.67 521.97 530.39 538.95 547.62 556.41 565.32 574.33 583.44 592.65 611.33 620.80 639.95 649.65 669.34 639.95 649.65 659.34 678.97 788.68 718.65 728.63 738.62 748.62 758.61 778.59 788.56 798.51 808.43 818.31 828.15 837.03 847.70 857.03 847.70 857.69 888.84 758.62 758.62 758.63 758.56 798.51 808.43 818.31 828.15 837.95 808.43 818.50 857.03 87.03 886.09 886.09 886.09	(ft) 138.82 131.75 124.85 118.13 111.59 105.23 99.06 93.08 87.29 81.71 76.32 71.14 66.16 61.40 56.85 52.51 48.39 44.49 40.81 37.36 34.14 25.84 23.54 23.54 23.54 13.65 13.65 13.65 13.65 13.65 13.65 13.65 13.58 13.90 14.46 15.26 13.58 13.5
49	895.49	39.68
50	904.82	43.28

51 52 53 54 55 56 57 58 59 60 62 63 66 66 66 76 86 970 71 72 73 74 75 76 77 78		914.0 923.2 932.2 941.1 950.0 958.7 967.3 975.7 984.1 992.3 1000.3 1008.3 1016.0 1023.6 1031.1 1038.4 1045.5 1052.5 1059.3 1065.9 1072.3 1078.5 1084.6 1090.4 1096.1 1101.5 1106.8 1108.9	6058132922807843620026051724	resu 47.11 51.16 55.43 59.91 64.61 69.52 74.63 79.95 85.48 91.20 97.11 103.22 116.00 122.67 129.51 136.52 143.71 151.06 158.57 166.23 174.05 182.02 190.13 198.37 206.75 215.26 218.89	lt.out				
Circl ***	e Cent	er At X of Saf	= 750 ety =	0.2 ; Y 1.9	= 429 56 ***	).4 and	Radius,	410	6.0
		Y	А	x	r	s		F	т
	(	0.00	270.00	54	0.00	810.00	1080.0	00	1350.00
<b>x</b>	0.00 270.00	+** - -  +   	+		-+		+		<b>+</b>
A	54 <b>0.</b> 00	.2115* .115 415 21 12 11	* * *						
x	810.00	01 .12 .112	*	Pac	up 19				

		.0 	1128. 51123.		result.out
I	1080.00	 + -	.51112	23 11 55 0	
		-		•	
		-			
S	1350.00	+			
		-			
		-			
		-			
		-			
	1000 00	-		*	
	1620.00	+			
		-			
		-		**	
		-		Ŷ	
		_			
F	1890.00	+			
•		÷.			
		-			
		-			
		-			
		-			
Т	2160.00	+	**	*	

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## LENA ROAD LANDFILL - X-SEC C - C' - FS Min- Spencer = 1.928



# LENA ROAD LANDFILL - X-SEC C - C' - FS Min- Spencer = 1.928

result.out \*\* STABL for WINDOWS \*\* by Geotechnical Software Solutions

--Slope Stability Analysis--Simplified Janbu, Simplified Bishop or Spencer`s Method of Slices

Run Date:	9/27/10
Time of Run:	14:30
Run By:	Shawkat Ali
Input Data Filename:	run.in
Output Filename:	result.out
Unit:	U.S.C.
Plotted Output Filename:	result.plt

PROBLEM DESCRIPTION LENA ROAD LANDFILL - X-SEC C - C'

#### BOUNDARY COORDINATES

20 Top Boundaries 28 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd			
1	0.00	135.00	300.00	135.00	2			
2	300.00	135.00	500.00	140.00	2			
3	500.00	140.00	560.00	155.00	1			
4	560.00	155.00	580.00	155.00	1			
5	580.00	155.00	660.00	175.00	1			
<u>6</u>	660.00	175.00	680.00	175.00	1			
/	680.00	175.00	760.00	195.00	1			
ŏ	760.00	195.00	780.00	195.00	1			
9	780.00	195.00	840.00	210.00	1			
10	840.00	210.00	840.00	210.00	1 1			
	840.00	210.00	980.00	215.00	1			
12	980.00	215.00	1100.00	220.00	1			
13	1220.00	220.00	1220.00	225.00	1			
14	1220.00	225.00	1340.00	230.00	1			
15	1340.00	230.00	1460.00	235.00	1			
10	1460.00	235.00	1510.00	235.00				
10	1510.00	235.00	1030.00	230.00	1			
10	1750.00	230.00	1/50.00	225.00	1			
19	1970.00	225.00	1870.00	220.00	1			
20	18/0.00	220,00	1990.00	215.00	1			
21	500.10	127.00	1000.20	127 00	1 2			
22	500.10	112 00	1990.00	112 00	2			
23	0.00	102 00	1000.00	108 00	2			
24	0.00	102.00	1000.00	102.00	4			
23	0.00	103.00	1000.00	103.00	2			
20	0.00	32.00	1000 00	32,00	7			
21	0.00	00.00	~ 1	00.00	/			
Page I								

#### **ISOTROPIC SOIL PARAMETERS**

8 Type(s) of Soil

1

1

1

Soil	Total	Saturated	Cohesion	Friction	Pore	Pressure	Piez.
туре	Unit Wt.	Unit Wt.	Intercept	Angle	Pressure	Constant	Surface
No.	(pcf)	(pcf)	(psf)	(deg)	Param.	(psf)	No.
1	70.0	80 O	0.0	20 0	0.00	0 0	1
Ť.	70.0	00.0	0.0	20.0	0.00	0.0	T
2	95.0	105.0	0.0	29.0	0.00	0.0	1
3	100.0	110.0	0.0	30.0	0.00	0.0	1
4	110.0	125.0	1000.0	0.0	0.00	0.0	1
5	100.0	110.0	0.0	30.0	0.00	0.0	1
6	110.0	120.0	0.0	36.0	0.00	0.0	1
7	105.0	120.0	750.0	0.0	0.00	0.0	1
8	115.0	130.0	1500.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Point	X-Water	Y-Water
No.	(ft)	(ft)
1 2 3	0.00 500.00 500.10	133.00 133.00 127.00 127.00

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

400 Trial Surfaces Have Been Generated.

20 Surfaces Initiate From Each Of 20 Points Equally Spaced Along The Ground Surface Between X = 300.00 ft. and X = 500.00 ft.

Each Surface Terminates Between X = 840.00 ft. and X = 1100.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

#### result.out

10.00 ft. Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By Spencer`s Method \* \*

Number of convergent trials379Number of non convergent trials21

1

Failure Surface Specified By 80 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3 4 5 6 7 8 9 0 112 14 5 6 7 8 9 0 112 14 5 6 7 8 9 0 112 14 5 6 7 8 9 0 112 14 5 6 7 8 9 0 112 14 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 1 22 2 22 2 2 5 6 7 8 9 0 1 22 3 4 5 6 7 8 9 0 1 22 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	394.74 401.88 409.19 416.65 424.26 432.02 439.92 447.96 456.14 464.44 472.87 481.42 490.09 498.87 507.76 516.75 525.83 535.02 544.29 553.64 563.07 572.58 582.15 591.79 601.49 611.24 630.88 640.76 650.68 660.55 700.55 720.55 720.55 730.53 740.51	$\begin{array}{c} 137.37\\ 130.37\\ 123.55\\ 116.89\\ 110.40\\ 104.09\\ 97.96\\ 92.02\\ 86.25\\ 80.68\\ 75.30\\ 70.12\\ 65.13\\ 60.35\\ 55.76\\ 51.38\\ 47.21\\ 43.25\\ 39.50\\ 35.96\\ 32.64\\ 29.54\\ 26.66\\ 23.99\\ 21.55\\ 19.33\\ 17.34\\ 15.57\\ 14.03\\ 12.71\\ 11.63\\ 10.77\\ 10.14\\ 9.74\\ 9.57\\ 9.62\\ 9.91\\ 10.43\\ 11.17\end{array}$

	444444444555555555555566666	012345678901234567890123	750.46 760.38 770.28 780.14 789.96 799.74 809.46 819.13 828.74 838.28 847.75 857.14 866.46 875.68 884.82 893.86 902.79 911.63 920.35 928.96 937.45 945.82 954.06 962.16	re 12. 13. 14. 16. 20. 22. 25. 28. 31. 34. 37. 41. 58. 62. 72. 78. 83. 895	sult.out 15 35 78 44 32 43 76 32 09 09 30 73 88 24 30 58 06 75 64 73 01 49 16 01				
	6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	45678901234567890	970.13 977.96 985.65 993.18 1000.56 1007.79 1014.85 1021.75 1028.49 1035.05 1041.44 1047.64 1053.67 1059.51 1065.17 1070.63 1075.32	101. 107. 113, 120. 126. 133. 140. 148. 155. 163. 170. 178. 186. 194. 203. 211. 218.	05 27 67 25 99 91 98 22 61 16 85 67 79 04 41 97				
	Circ ***	le Cente Factor Individ	r At X = of Safety Jal data	703.0 ; y = 1 on the	Y = 445 .928 *** 104 sli	5.2 and	Radius,	435.7	
Slice No. 2 3 4 5 6	Width (ft) 2.7 7.3 7.5 4.6 3.0	Weight (1bs) 949.9 1520.4 7852.5 13432.3 10804.2 8308.5	Water Force (lbs) 0.0 0.0 0.0 0.0 0.0 0.0	Water Force Bot (1bs) 307.5 3768.9 7976.8 6752.9 5325.1	Force Norm (1bs) 0.0 0.0 0.0 0.0 0.0 0.0 Page 4	Force Tan (1bs) 0.0 0.0 0.0 0.0 0.0	Earthq For (lbs) 0.0 0.0 0.0 0.0 0.0 0.0 0.0	uake ce Sur (1bs) 0.0 0.0 0.0 0.0 0.0 0.0	charge Load (1bs) 0.0 0.0 0.0 0.0 0.0

				re	esult.out				
7	3.0	8877.8	0.0	5652.2	0.0	0.0	0.0	0.0	0.0
å	4.8	5224 6	0.0	3274 1	0.0		0.0	0.0	0.0
10	6.5	26407.2	0.0	16677.0	0.0	0.0	0.0	0.0	0.0
11	6.7	31077.1	0.0	19536.0	0.0	0.0	0.0	0.0	0.0
12	1.3	6620.1	0.0	4183.0	0.0	0.0	0.0	0.0	0.0
13	5.7	30097.1	0.0	18700.1	0.0	0.0	0.0	0.0	0.0
14	2.5	13960.1	0.0	8671.6	0.0	0.0	0.0	0.0	0.0
16	0.5 4 2	27749 8	0.0	16701 3	0.0		0.0	0.0	0.0
17	4.2	29345.8	0.0	17622.7	0.0	0.0	0.0	0.0	0.0
18	8.6	63903.7	0.0	37620.0	0.0	0.0	0.0	0.0	0.0
19	8.7	70684.0	0.0	40793.5	0.0	0.0	0.0	0.0	0.0
20	8.8	77358.5	0.0	43842.9	0.0	0.0	0.0	0.0	0.0
21 22		10383.4 813 A	0.0	3/98.3	0.0		0.0	0.0	0.0
23	0.1	883.9	0.0	472 7	0.0		0.0	0.0	0.0
24	7.6	69224.5	0.0	36756.2	0.0	0.0	0.0	ŏ.ŏ	ŏ.ŏ
25	9.0	88510.0	0.0	45819.0	0.0	0.0	0.0	0.0	0.0
26	9.1	95964.9	0.0	48486.6	0.0	0.0	0.0	0.0	0.0
27	9.2	103272.0	0.0	51024.0	0.0	0.0	0.0	0.0	0.0
28	9.3	117360 0	0.0	55703 1	0.0		0.0	0.0	0.0
30	6.4	83054.5	0.0	38771.0	0.0		0.0	0.0	0.0
<b>31</b>	3.1	40965.4	Ŏ.Ŏ	19071.3	0.0	ŏ.ŏ	0.0	ŏ.ŏ	ŏ.ŏ
32	9.5	129315.0	0.0	59846.4	0.0	0.0	0.0	0.0	0.0
33	7.4	103519.0	0.0	47672.0	0.0	0.0	0.0	0.0	0.0
34 25	2.2	30497.8	0.0	14042.4	0.0	0.0	0.0	0.0	0.0
36	9.0	145225 7	0.0	65038 1	0.0		0.0	0.0	0.0
37	9.8	150640.2	0.0	66492.3	0.0	0.0	0.0	0.0	0.0
38	9,8	155746.4	0.0	67806.5	0.0	0.0	0.0	0.0	0.0
39	9.8	160531.0	0.0	68980.3	0.0	0.0	0.0	0.0	0.0
40	9.9	164982.6	0.0	70013.5	0.0	0.0	0.0	0.0	0.0
41 42	9,9	162017 6	0.0	70904.8	0.0		0.0	0.0	0.0
43	0.6	10816.7	0.0	4467.7	0.0	0.0	0.0	0.0	0.0
44	10.0	175245.3	0.0	72261.6	0.0	0.0	0.0	0.0	0.0
45	9.4	166580.3	0.0	68632.8	0.0	0.0	0.0	0.0	0.0
46	0.6	9934.1	0.0	4093.4	0.0	0.0	0.0	0.0	0.0
47	10.0	180500.9	0.0	/304/.3	0.0		0.0	0.0	0.0
49	10.0	182445.5	0.0	73261.1	0.0		0.0	0.0	0.0
50	10.0	183897.2	0.0	73153.2	0.0	0.0	0.0	ŏ.ŏ	0.0
51	10.0	184951.3	0.0	72902.2	0.0	0.0	0.0	0.0	0.0
52	10.0	185604.9	0.0	72507.8	0.0	0.0	0.0	0.0	0.0
53	10.0	185859.8	0.0	/19/1.2	0.0	0.0	0.0	0.0	0.0
55	9.5	7203 2	0.0	2750 4	0.0		0.0	0.0	0.0
56	9.9	184247.6	0.0	70469.9	0.0	0.0	0.0	0.0	0.0
57	9.7	178975.2	0.0	68500.2	ŏ.ŏ	0.0	0.0	0.0	0.0
58	0.1	2633.0	0.0	1006.1	0.0	0.0	0.0	0.0	0.0
59	9.8	179468.0	0.0	68401.6	0.0	0.0	0.0	0.0	0.0
60 61	9.0	1////1.5	0.0	0/100.0	0.0		0.0	0.0	0.0
62	9.7	173253.7	0.0	64246.5	0.0		0.0	0.0	0.0
63	9.6	170449.5	0.0	62583.6	ŏ.ŏ	ŏ.ŏ	0.0	0.0	0.0
64	9.5	167294.1	0.0	60783.1	0,0	0.0	0.0	0.0	0.0
65	1.7	29919.7	0.0	10834.2	0.0	0.0	0.0	0.0	0.0
00 67	/.8	158218 0	0.0	48011.4 56772 0	0.0		0.0	0.0	0.0
68	9.4	152785.8	0.0	54565 3	0.0	0.0	0.0	0.0	0.0
<b>6</b> 9	9.2	147088.5	ŏ.ŏ	52224.7	0.0	0.0	0.0	0.0	ŏ.ŏ
			• • •		Page 5		•		
					-				

			res	ult.out				
70	9.1 141141.1	0.0 49	9751.7	0.0	0.0	0.0	0.0	0.0
71	9.0 134963.6	0.0 42	7148.0	0.0	0.0	0.0	0.0	0.0
72	8.9 128573.7	0.0 44	4414.9	0.0	0.0	0.0	0.0	0.0
73	8.8 121990.0	0.0 4	1553.6	0.0	0.0	0.0	0.0	0.0
74	8.7 115234.4	0.0 3	3566.0	0.0	0.0	0.0	0.0	0.0
75	8.6 108325.7	0.0 3	5453.4	0.0	0.0	0.0	0.0	0.0
76	8.5 101070.1	0.0 32	2150.5	0.0	0.0	0.0	0.0	0.0
77	0.0 215.2	0.0	66.8	0.0	0.0	0.0	0.0	0.0
78	8.4 94366.4	0.0 28	3859.9	0.0	0.0	0.0	0.0	0.0
79	6.6 70149.5	0.0 20	0488.9	0.0	0.0	0.0	0.0	0.0
80	1.7 17435.7	0.0	4893.5	0.0	0.0	0.0	0.0	0.0
81	5.3 53614.8	0.0 14	4711.4	0.0	0.0	0.0	0.0	0.0
82	2.8 27153.1	0.0	7075.8	0.0	0.0	0.0	0.0	0.0
83	8.0 74252.9	0.0 1	3075.7	0.0	0.0	0.0	0.0	0.0
84	2.5 21788.9	0.0	4878.3	0.0	0.0	0.0	0.0	0.0
85	5.4 45855.7	0.0	9371.9	0.0	0.0	0.0	0.0	0.0
86	0.9 7168.1	0.0	1370.9	0.0	0.0	0.0	0.0	0.0
87	1.2 9484.4	0.0	1755.0	0.0	0.0	0.0	0.0	0.0
88	4.8 38008.4	0.0	5289.5	0.0	0.0	0.0	0.0	0.0
89	0.8 6152.4	0.0	897.0	0.0	0.0	0.0	0.0	0.0
90	7.5 54568.0	0.0	5264.7	0.0	0.0	0.0	0.0	0.0
91	7.4 48459.1	0.0	2109.1	0.0	0.0	0.0	0.0	0.0
92	0.0 47.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93	7.2 43227.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94	7.1 39001.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95	6.9 34777.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96	6.7 30617.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97	6.6 26534.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98	6.4 22540.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99	6,2 18649.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100	6.0 14875.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
101	5.8 11228.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102	5.7 7724.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
103	5.5 4373.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
104	4.7 1207.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Failure Surface Specified By 81 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3 4 5 6 7 8 9 10 112 13 14 15 16 17 18 9 0 21	415.79 422.92 430.20 437.64 445.23 452.97 460.85 468.87 477.03 485.31 493.73 502.26 510.91 519.67 528.55 537.52 546.59 555.76 565.02 574.36 583.78	$137.89 \\ 130.88 \\ 124.03 \\ 117.35 \\ 110.84 \\ 104.50 \\ 98.35 \\ 92.38 \\ 86.59 \\ 80.99 \\ 75.58 \\ 70.37 \\ 65.35 \\ 60.54 \\ 55.92 \\ 51.51 \\ 47.31 \\ 43.31 \\ 39.53 \\ 35.96 \\ 32.61 \\ \end{array}$

		result.out
22	593.27	29.47
23	602.84	26.55
24	612.47	23.85
25	622.16	21.37
26	631.90	19.11
2/	641.69	17.08
28	651.52	15.27
29	001.40 671 21	13.69
3U 21	0/1.31 601 34	11 21
32	601 20	10 31
32	701 18	9 64
34	711.17	9,20
35	721.17	8.99
36	731.17	9.00
37	741.16	9.25
38	751.15	9.72
39	761.13	10.43
40	771.09	11.36
41	/81.02	12.52
42	790.92	15.91
45	810.79	17 36
45	820.40	19 42
46	830.14	21.71
47	839.82	24.22
48	849.44	26.95
49	858.99	29.90
50	868.48	33.07
51	877.89	36.46
52	806 46	40.06
54	905.62	47.90
55	914.68	52.13
56	923,64	56.57
57	932.49	61.21
58	941.24	66.06
59	949.87	71.10
60	958.39	76.34
61 62	966.79	81.78
63	973.03	07.40
64	991.19	99 22
65	999.05	105.40
66	1006.77	111.75
67	1014.34	118.29
68	1021.76	124.99
69	1029.02	131.87
70	1036.12	138.91
/1 72	1043.00	140.11
73	1056 44	160.97
74	1062_87	168-63
75	1069.12	176.44
76	1075.19	184.38
77	1081.08	192.47
78	1086.78	200.68
/9	1092.29	209.03
8U 81	1000 00	217.50
от	T033'00	513.30

Circle Center At X = 725.5; Y = 445.3 and Radius, 436.3

re	su	٦t	.0	ut

\*\*\* Factor of Safety = 1.942 \*\*\*

1

Failure Surface Specified By 81 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
Point No. 1234567890112345678901123456789012223456789012334567890112344567890112234567890122234567890123334567890142344567	x-Surf (ft) 415.79 422.92 430.21 437.66 445.26 445.26 460.89 468.92 468.98 468.98 519.75 528.63 537.61 546.69 555.86 555.13 546.69 555.13 546.69 612.60 612.60 622.29 632.03 641.83 651.67 661.54 565.13 701.33 711.32 721.32 731.32 751.30 761.28 771.23 781.16 800.93 810.76 820.54 830.94	Y-Surf (ft) 137.89 130.89 124.04 117.37 104.54 98.39 92.43 86.65 81.06 75.66 70.46 65.45 60.65 56.04 51.65 47.45 43.47 39.70 36.14 32.80 29.68 26.77 24.08 21.62 19.38 17.36 15.57 14.00 12.67 10.55 10.67 10.55 10.67 11.55 10.67 10.91 11.86 13.04 14.44 16.08 17.93 20.02 22.35
49 50	859.10 868.58	30.58

					- r	esul	t.c	but			
50	L	87	7.98		37	.17					
52	2	- 88	7.31		40	.79					
5	3	ğ	6.54		ΔĂ	63					
52	1	ăñ	5 69		48	67					
51	T 5	01	1 71		52	.07					
5.	5	02			52	. 32					
50	7	32			27	. 30					
57	5	93	1 27		02	,03					
50	2	34	1.27		71	.91					
25	2	94	9.89		<u> </u>	.98					
00	) 1	93	8.40		11	. 24					
0.		90	0.78		8Z	. 69					
04	Ś	97	5.03		88	.34					
6:	5	98	3.16		.94	.1/					
64	1	99	1.14		100	.19					
6	2	99	8.99		106	.39					
66	2	100	6.69		112	.77					
67	7	101	.4.24		119	. 32					
68	3	102	1.64		126	.05					
69	9	102	8.89		132	.94					
- 70	)	103	5.97		140	.00					
71	1	104	2.89	•	147	.21					
72	2	104	9.65		154	.59					
73	3	105	6.23		162	. 12					
74	4	106	52.64		169	.79					
75	5	106	8.87		177	. 62					
76	5	107	4.92		185	.58					
77	7	108	0.78		193	. 68					
78	3	108	6.46		201	.91					
79	ā	109	1.95		210	.27					
80	5	109	7.24		218	75					
81	Ĩ	109	7.93		219	91					
0.	-					191					
Circì	le Cento	er A	at X =	724	.8	; Y	=	445.3	and	Radius,	435.9
***	Factor	of	Safety	=		1.94	4	***			

### Failure Surface Specified By 82 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3 4 5 6 7 8 9 10 11 12 13 14	321.05 328.33 335.76 343.34 351.05 358.90 366.88 375.00 383.24 391.60 400.07 408.66 417.36 426.17 435.08	135.53 128.67 121.98 115.45 109.08 102.89 96.87 91.02 85.35 79.87 74.56 69.44 64.51 59.77 55.23
10	444.08	50.88
17	453.18	46.72

Page 9

		result.out
18	462.36	42.77
19	471.63	39.01
20 21	400.98	32,12
22	499.90	28.98
23	509.46	26.04
24	519.08	23.32
25	528.76	20.81
20	538.49	
27 28	558.09	14 54
2 <b>9</b>	567.95	12.88
30	577.85	11.43
31	587.77	10.20
32 22	597.72	9.19
34	617.67	7.81
35	627.66	7.45
36	637.66	7.31
37	647.66	7.38
38 30	667 65	/.0/ 8 18
40	677.62	8,91
41	687.57	9.85
42	697.51	11.01
43	707.41	12.39
44 45	/1/.28 727 12	15.98
46	736.91	17.81
47	746.66	20.04
48	756.36	22.49
49 50	765.00	25.14
50 51	785.10	31.08
52	794.54	34.36
53	803.92	37.85
54	813.21	
55	831.55	49.51
Š7	840.58	53.80
58	849.52	58.28
59	858.36	62.96
60 61	807.09	07.83 72.89
62	884.24	78.13
63	892.63	83.56
64 65	900.91	89.17
60 66	909.07	94.90
67	924,99	107.06
68	932.74	113.37
<u>69</u>	940.36	119.85
70 71	947.84	126.49
71 72	962.35	140.25
73	969.37	147.37
74	976.24	154.64
75 76	982.95 080 50	162.05
, 77	995.88	177.31
78	1002.09	185.15
79	1008.13	193.12
80	1013.88	ZUI,ZZ
		raye 10

result.out 1019.68 209.45 1024.57 216.86 81 82 Circle Center At X = 639.3; Y = 466.3 and Radius, 459.0 \*\*\* Factor of Safety = 1.946 \*\*\*

1

Failure Surface Specified By 80 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
123456789011213456789011222222222222222333333333339012222222222	342.11 349.28 356.62 364.11 371.75 379.54 403.75 412.08 420.54 429.11 437.81 446.61 455.53 464.54 473.65 482.86 492.15 501.52 510.98 520.50 539.75 549.46 559.23 569.04 578.89 588.78 598.70 608.65 618.62 628.60 648.60 658.60 668.59 678.57 688.54 698.48 708.40 718.29 728.14 737.94	$\begin{array}{c} 136.05\\ 129.09\\ 122.30\\ 115.67\\ 109.22\\ 102.95\\ 96.86\\ 90.95\\ 85.23\\ 79.70\\ 74.37\\ 69.23\\ 64.29\\ 59.55\\ 55.01\\ 50.69\\ 46.57\\ 42.66\\ 38.96\\ 35.48\\ 32.21\\ 29.17\\ 26.34\\ 21.36\\ 19.20\\ 17.27\\ 15.57\\ 14.09\\ 12.84\\ 11.82\\ 11.03\\ 10.16\\ 10.52\\ 11.11\\ 11.93\\ 12.98\\ 14.25\\ 15.76\\ 17.49\\ 19.45\end{array}$
45	747.70	21.63

46 757.41 24.04	
47 767.06 26.67	
48 776.64 29.53	
49 786.16 32.60	
50 /95.00 35.89 51 804.06 20.40	
52 914 25 42 12	
53 $823$ $44$ $47$ $05$	
54 832 54 51 20	
55 841.54 55.55	
56 850.44 60.11	
57 859.23 64.88	
58 867.92 69.84	
59 876.48 75.00	
60 884.92 80.36	
6L 893.24 85.92	
62 901.43 91.66 63 000.49 07.50	
03 909.48 97.39 67 017.20 102.70	
65 925 16 100 00	
66 932,79 116 46	
67 940.26 123.11	
68 947.58 129.92	
69 954.74 136.91	
70 961.73 144.05	
71 968.56 151.36	
72 975.22 158.82	
73 981.71 166.43	
74 988.02 174.18 75 004.15 183.00	
75 994,15 182,09 76 1000,00 100,12	
70 1000.09 190.15	
78 1011 42 206 61	
79 1016.80 215.04	
80 1017.73 216.57	
Circle Center At $X = 648.0$ ; $Y = 444.3$ and Radius, 43	4.2
*** Factor of Safety = 1.947 ***	

### Failure Surface Specified By 80 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 10 11 12 13	394.74 402.03 409.47 417.05 424.79 432.66 440.67 448.80 457.07 465.46 473.98 482.60 491.34	137.37130.52123.84117.33110.98104.8298.8393.0287.3981.9576.7071.6566.78
		_

		result.out
14	500.18	62.12
15	509.13	57.65
10 17	518.1/	53,38
1/ 1 <b>0</b>	526 54	49.32
10	545 85	43.40
20	555 24	38 37
21	564.70	35.14
22	574.24	32.12
23	583.83	29.32
24	593.49	26.73
25	603.21	24.30
20	622.79	20.28
28	632.64	18.56
29	642.53	17.07
30	652.44	15.80
31	662.39	14.75
32	6/2.36	13.93
37	082.34 602.22	12 04
34	702 33	12.94
36	712.33	12.86
37	722.32	13.15
38	732.31	13.67
39	742.28	14.40
40	752.24	15.37
41 42	702.17	17 06
43	781.93	19.59
44	791.76	21,43
45	801.55	23.50
46	811.28	25.79
47	820.96	28,29
40	830.39	31.01
50	849.64	37.09
<b>Š</b> ľ	859.06	40,45
52	868.40	44.02
53	877.66	47.80
54	886.83	51.78
55	004 80 032.9T	55.97
57	913.78	64.95
58	922.56	69.74
59	931,23	74.72
60	939.78	79.90
61	948.22	85.26
62	950.54	90.82
64	972.79	102.47
65	980.71	108.57
66	988.50	114.85
67	996.14	121.30
60	1003.64	127.91
70	1010,99	141 64
71	1025.22	148.75
72	1032.10	156.01
73	1038.81	163.42
74	1045.35	170.98
/5	1051.73	178,69
/0	T021'82	100.00

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			]	result.(	out			
7	7	1063.95	194	4.52				
7	8	1069.79	202	2.63				
7	9	1075.45	210	0.88				
8	Ō	1080.90	219	9.20				
Circ	le Cente	er At X =	704.3	; Y =	459.6	and	Radius,	446.8
***	Factor	of Safety	=	1.947	***			

Failure Surface Specified By 80 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1234567890112345678901223456789012345678901233456789012234567890123345678901223456789012334567890122	363.16 377.98 385.61 393.39 409.34 417.52 425.82 434.24 442.79 451.44 460.20 469.07 478.04 487.11 496.27 505.51 514.84 524.24 533.72 543.27 552.88 562.55 572.27 582.04 601.72 611.61 621.53 631.43 631.43 651.43 6671.43 6671.43 6671.43 6671.43 6671.43 731.26 741.16 751.02	$\begin{array}{c} 136.58\\ 129.78\\ 123.15\\ 116.69\\ 110.40\\ 104.28\\ 98.35\\ 92.59\\ 87.01\\ 81.62\\ 76.42\\ 71.41\\ 66.60\\ 61.98\\ 57.56\\ 53.34\\ 49.32\\ 45.50\\ 41.90\\ 38.50\\ 35.31\\ 32.33\\ 29.57\\ 27.02\\ 24.69\\ 22.57\\ 18.99\\ 17.53\\ 16.29\\ 15.27\\ 14.47\\ 13.89\\ 13.54\\ 13.41\\ 13.50\\ 13.81\\ 13.50\\ 13.81\\ 13.51\\ 13.81\\ 13.50\\ 13.81\\ 13.51\\ 13.81\\ 13.50\\ 13.81\\ 13.51\\ 13.81\\ 13.50\\ 13.81\\ 13.51\\ 13.81\\ 13.50\\ 13.81\\ 13.81\\ 13.50\\ 13.81\\ 13.50\\ 13.81\\ 13.50\\ 13.81\\ 13.50\\ 13.81\\ 13.81\\ 13.50\\ 13.81\\ 13.50\\ 13.81\\ 13.81\\ 13.50\\ 13.81\\ 13.81\\ 13.81\\ 13.50\\ 13.81\\ 13.81\\ 13.50\\ 13.81\\ 13.$

44 45 46 47 48 49 50 52 53 54 55 67 58 90 61 23 45 66 78 90 71 72 73 74 56 77 89 80	760.85 770.63 780.04 799.66 809.22 818.71 828.13 837.47 846.73 855.91 864.99 873.98 822.87 891.65 900.33 908.89 917.33 925.66 933.86 941.93 949.86 957.66 957.66 957.41 994.47 1001.37 1008.10 1014.67 1021.07 1027.29 1033.35 1039.22 1044.91 1049.27	result. 22.20 24.28 26.57 29.08 31.81 34.74 37.89 41.25 44.82 48.60 52.58 56.76 61.15 65.73 70.51 75.48 80.65 86.00 91.54 97.27 103.17 109.26 115.52 121.95 128.55 135.31 142.24 149.32 156.56 163.96 171.50 179.18 187.01 194.97 203.06 211.28 217.89	out		
Circle Cent	er At X =	672.3 ; Y =	463.0	and Radius,	449.6
*** Factor	of Safety	= 1.949	***	ş	

## Failure Surface Specified By 83 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1	331.58	135.79
2	339.01	129.09
3	346.57	122.56
4	354.28	116.18
5	362.12	109.97
6	370.08	103.92
7	378.17	98.05
8	386.39	92.34
9	394.72	86.81
10	403.17	81.46
11	411.72	76.29

6

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		result.out
12	420.39	71.30
13	429.16	66.49
14 15	430.03	57 44
16	456.04	53.19
<b>1</b> 7	465,19	49.14
18	474.41	45.28
19	483.72	41.62
20	493.10	38.16
21	502.55	34.89
22	521.65	28 96
24	531.29	26.30
25	540.98	23.84
26	550.72	21.59
27	560.51	19.54
20	580 21	16 07
30	590.11	14.64
31	600.03	13.43
32	609.98	12.43
33	619.95	11.63
34	629.93	11.05
36	640 02	10.07
37	659.92	10.56
38	669.92	10.82
39	679.91	11.29
40	689.89	11.97
41 42	699.85	12.86
42	709.79	15,90
44	729.58	16.79
45	739,43	18.52
46	749.24	20.45
47	759.01	22.59
48	/68./3	24.94
50	788.02	30 25
51	797.57	33.20
52	807.06	36.36
53	816.48	39.72
54	825.82	43.27
55	844 28	47.02 50.97
57	853.38	55.11
58	862.40	59.44
59	871.32	63.96
60	880.14	68.67
61 67	888.80	/3.50
63	905.99	83.89
64	914.38	89.32
65	922.66	94.93
66	930.82	100.71
6/	938.85	106.67
60	940,70	110 08
70	962.18	125.53
71	969.68	132.14
72	977.05	138.90
73	984.27	145.82
74	991.34	132.89 Baco 16

.

		result.	out		
75	998.26	160.11			
76	1005.02	167.48			
77	1011.63	174.98			
78	1018.08	182,62			
79	1024.37	190.40			
80	1030.49	198.31			
81	1036.44	206.34			
82	1042.23	214.50			
83	1044.38	217.68			
Circl	e Center At X =	652.6 ; Y =	484.5	and Radius,	474.0
* * *	Factor of Safety	= 1.952	***		

Failure Surface Specified By 79 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	405.26 412.48 419.86 427.38 435.07 442.89 450.86 458.97 467.21 475.58 484.07 492.68 501.41 510.25 519.20 528.25 537.39 546.63 555.95 565.35 574.83 584.38 594.00 603.67 613.41 623.19 633.02 642.89 652.73 672.68 682.66 692.65 712.65 712.65 742.63 742.61	137.63 130.71 123.96 117.38 110.97 104.75 98.70 92.85 87.18 81.71 76.43 71.35 66.48 61.80 57.33 53.07 49.02 45.19 41.57 38.16 34.98 32.01 29.27 26.75 24.46 22.39 20.55 16.40 15.48 14.79 14.33 14.10 14.34 14.80 15.50

39 40 41 42 43 44 56 51 52 53 55 57 89 61 23 45 66 67 89 71 72 73 45 67 78 97	752.56 762.50 772.40 782.27 792.10 801.88 811.61 821.29 830.90 840.45 849.93 859.33 868.65 877.88 887.02 896.06 905.01 913.84 922.57 931.18 939.67 948.03 956.27 964.37 972.34 980.16 987.84 995.36 1002.73 1009.94 1016.99 1023.88 1030.59 1037.13 1043.49 1044.61	result.out 16.43 17.59 18.98 20.60 22.45 24.52 26.82 29.35 32.10 35.07 38.26 41.67 45.30 49.14 53.19 57.46 61.94 66.62 71.50 76.59 81.87 87.35 93.02 98.88 104.93 111.16 117.57 124.15 130.91 137.84 144.93 152.19 159.60 167.16 174.88 182.74 190.74 198.88 207.15 215.55 218.94	
Circle Cent	erAtX = 7	'07.5 ; Y = 445.5 and Ra	dius, 431.4
*** Factor	of Safety =	= 1.952 ***	
Failure Sur	face Specifi	ed By 76 Coordinate Point	s
Point No.	X-Surf (ft)	Y-Surf (ft)	
1 2 3 4 5 6 7	394.74 401.81 409.06 416.47 424.05 431.79 439.69	137.37 130.30 123.41 116.70 110.18 103.85 97.71 Page 18	

_		result.out
8	447.74	91.77
10	455.93	86.04
11	472.72	75.18
12	481.32	70.07
13	490.04	65.18
14	498.88	60.50
15	507.83	56.04
10	516.89	51.81
18	520.05	47.01
19	544.67	40.49
20	554.10	37.18
21	563.62	34.10
22	573.21	31.27
23	502,80	28.0/
25	602.36	20.31
2 <b>6</b>	612.18	22.33
27	622.05	20.70
28	631.95	19.32
29	641.89	18.19
2U 21	661 83	17.30
32	671.82	16.27
33	681.82	16.13
34	691.82	16.24
35	701.81	16.60
36	711.79	17.20
57 28	721.70	18.05
39	741.60	20.50
40	751.48	22.09
41	761.31	23.93
42	771.09	26.01
43	780.81	28,34
44	800 08	30.90
46	809.60	36.75
47	819.05	40.03
48	828.41	43.54
49	837.68	47.29
50	845.85	51.26
52	864.90	59.89
53	873.76	64,54
54	882.49	69.40
55	891.11	74.48
50	899.59	/9./8
58	907.94	03.20 00.99
59	924.22	96.90
60	932.13	103.01
61	939.89	109.32
62	947.50	115.81
05 64	954.95	120.30
65	969.30	136.41
6 <b>6</b>	976.22	143.63
67	982.96	151.02
80	989.51	158.57
70	995.87 1002 04	100.29
	1002.04	1/4.10 Dago 10
result.out 182.18 190.35 71 72 73  $1008.01 \\ 1013.78$ 198.66 207.10 1019.35 74 1024.70 75 1029.85 215.68 1030.66 76 217.11 Circle Center At X = 682.5; Y = 418.2 and Radius, 402.1 \*\*\* Factor of Safety = 1.953 \*\*\* Υ Α х I S F T 0.00 248.75 497,50 746.25 995.00 1243.75 х -\_ 248.75 + ÷ 44 445. - 44111 -.4112. 497.50 +411.\*\* А .11.... 412...\* 41.... 11.... 14.... х 746.25 11..... 214....\* -14....\* -214.... - 1144.... - .1144... 11144\* Ι 995.00 + 21114 .211 ---\* -× S 1243.75 + \* -\_ \* 1492.50 + × --× \_ \_ Page 20

F	1741.25 +		*	result.out
		•	×	
т	- 1990.00 +	***	*	



# LENA ROAD LANDFILL - X-SEC D - D'





# LENA ROAD LANDFILL - X-SEC D - D' - FS Min- Janbu = 1.684

result.out \*\* STABL for WINDOWS \*\* by Geotechnical Software Solutions

--Slope Stability Analysis--Simplified Janbu, Simplified Bishop or Spencer's Method of Slices

Run Date:	9/27/10
Time of Run:	16:00
Run By:	Shawkat Ali
Input Data Filename:	run.in
Output Filename:	result.out
Unit:	U.S.C.
Plotted Output Filename:	result.plt

PROBLEM DESCRIPTION LENA ROAD LANDFILL - X-SEC D - D'

#### BOUNDARY COORDINATES

15 Top Boundaries 24 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	135.00	300.00	135.00	2
2	300.00	135.00	500.00	140.00	2
3	500.00	140.00	560.00	155.00	1
4	560.00	155.00	580.00	155.00	1
5	580.00	155.00	660.00	175.00	1
6	660.00	175.00	680.00	175.00	1
7	680.00	175.00	760.00	195.00	1
8	760.00	195.00	780.00	195.00	1
9	780.00	195.00	840.00	210.00	1
10	840.00	210.00	940.00	212.00	1
11	940.00	212.00	1040.00	210.00	1
12	1040.00	210.00	1100.00	195.00	1
13	1100.00	195.00	1120.00	195.00	1
14	1120.00	195.00	1200.00	175.00	1
15	1200.00	175.00	1220.00	175.00	1
16	500.10	127,00	500.20	140.00	1
17	500.10	127.00	1220.00	127.00	2
18	0.00	117.00	1220.00	117.00	3
19	0.00	112.00	1220.00	112.00	4
20	0.00	107,00	1220.00	107.00	5
21	0.00	102.00	1220.00	102.00	6
22	0.00	97.00	1220.00	102.00	7
23	0.00	92.00	1220.00	92.00	8
24	0.00	82.00	1220.00	82.00	9

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**ISOTROPIC SOIL PARAMETERS** 

9 Type(s) of Soil

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Soil	Total	Saturated	Cohesion	Friction	Pore	Pressure	Piez.
Туре	Unit Wt.	Unit Wt.	Intercept	Angle	Pressure	Constant	Surface
No.	(pcf)	(pcf)	(psf)	(dēg)	Param.	(psf)	NO.
1	70.0	80.0	0.0	28.0	0.00	0.0	1
2	100.0	110.0	0.0	30.0	0.00	0.0	1
3	95.0	105.0	0.0	26.0	0.00	0.0	1
4	105.0	120.0	750.0	0.0	0.00	0.0	1
5	110.0	125.0	1000.0	0.0	0.00	0.0	1
6	105.0	120.0	750.0	0.0	0.00	0.0	1
7	115.0	130.0	1500.0	0.0	0.00	0.0	1
8	105.0	120.0	750.0	0.0	0.00	0.0	1
9	115.0	130.0	1500.0	0.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)		
1	0.00	133.00		
2	500,00	133.00		
3	500.10	127.00		
4	1190.00	127.00		

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

200 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 5.0

Box	X-Left	Y-Left	X-Right	Y-Right	Height
No.	(ft)	(ft)	(ft)	(ft)	(ft)
1	475.00	86.00	495.00	86.00	$\begin{array}{c} 10.00\\ 10.00 \end{array}$
2	800.00	86.00	820.00	86.00	

*	¥	ŵ	*	

***	* Error -	BK10 ****	result.	out			
	Y	А	x	I	S	F	т
	0.0	0 148.75	297.5	50	446.25	595.00	743.75
x	0.00 +-	*	+-		+	+	+
	-						
	-						
	148.75 +						
	-						
	-						
	-						
Α	297.50 +	*					
	-						
	-						
х	446.25 +						
	-	*					
	-						
-		*					
T	- 292.00						
	-	*					
	-						
5	743.75 +	رد					
	-	•					
	-	• • •	*		•		
	- 892.50 +		•				
	-		*				
	-						
	-						
F	1041.25 +		*				
	-	**	•				
	-						
т	1190.00 +	W *					
***	********	*******	****	*****	****		
***	*** EXECUT	ION OF STABL	ABORTE	) **	****		
			Page	3			

#### result.out

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Modified Janbu Method \* \*

Failure Surface Specified By 50 Coordinate Points

Point	X-Surf	Y-Surf
No.	(ft)	(ft)
1234567890112345678901223456789012334567890123444444444444444444444444444444444444	412.71 415.70 419.99 424.88 429.13 432.70 436.53 440.42 445.01 445.01 445.01 464.63 469.25 472.95 476.63 485.89 817.56 819.97 823.06 824.90 828.23 831.39 833.45 836.03 839.49 843.02 844.99 847.79 850.96 852.83 856.168 859.681 866.758 868.681 870.302 877.94 877.67 885.59	137.82 134.84 132.27 131.23 128.60 125.09 121.89 118.74 116.77 113.27 110.17 106.72 105.63 102.18 100.26 96.91 93.52 90.98 90.29 90.67 95.04 98.98 103.63 107.36 111.23 125.79 120.07 123.68 127.22 131.82 135.96 139.83 144.46 148.20 151.74 155.28 163.43 168.16 172.734 185.63 190.02 193.56

46 47 48 49 50	889.03 891.52 894.31 897.76 899.40	result.out 197.19 201.53 205.68 209.30 211.19
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Individual data on the 73 slices

			Water	Water			Earthq	uake	
			Force	Force	Force	Force	For	ce Sur	charge
Slice	Width	Weight	Тор	Bot	Norm	Tan	Hor	Ver	Load
NO.	(ft)	(1bs)	(lbs)	(lbs)	(1bs)	(1bs)	(lbs)	(lbs)	(lbs)
1	3.0	456.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	3.1	1232.9	0.0	Ŏ.Ŏ	Ő.Ő	Ŏ.Ŏ	0.0	Ő.Ő	Ő.Ő
3	1.2	654.3	Ő.Ő	32 2	0.0	0.0	0.0	Ő.Ő	ŏ.ŏ
Ă	4 9	3146 7	ő ő	380 7	õ õ	ň ň	ŏ.ŏ	ŏ.ŏ	ŏ.ŏ
5	4.3	3642 0	0.0	063 2	0.0	0.0	0.0	0.0	0.0
à	3 6	1206 3	0.0	1020 6	0.0	0.0	0.0	0.0	0.0
2	3.0	6074 2	0.0	2067 0	0.0	0.0	0.0	0.0	0.0
6	2.0	7520 6	0.0	2907.0	0.0	0.0	0.0	0.0	0.0
õ	2.9	1228.0	0.0	3938.4	0.0	0.0	0.0	0.0	0.0
10	4.0	0900.0	0.0	4159.4	0.0	0.0	0.0	0.0	0.0
10	0.5	12/5.5	0.0	598.1	0.0	0.0	0.0	0.0	0.0
11	3.0	906T.0	0.0	5610.7	0.0	0.0	0.0	0.0	0.0
12	1.6	4490.1	0.0	2603.3	0.0	0.0	0.0	0.0	0.0
13	2.3	6889.0	0.0	4035.9	0.0	0.0	0.0	0.0	0.0
14	3.3	10909.8	0.0	7001.8	0.0	0.0	0.0	0.0	0.0
15	0.3	1020.9	0.0	658.9	0.0	0.0	0.0	0.0	0.0
16	4.9	17489.5	0.0	8369.5	0.0	0.0	0.0	0.0	0.0
17	3.6	14047.4	0.0	9077.8	0.0	0.0	0.0	0.0	0.0
18	0.4	1791.5	0.0	910.0	0.0	0.0	0.0	0.0	0.0
19	4.2	17700.4	0.0	9004.5	0.0	0.0	0.0	0.0	0.0
20	1.5	6511.7	0.0	4143.0	0.0	0.0	0.0	0.0	0.0
21	2.2	10351.5	0.0	6594.5	0.0	0.0	0.0	0.0	0.0
22	3.7	18397.2	Ŏ.Ŏ	11789.5	Ŏ.Ŏ	Ŏ.Ŏ	0.0	0.0	0.0
23	2.6	13737.1	Ŏ.Ŏ	7518.7	0.0	Ŏ.Ŏ	Ŏ.Ŏ	Ŏ.Ŏ	Ŏ.Ŏ
24	1.7	9487.0	Ő.Ő	5195.0	Ő.Ő	0.0	Ő.Ő	Ŏ.Ŏ	Ő,Ő
25	5.0	27741 6	0.0	13217 5	0.0	õ õ	0.0	õ õ	Ő Ő
26	14 1	79954 0	ŏ.ŏ	37595 4	0.0	ŏ,ŏ	ŏ.ŏ	ň ň	0.0
27	01	475 7	0.0	123 0	ŏ.ŏ	ň ň	ñ.ň	ŏ.ŏ	ů ů
28	ŏ.1	573 7	ŏ.ŏ	220 0	ŏ.ŏ	Ň Ň	ň ň	ŏ.ŏ	ñ ñ
20	50.2	344302 5	0.0	******	0.0	0.0	0.0	0.0	0.0
30	20.0	125540 7	0.0	45604 2	0.0	0.0	0.0	0.0	ŏ.ŏ
30	20.0		0.0	43034.2	0.0	0.0	0.0	0.0	0.0
32	20.0	152251 A	0.0	45552 0	0.0	0.0	0.0	0.0	0.0
22	20.0	100001 0	0.0	43333.0	0.0	0.0	0.0	0.0	0.0
22	20.0	101161 4	0.0	ACA11 7	0.0	0.0	0.0	0.0	0.0
24	20.0	101101.4	0.0	42411./	0.0	0.0	0.0	0.0	0.0
30	37.0	332434.8	0.0	85200.4	0.0	0.0	0.0	0.0	0.0
30	0.7	7093.8	0.0	3390.5	0.0	0.0	0.0	0.0	0.0
3/	1.1	12/28.1	0.0	7262.8	0.0	0.0	0.0	0.0	0.0
38	3.1	27665.4	0.0	9356.5	0.0	0.0	0.0	0.0	0.0
39	0.6	4801.9	0.0	2562.2	0.0	0.0	0.0	0.0	0.0
40	0.6	5470.5	0.0	2815.4	0.0	0.0	0.0	0.0	0.0
41	0.6	5353.4	0.0	2640.1	0.0	0.0	0.0	0.0	0.0
42	3.0	24122.5	0.0	6121.3	0.0	0.0	0.0	0.0	0.0
43	0.3	2477.6	0.0	589.6	0.0	0.0	0.0	0.0	0.0
44	3.2	23962.3	0.0	5524.7	0.0	0.0	0.0	0.0	0.0

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45	0.3	2548.7	0.0	811.0	0.0	0.0	0.0	0.0	0.0
40	1.7	12148.0	0.0	3398.3	0.0	0.0	0.0	0.0	0.0
4/	0.7	5005.8	0.0	936.5	0.0	0.0	0.0	0.0	0.0
48	1.8	12293.9	0.0	1893.4	0.0	0.0	0.0	0.0	0.0
49	3.5	21905.1	0.0	1598.1	0.0	0.0	0.0	0.0	0.0
50	0.5	3158.4	0.0	138.8	0.0	0.0	0.0	0.0	0.0
51	2.8	16710.0	0.0	346.4	0.0	0.0	0.0	0.0	0.0
52	0.2	1275.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53	2.0	11107.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
54	2.8	14917.8	0,0	0.0	0.0	0.0	0.0	0.0	0.0
55	3.2	16041.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
56	1.9	8 <del>9</del> 24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
57	3.3	14901.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
58	3.5	14891.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
59	3.5	14085.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60	3.5	13219.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61	1.9	6695.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
62	1.6	5061.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
63	2.0	5705.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
64	3.2	8164.9	Ŏ.Ŏ	0.0	0.0	0.0	0.0	0.0	0.0
65	2.4	5337.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
66	1.7	3331.9	0.0	0.0	0.0	Ŏ.Ŏ	0.0	0.0	0.0
67	2.4	3853.2	Ŏ.Ŏ	0.0	Ő.Ő	Ŏ.Ŏ	0.0	Ŏ.Ŏ	Ŏ.Ŏ
68	3.5	4710.4	Ŏ.Ŏ	Õ,Õ	0.0	0.0	ŏ.ŏ	Õ.Ō	0.0
69	3.4	3748.8	Ő.Ő	Ő.Ő	Ő.Ő	Ő.Ő	ŏ.ŏ	Ŏ.Ŏ	Ŏ.Ŏ
70	2.5	2022.2	0.0	0.0	0.0	0.0	ŏ.ŏ	Ő.Ő	0.0
71	2.8	1457.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
72	3.4	875.4	ň ň	ň.ň	ŏ.ŏ	0.0	0.0	ŏ.ŏ	ŏ.ŏ
73	1.6	106.4	0.0	0.0	0.0	0.0	ŏ.ŏ	õ.õ	ŏ.ŏ
				~ ~ ~	~ ~ ~	~ ~ ~	~ ~ ~	~ ~ ~	

Failure Surface Specified By 52 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 2 1 8 9 0 2 1 2 2 1 2 2 3 2 2 1 2 2 1 2 2 1 2 2 1 2 2 3 2 2 3 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2	413.98 415.62 419.70 423.85 427.48 431.02 434.60 439.10 443.63 448.00 451.64 456.58 460.59 464.46 468.04 471.80 475.42 479.38 482.96 816.83 818.52 821.76 825.20 826.99 829.42 832.49	137.85 136.80 133.92 131.13 127.68 124.16 120.66 118.48 116.37 113.94 110.51 109.75 106.77 103.60 100.11 96.82 93.37 90.32 86.83 81.98 86.68 90.49 94.12 98.79 103.16 107.11
27	832.97	112.08

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# Failure Surface Specified By 50 Coordinate Points

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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	64 107 128 107 107 107 107 107 107 107 107

25 26 27 28 30 31 33 34 35 37 39 41 23 44 45 47 48 90	817.44 820.98 824.51 827.96 830.81 831.05 831.85 834.45 835.83 837.47 846.36 849.19 852.39 854.74 858.07 858.47 858.47 858.47 858.47 858.47 858.47 858.47 858.47 858.47 863.62 866.00 869.53 871.13 874.44	result.out 103.76 107.30 110.83 114.45 118.56 123.55 128.49 132.76 137.56 142.29 147.05 151.88 155.55 159.76 163.89 167.72 172.14 175.87 180.86 185.70 189.52 194.47 198.87 202.41 207.15 210.69
48 49 50 ***	869.53 871.13 874.44 1.767	202.41 207.15 210.69

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Failure Surface Specified By 0 Coordinate Points

Point X-Surf Y-Surf No. (ft) (ft)

\*\*\* 0.000 \*\*\*

Failure Surface Specified By 0 Coordinate Points

PointX-SurfY-SurfNo.(ft)(ft)

\*\*\* 0.000 \*\*\*

Failure Surface Specified By O Coordinate Points Page 8 PointX-SurfY-SurfNo.(ft)(ft)

\*\*\* 0.000 \*\*\*

Failure Surface Specified By 0 Coordinate Points

Point X-Surf Y-Surf No. (ft) (ft)

\*\*\* 0.000 \*\*\*

Failure Surface Specified By 0 Coordinate Points

Point X-Surf Y-Surf No. (ft) (ft)

\*\*\* 0.000 \*\*\*

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Failure Surface Specified By 0 Coordinate Points

Point X-Surf Y-Surf No. (ft) (ft)

\*\*\* 0.000 \*\*\*

Failure Surface Specified By 0 Coordinate Points

Point	X-Surf	Y-Surf
NO.	(ft)	(ft)

	*** 0.0	000 ***					
	Y	Α	х	I	S	F	т
	0.00	148.75	297.50	)	446.25	595.00	743.75
x	0.00 +	_******_	+		+	+	+
	-						
	 148.75 +						
	-						
	-						
Α	 297.50 +	*					
	-						
		3					
x	446.25 +	11 11					
	-	11 1 *					
	-						
r	- 595.00 +	*					
	-						
		*					
S	- 743.75 +						
5	-	*					
		113 111133 *			•		
	892 50 ±	11133					
	-	**					
	-						
F	- 1041 25 ±	*					
•	-	*					
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ATTACHMENT C

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SETTLEMENT ANALYSIS RESULTS

Bore Hole	B-1	Elev		37 ft-NG\	/D								
<b>Assumpti</b> Landfill:	ons: Max. Heigi Unit Weigi Separation Assumed I Thickness	ht of Landfill @ Eleva ht of Landfill Material h of Landfill Bottom fro HGWL Elevation =	tion om GWL		105 ft-NGVD 110 pcf 5 ft 32 ft 68 ft	)							
Solls:	Loose/Med Loose/Med Thickness Thickness	d. Dense Sand, Unit v d. Dense Sand, Unit v above GWL below GWL	vt above GWL vt below GWL		110 pcf 115 pcf 5 ft 23.5 ft	Es Es	432,000 lb/ft2 432,000 lb/ft2						
	Medium Do Thickness	ense Silty Sand, Unit	wt below GWL		120 pcf 15 ft	Es	720,000 lb/ft2						
	Very Stiff S Very Stiff O Thickness	Silty Clay, Unit wt belc Clay, OCR	w GWL		115 pcf 3.5 5 ft	w	62 %	80	1.67	Cc	0.300	Cr	0.060
	Stiff Clay, Stiff Clay, Thickness	Unit weight below GV OCR	VL		110 pcf 3 13.5 ft	w	46 %	80	1.23	Cc	0.200	Cr	0.040
	Hard Clay, Hard Clay, Thickness	Unit weight below G OCR	WL		120 pcf 4 18 ft	w	80 %	60	2.14	Cc	0.100	Cr	0.020
Excavation Landfill Lo Net Loadin	n to bottom ad ng (delta sig	of landfill ma)		0 7480 7480									
Settlemen Elastic Set Thickness (ft) 28.5	tt of Loose/ ttlement Settlement (ft) 0.49	/Med. Dense Sand	Settlement of Elastic Settlem Thickness (ft)	Med. Dense ent Settler (ft) 15	Silty Sand ment 0.16		Settlement of Silf Primary Thickness Eff Stre (ft) (psf) 5 204	t <b>y Clay Layer</b> y ass Settlement (ft) 9.1 0.06	Setti Thick (ft)	ement of Stiff ( Primary ness Eff Stress (psf) 13.5 3555.7	Clay layer Settlement (ft) 0.12	Settlemer Thickness (ft) 18	nt of Hard Clay layer Primary Eff Stress Settlement (psf) (ft) 4592.5 0.07
Total Set	tlements												
Elastic (Im Elastic (Im Primary Co Primary Co	mediate) So mediate) So onsolidation onsolidation	ettlement of Loose an ettlement of Medium I Settlement of Very S Settlement of Stiff Cla Settlement of Hard C	nd Med Sand Dense Silty Sand Stiff Silty Clay ay Clay		0.4 0.1 0.0 0.1 0.0	49 ft 16 ft 06 ft 12 ft 07 ft							
			Total		0.9	90 ft							

Bore Hole	B-2	Elev		34 ft-NGVD											
Assumpti Landfill:	ons: Max. Heig Unit Weig Separation Assumed Thickness	ht of Landfill @ Elevatio ht of Landfill Material n of Landfill Bottom from HGWL Elevation = s	on n GWL	130 ft-NG\ 110 pcf 5 ft 32 ft 96 ft	/D										
Soils:	Loose/Me Loose/Me Thickness Thickness	d. Dense Sand, Unit wt d. Dense Send, Unit wt s above GWL s below GWL	above GWL below GWL	110 pcf 115 pcf 5 ft 13.5 ft	Es Es	432,000 lb/ft2 432,000 lb/ft2									
	Medium D Thickness	Dense Silty Sand, Unit w	t below GWL	115 pcf 5 ft	Es	720,000 lb/ft2									
	Very Soft Very Soft Thickness	Sandy Clay, Unit wt bel Sandy Clay, OCR	ow GWL	95 pcf 1.2 6.5 ft	w	30 %	80	0.80	Cc	0.500	Cr	0.100 Cv	0.3	Са	0.02
	Very Stiff Very Stiff Thickness	Clay, Unit weight below Clay, OCR	V GWL	115 pcf 3.5 18.5 ft	w	62 %	eo	1.66	Cc	0.200	Cr	0.040			
	Hard Silty Hard Silty Thickness	Clay to Cley, Unit weig Clay to Clay, OCR	ht below GWL	. 120 pcf 4 31.5 ft	w	80 %	eo	2.14	Cc	0.100	Cr	0.020			
Excavation Landfill Lo Net Loadin	n to bottom ad ng (delta sig	of landfill gma)	10 10	0 9560 9560											
Settlemer Elastic Se Thickness (ft) 18.5	ttiement Settlement (ft) 0.45	ə/Med. Dense Sand nt	Settlement of Elastic Settle Thickness (ft)	of Mad. Dense Silty S iment Settlement (ft) 5 0.07	and	Settlement of Very Primary Thickness Eff Stree (ft) (psf) 6.5 14 Second Thickness Drainag (ft) (ft) 6.5 3.	y Soft Sandy Cla (ft) 72 0.16 ary for 50 years e tp Se (years) (ft) 25 0.11	ny Sett Thic (ft) attlement ) 0.19	lement of Very 5 Primary kness Eff Stress (psf) 18.5 2445.1	Settlff Clay Settlement (ft) 0.16	Settleme Thicknes: (ft) 31.:	nt of Hard Clay layer Primary s Eff Stress Settlement (psf) (ft) 5 4522.5 0.12			
Total Set	ttlements	•													
Elastic (In Elastic (In Primary C Primary C Primary C Secondary	nmediate) S amediate) S onsolidatio onsolidatio onsolidatio y Consolida	Settlement of Loose and Settlement of Medium D on Settlement of Very Sti on Settlement of Stiff Clay on Settlement of Hard Cl ation Settlement of Soft	l Med Sand ense Silty Sand iff Silty Clay y ey Clay Total	d	0.45 ft 0.07 ft 0.16 ft 0.16 ft 0.12 ft 0.19 ft <b>1.15 ft</b>										

Bore Hole	B-3	Elev	34 ft-NGVD								
<b>Assumpti</b> Landfill:	ons: Max. Hei Unit Wei Separatio Assumed Thicknes	ght of Landfill @ Elevation ght of Landfill Material on of Landfill Bottom from GWL I HGWL Elevation = s	95 ft-N 110 pcf 5 ft 32 ft 61 ft	IGVD							
Solls:	Loose/M Loose/M Thicknes Thicknes	ed. Dense Sand, Unit wt above GWL ed. Dense Sand, Unit wt below GWL s above GWL s below GWL	110 pcf 115 pcf 5 ft 13.5 ft	Es Es	432,000 ib/ft2 432,000 ib/ft2						
	Medium Very Stiff Thicknes	Stiff SIIty Clay, Unit wt below GWL Silty Clay, OCR s	105 pcf 3 15 ft	w	62 %	eo	1.67	Cc	0.300	Cr	0.060
	Stiff Clay Stiff Clay Thicknes	, Unit weight below GWL , OCR s	110 pcf 3.5 10 ft	w	46 %	60	1.23	Cc	0.250	Cr	0.050
	Hard Silty Hard Silty Thicknes	/ Clay to Clay, Unit weight below GWL / Clay to Clay, OCR s	. 120 pcf 4 36.5 ft	w	80 %	eo	2.14	Cc	0.100	Cr	0.020
Excavatior Landfill Lo Net Loadir	n to botton ad ng (delta s	n of landfill igma)	0 6710 6710								
Settlemen Elastic Set Thickness (ft) 18.5	t of Loos ttlement Settleme (ft) 0.2	e/Med. Dense Sand nt 9			Settlement of Medi Primary Thickness Eff Stres (ft) (psf) 15 1899	um Stiff Silty Cl s Settlement (ft) .1 0.17	ay Settl Thick (ft)	ement of Stiff C Primary ness Eff Stress (psf) 10 2375.1	Settlement (ft) 0.12	Settlemen Thickness (ft) 36.5	t of Hard Clay layer Primary Eff Stress Settlement (psf) (ft) 4477.5 0.13
Total Set	tlements										
Elastic (Im Primary Co Primary Co Primary Co	mediate) onsolidatio onsolidatio onsolidatio	Settlement of Loose and Med Sand on Settlement of Medium Stiff Silty Clay on Settlement of Stiff Clay on Settlement of Hard Clay Total	/	0.29 ft 0.17 ft 0.12 ft 0.13 ft <b>0.72 ft</b>							

Bore Hole	B-4	Elev		34 ft-NGVD								
Assumpti Landfill:	ons: Max. Heig Unit Weig Separettor Assumed Thickness	ht of Landfill @ Elevati ht of Landfill Material n of Landfill Bottom fro HGWL Elevation =	lon m GWL	115 ft-NG 110 pcf 5 ft 32 ft 81 ft	9VD							
Solis:	Loose/Mea Loose/Mea Thickness Thickness	d. Dense Sand, Unit w d. Dense Sand, Unit w above GWL below GWL	t above GWL t below GWL	110 pcf 115 pcf 5 ft 13.5 ft	Es Es	576,000 lb/ft2 576,000 lb/ft2						
	Medium S Very Stiff S Thickness	tiff Silty Clay, Unit wt b Silty Clay, OCR	elow GWL	105 pcf 3 10 ft	w	62 %	eo	1.67	Cc	0.300	Cr	0.060
	Hard Clay, Hard Clay, Thickness	Unit weight below GN OCR	WL	120 pcf 4 20 ft	w	80 %	60	2.14	Cc	0.100	Cr	0.020
	Very Stiff ( Very Stiff ( Thickness	Clay, Unit weight below Clay, OCR	w GWL	115 pcf 3 5 ft	w	46 %	60	1.23	Cc	0.200	Cr	0.040
	Hard Clay, Hard Clay, Thickness	Unit weight below GN OCR	WL	120 pcf 4 46.5 ft	w	80 %	60	2.14	Cc	0.100	Cr	0.020
Excavation Landfill Lo Net Loadin	n to bottom ad ng (delta sig	of landfill jma)		0 8910 8910								
Settlemer Elastic Se Thickness (ft) 18.5	ttlement Settlemen (ft) 0.29	/Med. Dense Sand t	Settlement of I Thickness (ft)	Med Stiff Clay Layer Primary Eff Stress Settle (psf) (ft) 10 1686.1	ement 0.12	Settlement of Ha Primar Thickness Eff Str (ft) (psf) 20 283	rd Clay Layer Y ess Settlement (ft) 38.1 0.08	Settle Thick (ft)	Primary Primary ness Eff Stress (psf) 13.5 2802.9	Stiff Clay layer Settlement (ft) 0.12	Settlemen Thickness (ft) 18	t of Hard Clay layer Primary Eff Stress Settlement (psf) (ft) 5481.3 0.07
Total Set	ttlements											
Elastic (Im Primary C Primary C Primary C Primary C	nmediate) S onsolidation onsolidation onsolidation onsolidation	ettlement of Loose and Settlement of Mediur Settlement of Hard O Settlement of Very S a Settlement of Hard O	d Med Sand n Stiff Silty Clay tay tiff Clay tay <b>Total</b>		0.29 ft 0.12 ft 0.08 ft 0.12 ft 0.07 ft <b>0.67 ft</b>							

Bore Hole	B-5	Elev	34 ft-NGV	Ð														
Assumpti Landfill:	ons: Max. Heigi Unit Weigh Separation Assumed I Thickness	nt of Landfill @ Elevation t of Landfill Material of Landfill Bottom from GWL IGWL Elevation =		105 ft-NGVD 110 pcf 5 ft 32 ft 71 ft														
Soils:	Loose/Med Loose/Med Thickness Thickness	I. Dense Sand, Unit wt above GWL I. Dense Sand, Unit wt below GWL above GWL below GWL		110 pcf 115 pcf 5 ft 13.5 ft	Es Es	576,000 lb/ft2 576,000 lb/ft2												
	Very Soft S Very Soft S Thickness	Sendy Clay, Unit wt below GWL Sandy Clay, OCR		95 pcf 1.2 5 ft	w	26 %	60	<b>0.7</b> 0		Cc	0.500		Cr	0.100	Cv	0. <b>3</b>	Ca	0. <b>02</b>
	Very Stiff ( Very Stiff ( Thickness	Clay, Unit weight below GWL Clay, OCR		115 pcf 3.5 5 ft	w	62 %	60	1.66		Cc	0.200		Cr	0.040				
	Hard Silty Hard Silty Thickness	Clay to Clay, Unit weight below GWL Clay to Clay, OCR		120 pcf 4 51.5 ft	w	80 %	60	2.14		Cc	0.100		Cr	0.020				
Excavation Landfill Los Net Loadin	i to bottom ad g (deita sig	of landfill ma)	0 7810 7810															
Settlemen Elastic Set Thickness (ft) 18.5	t of Loose tiement Settlement (ft) 0.25	/Med. Dense Sand				Settlement of Very : Primary Thickness Eff Stress (ft) (psf) 5 1423.	Soft Sandy Clay 5 Settlement (ft) 1 0.10	ר דו (fi דו (fi	ettlemen nickness :) 5 nickness :) 5	t of Very Si Primary Eff Stress (psf) 1686.1 Secondary Drainage (ft) 255	tiff Clay Settlement (ft) 0.04 for 50 years tp Settl (years) (ft) 0.06	lement 0 17	Settlement Thickness I (ft) ( 51.5	of Hard Cl. Primary Eff Stress psf) 4652.5	ay layer Settlement (ft) 0.19			
Total Set	lements								5	2.5	0.00	0.17						
Elastic (Im Elastic (Im Primary Co Primary Co Primary Co Secondary	mediate) So mediate) So onsolidation onsolidation onsolidation Consolidation	attlement of Loose and Med Sand attlement of Medium Dense Silty Sand Settlement of Very Stiff Silty Clay Settlement of Stiff Clay Settlement of Hard Clay tion Settlement of Soft Clay Total		0.25 0.00 0.10 0.04 0.19 0.17 0.75	ਜ ft ft ft													

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Bore Hole	B-6	Elev		35 ft-NGVD								
Assumpt Landfill:	ions: Max. Heig Unit Weigi Separatior Assumed Thickness	ht of Landfill @ Elevat ht of Landfill Material n of Landfill Bottom fro HGWL Elevation =	tion om GWL	110 ft 110 p 5 ft 32 ft 75 ft	-NGVD cf							
Solls:	Loose/Mea Loose/Mea Thickness Thickness	d. Dense Sand, Unit w d. Dense Sand, Unit w above GWL below GWL	rt above GWL rt below GWL	115 pc 120 pc 5 ft 18.5 ft	cf Es cf Es	576,000 lb/ft2 576,000 lb/ft2						
	Stiff Sandy Stiff Sandy Thickness	r Clay, Unit wt below G r Clay, OCR	<b>GWL</b>	110 po 3 5 ft	cf w	41 %	60	1.11	Cc	0.300	Cr	0.060
	Hard Sand Hard Sand Thickness	ly Clay, Unit weight bo ly Clay, OCR	elow GWL	120 po 4 15 ft	cf w	80 %	60	2.14	Cc	0.100	Cr	0.020
	Stiff Clay, Stiff Clay, Thickness	Unit weight below GV OCR	VL	110 po 3 14 ft	cf w	46 %	eo	1.23	Cc	0.300	Cr	0.060
	Hard Clay, Hard Clay, Thickness	Unit weight below GI OCR	WL	120 po 4 22.5 ft	cf w	80 %	60	2.14	Cc	0.100	Cr	0.020
Excavatio Landfill Lo Net Loadi	n to bottom bad ng (delta sig	of landfili ma)	1	0 8250 8250								
Settleme Elastic Se Thickness (ft) 23.5	nt of Loose attlement s Settlement (ft) 5 0.34	/Med. Dense Sand	Settlement of S Thickness (ft)	Stiff Sandy Clay La Primary Eff Stress Si (psf) (ft 5 1878.6	ettlement t) 0.07	Settlement of H. Prima Thickness Eff Si (ft) (psf) 15 27	ard Sandy Clay ary ress Settlemen (ft) 742.6 0.06	Layer Settle t Thickr (ft)	ment of Stiff ( Primary ness Eff Stress (psf) 14 3313.	Clay layer Settlement (ft) 8 0.19	Settlemer Thickness (ft) 22.5	nt of Hard Clay layer Primary Eff Stress Settlement (psf) (ft) 5 4609.8 0.08
Total Se	ttlements											
Elastic (In Primary C Primary C Primary C Primary C	nmediate) S consolidation consolidation consolidation consolidation	ettlement of Loose an Settlement of Stiff Ci Settlement of Hard S Settlement of Stiff Ci Settlement of Hard C	d Med Sand ay Silty Clay ay Clay <b>Total</b>		0.34 ft 0.07 ft 0.06 ft 0.19 ft 0.08 ft <b>0.74 ft</b>							

Bore Hole	B-7	Elev		34 fi	t-NGVD									
Assumpt Landfill:	lons: Max. Heig Unit Welg Separatio Assumed Thickness	ht of Landfill @ Elevati ht of Landfill Material n of Landfill Bottom fro HGWL Elevation =	on m GWL		75 ft-N 110 pcf 5 ft 32 ft 41 ft	GVD								
Soils:	Loose/Me Loose/Me Thickness Thickness	d. Dense Sand, Unit wi d. Dense Sand, Unit wi a above GWL a below GWL	t above GWL t below GWL		110 pcf 115 pcf 5 ft 13.5 ft	Es Es	432,000 432,000	0 lb/ft2 0 lb/ft2						
	Hard Sand Hard Sand Thickness	dy Clay, Unit weight be dy Clay, OCR ;	elow GWL		120 pcf 4 20 ft	w	80	0%	ео	2.14	Cc	0.100	Cr	0.020
	Very Stiff Very Stiff Thickness	Clay, Unit weight below Clay, OCR ;	w GWL		115 pcf 3.5 21.5 ft	w	99	9 %	eo	2.65	Cc	0.200	Cr	0.040
Excavation Landfill Lo Net Loadin	n to bottom oad ng (delta si	of landfill gma)		0 4510 4510										
Settlemen Elastic Se Thickness (ft) 18.5	nt of Loose attlement s Settlemen (ft) 5 0.19	e/Med. Dense Sand It	Settlement of Thickness (ft)	Hard S F E 20	<b>Sandy Clay Lay</b> Primary Eff Stress Sett (psf) (ft) 2412.1	<b>yer</b> Idement 0.08	Settleme Thickness (ft) 21.5	nt of Very S Primary S Eff Stress (psf) 5 3543	stiff Clay Layer Settlement (ft) 0.12					
Total Se	ttlements													
Elastic (In Primary C Primary C	nmediate) S consolidatio consolidatio	Settlement of Loose and n Settlement of Hard S n Settlement of Very Si	d Med Sand andy Clay tiff Clay <b>Total</b>			0.19 ft 0.08 ft 0.12 ft <b>0.39 ft</b>								

Bore Hole	B-8	Elev		34 ft-NG\	VD											
Assumpti Landfill:	ons: Max. Heigi Unit Welgi Separation Assumed I Thickness	ht of Landfill @ Elevation ht of Landfill Material h of Landfill Bottom from GW HGWL Elevation =	/L		95 ft-NG 110 pcf 5 ft 32 ft 61 ft	VD										
Soils:	Loose/Med Loose/Med Thickness Thickness	d. Dense Sand, Unit wt abov d. Dense Sand, Unit wt belov above GWL below GWL	ve GWL w GWL		110 pcf 115 pcf 5 ft 13.5 ft	Es Es	432,000 16/ft2 432,000 16/ft2	2 2								
	Soft Silty S Thickness	and, Unit wt below GWL			100 pcf 5 ft	Es	100,800 lb/ft2	2								
	Very Stiff S Very Stiff S Thickness	Sandy Clay, Unit weight beic Sandy Clay, OCR	ow GWL		115 pcf 3.5 10 ft	w	62 %	60	1. <del>6</del> 6	Cc	0.200	Cr	0.040	0.3	Ca	0.008
	Very Stiff C Very Stiff C Thickness	Clay, Unit weight below GWI Clay, OCR	L		115 pcf 3.5 20 ft	w	110 %	eo	2.95	Cc	0.200	Cr	0.040			
	Hard Silty ( Hard Silty ( Thickness	Clay to Clay, Unit weight be Clay to Clay, OCR	llow GWL	4	120 pcf 4 46.5 ft	w	80 %	<del>0</del> 0	2.14	Cc	0.100	Cr	0.020			
Excavation Landfill Los Net Loadin	n to bottom ad ig (delta sig	of landfill ma)	6	0 710 710												
Settlemen Elastic Set Thickness (ft) 18.5	t of Loose tiement Settlement (ft) 0.29	/Med. Dense Sand	Settlement of Elastic Settle Thickness (ft)	of Soft Silty ment Settler (ft) 5 (	y Sand ment 0.33		Settlement of V Prim Thickness Eff S (ft) (psf) 10 1	Very Stiff Sandy Clay Nary Stress Settlement (ft) 974.1 0.08	Se Th (ft)	ttlement of Very S Primary ickness Eff Stress (psf) 20 3026.1	Stiff Clay Settlement (ft) 0.11	Settlemen Thickness (ft) 46.5	t of Hard Clay layer Primary Eff Stress Settlement (psf) (ft) 5704.5 0.16			
Total Set	tiements															
Elastic (im Elastic (im Primary Co Primary Co Primary Co	mediate) Se mediate) Se onsolidation onsolidation onsolidation	ettlement of Loose and Med attlement of Soft Slity Sand Settlement of Very Stiff San Settlement of Very Stiff Clay Settlement of Hard Clay	Sand ndy Clay y Total			0.29 ft 0.33 ft 0.08 ft 0.11 ft 0.16 ft <b>0.98 ft</b>										

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Bore Hole	e <b>B-9</b>	Elev	33 ft-NG	/D								
<b>Assumpt</b> Landfill:	tions: Max. Heig Unit Weig Separatio Assumed Thickness	iht of Landfill @ Elevation iht of Landfill Material n of Landfill Bottom from GWL HGWL Elevation = s		60 ft-NGV 110 pcf 5 ft 32 ft 27 ft	Ō							
Solls:	Loose/Me Loose/Me Thickness Thickness	d. Dense Sand, Unit wt above GWL d. Dense Sand, Unit wt below GWL s above GWL s below GWL		110 pcf 115 pcf 5 ft 18.5 ft	Es Es	576,000 lb/ft2 576,000 lb/ft2						
	Hard San Hard San Thickness	dy Clay, Unit weight below GWL dy Clay, OCR s		120 pcf 4 15 ft	w	31 %	eo	0.82	Cc	0.100	Cr	0.020
	Very Stiff Very Stiff Thickness	Clay, Unit weight below GWL Clay, OCR s		115 pcf 3 10 ft	w	88 %	eo	2.35	Cc	0.200	Cr	0.040
	Hard Clay Hard Clay Thickness	, Unit weight below GWL , OCR		120 pcf 4 11.5 ft	w	80 %	eo	2.14	Cc	0.100	Cr	0.020
Excavatio Landfill Lo Net Loadi	on to bottom oad ing (delta si	of landfill gma)	0 2970 2970									
Settleme Elastic Se Thickness (ft) 23.8	nt of Loose attlement s Settlemen (ft) 5 0.12	e/Med. Dense Sand It 2				Settlement of H Prim Thickness Eff S (ft) (psf) 15 2	ard Sandy Clay ary tress Settlemen (ft) 387.1 0.10	Layer S t ⊤ (fi	ettlement of Very S Primary hickness Eff Stress t) (psf) 13.5 2913.1	Stiff Clay layer Settlement (ft) 0.07	Settlement Thickness I (ft) 18	of Hard Clay layer Primary Eff Stress Settlement (psf) (ft) 3575.5 0.07
Total Se	ettlements											
Elastic (Ir Primary C Primary C Primary C	nmediate) S Consolidatio Consolidatio Consolidatio	Settlement of Loose and Med Sand n Settlement of Hard Clay n Settlement of Very Stiff Clay n Settlement of Hard Clay <b>Total</b>		0 0 0 0 0	0.12 ft 0.10 ft 0.07 ft 0.07 ft <b>.36 ft</b>							

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Bore Hole	TH-16	Elev		33 ft-	NGVD								
Assumptio Landfili:	Max. Heigh Unit Weigh Separation Assumed I Thickness	nt of Landfill @ Elevat ht of Landfill Material n of Landfill Bottom fro HGWL Elevation =	lon m GWL		118 ft-NG 110 pcf 5 ft 32 ft 85 ft	ŝVD							
Solls:	Loose/Med Loose/Med Thickness Thickness	I. Dense Sand, Unit w I. Dense Sand, Unit w above GWL below GWL	t above GWL t below GWL		110 pcf 115 pcf 5 ft 13.5 ft	Es Es	432,000 lb/ft2 432,000 lb/ft2						
	Medlum De Thickness	ense Silty Sand, Unit v	wt below GWL		120 pcf 17.5 ft	Es	576,000 lb/ft2						
	Medium St Medium St Thickness	iff Silty Clay, Unit wt b iff Silty Clay, OCR	elow GWL		115 pcf 3 2.5 ft	w	80 %	60	2.16	Cc	0.400	Cr	0.080
	Hard Silty Hard Silty Thickness	Clay, Unit weight belo Clay, OCR	w GWL		120 pcf 4 21.5 ft	w	80 %	60	2.14	Cc	0.100	Cr	0.020
Excavation Landfill Loa Net Loadin	n to bottom ad ig (delta sig	of landfill ma)		0 9350 9350									
Settlemen Elastic Set Thickness (ft) 18.5	t of Loose tlement Settlement (ft) 0.40	Med. Dense Sand	Settlement of Elastic Settlem Thickness (ft)	Med. De ent Si (ft 17.5	ense Silty Sand ettlement ) 0.28	ł	Settlement of Me Primar Thickness Eff Str (ft) (psf) 2.5 139	dium Stiff Silty y ess Settlement (ft) 91.6 0.03	r Clay Layer			Settlement F Thickness E (ft) ( 21.5	of Hard Slity Clay layer Primary Eff Stress Settlement psf) (ft) 3638 0.08
Total Set	tlements												
Elastic (im Elastic (im Primary Co Primary Co	mediate) S mediate) S onsolidatior onsolidatior	ettlement of Loose and ettlement of Medium I a Settlement of Mediur a Settlement of Hard S	d Med Sand Dense Slity Sand n Stiff Slity Clay Silty Clay <b>Total</b>			0.40 ft 0.28 ft 0.03 ft 0.08 ft <b>0.80 ft</b>							

Bore Hole	TH-17	Elev		33 ft-NG	VD									
Assumption Landfill:	Max. Heigi Unit Weigi Separatior Assumed I Thickness	nt of Landfill @ Elevati at of Landfill Matarial of Landfill Bottom fro HGWL Elevation =	lon m GWL		118 ft-NG 110 pcf 5 ft 32 ft 85 ft	VD								
Solls:	Loose/Med Loose/Med Thickness Thickness	I. Dense Sand, Unit w I. Dense Sand, Unit w above GWL below GWL	t above GWL t below GWL		110 pcf 115 pcf 5 ft 18.5 ft	Es Es	432,000   432,000	b/ft2 b/ft2						
	Medium Do Thickness	ense Silty Sand, Unit v	wt below GWL		120 pcf 10 ft	Es	576,000	b/ft2						
	Hard Sand Hard Sand Thickness	y Clay, Unit wt below ( y Clay, OCR	GWL		120 pcf 4 5 ft	w	80 %	%	80	2.16	Cc	0.100	Cr	0.020
	Hard Silty Hard Silty Thickness	Clay, Unit weight belo Clay, OCR	w GWL		120 pcf 4 21.5 ft	w	80 %	%	e0	2.14	Cc	0.100	Cr	0.020
Excavation Landfill Loa Net Loadin	i to bottom ad g (delta sig	of landfill ma)		0 9 <b>3</b> 50 9350										
Settlemen Elastic Set Thickness (ft) 23.5	t of Loose/ tlement Settlement (ft) 0.51	Med. Dense Sand	Settlement of I Elastic Settleme Thickness (ft)	Med. Dense ent Settle (ft) 10	e Sility Sand ment 0.16		Settlement F Thickness E (ft) ( 5	of Mediun Primary Eff Stress (psf) 1811.1	n Stiff Silty C Settlement (ft) 0.02	ay Layer			Settlement Thickness I (ft) 21.5	of Hard Clay layer Primary Eff Stress Settlement (psf) (ft) 3625.5 0.08
Total Set	tlements													
Elastic (Im Elastic (Im Primary Co Primary Co	mediate) So mediate) So onsolidation onsolidation	attlement of Loose and attlement of Medium D Settlement of Mediun Settlement of Hard C	d Med Sand Dense Silty Sand n Stiff Silty Clay Clay <b>Total</b>		(	0.51 ft 0.16 ft 0.02 ft 0.08 ft <b>0.77 ft</b>								

Appendix F Secondary Stormwater Management Analysis

November 24, 2020 File No. 09217088.18

TECHNICAL MEMORANDUM

TO: FILE

FROM: Johnny Edwards, PE

SUBJECT: Secondary Stormwater System – Lena Road Landfill Stage II

### PURPOSE

This memorandum describes SCS' analysis of the secondary stormwater management system in Stage II of the Lena Road Landfill, Manatee County.

### CONDITIONS

The currently permitted conditions of the Stage II Area include 30' wide terraces. This application proposes to narrow those terraces to a previously permitted condition of 20' wide. This analysis uses an ICPR model and considers downcomers of the same diameter in the same general locations as currently permitted to verify that 20' wide terraces provide sufficient flow capacity without increasing the number of downcomers.

### **MODEL INPUT**

The model simulates one downcomer system that receives runoff from the largest contributing drainage basin areas in Stage II. While the 25-year/24-hour storm event is the standard for secondary stormwater systems, the model compares the results of three storm events; 4.16-in/hour, 12-in/24-hour (100-year/24-hour) and 9-in/24-hour (25-year/24-hour).

- Basins Five Basins, identified as Levels A-E, are included as contributing to the downcomer system with Level E representing 7.57-AC atop the landfill and the other levels, in descending order, down the sideslope at each terrace. A curve number of 84 is used for each to represent a closed condition (impermeable layer with geocomposite and with 2' of cover). A peaking factor of 256 is assigned to Level E, which will have a final slope of 4%, while 484 is used in the other basins in which most of the area is a 4:1 slope.
- Nodes Four types of nodes are established.
  - The first type are swales represented as stage/area relationships based on the geometry of the terraces shown in Appendix C. These nodes allow water to stage as needed during a storm event.
  - The second type function as unions with stage/volume relationships, represent 10' sections of culverts that receive water from the associated terraces (through inlets) as well as the downcomer pipe above this location, as appropriate.
  - The third type are drop inlets situated in the bottom swale at the toe of slope. These inlets will help dissipate energy of the stormwater entering the bottom swale to reduce the potential for erosion.

Secondary Stormwater Analysis November 24, 2020 Page 2

- Finally, as a boundary condition, the exterior swale is set not to exceed 37', which is higher than the elevations of the weirs from which the exterior swale discharges.
- Links The links in this model are culverts used to convey water between nodes.

### MODEL RESULTS

The model shows that stages in the terraces, and on the top deck (Level E), each provide adequate freeboard for the three storms considered. On the top deck, the 110 swale gets as high as 112.01' during the 100-year/24-hour storm. 112' is the elevation at which the basin could drain into another drainage basin, which shouldn't stage as high because the subject downcomer has the largest contributing drainage basin.

### CONCLUSIONS

Reducing the terrace widths in the Stage II Area will not adversely impact the function of the secondary stormwater system. The inlet and downcomers are sufficiently spaced and sized to receive runoff and convey it down the sideslopes. This analysis has not evaluated tailwater conditions which are typically part of the ERP permitting process.



Simulation: 1 hour				
Scenario	Scenario 1 Culvert			
Run Date/Time	11/23/2020 8:06:01 PM			
Program Version:	ICPR4 4 05 02			
riogram version.	1011(4 4.03.02			
		General		
Run Mode:	Normal			
	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000
	Hydrology [sec]	Surface Hydraulics	Groundwater [sec]	
Min Calculation Time:	60,0000	0 1000	900 000	
Max Calculation Time:	00.0000	30,0000	900.0000	
		30.0000		
		Output Time Increments		
Hydr	ology	l		
Vear	Month	Dav	Hour [br]	Time Increment [min]
0	0	0	0.0000	5.0000
°	°	0	0.0000	0.0000
Surface F	lydraulics			
Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	5.0000
Groun	dwater	l		
Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000
		-		
Resta	rt File			
Save Restart:	False			
		Decourace & Lookup Table		
		Resources & Lookup Tables		
Reso	urces		Lookup	Tables
Rainfall Folder:			Boundary Stage Set:	
Reference ET Folder:			Extern Hydrograph Set:	
Unit Hydrograph			Curve Number Set:	
Folder:				
			Green-Ampt Set:	
			Vertical Layers Set:	
			Impervious Set:	
			Roughness Set:	
			Crop Coef Set:	
			Fillable Porosity Set:	

11/24/2020 08:11

Conductivity Set: Leakage Set:

### Tolerances & Options

Time Marching: Max Iterations:	SAOR 6	IA Recovery Time: ET for Manual Basins:	24.0000 hr False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FDOT-1
		Rainfall Amount:	4.16 in
Edge Length Option:	Automatic	Storm Duration:	1.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area	100 ft2	Min Node Srf Area	100 ft2
(2D):		(1D):	
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

#### Comment:

Simulation: 100/24				
Scenario: S	Scenario 1 Culvert			
Run Date/Time: 1	11/23/2020 8:06:07 PM			
Program Version: I	ICPR4 4.05.02			
		General		
Run Mode: N	Normal			
_	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000
	Hydrology [sec]	Surface Hydraulics	Groundwater [sec]	
_		[sec]		
Min Calculation Time:	60.0000	0.1000	900.0000	
Max Calculation Time:		30.0000		
		Output Time Increments		
Hydrold	ogy			
Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

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#### Input and Results - Stage II Downcomer

Surface F	lydraulics	I		
Year	Month	Dav	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
	ł	1		1
Groun	dwater	I		
Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000
Deete	rt Filo			
Save Restart:	False	1		
Suve Restart.				
		Resources & Lookup Table	2S	
Reso	urces		Lookup	Tables
Rainfall Folder:			Boundary Stage Set:	
Reference ET Folder:			Extern Hydrograph Set:	
Unit Hydrograph			Curve Number Set:	
Tolder.			Green-Ampt Set:	
			Vertical Lavers Set:	
			Impervious Set:	
			Roughness Set:	
			Crop Coef Set:	
			Fillable Porosity Set:	
			Conductivity Set:	
			Leakage Set:	
		Tolerances & Options		
Time Marching:	SAOR		IA Recovery Time:	24.0000 hr
Max Iterations:	6		ET for Manual Basins:	False
Over-Relax Weight	0.5 dec			
Fact:				
dZ Tolerance:	0.0010 ft		Smp/Man Basin Rain	Global
			Opt:	
Max dZ:	1.0000 ft		OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft		Rainfall Name:	~SCSI-24
Educ Loueth Outlon	A t t' .		Rainfall Amount:	12.00 in
Eage Length Option:	Automatic		Storm Duration:	24.0000 nr
Dflt Damping (2D):	0.0050 ft		Dflt Damping (1D):	0.0050 ft
Min Node Srf Area	100 ft2		Min Node Srf Area	100 ft2
(2D):			(1D):	
Energy Switch (2D):	Energy		Energy Switch (1D):	Energy
Commont				

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Simulation, 25/24				
Simulation: 25/24	Scopario 1 Culvort			
Scenario. Pun Date/Time:				
Program Version:				
riogram version.	101 104 4:03:02			
		General		
Run Mode:	Normal			
	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000
	Hydrology [sec]	Surface Hydraulics	Groundwater [sec]	
		[sec]		
Min Calculation Time:	60.0000	0.1000	900.0000	
Max Calculation Time:		30.0000		
		Output Time Increments		
Hydr	ology			
	-			
Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000
Surface H	lydraulics			
Voor	Month	Dav	Hour [br]	Time Increment [min]
		Day		
0	0	0	0.0000	13.0000
Groun	dwater			
Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000
Resta	rt File			
Save Restart:	False			
		Resources & Lookup Tables	5	
Peso	urces		Lookun	Tables
Rainfall Folder	ul cos		Boundary Stage Set:	
Reference FT Folder:			Extern Hydrograph Set:	
Unit Hydrograph			Curve Number Set:	
Folder:				
			Green-Ampt Set:	
			Vertical Layers Set:	
			Impervious Set:	
			Roughness Set:	
			Crop Coef Set:	
			Fillable Porosity Set:	

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Conductivity Set: Leakage Set:

### Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight	0.5 dec		
Fact:			
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain	Global
		Opt:	
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSI-24
		Rainfall Amount:	9.00 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area	100 ft2	Min Node Srf Area	100 ft2
(2D):		(1D):	
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

## Comment:

Simple Basin: Level A	
Scenario:	Scenario 1 Culvert
Node:	Bottom Swale
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	5.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	0.5700 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	~SCSI-24

#### Comment:

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Simple Basin: Level B	
Scenario:	Scenario 1 Culvert
Node:	55 Swale
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	5.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	0.6500 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	~SCSI-24



Simple	Dac	in I	$\sim v$	<u> </u>	
SITIPI	e Das	ын. с	ev.	erv	

Scenario:	Scenario 1 Culvert
Node:	75 swale
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	5.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	0.8300 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	~SCSI-24

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	<b></b>		200				1.5

Scenario:	Scenario 1 Culvert
Node:	95 swale
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	5.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH484
Peaking Factor:	484.0
Area:	0.9500 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	~SCSI-24



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Summ	Bas	1014	$\Box \Delta V \Delta$	

Scenario:	Scenario 1 Culvert
Node:	110 Swale
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	15.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	7.5700 ac
Curve Number:	84.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	~SCSI-24



Nodo	110	Swalo	
noue.	110	Swale	

Scenario:	Scenario 1 Culvert
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	110.00 ft
Warning Stage:	112.00 ft

Stage [ft]	Area [ac]	Area [ft2]
110.00	0.0023	100
111.00	0.1865	8124
112.00	0.6803	29634
112.50	0.8340	36329

Comment:
----------

Node Max Conditions w/ Times [Scenario 1 Culvert]											
Node	Sim	Warning	Max	Min/Max	Max	Max	Max	Time to	Time to	Time to	Time to

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
110 Swale	1-hour	112.00	111.81	0.0105	27.66	15.23	25517	1.0724	0.0001	0.7500	1.0725
110 Swale	100/24	112.00	112.01	0.0105	27.83	15.67	29737	10.6018	0.0001	10.0667	10.6020
110 Swale	25/24	112.00	111.35	0.0105	19.81	14.17	15568	10.3371	0.0001	10.0667	10.3379



Scenario: Scenario 1 Culvert Type: Stage/Area Base Flow: 0.00 cfs Initial Stage: 52.50 ft

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#### Warning Stage: 54.50 ft

Stage [ft]	Area [ac]	Area [ft2]
52.50	0.0023	100
53.50	0.0251	1093
54.50	0.1002	4365
55.00	0.1253	5458

Comment:

-

#### Node Max Conditions w/ Times [Scenario 1 Culvert]

Node	Sim	Warning	Max	Min/Max	Max	Max	Max	Time to	Time to	Time to	Time to
Name	Name	Stage	Stage	Delta	Total	Total	Surface	Max	Min/Max	Max	Max
		[ft]	[ft]	Stage	Inflow	Outflow	Area	Stage	Delta	Total	Total
				[ft]	[cfs]	[cfs]	[ft2]	[hr]	Stage	Inflow	Outflow
									[hr]	[hr]	[hr]
55	1-hour	54.50	53.41	0.0009	4.25	4.14	1016	0.5622	0.2628	0.5333	0.5613
Swale											
55	100/24	54.50	53.30	0.0010	3.10	3.09	901	10.0020	8.1409	10.0000	10.0004
Swale											
55	25/24	54.50	53.19	0.0010	2.23	2.22	797	10.0030	8.6943	10.0000	10.0021
Swale											



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Scenario:	Scenario 1 Culvert
Туре:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	72.50 ft
Warning Stage:	74.50 ft

Stage [ft]	Area [ac]	Area [ft2]
72.50	0.0023	100
73.50	0.0312	1359
74.50	0.1250	5445
75.00	0.1560	6795

Node Max	Node Max Conditions w/ Times [Scenario 1 Culvert]										
Node	Sim	Warning	Max	Min/Max	Max	Max	Max	Time to	Time to	Time to	Time to

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
75 swale	1-hour	74.50	74.42	0.0010	5.43	61.35	5107	0.8217	1.1593	0.5333	1.1593
75 swale	100/24	74.50	74.39	0.0010	3.95	30.41	5001	10.1143	9.5445	10.0000	24.1526
75 swale	25/24	74.50	73.66	0.0010	2.85	3.09	2012	10.0623	10.2057	10.0000	10.1069



ode: 95 swale

Scenario:Scenario 1 CulvertType:Stage/AreaBase Flow:0.00 cfsInitial Stage:92.50 ft

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#### Warning Stage: 94.50 ft

Stage [ft]	Area [ac]	Area [ft2]
92.50	0.0023	100
93.50	0.0376	1638
94.50	0.1510	6578
95.00	0.1880	8189

Comment:

-

#### Node Max Conditions w/ Times [Scenario 1 Culvert]

Node	Sim	Warning	Max	Min/Max	Max	Max	Max	Time to	Time to	Time to	Time to
Name	Name	Stage	Stage	Delta	Total	Total	Surface	Max	Min/Max	Max	Max
		[ft]	[ft]	Stage	Inflow	Outflow	Area	Stage	Delta	Total	Total
				[ft]	[cfs]	[cfs]	[ft2]	[hr]	Stage	Inflow	Outflow
									[hr]	[hr]	[hr]
95	1-hour	94.50	93.72	0.0010	6.22	5.76	2705	0.6079	0.2471	0.5333	0.6056
swale											
95	100/24	94.50	93.66	0.0008	4.53	4.44	2420	10.0405	9.5360	10.0000	9.9220
swale											
95	25/24	94.50	93.45	0.0009	3.26	3.23	1567	10.0057	9.5555	10.0000	10.0038
swale											



Mod	0.	Pottom	Inlat
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Scenario:	Scenario 1 Culvert
Type:	Stage/Area
Base Flow:	0.00 cfs
Initial Stage:	37.00 ft
Warning Stage:	39.50 ft

Stage [ft]	Area [ac]	Area [ft2]
33.00	0.0023	100
37.00	0.0023	100

#### Node Max Conditions w/ Times [Scenario 1 Culvert]

Node	Sim	Warning	Max	Min/Max	Max	Max	Max	Time to	Time to	Time to	Time to
Name	Name	Stage	Stage	Delta	Total	Total	Surface	Max	Min/Max	Max	Max
		[ft]	[ft]	Stage	Inflow	Outflow	Area	Stage	Delta	Total	Total

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
Bottom Inlet	1-hour	39.50	39.26	0.0010	23.31	23.23	192	0.7184	1.8581	0.6264	0.6127
Bottom Inlet	100/24	39.50	39.26	0.0016	22.79	22.77	192	10.0439	5.9019	10.0249	10.0276
Bottom Inlet	25/24	39.50	38.87	0.0017	20.49	20.49	192	10.0345	21.8563	10.0277	10.0298



Node: Bottom Swale

Scenario:Scenario 1 CulvertType:Stage/AreaBase Flow:0.00 cfsInitial Stage:37.00 ft

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#### Warning Stage: 39.50 ft

Stage [ft]	Area [ac]	Area [ft2]
37.00	0.0688	2997
38.00	0.1102	4800
39.00	0.1515	6600
40.00	0.1791	7800

Comment:

-

#### Node Max Conditions w/ Times [Scenario 1 Culvert]

Node	Sim	Warning	Max	Min/Max	Max	Max	Max	Time to	Time to	Time to	Time to
Name	Name	Stage	Stage	Delta	Total	Total	Surface	Max	Min/Max	Max	Max
		[ft]	[ft]	Stage	Inflow	Outflow	Area	Stage	Delta	Total	Total
				[ft]	[cfs]	[cfs]	[ft2]	[hr]	Stage	Inflow	Outflow
									[hr]	[hr]	[hr]
Bottom	1-hour	39.50	38.70	0.0010	26.69	24.47	6233	0.7504	1.8401	0.6000	0.7487
Swale											
Bottom	100/24	39.50	38.69	0.0010	25.40	24.36	6225	10.0604	11.8498	10.0106	10.0591
Swale											
Bottom	25/24	39.50	38.41	0.0009	22.37	22.08	5783	10.0410	11.1343	10.0166	10.0389
Swale											



Weir Link: Bottom Weir		
Scenario:	Scenario 1 Culvert	Bottom Clip
From Node:	Bottom Swale	Default: 0.00 ft
To Node:	Bottom Inlet	Op Table:
Link Count:	200	Ref Node:
Flow Direction:	Both	Top Clip
Damping:	0.0000 ft	Default: 0.00 ft
Weir Type:	Horizontal	Op Table:
Geometry Type:	Rectangular	Ref Node:
Invert:	37.00 ft	Discharge Coefficients
Control Elevation:	37.00 ft	Weir Default: 2.800
Max Depth:	0.38 ft	Weir Table:
Max Width:	0.08 ft	Orifice Default: 0.600
Fillet:	0.00 ft	Orifice Table:
Comment:		

Link Min/Max Conditions with Times [Scenario 1 Culvert]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Bottom Weir	1-hour	0.20	-23.23	-1.30	-0.03	-0.03	0.1735	0.6127	1.9475	0.0719	0.0719
Bottom Weir	100/24	0.20	-22.77	-1.66	-0.04	-0.04	0.1735	10.0276	5.9018	2.5644	2.5644
Bottom Weir	25/24	0.20	-20.49	-1.73	-0.04	-0.04	0.1735	10.0298	21.8562	3.2802	3.2802



Pipe Link: Culvert B-	A	Upst	ream	D	Downstream		
Scenario:	Scenario 1 Culvert	Invert:	48.50 ft	Inv	ert: 33.00 ft		
From Node:	55 Culvert	Manning's N:	0.0120	Manning's	N: 0.0120		
To Node:	Bottom Inlet	Geometry	: Circular	Geor	etry: Circular		
Link Count:	1	Max Depth:	2.00 ft	Max Dep	th: 2.00 ft		

Flow Direction:	Both			Bottom Clip	
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	100.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.20	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.10			Top Clip	
Bend Loss Coef:	0.10	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	80.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

#### Link Min/Max Conditions with Times [Scenario 1 Culvert]

Link	Sim	Max	Min	Min/Max	Max Us	Max Ds	Time to	Time to	Time to	Time to	Time to
Name	Name	Flow	Flow	Delta	Velocity	Velocity	Max	Min	Min/Max	Max Us	Max Ds
		[cfs]	[cfs]	Flow	[fps]	[fps]	Flow	Flow	Delta	Velocity	Velocity
				[cfs]			[hrs]	[hrs]	Flow	[hrs]	[hrs]
									[hrs]		
Culvert	1-hour	23.31	0.00	0.03	7.42	21.11	0.6264	0.0000	0.0076	0.6264	1.7333
B-A											
Culvert	100/24	22.79	0.00	-0.05	7.25	21.11	10.0249	0.0000	24.9191	10.0249	11.7658
B-A											
Culvert	25/24	20.49	0.00	0.07	6.52	21.11	10.0277	0.0000	3.1346	10.0277	11.0670
B-A											



		-		-	-
Pipe Link: Culvert C-	В	Upst	ream	Dow	nstream
Scenario:	Scenario 1 Culvert	Invert:	68.50 ft	Invert	48.50 ft
From Node:	75 Culvert	Manning's N:	0.0120	Manning's N	0.0120
To Node:	55 Culvert	Geometry	y: Circular	Geomet	ry: Circular
Link Count:	1	Max Depth:	1.50 ft	Max Depth	1.50 ft
Flow Direction:	Both			Bottom Clip	
Damping:	0.0000 ft	Default:	0.00 ft	Default	0.00 ft
Length:	100.00 ft	Op Table:		Op Table	
FHWA Code:	1	Ref Node:		Ref Node	
Entr Loss Coef:	0.20	Manning's N:	0.0000	Manning's N	0.0000
Exit Loss Coef:	0.10			Top Clip	
Bend Loss Coef:	0.10	Default:	0.00 ft	Default	0.00 ft
Bend Location:	80.00 ft	Op Table:		Op Table	
Energy Switch:	Energy	Ref Node:		Ref Node	
		Manning's N:	0.0000	Manning's N	0.0000
Comment:					

Link Min/I	Max Condit	ions with Ti	imes [Scen	ario 1 Culve	ert]	-					
Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [brs]	Time to Min Flow [brs]	Time to Min/Max Delta Flow	Time to Max Us Velocity [brs]	Time to Max Ds Velocity [brs]
				ניסן			[[[]]]	[[[]]]	[hrs]	[[[]]]	[[[]]]
Culvert C-B	1-hour	19.93	0.00	0.14	11.28	20.28	0.8166	0.0000	1.1593	0.8166	0.4102
Culvert C-B	100/24	19.87	0.00	0.09	11.25	21.67	10.1091	0.0000	2.3664	10.1091	24.1694
Culvert C-B	25/24	18.37	0.00	0.09	10.40	20.80	10.0628	0.0000	24.8390	10.0628	11.1101



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Pipe Link: Culvert D-	С	Upst	ream	Downs	tream
Scenario:	Scenario 1 Culvert	Invert:	88.50 ft	Invert:	68.50 ft
From Node:	95 Culvert	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	75 Culvert	Geometry	y: Circular	Geometry	: Circular

Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both			Bottom Clip	
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	100.00 ft	Op Table:		Op Table:	
FHWA Code:	1	Ref Node:		Ref Node:	
Entr Loss Coef:	0.20	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.10			Top Clip	
Bend Loss Coef:	0.10	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	80.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

#### Link Min/Max Conditions with Times [Scenario 1 Culvert]

Link	Sim	Max	Min	Min/Max	Max Us	Max Ds	Time to	Time to	Time to	Time to	Time to
Name	Name	Flow	Flow	Delta	Velocity	Velocity	Max	Min	Min/Max	Max Us	Max Ds
		[cfs]	[cfs]	Flow	[fps]	[fps]	Flow	Flow	Delta	Velocity	Velocity
				[cfs]			[hrs]	[hrs]	Flow	[hrs]	[hrs]
									[hrs]		
Culvert	1-hour	18.48	0.00	0.06	10.46	19.60	0.6249	0.0000	0.0004	0.6249	1.7717
D-C											
Culvert	100/24	18.36	0.00	0.09	10.39	19.56	10.0425	0.0000	2.3668	10.0425	11.7826
D-C											
Culvert	25/24	16.55	0.00	-0.07	9.37	19.57	10.0455	0.0000	24.8295	10.0455	11.2207
D-C											



	-	-			-
Pipe Link: Culvert E-	D	Upst	ream	Dow	nstream
Scenario:	Scenario 1 Culvert	Invert:	107.00 ft	Invert	88.50 ft
From Node:	110 Swale	Manning's N:	0.0120	Manning's N	0.0120
To Node:	95 Culvert	Geometry	: Circular	Geomet	ry: Circular
Link Count:	1	Max Depth:	1.50 ft	Max Depth	1.50 ft
Flow Direction:	Both			Bottom Clip	
Damping:	0.0000 ft	Default:	0.00 ft	Default	0.00 ft
Length:	80.00 ft	Op Table:		Op Table	
FHWA Code:	5	Ref Node:		Ref Node	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N	0.0000
Exit Loss Coef:	0.10			Top Clip	
Bend Loss Coef:	0.10	Default:	0.00 ft	Default	0.00 ft
Bend Location:	60.00 ft	Op Table:		Op Table	
Energy Switch:	Energy	Ref Node:		Ref Node	
		Manning's N:	0.0000	Manning's N	0.0000
Comment:					

Link	Sim	Max	Min	Min/Max	Max Us	Max Ds	Time to	Time to	Time to	Time to	Time to
Name	Name	Flow	Flow	Delta	Velocity	Velocity	Max	Min	Min/Max	Max Us	Max Ds
		[cfs]	[cfs]	Flow	[fps]	[fps]	Flow	Flow	Delta	Velocity	Velocity
				[cfs]			[hrs]	[hrs]	Flow	[hrs]	[hrs]
									[hrs]		
Culvert	1-hour	15.23	0.00	-1.09	8.62	23.90	1.0725	0.0000	0.4234	1.0725	0.0001
E-D											
Culvert	100/24	15.67	0.00	2.18	8.87	23.90	10.6020	0.0000	14.7223	10.6020	0.0001
E-D											
Culvert	25/24	14.17	0.00	2.18	8.02	23.90	10.3379	0.0000	12.8337	10.3379	0.0001
E-D											





Pipe Link: Existing C	ulverts	Upsti	ream	Downs	tream
Scenario:	Scenario 1 Culvert	Invert:	37.00 ft	Invert:	36.20 ft
From Node:	Bottom Swale	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	Exterior Swale	Geometry	: Circular	Geometry	: Circular

Link Count:	4	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both			Bottom Clip	
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	50.00 ft	Op Table:		Op Table:	
FHWA Code:	5	Ref Node:		Ref Node:	
Entr Loss Coef:	0.20	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.10			Top Clip	
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 ft	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

#### Link Min/Max Conditions with Times [Scenario 1 Culvert]

Link	Sim	Max	Min	Min/Max	Max Us	Max Ds	Time to	Time to	Time to	Time to	Time to
Name	Name	Flow	Flow	Delta	Velocity	Velocity	Max	Min	Min/Max	Max Us	Max Ds
		[cfs]	[cfs]	Flow	[fps]	[fps]	Flow	Flow	Delta	Velocity	Velocity
				[cfs]			[hrs]	[hrs]	Flow	[hrs]	[hrs]
									[hrs]		
Existing	1-hour	24.47	0.00	2.35	3.46	8.25	0.7487	0.0000	1.0585	0.7487	0.6127
Culverts											
Existing	100/24	24.36	0.00	-2.35	3.45	8.25	10.0591	0.0000	9.9168	10.0591	9.9168
Culverts											
Existing	25/24	22.08	0.00	-0.08	3.21	7.61	10.0389	0.0000	3.8312	10.0471	10.0494
Culverts											



		-	_			
Pipe Link: Inlet 55		Upst	ream		Downs	stream
Scenario:	Scenario 1 Culvert	Invert:	52.50 ft		Invert:	48.50 ft
From Node:	55 Swale	Manning's N:	0.0120	Mar	nning's N:	0.0120
To Node:	55 Culvert	Geometry	: Circular		Geometry	: Circular
Link Count:	2	Max Depth:	1.50 ft	Ma	ax Depth:	1.50 ft
Flow Direction:	Both			Bottom Clip		
Damping:	0.0000 ft	Default:	0.00 ft		Default:	0.00 ft
Length:	20.00 ft	Op Table:		(	Op Table:	
FHWA Code:	5	Ref Node:		F	Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Mar	nning's N:	0.0000
Exit Loss Coef:	0.20			Top Clip		
Bend Loss Coef:	0.20	Default:	0.00 ft		Default:	0.00 ft
Bend Location:	18.00 ft	Op Table:		(	Op Table:	
Energy Switch:	Energy	Ref Node:		F	Ref Node:	
		Manning's N:	0.0000	Mar	nning's N:	0.0000
Comment						

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow [hrs]	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
Inlet 55	1-hour	4.14	0.00	0.17	1.84	1.17	0.5613	0.0000	0.2950	0.5668	0.5613
Inlet 55	100/24	3.09	0.00	0.17	1.75	0.87	10.0004	0.0000	8.1211	8.1176	10.0004
Inlet 55	25/24	2.22	0.00	0.17	1.75	0.63	10.0021	0.0000	8.6771	8.6740	10.0021





Pipe Link: Inlet 75		Upst	ream		Downs	stream
Scenario:	Scenario 1 Culvert	Invert:	72.50 ft		Invert:	68.50 ft
From Node:	75 swale	Manning's N:	0.0120		Manning's N:	0.0120
To Node:	75 Culvert	Geometry	: Circular		Geometry	r: Circular
Link Count:	2	Max Depth:	1.50 ft		Max Depth:	1.50 ft
Flow Direction:	Both			Bottom Clip		
Damping:	0.0000 ft	Default:	0.00 ft		Default:	0.00 ft

#### Input and Results - Stage II Downcomer

Length:	10.00 ft	Op Table:		Op Ta	able:	
FHWA Code:	5	Ref Node:		Ref N	ode:	
Entr Loss Coef:	0.00	Manning's N:	I: 0.0000 Manning's N: 0.0000			0.0000
Exit Loss Coef:	0.20			Top Clip		
Bend Loss Coef:	0.10	Default:	0.00 ft Default: 0.00 ft		0.00 ft	
Bend Location:	8.00 ft	Op Table:		Op Ta	able:	
Energy Switch:	Energy	Ref Node:		Ref N	ode:	
		Manning's N:	0.0000	Manning	's N:	0.0000
Comment:						

#### Link Min/Max Conditions with Times [Scenario 1 Culvert]

Link	Sim	Max	Min	Min/Max	Max Us	Max Ds	Time to	Time to	Time to	Time to	Time to
Name	Name	Flow	Flow	Delta	Velocity	Velocity	Max	Min	Min/Max	Max Us	Max Ds
		[cfs]	[cfs]	Flow	[fps]	[fps]	Flow	Flow	Delta	Velocity	Velocity
				[cfs]			[hrs]	[hrs]	Flow	[hrs]	[hrs]
									[hrs]		
Inlet 75	1-hour	61.35	0.00	61.34	17.36	17.36	1.1593	0.0000	1.1593	1.1593	1.1593
Inlet 75	100/24	30.41	0.00	30.41	8.61	32.30	24.1526	0.0000	24.1526	24.1526	24.1526
Inlet 75	25/24	3.09	0.00	-1.98	2.50	0.87	10.1069	0.0000	10.0732	9.5554	10.1069



		-		_	_		
Pipe Link: Inlet 95		Upst	ream	Dow	Downstream		
Scenario:	Scenario 1 Culvert	Invert:	92.50 ft	Invert	: 88.50 ft		
From Node:	95 swale	Manning's N:	0.0120	Manning's N	: 0.0120		
To Node:	95 Culvert	Geometry	y: Circular	Geome	try: Circular		
Link Count:	2	Max Depth:	1.50 ft	Max Depth	: 1.50 ft		
Flow Direction:	Both			Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default	: 0.00 ft		
Length:	10.00 ft	Op Table:		Op Table	:		
FHWA Code:	5	Ref Node:		Ref Node	:		
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N	: 0.0000		
Exit Loss Coef:	0.20			Top Clip			
Bend Loss Coef:	0.20	Default:	0.00 ft	Default	: 0.00 ft		
Bend Location:	8.00 ft	Op Table:		Op Table	:		
Energy Switch:	Energy	Ref Node:		Ref Node	:		
		Manning's N:	0.0000	Manning's N	: 0.0000		
Comment:							

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Time to Max Flow [hrs]	Time to Min Flow [hrs]	Time to Min/Max Delta Flow	Time to Max Us Velocity [hrs]	Time to Max Ds Velocity [hrs]
									[hrs]		
Inlet 95	1-hour	5.76	0.00	-1.25	2.50	19.11	0.6056	0.0000	0.6654	0.3296	0.5148
Inlet 95	100/24	4.44	0.00	-1.19	2.50	1.26	9.9220	0.0000	10.1322	9.5288	9.9220
Inlet 95	25/24	3.23	0.00	0.61	2.50	0.91	10.0038	0.0000	9.5511	9.5500	10.0038



Link Min/Max Conditions with Times [Scenario 1 Culvert]

Appendix G Environmental Resource Permit



# FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office 13051 North Telecom Parkway #101 Temple Terrace, Florida 33637-0926 Ron DeSantis Governor

Jeanette Nuñez Lt. Governor

Noah Valenstein Secretary

November 4, 2020

Manatee County Utilities Department c/o Robert Shankle 3333 Lena Road Bradenton, FL 34210 <u>Robert.Shankle@mymanatee.org</u>

Dear Mr. Shankle:

Enclosed is the Environmental Resource Permit, DEP Project No. 41-0224996-004, issued pursuant to Part IV of Chapter 373, Florida Statutes, and Title 62, Florida Administrative Code.

Appeal rights for you and for any affected third party are described in the text of the permit along with conditions that must be met when authorized activities are undertaken.

You, as the applicant, are responsible for all aspects of permit compliance. You should therefore review this permit document carefully to ensure compliance with the general conditions and specific conditions contained herein.

Please be aware of permit General Condition number 4, which states, "At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice"."

If you have any questions about this document, please contact me at <u>Greg.Alba@floridadep.gov</u> or 813-470-5773. Thank you for your participation in the permit process and in managing the natural resources of the State of Florida.

Sincerely,

Dregory alla

Gregory Alba Engineering Specialist II Permitting and Waste Cleanup Programs

cc:

William Edwards, SCS Engineers, <u>wedwards@scsengineers.com</u> Southwest District, <u>SW\_ERP@floridadep.gov</u> Greg Alba, Southwest District, <u>greg.alba@floridadep.gov</u> Army Corps of Engineers, Tampa Regulation, <u>TampaReg@usace.army.mil</u>

Enclosure: Environmental Resource Permit with Attachments (26 Pages)



## FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office 13051 North Telecom Parkway #101 Temple Terrace, Florida 33637-0926 Ron DeSantis Governor

Jeanette Nuñez Lt. Governor

Noah Valenstein Secretary

**Permittee/Authorized Entity:** 

Manatee County Utilities Department c/o Robert Shankle 3333 Lena Road Bradenton, FL 34210

## Lena Road Landfill Stormwater Modification

Authorized Agent: SCS Engineers c/o William Edwards wedwards@scsengineers.com Orlando, FL 32822

## **Individual Environmental Resource Permit**

**State-owned Submerged Lands Authorization – Not Applicable** 

U.S. Army Corps of Engineers Authorization – Not Approved

Permit No.: 41-0224996-004

Permit Issuance Date: 11/4/2020 Permit Construction Phase Expiration Date: 11/4/2025



# FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office 13051 North Telecom Parkway #101 Temple Terrace, Florida 33637-0926

Environmental Resource Permit Permittee: Manatee County Utilities Permit No: 41-0224996-004-EI

### **PROJECT LOCATION**

The activities authorized by this permit are located at 3333 Lena Road Bradenton, Florida, Section 06, Township 35 South, Range 19 East, in Manatee County, at latitude  $27^{\circ}27'54.0000"$  N / longitude  $-82^{\circ}26'44.0000"$  W.

### **PROJECT DESCRIPTION**

The permittee is authorized to remove the existing pump and disc-filter system from service and placement of a control structure in Pond #2 with the discharge routed to Pond #1. The total impervious area for the site is 154 acres, the project area is approximately 2.5 acres. There are no new impervious or semi-impervious areas proposed with this permit. All impervious and semi-impervious areas were previously permitted under ERP No.41-0224996-001.

The proposed changes to the system will route the stormwater discharge from the wet detention Pond #2 to the dry retention Pond #1. Pond #2 that operated with the disc system has become increasingly difficult to maintain thus to address this issue a control structure will be installed within Pond #2 that will allow stormwater discharge to Pond #1. Pond #1 has control structures and an underdrain system that were previously permitted under ERP No. 41-0224996-001 and will operate as originally intended. The pond systems in the (-001) ERP provided treatment for Stage I and III when originally designed. Stage I was treated by Pond 2 and Stage III was treated by Pond 1, but currently a different Stormwater Management System (SWMS) treats the majority of the inactive Stage III. Ponds 1 and 2 will instead provide treatment for Stage I and the portion of Stage III that is not treated by the other SWMS.

For the SWMS the required treatment volume of the wet and dry ponds are 9.61 ac-ft and 1.62 ac-ft respectively. Pond #1 treats the first inch of rainfall and Pond #2 treats the first half inch of rainfall. The proposed changes provide 24.04 ac-ft and 3.51 ac-ft of treatment respectively. The runoff for the site in pre-developed conditions was 327 cubic feet per second (cfs) and 396.8 cfs in a 25- and 100-year storm events. The post developed conditions reduce the cfs to 28.13 and 61.79 for the 25- and 100-year storm events.

No impacts to wetlands or other surface waters are authorized. The activity will not take place within the 100-year flood plain but is in a closed drainage basin. The SWMS has been designed accordingly.

Authorized activities are depicted on the attached exhibits.

Ron DeSantis Governor

Jeanette Nuñez Lt. Governor

Noah Valenstein Secretary

## AUTHORIZATIONS

## Lena Road Landfill Stormwater Modification

### Environmental Resource Permit

The Department has determined that the activity qualifies for an Environmental Resource Permit. Therefore, the Environmental Resource Permit is hereby granted, pursuant to Part IV of Chapter 373, Florida Statutes (F.S.), and Chapter 62-330, Florida Administrative Code (F.A.C.).

## Sovereignty Submerged Lands Authorization

As staff to the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), the Department has determined the activity is not on submerged lands owned by the State of Florida. Therefore, your project is not subject to the requirements of Chapter 253, F.S., or Rule 18-21 (18-20, 18-18), F.A.C.

### Federal Authorization

This permit does not include federal authorization or imply the presence or limits of Waters of the United States (WOTUS) on the subject property. Activities that may impact WOTUS shall require a separate permit from the Corps. It is recommended that you contact your local Corps office to determine whether your project site contains WOTUS and/or if a Department of the Army permit is needed. A map of local Corps offices and the federal application form (ENG 4345) are available online at the Jacksonville District Regulatory Division website.

#### Coastal Zone Management

Issuance of this authorization also constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act.

#### Water Quality Certification

This permit also constitutes a water quality certification under Section 401 of the Clean Water Act, 33 U.S.C. 1341.

## Other Authorizations

You are advised that authorizations or permits for this activity may be required by other federal, state, regional, or local entities including but not limited to local governments or municipalities. This permit does not relieve you from the requirements to obtain all other required permits or authorizations.

The activity described may be conducted only in accordance with the terms, conditions and attachments contained in this document. Issuance and granting of the permit and authorizations herein do not infer, nor guarantee, nor imply that future permits, authorizations, or modifications will be granted by the Department.

## PERMIT CONDITIONS

The activities described must be conducted in accordance with:

- The Specific Conditions
- The General Conditions
- The limits, conditions and locations of work shown in the attached drawings
- The term limits of this authorization

Permittee: Manatee County Utilities Permit No: 41-0224996-004-EI Page 3 of 11

You are advised to read and understand these conditions and drawings prior to beginning the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings herein. If you are using a contractor, the contractor also should read and understand these conditions and drawings prior to beginning any activity. Failure to comply with these conditions, including any mitigation requirements, shall be grounds for the Department to revoke the permit and authorization and to take appropriate enforcement action. Operation of the facility is not authorized except when determined to be in conformance with all applicable rules and this permit, as described.

## SPECIFIC CONDITIONS

 Submittals required herein (e.g., progress reports, as-built drawings, etc.) shall include the permittee's name and permit number 41-0224996-004-EI and shall be directed by e-mail to <u>SW\_ERP@dep.state.fl.us</u> with a subject line of "Compliance: permit number 41-0224996-004-EI", or by mail to:

> Department of Environmental Protection Southwest District ATTN: ERP Compliance Assurance 13051 North Telecom Parkway Temple Terrace, FL 33637-0926

- 2. The work authorized by this permit shall not be conducted on any property, other than that owned by the permittee, without the prior written approval of that property owner.
- 3. In the event the permittee files for bankruptcy prior to completion of work permitted and required by this permit, the permittee must notify the Department within 30 days of filing. The notification shall identify the bankruptcy court and case number and shall include a copy of the bankruptcy petition.

## SPECIFIC CONDITIONS - PRIOR TO ANY CONSTRUCTION

- 4. Prior to construction, the limits of impact shall be clearly marked in a way which is visible and obvious to anyone performing work on-site, including someone operating heavy equipment. Orange construction fence or tall flagged stakes along the construction limits are possible methods.
- 5. Best management practices for erosion control shall be implemented prior to construction commencement and shall be maintained at all times during construction to prevent siltation and turbid discharges in excess of State water quality standards (>29 NTU's above background, pursuant to Rule 62-302, F.A.C. Methods may include, but are not limited to, the use of staked hay bales, staked filter cloth, sodding, seeding, staged construction and the installation of turbidity screens around the immediate project site.

## SPECIFIC CONDITIONS - CONSTRUCTION ACTIVITIES

6. Wetland areas or waterbodies that are outside the specific limits of construction authorized by this permit, must be protected from erosion, sedimentation, siltation, scouring, excess turbidity, and/or dewatering. There shall be no discharge in violation of the water quality standards in Chapter 62-302, F.A.C. Turbidity/erosion controls shall be installed prior to clearing, excavation or placement of fill material, shall be maintained until construction is completed,

disturbed areas are stabilized, and turbidity levels have fallen to less than 29 NTU's above background. The turbidity and erosion control devices shall be removed within 14 days once these conditions are met.

- 7. The permittee shall be responsible for ensuring erosion control devices/procedures are inspected and maintained daily during all phases of construction authorized by this permit until areas disturbed during construction are sufficiently stabilized to prevent erosion, siltation, and turbid discharges.
- 8. Staked filter cloth shall be positioned at the edge of the permitted fill slopes adjacent to wetlands to prevent turbid run-off and erosion.
- 9. Grass seed, or sod shall be installed and maintained on exposed slopes and disturbed soil areas within 48 hours of completing final grade, and at other times as necessary, to prevent erosion, sedimentation or turbid discharges into waters of the state and adjacent wetlands. A vegetative cover that stabilizes and prevents erosion of the fill material shall be established within 60 days of sodding or seeding. Turbidity barriers/erosion control devices shall be removed upon establishment of a substantial vegetative cover.
- 10. Unauthorized impacts to wetlands resulting from authorized construction shall be reported to the Department within 24 hours.
- 11. This permit does not authorize the installation of water, sewer, cable or utility lines within wetlands or waterbodies.
- 12. Storage or stockpiling of tools and materials (i.e., lumber, pilings, debris) within wetlands or other surface waters is prohibited.
- 13. Excavation of stormwater management areas is limited to permitted design specifications as depicted on the attached permit drawing. If limestone bedrock is encountered during construction, the permittee shall notify the Department immediately and shall cease construction in the affected area. The permittee shall submit a design revision to the Department for review and approval that will demonstrate compliance with Rule 5.4.1.b. of the SWFWMD Applicant's Handbook, Volume II prior to proceeding with construction.
- 14. The permittee shall notify the Department of any sinkhole development in the stormwater management system within 24 hours after discovery and must submit a detailed sinkhole evaluation and repair plan for Department approval within 30 days of discovery.
- 15. The authorized stormwater management system shall be completed prior to or simultaneously with associated upland development.

## **SPECIFIC CONDITIONS - CONSTRUCTION COMPLETION**

16. The permittee shall submit one set of signed, dated and sealed as-built drawings to the Department via email at <u>SW\_ERP@dep.state.fl.us</u> for review and approval within **30 days** of completion of construction. (Please contact the Department for files that are too large to email for alternative means of submitting electronically.) The as-built drawings shall be based on the Department permitted construction drawings and any pertinent specific conditions, which should be revised

to reflect changes made during construction. Both the original design and constructed elevations must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. Surveyed dimensions and elevations required shall be verified and signed, dated and sealed by a Florida registered professional. As-builts shall be submitted to the Department regardless of whether deviations are present or not. In addition, the permittee shall submit the "As-Built Certification and Request for Conversion to Operation Phase" form (Ch. 62-330.310(1), F.A.C.); as required in General Condition #6.

The following information shall be verified on the as-built drawing from the engineering drawings signed and sealed by William J Edwards, P.E., #60876, on October 14, 2020.

Plan View/Cross Section Name	Drawing Number(s)
Project Area with Aerial	4 of 8
Pond Control Modification Plan	5 & 6 of 8
Details	7 & 8 of 8

### **SPECIFIC CONDITIONS – OPERATION AND MAINTENANCE ACTIVITIES**

- 17. The dry retention ponds must recover the total treatment volume within 72 hours after a rainfall event. A system that is unable to recover the treatment volume in the allotted timeframe shall not be considered in compliance with this permit and possible modifications to the system may be required.
- 18. The underground effluent filtration system shall meet the requirements of Applicant's Handbook II including to the design requirements and the maintenance requirements to assure that the system will operate as intended.
- 19. SWMS conveyance pipes and inlets shall be maintained free of blockage and the pond must be kept free of obstructions or blockage by sediment. Any scouring or erosion at these locations must be repaired.
- 20. All ditches and swales from the point at which they receive runoff from the project area and through their entire downstream length shall be well maintained and stabilized to ensure that they are not subject to erosion.
- 21. The permitted SWMS shall only be used for the purpose of controlling surface water runoff from the site and shall not be used to dispose of or store any solid/liquid waste or products generated or used during operation or construction of the facility.
- 22. The permittee shall notify the Department of any sinkhole development in the SWMS within 24 hours after discovery and must submit a detailed sinkhole evaluation and repair plan for approval by the Department within 30 days of discovery.
- 23. Required inspections by the permittee.
  - a. The stormwater system shall be inspected periodically for accumulation of debris and trash. Accumulations of debris and trash that negatively affect the function of the system shall be removed upon discovery.

- b. The stormwater system shall be inspected periodically for silt accumulation. Accumulations of silt that negatively affect the function of the system shall be removed.
- 24. The operation and maintenance entity shall provide for the inspection of the permitted project after conversion of the permit to the operation and maintenance phase. For systems utilizing retention or wet detention, the inspections shall be performed five (5) years after operation is authorized and every five (5) years thereafter.
- 25. The operation and maintenance entity must maintain a record of each inspection, including the date of inspection, the name and contact information of the inspector, whether the system was functioning as designed and permitted, and make such record available upon request of the District.
- 26. Within 30 days of any failure of a stormwater management system or deviation from the permit, an inspection report shall be submitted using Form 62-330.311(1), "Operation and Maintenance Inspection Certification" describing the remedial actions taken to resolve the failure or deviation.
- 27. The maintenance of the SWMS shall be in accordance with the "Operation and Maintenance Plan". It is the responsibility of the permittee to ensure that that the surface water management system is functioning as designed.

## **GENERAL CONDITIONS FOR INDIVIDUAL PERMITS**

The following general conditions are binding on all individual permits issued under chapter 62-330, F.A.C., except where the conditions are not applicable to the authorized activity, or where the conditions must be modified to accommodate project-specific conditions.

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation June 2007)*, and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008)*, which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.
4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice," [October 1, 2013], which is incorporated by reference in paragraph 62-330.350(1)(d), F.A.C., indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.

6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:

- a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit" [Form 62-330.310(3)]; or
- b. For all other activities "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
- c.If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.
- 7. If the final operation and maintenance entity is a third party:
  - a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
  - b. Within 30 days of submittal of the as- built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

- 9. This permit does not:
  - a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
  - b. Convey to the permittee or create in the permittee any interest in real property;
  - c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
  - d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

Permittee: Manatee County Utilities Permit No: 41-0224996-004-EI Page 8 of 11

10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the Agency in writing:

- a. Immediately if any previously submitted information is discovered to be inaccurate; and
- b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, stone tools, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section (DHR), at (850)245-6333, as well as the appropriate permitting agency office. Project activities shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and the proper authorities notified in accordance with section 872.05, F.S. For project activities subject to prior consultation with the DHR and as an alternative to the above requirements, the permittee may follow procedures for unanticipated discoveries as set forth within a cultural resources assessment survey determined complete and sufficient by DHR and included as a specific permit condition herein.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

Permittee: Manatee County Utilities Permit No: 41-0224996-004-EI Page 9 of 11

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with subsection 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

## **NOTICE OF RIGHTS**

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

## Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rule 28-106.201, F.A.C., a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, any email address, any facsimile number, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;

(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Permittee: Manatee County Utilities Permit No: 41-0224996-004-EI Page 10 of 11

## Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who has asked the Department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

## Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

## Mediation

Mediation is not available in this proceeding.

## FLAWAC Review

The applicant, or any party within the meaning of Section 373.114(1)(a) or 373.4275, F.S., may also seek appellate review of this order before the Land and Water Adjudicatory Commission under Section 373.114(1) or 373.4275, F.S. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the Department within 20 days from the date when this order is filed with the Clerk of the Department.

## Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, M.S. 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this action is filed with the Clerk of the Department.

Permittee: Manatee County Utilities Permit No: 41-0224996-004-EI Page 11 of 11

Executed in Hillsborough County, Florida.

## STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Pamala Vazquez Program Administrator Permitting/Waste Cleanup Program FDEP Southwest District

## **Attachments:**

Project Drawings and Design Specs., 6 pages Construction Commencement Notice/Form 62-330.350(1) As-built Certification and Request for Conversion to Operational Phase/ Form 62-330.310(1) Request for Transfer to the Perpetual Operation Entity/Form 62-330.310(2) Request to Transfer Permit/Form 62-330.340(1) Operation and Maintenance Inspection Certification/Form 62-330.311(1)

## **Copies furnished to:**

William Edwards, SCS Engineers, <u>wedwards@scsengineers.com</u> Greg Alba, Southwest District, <u>greg.alba@floridadep.gov</u> Army Corps of Engineers, Tampa Regulation, <u>TampaReg@usace.army.mil</u> Southwest District, DEP, <u>SW\_ERP@floridadep.gov</u>

## CERTIFICATE OF SERVICE

The undersigned hereby certifies that this permit, including all copies, were mailed before the close of business on **November 4, 2020**, to the above listed persons.

## FILING AND ACKNOWLEDGMENT

FILED, on this date, under 120.52(7) of the Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Barbara Browning

Clerk

November 4, 2020 Date



















STATE OF REPUNSION						
CHK.						
DESCRIPTION	W SHEET ADDED FOR ADDITIONAL SECTION A					
REV DATE	<u> 1 8/25/2020 NI</u>	$\bigtriangledown$	$\square$	$\square$		$\bigtriangledown$
SHEET TITLE DETAILS		PROJECT TITLE	LENA ROAD LANDFILL	STORMWATER SYSTEM REVISIONS		
International control of the second of the s						
CLIENT NA NA			4410	BRADEN		
SENGINEERS		COCONUT PALM DRIVE, SUITE 102, TAMPA, FL 33619	13) 621-0080 FAX NO. (813) 623-6757 4410 (		17088.16 WW. BT. SRF	WJE CHK. BY: APP. BY: SRF
SCS ENGINEERS		3922 COCONUT PALM DRIVE, SUITE 102, TAMPA, FL 33619	PH (813) 621-0080 FAX NO. (813) 623-6757		09217088.16 WW. BY. SRF	DSN. BY: CHK. BY: WJE APP. BY: SRF
SCS ENGINEERS		8 3922 COCONUT PALM DRIVE, SUITE 102, TAMPA, FL 33619	PH (813) 621-0080 FAX NO. (813) 623-6757 4410 (813) 621-0080 FAX NO. (813) 623-6757		G 09217088.16 WW.B.C WARWEN.	DSN. BY: WJE CHK. BY: WJE APP. BY: SRF
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# PUMP SPECIFICATIONS

PUMP REQUIRED	TWO
MFGR. & MODEL NO.:	FLYGT C-3252
PUMP SIZE	6"DISCHARGE
PUMP CAPACITY	<u>800</u> GPM
TOTAL HEAD	<u>80</u> FT.
IMPELLER NO.	452
MOTOR REQUIREMENTS *	HP. MIN. 460VOLT,
SPEED	<u>1750</u> R.P.M.
ELECTRICAL SERVICE	<u>460</u> VOLTS, <u>3</u> PHASE,
* HP SHALL BE ADEQUATE THRU AL	L POINTS ON THE PUMP CURVE

# PUMP CONTROL LEVELS

HIGH WATER ALARM	ELEV.	34.00
Z LEAD PUMP No.1 ON	ELEV.	32.77
ALL PUMPS OFF	ELEV.	30.77

# STATION DESIGN

800 GPM (ONE PUMP) 1600 GPM (TWO PUMPS)



# **FROM NORTH**

N.T.S.

MIN. <u>460</u> VOLT, <u>3</u> PHASE

LTS, <u>3</u> PHASE, 60 HERTZ

NOTE: EXISTING INFORMATION PROVIDED FOR REFERENCE ONLY. NO MODIFICATIONS REQUIRED FOR THE PUMP STATION.





Appendix H Cost Estimates for Closure and Long-Term Care

**Print Form** 



# Florida Department of Environmental Protection

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

DEP Form # 62-701.900(28), F.A.C.
form Title: Closure Cost Estimating Form for Solid Waste Facilities
Effective Date: January 6, 2010
ncorporated in Rule 62-701.630(3), F.A.C.

## CLOSURE COST ESTIMATING FORM FOR SOLID WASTE FACILITIES

Date of DEP Approval:

## I. GENERAL INFORMATION:

-	_						
Facility Name: <u>N</u>	lanatee Cou	nty Lena R	oad Class I La	andfill	\	WACS ID: SWD4	144795
Permit Application	or Consent C	Order No.:	39884-021-9	SO-01	Expira	tion Date: 3/24	/36
Facility Address:	3333 Lena I	Road, Brac	lenton FL 342	211			
Permittee or Owner	/Operator:	Manatee	County Utilitie	es Department			
Mailing Address:	3333 Lena I	Road, Brac	lenton FL 342	11			
Latitude:	27 °	28'	10 "	Longitude:	82°	26'	35 "
Coordinate Method:	State Pla	ane NAD83	<u>3 W</u> C	atum: NGVD29			
Collected by: Jeff	Young, PSN	Л	C	company/Affiliation	Pickett and As	sociates, Inc.	
Solid Waste Dispos	al Units Inclu	uded in Est	timate:	1		1	1
			Date Unit	Active Life of		If closed:	If closed:
			Began	Onit From Date	If active: Remaining	Date last	Official date of
Phase / C	ell	Acres	Waste	of Waste	life of unit	received	closing
Stage I (30-AC	Closed)	132	1972	68	18		
Stage III		66	2004	10	0		
Stage II		118	2016	30	21		
Total disposal unit a	acreade inclu	ided in this	e ostimato:	Closure: 286	Lor	ng-Term Care.	316
			estimate.	Closure. <u>200</u>		ig-renn care.	510
Facility typ	e: 🎽	Class I		Class III 🛛 🗆	C&D Debris	Disposal	
(Check all that	apply)	Other:					
II. TYPE OF FINA	NCIAL ASSU			Check type)			
□ Letter o	of Credit*		□ Insuran	ce Certificate	□ Esc	row Account	
□ Perforr	nance Bond'	ł	🖄 Financi	al Test	□ For	m 29 (FA Defe	erral)
🗆 Guarar	ntee Bond*		□ Trust F	und Agreement			
* - Indica	tes mechanisms	that require t	he use of a Stand	by Trust Fund Agreemen	t		
Northwest District	Northaad	District	Control District	Southwoot District	South Distric	at Court	thoast District
160 Government Center Pensacola, FL 32502-5794 850-595-8360	7825 Baymeadows Jacksonville, FL 904-807	Way, Ste. B200 232256-7590 7-3300	3319 Maguire Blvd., Sta Orlando, FL 32803-3 407-894-7555	e. 232 13051 N. Telecom Pky 767 Temple Terrace, FL 3363 813-632-7600	. 2295 Victoria Ave., 37 Fort Myers, FL 339 239-332-697	Ste. 364 400 N. Con 01-3881 West Palr 75 56	gress Ave., Ste. 200 n Beach, FL 33401 1-681-6600

## **III. ESTIMATE ADJUSTMENT**

40 CFR Part 264 Subpart H as adopted by reference in Rule 62-701.630, Florida Administrative Code, (F.A.C.) sets forth the method of annual cost estimate adjustment. Cost estimates may be adjusted by using an inflation factor or by recalculating the maximum costs of closure in current dollars. Select one of the methods of cost estimate ajustment below.

### □ (a) Inflation Factor Adjustment

### ☑ (b) Recalculated or New Cost Estimates

Inflation adjustment using an inflation factor may only be made when a Department approved closure cost estimate exists and no changes have occurred in the facility operation which would necessitate modification to the closure plan. The inflation factor is derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its survey of Current Business. The inflation factor is the result of dividing the latest published annual Deflatory by the Deflator for the previous year. The inflation factor may also be obtained from the Solid Waste website <a href="http://www.dep.state.fl.us/waste/categories/swfr">www.dep.state.fl.us/waste/categories/swfr</a> or call the Financial Coordinator at (850) 245-8706.

This adjustment is based on the	Department approved clo	osing cost estimate	dated:	
Latest Department Approved Closing Cost Estimate:	Current Year Infla Factor, <b>e.g. 1.0</b>	tion 2	-	Inflation Adjusted Closing Cost Estimate:
·	^		-	
This adjustment is based on the	Department approved lor	ng-term care cost e	stimate dated:	
Latest Department Approved Annual <b>Long-Term Care</b> Cost Estimate:	Current Year Infla Factor, <b>e.<i>g.</i> 1.0</b> 2	tion <b>2</b>	_	Inflation Adjusted Annual Long-Term Care Cost Estimate:
	^		-	
Number of Years of	Long Term Care Remainir	ng:	×	
Inflation Adjusted I	ong-Term Care Cost Es	timate:	=	
Signature by:	Owner/Operator	🖄 Engineer	(check what ap	oplies)
Shy	2	392	2 Coconut Palm Drive	e, Suite 102
S88 Sigra	ture		А	ddress
Shane R. Fischer, PE, Vice Pres	sident	Tan	ıpa, FL 33619	
Name 8	Title		City, St	ate, Zip Code
3/22/2021		ofic	hor@coconginooro o	om
Dat	8		E-Ma	il Address
813 804 6714				
Telephone	Number			

## IV. ESTIMATED CLOSING COST (check what applies)

## Ճ Recalculated Cost Estimate

### □ New Facility Cost Estimate

Notes: 1. Cost estimates for the time period when the extent and manner of landfill operation makes closing most ext

2. Cost estimate must be certified by a professional engineer.

- 3. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.
- 4. In some cases, a price quote in support of individual item estimates may be required.

		Number		
Description	Unit	of Units	Cost / Unit	<b>Total Cost</b>
1. Proposed Monitoring Wells	(Do not inclu	ide wells already	in existence.)	
	EA	0	\$0.00	
		Subtotal F	Proposed Monitoring Wells:	
2. Slope and Fill (bedding layer	between waste	e and barrier lay	er):	
Excavation	CY	235,321	\$3.50	\$823,623.50
Placement and Spreading	CY			
Compaction	CY	235,321	\$0.41	\$95,305.01
Off-Site Material	CY	235,321	\$18.00	\$4,235,778.00
Delivery	CY			
			Subtotal Slope and Fill:	\$5,154,706.50
3. Cover Material (Barrier Layer	):			
Off-Site Clay	CY			
Synthetics - 40 mil	SY	1,411,92	\$3.27	\$4,612,903.43
Synthetics - GCL	SY			
Synthetics - Geonet	SY	1,411,92	\$4.87	\$6,876,220.81
Synthetics - Other (explain)				
			Subtotal Cover Material:	\$11,489,124.25
4. Top Soil Cover:	_		-	
Off-Site Material	CY	941,284	\$22.50	\$21,178,890.00
Delivery	CY			
Spread	CY			
			Subtotal Top Soil Cover:	\$21,178,890.00
5. Vegetative Layer			-	
Sodding	SY	1,411,92	\$2.70	\$3,812,200.20
Hydroseeding	AC			
Fertilizer	AC			
Mulch	AC			
Other (explain)				
			Subtotal Vegetative Layer:	\$3,812,200.20
6. Stormwater Control System:	_		-	
Earthwork	CY			
Grading	SY			
Piping	LF	15,500	\$35.00	\$542,500.00
Ditches	LF			
Berms	LF	61,500	\$10.66	\$655,590.00
Control Structures	EA	177	\$1,466.10	\$259,500.05
Other (explain)	SF	17,700	\$36.00	\$637,200.00
Fabriform concrete	_	Subtotal S	Stormwater Control System:	\$2,094,790.05

		Number		
Description	Unit	of Units	Cost / Unit	Total Cost
7. Passive Gas Control:				
Wells	EA			
Pipe and Fittings	LF			
Monitoring Probes	EA			
NSPS/Title V requirements	LS	1		
		Subt	otal Passive Gas Control:	
8. Active Gas Extraction Control:			-	
Traps	EA			
Sumps	EA			
Flare Assembly	EA			
Flame Arrestor	EA			
Mist Eliminator	EA			
Flow Meter	EA			
Blowers	EA			
Collection System	LF			
Other (explain) (See attachment)	LS	1	\$2,537,400.00	\$2,537,400.00
		Subtotal Activ	e Gas Extraction Control:	\$2,537,400.00
9. Security System:			_	
Fencing	LF			
Gate(s)	EA			
Sign(s)	EA			
		:	Subtotal Security System:	
10. Engineering:				
Closure Plan Report	LS	1	\$1,269,450.00	\$1,269,450.00
Certified Engineering Drawings	LS	1	\$224,850.00	\$224,850.00
NSPS/Title V Air Permit	LS	1	\$50,000.00	\$50,000.00
Final Survey	LS	1	\$478,480.00	\$478,480.00
Certification of Closure	LS	1	\$233,390.00	\$233,390.00
Other (explain) Bidding	LS	1	\$168,390.00	\$168,390.00
			Subtotal Engineering:	\$2,424,560.00

Description	Hours	Cos	st / Hour	Hours	Cost / Hour	Total Cost
11. Professional Servic	es					
	<u>Contract</u>	Manageme	<u>nt</u>	<u>Qual</u>	ity Assurance	
P.E. Supervisor	640	4	179.00	160	\$179.00	\$143,200.00
On-Site Engineer	2,000		694.00	1,000	\$94.00	\$282,000.00
Office Engineer	400		\$77.00	1,200	\$77.00	\$123,200.00
On-Site Technician	2,400		573.00	9,600	\$73.00	\$876,000.00
Other (explain)	400	\$	104.45	400	\$904.7	\$403,680.00
Admin&Reimbursables						
			Numbe	r		
Description		Unit	of Units	s (	Cost / Unit	Total Cost
Quality Assurance	Testing	LS	1	_	\$572,000.00	\$572,000.00
				Subtotal	Professional Services:	\$2,400,080.00

Subtotal of 1-11 Above:	\$51,091,751.01
<b>12. Contingency</b> <u>10</u> % of Subtotal of 1-11 Above	\$5,109,175.10
Subtotal Contingency:	\$5,109,175.10
Estimated Closing Cost Subtotal:	\$56,200,926.11
Description	Total Cost
13. Site Specific Costs	
Mobilization	\$5,109,175.10
Waste Tire Facility	\$42,000.00
Materials Recovery Facility	
- Special Wastes	\$121,550.63
_ Leachate Management System Modification	
Other (explain)	
Subtotal Site Specific Costs:	\$5,272,725.73

TOTAL ESTIMATED CLOSING COSTS (\$): \$61,473,651.84

### V. ANNUAL COST FOR LONG-TERM CARE

See 62-701.600(1)a.1., 62-701.620(1), 62-701.630(3)a. and 62-701.730(11)b. F.A.C. for required term length. For landfills certified closed and Department accepted, enter the remaining long-term care length as "Other" and provide years remaining.

(Check Term Length) □ 5 Years □ 20 Years □ X 30 Years □ Other, \_\_\_\_ Years

Notes: 1. Cost estimates must be certified by a professional engineer.

2. Cost estimates based on third party suppliers of material, equipment and labor at fair market value.

3. In some cases, a price quote in support of individual item estimates may be required.

All items must be addressed. Attach a detailed explanation for all entries left blank.

	Sampling	Number of		
Description	(Events / Year)	Wells	Event	Annual Cost
1. Groundwater Monitori	ng [62-701.510(6), and (8	8)(a)]		
Monthly	12			
Quarterly	4			
Semi-Annually	2	26	\$1,221.39	\$63,512.28
Annually	1			
		Subtotal	Groundwater Monitoring:	\$63,512.28
2. Surface Water Monito	oring [62-701.510(4), and (	(8)(b)]		
Monthly	12			
Quarterly	4			
Semi-Annually	2	2	\$1,221.39	\$4,885.56
Annually	1			
		Subtotal S	urface Water Monitoring:	\$4,885.56
3. Gas Monitoring [62-70	1.400(10)]			
Monthly	12			
Quarterly	4			
Semi-Annually	2			
Annually	1	1	\$142 813 00	\$142,813.00
,			Subtotal Gas Monitoring:	\$142,813.00
4. Leachate Monitoring	[62-701.510(5), (6)(b) and	62-701.510(8)c]	Ū.	
Monthly	12			
Quarterly	4			
Semi-Annually	2			
Annually	1	1	\$78,207,00	\$78 207 00
Other (explain)	·		φ <i>1</i> 0,201.00	\$70,207.00
		Subt	otal Leachate Monitoring:	\$78 207 00
				\$10,201.00
Description	11	Number of	•	A
Description	Unit	Units / Year	Cost / Unit	Annual Cost
5. Leachate Collection/T	reatment Systems Maint	enance		
<u>Maintenance</u>				
Collection Pipes	LF	38,633	\$0.16	\$6,181.28
Sumps, Traps	EA			
Lift Stations	EA	1	\$8,000.00	\$8,000.00
Cleaning	LS	1		
Tanks	EA			

			Number of		
D	escription	Unit	Units / Year	Cost / Unit	Annual Cost
5.	(continued)				
Imp	oundments				
	Liner Repair	SY			
	Sludge Removal	CY			
Aera	ation Systems				
	Floating Aerators	EA			
	Spray Aerators	EA			
Disp	oosal				
	Off-site (Includes	1000 gallon		\$31,789.60	\$31,789.60
tran	sportation and disposal)		Subtotal Leachat	te Collection / Treatment	
				Systems Maintenance:	\$45,970.88
6. G	Froundwater Monitoring V	Nell Maintenance		-	
	Monitoring Wells	LF	1	\$1,000.00	\$1,000.00
	Replacement	EA			
	Abandonment	EA			
		Subto	al Groundwater Monit	oring Well Maintenance:	\$1.000.00
7. (	Gas System Maintenance	•		-	
	Piping, Vents	LF			
	Blowers	EA			
	Flaring Units	EA			
	Meters, Valves	EA			
	Compressors	EA			
	Flame Arrestors	EA			
	Operation	LS	1	\$43 800 00	\$43,800,00
			Subtotal Ga	as System Maintenance:	\$43,800,00
8. L	_andscape Maintenance			· · · · ·	\$ 101000100
	Mowing	AC	328.9	\$337.03	\$110,849.17
	Fertilizer	AC			
			Subtotal L	andscape Maintenance:	\$110 849 17
9. E	Erosion Control and Cove	er Maintenance		· · · · · ·	<b>•</b> ••• <b>•</b> •••••
	Sodding	SY	4.840	\$2 70	\$13 068 00
	Regrading	AC	1	\$7 647 20	\$7,647.20
	Liner Repair	SY	500	\$7.44	\$3.720.00
	Clay	CY			
		Sub	ototal Erosion Control	and Cover Maintenance:	\$24.435.20
10.	Storm Water Manageme	nt System Maintena	nce	-	, ,
	Conveyance Maintenance	e LS	1	\$8,750.00	\$8,750.00
	-	Subtotal Sto	orm Water Manageme	nt System Maintenance:	\$8 750 00
11.	Security System Mainte	enance	C C	•	÷;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
	Fences	LS	1	\$2.093.00	\$2.093.00
	Gate(s)	EA	0.2	\$6,353.00	\$1 270 60
	Sign(s)	EA			ψι, ζι Ο.ΟΟ
			Subtotal Secur	ity System Maintenance:	\$3.363.60

			Number of		
C	Description	Unit	Units / Year	Cost / Unit	Annual Cost
12.	Utilities	LS	1	\$22,000.00	\$22,000.00
				Subtotal Utilities:	\$22,000.00
13.	Leachate Collection/Treatment	nent Systems	S Operation	-	
<u>Op</u>	eration				
	P.E. Supervisor	HR	24	\$179.00	\$4,296.00
	On-Site Engineer	HR	0		
	Office Engineer	HR	0		
	OnSite Technician	HR	480	\$94.00	\$45,120.00
	Materials	LS	1		
		Subtotal	Leachate Collection/Treatme	ent Systems Operation:	\$49,416.00
14.	Administrative			-	
	P.E. Supervisor	HR	12	\$179.00	\$2,148.00
	On-Site Engineer	HR			
	Office Engineer	HR			
	OnSite Technician	HR	480	\$94.00	\$45,120.00
	Other				
			:	Subtotal Administrative:	\$47,268.00
				-	
			S	ubtotal of 1-14 Above:	\$646,270.69
				-	
15.	Contingency	5	% of Subtotal of 1-14 Ab	ove	\$32,313.53
				Subtotal Contingency:	\$32,313.53
				-	
			Number of		
	Description	Unit	Units / Year	Cost / Unit	Annual Cost
16.	Site Specific Costs				
			Subt	otal Site Specific Costs:	
			ANNUAL LONG-TERM CA	ARE COST (\$ / YEAR):	\$678,584.22
			<b>KI I 657</b>		20
			Number of Yea	ars of Long-Term Care:	30

TOTAL LONG-TERM CARE COST (\$): <u>\$20,357,526.64</u>

## VI. CERTIFICATION BY ENGINEER

This is to certify that the Cost Estimates pertaining to the engineering features of this solid waste management facility have been examined by me and found to conform to engineering principles applicable to such facilities. In my professional judgment, the Cost Estimates are a true, correct and complete representation of the financial liabilities for closing and/or long-term care of the facility and comply with the requirements of Rule 62-701.630 F.A.C. and all other Department of Environmental Protection rules, and statutes of the State of Florida. It is understood that the Cost Estimates shall be submitted to the Department annually, revised or adjusted as required by Rule 62-701.630(4), F.A.C.

Signature

Shane R. Fischer, PE, Vice President Name and Title (please type)

58026

Florida Registration Number (please affix seal)

3922 Coconut Palm Drive, Suite 102 Mailing Address

Tampa, FL 33619

City, State, Zip Code

sfischer@scsengineers.com E-Mail address (if available)

813-804-6714

Telephone Number

VII. SIGNATURE BY OWNER/OPERATOR

Signature of Applicant

Robert Shankle, Solid Waste Manager Name and Title (please type)

robert.shankle@mymanatee.org E-Mail address (if available) 3333 Lena Road

Mailing Address

Bradenton, FL 34211 City, State, Zip Code

941-748-5543 x5275 **Telephone Number** 

DEP FORM 62-701.900(28) Effective January 6, 2010

Attachment A

Cost Estimate Backup

S	CS ENGINEERS							
		SHEET	1	OF	13			
	PROJECT							
Manatee County	5-Year Permit Update	ر ۱	05 NO.					
SUBJECT		BY		DATE				
Manatee County Lena Road Landfill Financial Assurance		MTR		9/18/20	)20			
5-Year Permit Update		CHECKED		DATE	24			
		SKF		3/22/20	)21			
1.) Proposed Monitoring Wells								
All monitoring wells were constructed during the of preparation of this cost estimate.	ne landfill construction. No ac	lditional wells	proposed at th	e time				
Subtotal Proposed Monitoring Wells: \$0.00								
2.) Slope and Fill (bedding layer between waste and barrier laye	er)							
Excavation								
Final 3D surface area = 12,707,334 SF								
Assume 0.5 FT of fill is required over Final 3D	surface area as bedding laye	r for geomemi	brane after sur	face				
of landfill has been stripped. Cost includes ma	terial, placment, and spreadi	ng.						
=> (12,707,334 SE) x (0.5 ET) = 235,321 CY								
=> (235,321 CY) x (\$3.50/CY)		(	COMANCO quot	e Attachn	nent 2			
= <u>\$823.623.50</u>								
Placement and Spreading								
Included in the Off-Site Material price = $\$0.00$	/CY							
<u>Compaction</u>								
Volume = (12,707,334 SF) x (0.5 FT) = 235,32	21 CY							
=> (235,321 CY) x (\$0.405/CY) = <u>\$95,305.01</u>	L	(	COMANCO quot	e Attachn	nent 2			
Off-Site Material								
Volume = (12 707 334 SE) x (0 5 ET) = 235 33	21 CY							
$=> (235,321 \text{ CY}) \times (\$18/\text{CY}) = \$4.235.778$		(	COMANCO quot	e Attachn	nent 2			
Delivery								
Included in the Off-Site Material price = <u>\$0.00</u>	/CY							
Subtotal Slope and Fill: \$823,623.50 +\$95,305.01 + \$4,235,	778 = \$5,154,706.50							
3.) Cover Material (Barrier Layer)								
Off-Site Clay								
Not anticipated at the time of preparation of the	nis cost estimate.							
Synthetics - 40 mil								
Quantity based on 3D surface area of closure Final 3D surface area = 12,707,334 SF => 12,707,334 SF + 8%	plus an additional 8% for loss	s factor ("lap a	nd scrap")					

	SCS I	ENGINEERS				
			SHEET	2	OF	13
		DDOJECT				
		PROJECI		JOB NO.		
Manatee County		5-Year Permit Update	DV	09217088.18	DATE	
SUBJECT			BY		DATE	
Manatee County	Lena Road Landfill Financial Assurance		MIR		9/18/2	020
5-Year Permit Up	odate		CHECKED		DATE	0.0.1
			SRF		3/22/2	021
3.) Cover Materi	ial (Barrier Layer) (Continued)					
	Material					
	=> 12,707,334 SF x (1.08) = 13,723,921 SF => (13,723,921 SF) / (9 SF/SY) = 1,524,880 SY					
	Textured liner material cost =\$0.1792/SF					
	=> (\$0.1792/SF) x (9 SF/SY) = \$1.6128/SY			SKAPS quote A	ttachmer	nt 3
	$=> (1.524.880 \text{ SY}) \times (\$1.6128/\text{SY}) = \$2.459.327$			ere a e quete /		
	Freight					
	Textured liner area per roll = (23.5 FT) x (720 FT) =	16,920 SF				
	Rolls of liner required = (13,723,921 SF) / (16,920	) SF/roll) = 811 rolls				
	Assume 16 rolls of liner per truckload x 16,920 SF/	roll = 270,720 SF/truck	load			
	Truckloads = (811 rolls) / (16 rolls/truckload) = 51	truckloads				
	Freight Commerce, GA to Bradenton, FL is \$1,400/	truckload				
	=> (55 truckloads) x (\$1,400/truckload) = <u>\$70,980</u>	<u>)</u>		SKAPS quote A	ttachmer	nt 3
	Installation					
	Installation = $$0.15$ /SE				to Attach	ment 2
	$= > (\$0.15/SE) \times (12.707.334 SE) = \$1.906.100$					
	$=$ ( $0.13/31$ ) × ( $12,707,33431$ ) = ${91,300,100}$					
	Liner tie in $= 4.000 \text{ LE}$ (accurate along the liner)					
	Lifter the initial 4,000 LF (assume closure edge) $= 2 (f \in \Omega \cap (LF) \times (4,000 LF) = f \cap (4,000)$					
	=> (\$6.00/LF) X (4,000 LF) = <u>\$24,000</u> => installation = \$1,006,100 + \$24,000 = \$1,020	100				
	=> Installation = \$1,906,100 + \$24,000 = $\frac{$1,930}{}$	.100				
	Total					
	Total (material, freight, installation) = \$2,459,327 => Total (material, freight, installation) = (\$4,612,9	+ \$70,980 + \$2,082,58 003.43) / (1,411,926 SY	8 = \$4,612, ) = <u>\$3.2671</u>	903.43 <u>/SY</u>		
	Synthetics - GCL					
	Not anticipated at the time of preparation of this co	ost estimate.				
	Synthetics - Geocomposite					
	Quantity based on 3D surface area of closure plus Final 3D surface area = 12,707,334 SF => 12,707,334 SF + 8% => 12,707,334 SF x (1.08) = 13,723,921 SF	an additional 8% for loss	factor ("lap	and scrap")		
	=> (13,723,921 SF) / (9 SF/SY) = 1,524,880 SY					
	Material					
	=> (\$0.3350/SF) x (9 SF/SY) = \$3.0150/SY			SKAPS quote A	ttachmer	nt 3
1						

	SCS	ENGINEERS				
			SHEET	3	OF	13
CLIENT		PROJECT		JOB NO.		
Manatee Coun	ty	5-Year Permit Update		09217088.18		
SUBJECT	-	• · · · · ·	BY		DATE	
Manatee Coun	ty Lena Road Landfill Financial Assurance		MTR		9/18/20	20
5-Year Permit l	Jpdate		CHECKED		DATE	
			SRF		3/22/20	21
3.) Cover Mate	erial (Barrier Layer) (Continued)					
	Geocomposite material cost = (13,723,921 SF) x (	\$0.3350/SF) = <u>\$4.597.5</u>	513			
	Freight					
	Area per roll = (14.5 FT) x (230 FT) = 3,335 SF					
	Rolls of geocomposite required = (13,723,921 SF)	/ (3,335 SF/roll) = 4,115	5 rolls			
	Assume 26 rolls of geocomposite per truckload x 3 Truckloads = (4,115 rolls) / (26 rolls/truckload) = 4	8,335 SF/roll = 86,710 SI 158 truckloads	F/truckload			
	Freight Commerce, GA to Bradenton, FL is $1,400$	/truckload			ttachment	3
	$- (130 \text{ trackloads}) \times (1,400) \text{ trackload} - \frac{2221}{2221}$	363		SNAFS quote A	llachment	5
	Installation					
	Installation = \$0.16/SF			COMANCO quo	te Attachm	ient 2
	=> (\$0.16/SF) x (12,707,334 SF) = <u>\$2,057,124</u>					
	Installation (tie-in to existing geocomposite) = \$6.0	00/LF				
	Liner tie-in = 4,000 LF (assume closure edge)					
	=> (\$6.00/LF) X (4,000 LF) $=$ <u>\$24,000</u>	7 172				
	$-2 \ln \sin \alpha \sin \alpha \sin \beta = 42,033,173 \pm 424,000 = \frac{42,037}{2}$	.175				
	Total					
	Total (material, freight, installation) = \$4,597,513 => total (material, freight, installation) = \$6,876,23	+ \$221,583 + \$2,057,12 20.81 / 1,411,926 SY =	24 = <u>\$6.876</u> \$4.8701/SY	<u>6.220.81</u> <u>′</u>		
Subtotal Cover	Material (Barrier Layer): \$4,612,903.43 + \$6,876,2	220.81 = \$11,489,124.2	25			
4.) Top Soil Co	ver					
	Off-Site Material					
	Final 3D surface area = 12,707,334 SF			COMANCO quo	te Attachm	ient 2
	Assume the following, materal average cost is \$22	.50/CY:				
	=> 6 inch topsoil layer used = {(12,707,334 SF) x (	(0.5 FT)} / 27 CY/CF = 23	35,321 CY x	\$22.50 CY = <u>\$5</u>	5.294 <u>.723</u>	
	=> 18 inch protective layer = {(12,707,334 SF) x (2	1.5 FT)} / 27 CY/CF = 705	5,963 CY x \$	\$22.50 CY = <u>\$1</u>	<u>5,884,168</u>	
	Total Off-Site Material Material required = 235,322 => \$5,294,723 + \$15,884,168 = <u>\$21,178,890</u>	1 CY + 705,963 CY = 941	L,284 CY			
	<u>Delivery</u>					
	Included in the Off-Site Material price = $\frac{0.00}{CY}$					
	Spread					
	Included in the Off-Site Material price = $\frac{0.00}{CY}$					
Subtotal Top S	oil Cover: \$21,178,890					

	SCS	ENGINEERS							
			SHEET	4	OF	13			
CLIENT		PROJECT		JOB NO					
Manatee County		5-Year Permit Update		09217088.18					
SUBJECT		·	BY	1	DATE				
Manatee County	Lena Road Landfill Financial Assurance		MTR		9/18/202	20			
5-Year Permit Up	odate		CHECKED		DATE	04			
			SNF		3/22/20.	21			
5.) Vegetative L	ayer								
	Codding								
	Sodding								
	Final 3D surface area = 12,707,334 SF = 1,411,92	26 SY		COMANCO quot	e Attachm	ent 2			
	=> (1,411,926 SY) x (\$2.70/SY) = <u>\$3.812.200.20</u>								
	Hydroseeding								
	Hydroseeding								
	Not anticipated at the time of preparation of this cost estimate.								
	Fertilizer								
	Not anticipated at the time of preparation of this or	oct octimato							
	Not anticipated at the time of preparation of this of	ost estimate.							
	Mulch								
	Not anticipated at the time of preparation of this co	ost estimate.							
Subtotal Vegeta	tive Layer: \$3,812,200.20								
6.) Stormwater	Control System								
	Earthwork								
	Included in Piping cost identified below.								
	Grading								
	Will not be required, will be constructed during the	landfill construction.							
	Piping								
	The stormwater control system is already in place in The remaining system is shown on the Operation D	n 30 AC closure area (Sta rawings.	age I - south	east)					
	=> 15,500 LF of piping for Stage I-III => (15,500) x (\$35/LF) = <u>\$542,500</u>			COMANCO quot	e Attachm	ent 4			
	Ditches								
	Constructed during operations.								
	Berms								
	4 berms per Permit Plans								
	EL 55 berm = 16 SF/LF based on 3:1 berm 2 FT ta EL 75 berm = 16 SF/LF based on 3:1 berm 2 FT ta	II with 2 FT top deck II with 2 FT top deck							
1									

			SCS I	ENGINEEF	RS				
						SHEET	5	OF	13
				DROJECT					
JLIENI Manatee Count	V			5-Year Per	mit Undate		JUB NU. 09217088 18		
	3			o rearrer		BY	00211000.10	DATE	
Manatee Count	y Lena Road Landfill Financial Assu	rance				MTR		9/18/2	020
5-Year Permit U	pdate					CHECKED		DATE	
						SRF		3/22/2	021
5.) Stormwater	Control System (Continued)								
	<u>Berms</u>						COMANCO quo	te Attach	ment 2
	EL 95 berm = 16 SE/LE based on	3.1 herm	2 FT ta	ll with 2 FT	ton deck				
	EL 110 berm = 16 SF/LF based of	n 3:1 berr	m 2 FT t	all with 2 F	T top deck				
	=> Total berm length = 61,500 LF	=							
	=> (61,500 LF) x (\$10.66/LF) = <u>\$</u>	655.590							
	Control Structures								
	$= (144 \text{ inlets}) \times (\$1 000/\text{inlet}) =$	\$144 00	s ciosure O	e area dowr	ionules. Estim	iateu as 144	F LEFFACE INIETS &	ar ⊅1,000	U EA.
	33 Energy dissipators, ditch botto	m inlets. I	<u>-</u> Estimate	e cost as Tv	pe C structure	e @ \$3.500 I	ΞA		
	=> (33 dissipators) x (\$3,500/dis	sipators) :	= <u>\$115.</u>	<u>500</u>					
	Other								
	Fabriform stormwater discharge p	ads					COMANCO cost	Attachm	nent 1
	Assume 10 FT x 10 FT outside ea	ch inlet ar	nd MES				Adjusted 5% fo	r inflatior	n
	=> 10 FT x 10 FT = 100 SF per dis	scharge lo	ocation						
	=> (100 SF per discharge) x (177	locations	) = 17,7	00 SF					
	=> (17,700 SF) x (\$36.00/SF) = <u>9</u>	\$637,200							
ubtotal Storm	water Control System: \$542,500 + 3	\$655,590	) + \$259	9,500.05 +	\$637,200 = :	\$2,094,790	.05		
.) Passive Gas	Control								
	Not applicable since an active ext	raction sy	stem is	operationa	l.				
) Active Gas I	Extraction Control								
	An active gas collection system wi	ith a flare	is in pla	ce for all of	Stages I and	III and part of	of Stage II.		
	The active system will expand with	h the land	fill as re	quired by T	itle V (40CFR	Part 60).			
	Closure construction is assumed	to include	replace	ment/upda	te of parts of	the LFG syst	tem as itemized	below.	
	Cost estimates based on 2020 bi	d for expa	nsion of	LFG syster	n at Lena Roa	ad.			
	ltem	Q	ty	Unit price	Extended	Comments			
				•	Price				
	Landfill gas collection we	ells (LF)	2,212	\$150	\$331,800	Replace 1 v	vell/10-AC - Avg	. 70; dep	oth
	Landfill gas collection wel	l heads	32	\$900	\$28,800	Estimate 32	2 new wells		
	8-inch HDPE gas collection pipe	laterals	6,400	\$43	\$275,200	Estimate 20	DU-feet per well	toral-	
	4-inch Dewatering Pipe (common	(rench)	6,400	\$11	\$/0,400 \$10,200	Add compare	ering pipe with la	ith laters	ale
	2-incli Air Supply (Common 18-inch HDPE des collection ping h	nencii)	20,400	6¢ 02\$	⊕19,200 000 000	Replace be	ader around no	rimetor	15
		station	0,000_ 1	\$500 000	\$500 000	ivehiace lie	ader around per	metel	
	Condensate Sumps with	Pumps	4	\$28.000	\$112.000	Estimate 10	)% of 40 sumps	;	
			•	Total =	<u>\$2,537,400</u>				
ubtotal Active	Gas Extraction Control: \$2,537,400	)					COMANCO quo	te Attach	ment 5

	SCS	ENGINEERS								
			SHEET	6	OF	13				
		PPOIECT								
Manatee County		5-Year Permit Update		09217088.18						
SUBJECT			BY	0011000110	DATE					
Manatee County	Lena Road Landfill Financial Assurance		MTR		9/18/202	20				
5-Year Permit Up	odate		CHECKED		DATE					
			SRF		3/22/202	21				
9.) Security Syst	em									
	Fencing									
	No additional Fencing proposed at the time of preparation of this cost estimate.									
	Gates									
	No additional Gates proposed at the time of preparation of this cost estimate.									
	Signs									
	No additional Signs proposed at the time of prepa	ration of this cost estimat	e.							
Subtotal Security	y System: \$0.00									
10.) Engineering	5									
	All engineering costs and services are estimated b engineering consulting firm to perform these tasks (286 AC total). Therefore, 10 closure phases were	y SCS Engineers. These c s. Assume each closure ph assumed. See Attachmer	osts would k hase would k nt 6.	be typical for any be no more than	/ third party 30 AC	ý				
	Closure Plan Report - Refer to Attachment 6 for the => (\$120,036 + \$6,900) = \$126,945/closure pha => (\$126,945/closure phase) x (10 closure phase)	e Manpower and Fee estin ase es) = <u>\$1.269.450</u>	mates, Colui	mns 10a + 10b.						
	Certified Engineering Drawings - Included in the Cl estimates, Column 10c.	osure Plan Report. Refer	to Attachme	nt 6 for the Man	power and	Fee				
	=> (\$22,485/closure phase) x (10 closure phases	s) = <u>\$224,850</u>								
	NSPS/Title V Air Permit									
	NSPS/Title V Air Permit design/permitting of the n	ew flare = <u>\$50.000</u>								
	<u>Final Survey</u> - Refer to Attachment 6 for the Manpe => (\$47,848/closure phase) x (10 closure phases	ower and Fee estimates, ( a) = <u>\$478,480</u>	Column 10e.							
	<u>Certification of Closure</u> - Refer to Attachment 6 for => (\$23,339/closure phase) x (10 closure phases	the Manpower and Fee e ; )= $\frac{233,390}{2}$	estimates, Co	olumn 10f.						
	<u>Other (explain)</u> - Refer to Attachment 6 for the Man => (\$16,839/closure phase) x (10 closure phases	npower and Fee estimates =) = <u>\$168,390</u>	s, Column 10	Dd.						
Subtotal Enginee	ering: \$1,269,450 + \$224,850 + \$50,000 + \$478,	,480 + \$233,390 + \$168	8,360 = \$2,4	24,560						
11.) Professiona	al Services									
	Refer to Attachment 6 for the Manpower and Fee Admin+Reimbursables:	estimates, Column 11a ai	nd 11b.							
	Contract Management Admin/Clerical = (40	0 hrs/closure phase) x (1	0 closure ph	nases) x (\$54/hr	r) = <u>\$21.60</u>	<u>)0</u>				

	SCS I	ENGINEERS				
			SHEET	7	OF	13
		PROJECT		B NO		
Janatee County		5-Year Permit Undate	09	217088 18		
		o real remit opdate	BY	211000.10	DATE	
Manatee County Lena Road Landfill Financia	al Assurance		MTR		9/18/20	20
5 Vear Permit Undate			CHECKED			20
			SRF		3/22/20	21
			10		-//	
L1.) Professional Services (Continued)						
Admin+Reimbursables (Cor	ntinued):					
Contract Management	Reimbursables = (\$2,	018 /closure phase) x (1	.0 closure phase	es) = <u>\$20,18</u>	<u>30</u>	
	Total Weighted = \$21	.,600 + \$20,180 = <u>\$41,7</u>	<u>′80</u>			
	Total Weighted per ho	our = \$41,780/400 hrs =	: <u>\$104.45</u>			
Admin+Poimbursables	Admin/Clarical - (400	) hrs (closuro phaso) x (1		) x (¢54/b	r) - ¢01 6(	20
Quality Accurance	Roimbursables = $(400)$		(10 closure pliase	$(404/10) \times (404/10)$	$1) = \frac{1}{\Phi \leq 1.00}$	<u></u>
Quality Assurance	Total Waighted - 004	+,000 + 000  mosule plidse		363) - <u>9340</u>		
	Total Weighted = \$21	$-5000 \pm 3340,300 = 336$	$\frac{1,300}{2}$			
	Total weighted per no	50r = \$361,900/400  nrs	$= \frac{904.75}{400}$			
	=> 10tal = (400  hrs x)	\$104.45) + (400 hrs x \$	904.75) = <u>\$403</u>	<u>3,680</u>		
Contract Management	P.E. Supervisor = (64	nrs/closure phase) x (10	closure phases	s) x (\$179/h	r) = <u>\$114,5</u>	560
	On-Site Engineer = (20	00 hrs/closure phase) x	(10 closure pha	ses) x (\$94/	'hr) = <u>\$296</u>	<u>5,000</u>
	Office Engineer = (40	hrs/closure phase) x (10	closure phases	s) x (\$77/hr)	) = <u>\$44.00</u>	<u>0</u>
	On-Site Technician = (	(240 hrs/closure phase)	x (10 closure pł	nases) x (\$7	3/hr) = <u>\$1</u> 3	<u>32.000</u>
	RE Supervisor - (16	hre (closure phase) x (10	) alocura phacor	x) x (\$170/b	n) - ¢29 6.	40
Quality Assurance	P.E. Supervisor $-(10)$			) X (みエ/ 9/ 11	$(b_{1}) = \frac{1}{2} $	<u>40</u>
	On-Site Engineer = (10)	00 nrs/closure phase) x	(10 closure pha	ses) x (\$94/	$rnr) = \frac{$148}{20}$	<u>3.000</u>
	Office Engineer = $(120)$	0 nrs/ closure phase) x (1	.0 closure phase	es) x (\$77/n	$r_{r} = \frac{132.0}{2}$	000
	On-Site Technician = (	(960 nrs/closure phase)	x (10 closure pr	lases) x (\$7.	3/nr) = <u>\$5</u> 2	28,000
Quality Assurance Testing:	CQA testing is estimat	ted at \$2,000 per acre fo	or MSW landfill o	closures per	SCS exper	ience.
-	Total CQA Testing Cos	t = (\$2,000/acre) x (286	3 acres) = <u>\$572</u>	.000		
Subtotal Professional Services: \$2,400,080	)					
Subtotal of 1-11: \$51.091.751.01						
12.) Contingency						
A contingency amount of 10	0% of the total cost was	used in the cost estimat	e. This value is o	consistent w	ith actual	
contingency values used in	bidding landfill construct	ction projects.				
-> (¢51 001 751 01) × (10	)%) - ¢5 100 175 10					
-> (\$31,031,751.01) X (10	(%) = <u>\$3,109,173.10</u>					
Subtotal Contingency: \$5,109,175.10						
Estimated Closing Cost Subtotal: \$56,200,9	926.11					
13.) Site-specific Costs						
	(\$51.001.751.04) - (44	<b>1</b> %) - ¢5 100 175 10				
=> 10% of Subtotal 1-11 =	(\$31,UST,121.01) X (10	$(J_{70}) = \underline{95,109.175.10}$				
Waste Tire Facility						
Estimated storage amount	of 500 tons.					
Using \$84/ton for disposal						

	SCS ENGINEERS				
		SHEET	8	OF	13
CLIENT	PROJECT				
Manatee County	5-Year Permit Update		09217088.18	5	
SUBJECT		BY		DATE	
Manatee County Lena Road Landfill Financial Assurance		MTR		9/18/202	20
5-Year Permit Update		CHECKED		DATE	
		SRF		3/22/202	21
13.) Site-specific Costs (Continued)					
=> (500 tons) x (\$84/ton) = <u>\$42,000</u>					
Special Wastes					
2017 Manatas County Agroement with C	Near Harbara actimates un to ¢400				
HHW is typically removed on a monthly b quarter of waste is on site and approxim	ately 5%/year for inflation:	y, Assuming a	n entire		
=> (\$100,000) x (1.05^4) = <u>\$121,550.6</u>	<u>63</u>				
Subtotal Site Specific Costs: \$5,272,725,73					

TOTAL ESTIMATED CLOSING COSTS = \$61,473,651.84

SCS I	INGINEERS				
		SHEET	9	OF	13
CLIENT	PROJECT				
	F NUJEUT		00217089 10		
	S-real Fermit Opuale	PV	09211000.10	DATE	
SUBJEUT Manatae County Lena Road Landfill Einancial Accurance				0/10/202	20
Manatee County Lena Road Landini Financial Assurance				9/18/202	20
5-rear Permit Opdate				DATE 3/22/202	91
		ON		5/22/202	. 土
1) Groundwater Monitoring	26 wells				
Annual sam	bling and analytical costs	= \$46.398			
	Reporting Costs	= \$22,000			
	Total = 9	63.512.28			
Subtotal Groundwater Monitoring: \$63,512.28	_				
-					
2.) Surface Water Monitoring					
An	nual cost per location =	\$2,443			
Semi-ar	nual cost per location =	\$1,221			
Subtotal Surface Water Monitoring: \$4,885.56					
3.) Gas Monitoring					
See breakdown of annual costs in Attachment 7					
See breakdown of annual costs in Attachment 7					
Subtotal Gas Monitoring: \$142,813					
· · · · · · · · · · · · · · · · · · ·					
4.) Leachate Monitoring					
See breakdown of annual costs in Attachment 7					
Subtotal Leachate Monitoring: \$78,207					
5) Leachate Collection/Treatment Systems Maintenance					
Collection Pipes					
A leachatepipe cleaning and inspection estimate w	as provided by Florida Je	tClean for 3	38,633 LF pipe; /	Attachment	8.
The total cost for services is \$29,918.					
Pipe cleaning and inspection wil be performed ever	y 5 yrs				
=> \$29,918.48/5 years = <u>\$5.983.70/year</u>					
=> \$5,983.70 per year/38,633 LF = \$0.155 per F	ſ/yr				
<u>Sumps. Traps</u>					
Not opticipated at the time of this cost estimate fly	wheel during hime alconing				
Not anticipated at the time of this cost estimate, ht	ished during pipe cleanin	ig.			
Lift Stations					
<u>=</u>					
Assume 4 lift stations will need duplex pumps repla	ced every 10 years.				
Assume \$20,000 per duplex pump					
=> (\$20,000 per duplex pump) x (4 pump stations)	/ (10 years) = <u>\$8.000/y</u>	<u>r</u>			
Cleaning					
Included during the pipe cleaning					
Tests					
No Tanks are proposed at the time of preparation of	f this cost estimate.				

	SCS E	ENGINEERS				
			SHEET	10	OF	13
		PROIFCT				
Manatee County		5-Year Permit Update		09217088.18		
SUBJECT			BY		DATE	
Manatee County	Lena Road Landfill Financial Assurance		MTR		9/18/202	0
5-Year Permit Up	date		CHECKED		DATE	
			SRF		3/22/202	1
5.) Leachate Coll	ection/Treatment Systems Maintenance (Continued	d)				
	Impoundments					
	No Impoundments are proposed at the time of prep	paration of this cost estin	nate.			
	Liner Repair					
	Not anticipated at the time of this cost estimate					
	Sludge Removal					
	No Sludge Removal is proposed at the time of prep	aration of this cost estim	ate.			
	Aeration Systems					
	No Aeration Systems are proposed at the time of pr	eparation of this cost es	timate.			
	Floating Aerators					
	No Floating Aerators are proposed at the time of pro	eparation of this cost est	imate.			
	<u>Spray Aerators</u>					
	No Spray Aerators are proposed at the time of prep	aration of this cost estim	iate.			
	Disposal					
	Disposal estimated at 20,000 gal/AC/year. Manate => 316 AC x 20,000 gal/AC/year = 6,320,000 gall => 6,320,000 gallons/year / 1,000 x 5.03 = <u>\$31,7</u>	ee County rate is \$5.03/t ons/year 789.60	housand ga	illons.		
Subtotal Site Spe	ecific Costs: \$45,970.88					
6.) Groundwater	Monitoring Well Maintenance					
	Assume replacement of one well every five years at	\$5,000/well = <u>\$1,000/</u>	<u>YR</u>			
7.) Gas System N	Naintenance					
	For refurbishment, assume replacement of two wel Wells: 2 well @ 70 feet deep x \$150/foot = <u>\$21.00</u>	ls and 400 LF of associa <u>0</u>	ted pipe ead	ch year.		
	Pipe: 400 feet x \$57/foot (includes 8-inch, 4-inch a	nd 2-inch) = <u>\$22,800</u>				
8.) Landscape M	aintenance					
	Mowing					
	Unit cost is based on Orange County Contract at \$1	06,500/year for 316 AC	= <u>\$337.03</u>	/AC		
	Wowing area = 14,326,884 SF = 328.9 AC	17/				
	$\varphi = 00,500$ year x (328.9 AC/316 AC) = $\frac{\varphi = 10,849.3}{\varphi = 10,849.3}$	<u>rijyedi</u>				

SCS	ENGINEERS								
		SHEET	11	OF	13				
CLIENT	PROJECT		JOB NO.						
Manatee County	5-Year Permit Update		09217088.18						
SUBJECT		BY		DATE					
Manatee County Lena Road Landfill Financial Assurance		MTR		9/18/20	020				
5-Year Permit Update		CHECKED		DATE					
		SRF		3/22/20	021				
8.) Landscape Maintenance (Continued)									
Fertilizer									
No Fertilizer is proposed at the time of preparation of this cost estimate.									
Subtotal Landscape Maintenance:									
9.) Erosion Control and Cover Maintenance									
Sodding									
Assume 1 AC of erosion wash per year									
Sod quantity = (1 AC) x (43,560 SF/AC) x (1 SY/9 S	SF) = 4,840 SY								
=> 4,840 SY x \$2.70/SY = <u>\$13,068/year</u>			COMANCO quot	e Attachr	ment 2				
Regrading									
Assume 1 AC per year regraded = 4,840 SY									
=> \$1.58/SY x 4,840 SY = <u>\$7.647.20/AC</u>			COMANCO quot	e Attachr	ment 2				
Liner Repair									
Assume 500 SY of liner is repaired every year									
=> (500 SY/year) x (\$7.44/SY)			COMANCO quot	e Attachr	ment 2				
=> This includes geomemebrane and geocomposi	te = <u>\$3,720/year</u>		SKAPS quote At	tachmen	t 3				
Clay									
No Clay is proposed at the time of preparation of t	his cost estimate.								
Subtotal Erosion Control and Cover Maintenance: \$24,435.20									
10.) Storm Water Management System Maintenance									
Assume 1,000 LF of pipe is replaced every five vea	ars or 200 LF per vear								
20  LF x  \$35/LF = \$7,000/year			COMANCO quot	e Attachr	ment 4				
Assume 500 CY has to be excavated from ponds a	and ditches every year								
\$3.50/CY x 500 CY = \$1,750/year			COMANCO quot	e Attachr	ment 2				
Total => \$7,000 + \$1,750 = <u>\$8,750</u>									
Subtotal Storm Water Management System Maintenance: \$7,000	+ \$1,750 = \$8,750								
11.) Security System Maintenance									
<u>Fences</u>									
Unit cost is based on FDOT Type B Fencing with ba	arbed wire attachment								

	SCS	ENGINEERS						
			SHEET	12	OF	13		
		PROJECT		JOB NO.				
lanatee Coun	tv	5-Year Permit Update		09217088.18				
UBJECT	~		BY		DATE			
Anatee Coun	ty Lena Road Landfill Financial Assurance		MTR		9/18/202	20		
5-Year Permit l	Jpdate		CHECKED		DATE			
			SRF		3/22/202	21		
L1.) Security S	ystem Maintenance (Continued)							
	Accume 100 LE of fonce to be replaced per year							
	2019 Fence Cost = $$19.93$ adjusted to 5% inflation = $$20.93/IF$			Refer to Attachment 9				
	=> 100 LF x \$20.93/LF = <u>\$2.093/year</u>	\$10 \$20.00/ El						
	Gates							
	Unit cost is based on 2019 FDOT Type B Fencing 2	0-24' Slide Gate		Refer to Attach	ment 9			
	=> \$6.050/gate							
	Adjusted to 2020 for 5% inflation = \$6,353/gate							
	Assume replace one gate every 5 years							
	=> \$6,353/5 years = <u>\$1,270.60/year</u>							
	Sign							
	Not anticipated at the time of this cost estimate							
Subtotal Secur	ity System Maintenance: \$2,093 + \$1,270.60 = \$3,	363.60						
L2.) Utilities								
	\$22,000/year from 2015 Atkins Financial Assuran	ce Estimate adjusted 5%	b per year for	r inflation				
	=3 \$22,000 x 1.05% = <u>\$22,000</u>							
Subtotal Utilitie	es: \$22,000							
L3.) Leachate	Collection/Treatment Systems Operation							
	P.E. Supervisor = 2 hours/month at \$179/hour							
	=> (2 hours/month) x (12 months) x (\$179/hour) =	= <u>\$4,296</u>						
	On-Site Engineer - Not anticipated at the time of th	is cost estimate.						
	Office Engineer - Not anticipated at the time of this	cost estimate.						
	On-Site Technician = Staff Professional 40 hours/n	nonth at \$94/hour						
	=> (40 hours/month) x (12 months) x (\$94/hour) =	= <u>\$45,120</u>						
	Materials - Not anticipated at the time of this cost e	estimate.						
Subtotal Leach	ate Collection/Treatment Systems Operation: \$49,4	-16						
L4.) Administr	ative							
	P.E. Supervisor = 1 hour/month at \$179/hour							
	=> (1 hour/month) x (12 months) x (\$179/hour) =	<u>\$2.148</u>						
	On-Site Engineer - Not anticipated at the time of thi	is cost estimate.						

SCS	ENGINEERS					
		SHEET		L3	OF	13
CLIENT	PROJECT		JOB NC	).		
Manatee County	5-Year Permit Update		09217	088.18		
SUBJECT		BY			DATE	
Manatoo County Lona Road Landfill Einangial Accurance		MTD			0/10/202	20
					9/10/202	20
5-Year Permit Update		CHECKED			DATE	
		SRF			3/22/202	21
14.) Administrative (Continued)						
Office Engineer - Not anticipated at the time of this	s cost estimate.					
On-Site Technician = Staff Professional 40 hours/r	nonth at \$94/hour					
=> (40 hours/month) x (12 months) x (\$94/hour) =	= <u>\$45,120</u>					
Other - Not anticipated at the time of this cost estin	nate.					
Subtotal Administrative: \$47,268						
Subtotal of 1-14: <u>\$646,270.69</u>						
15.) Contingency						
5% of estimated subtotal cost. => \$646,270.69 x 5% = <u>\$32,315.53</u>						
16.) Site Specific Costs						
No Site Specific Costs anticipated at the time of the	is cost estimate.					
ANNUAL LONG-TERM CARE COST (\$ / YEAR): <u>\$678,584.22</u>						
Number of Years of Long-Term Care: <u>30 years</u>						
TOTAL LONG-TERM CARE COST: <u>\$20,357,526.64</u>						

## Attachment B

## Cost Quotes

- Attachment 1: COMANCO Invoice 19563 June 2019 Section 16 Landfill Zone 3 & 4 Closure
- Attachment 2: COMANCO Earthwork Estimates, August 2020
- Attachment 3: SKAPS liner/composite cost estimate with COMANCO installation estimate August 2020
- Attachment 4: COMANCO Stormwater Item Estimates, August 2020
- Attachment 5: COMANCO Landfill Gas and Mowing Estimates, August 2020
- Attachment 6: Professional Engineering Fee Estimates
- Attachment 7: Environmental Monitoring & Reporting Fee Estimates (groundwater, surface water, leachate, landfill gas)
- Attachment 8: Florida Jetclean Estimate for leachate collection pipe, August 2020
- Attachment 9: FDOT Type B Fencing and Slide Gate, 2019
Payment Appl. No. : Application Date : For Period Beginning For Period Ending : 12

6/30/2019

6/1/2019

6/30/2019

ATTACHMENT 1, pg 1: COMANCO Invoice 19563 June 2019 - Section 16 Landfill Zone 3 & 4 Closure Project Name: Project Number: Contractor : Desoto County Section 16 Landfill Zone 3 & 4 Closure 18-29-00ITB COMANCO Environmental

							WORK PERFORMED					
А	В	С	D	E		F	G	Н	I	J	К	L
ITEM #	ITEM DESCRIPTION			CONTRAC	TITEMS		PREVIOU	IS PERIODS	THIS F	PERIOD	тота	L TO DATE
		UNIT	QTY	\$/Ui	nit	Total Amount	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT
								(G*E)		(I*E)	(G+I)	(K*E)
1	Mobilization	LS	1	\$ 105,	00.00	\$ 105,000.00	0.8 \$	84,000.00	0\$	-	0.80	\$ 84,000.00
2	Project Survey	LS	1	\$ 40,	00.00	\$ 40,000.00	0.69 \$	3 27,600.00	0.075 \$	3,000.00	0.77	\$ 30,600.00
3	Erosion and Sediment Control - Zone 5, Zone 3 &4	LS	1	\$ 13,	500.00	\$ 13,500.00	0.8 \$	10,800.00	0.09 \$	1,215.00	0.89	\$ 12,015.00
4	Site Clearing, Grubbing, Stripping	LS	1	\$ 40,	00.00	\$ 40,000.00	1 \$	40,000.00	0\$	-	1.00	\$ 40,000.00
5	Dewatering	LS	1.00	\$8,	500.00	\$ 8,500.00	0.8 \$	6,800.00	0 \$	-	0.80	\$ 6,800.00
6	Zone 5 Exp - Basegrade Embankment/Stormwater S	CY	35500	\$	7.00	\$ 248,500.00	35500 \$	6 248,500.00	0 \$	_	35,500.00	\$ 248,500.00
7	Zone 5 Exp - Basegrade/Stormwater Swale - OS	CY	4500	\$	12.00	\$ 54,000.00	0 \$	; -	0\$	-	-	\$-
8	Zone 5 Exp - Grading & Compaction prior to Liner	SY	37050	\$	0.95	\$ 35,197.50	37050 \$	35,197.50	0 \$	-	37,050.00	\$ 35,197.50
9	Partial Zones 3 & 4 Closure - Intermediate Cover - OS	CY	2600	\$	12.00	\$ 31,200.00	1550 \$	5 18,600.00	0 \$	-	1,550.00	\$ 18,600.00
10	Partial 3 & 4 Closure - Grade/Compact prior to liner	SY	10780	\$	1.50	\$ 16,170.00	10780 \$	6 16,170.00	0 \$	-	10,780.00	\$ 16,170.00
11	Geosynthetic Clay Liner	SF	350000	\$	0.09	\$ 31,500.00	340526.08 \$	30,647.35	0 \$	-	340,526.08	\$ 30,647.35
12	40mil Text LLDPE Geomembrane Liner - Zone 3 & 4	SF	91500	\$	0.20	\$ 18,300.00	91500 \$	5 18,300.00	3159.92 \$	631.98	94,659.92	\$ 18,931.98
13	60mil Text HDPE Liner - Z5 Primary and Secondary	SF	700000	\$	0.11	\$ 77,000.00	681052.16 \$	5 74,915.74	0 \$	-	681,052.16	\$ 74,915.74
14	Geocomposite (Secondary) Zone 5	SF	350000	\$	0.10	\$ 35,000.00	340526.08	34,052.61	0 \$	_	340,526.08	\$ 34,052.61
15	Geocomposite (Primary) Zone 5	SF	350000	\$	0.10	\$ 35,000.00	340526.08 \$	34,052.61	0 \$	-	340,526.08	\$ 34,052.61
16	Geocomposite - Partial Zone 3 & 4 Closure	SF	91500	\$	0.20	\$ 18,300.00	91500 \$	18,300.00	3159.92 \$	631.98	94,659.92	\$ 18,931.98
17	Zone 5 - Protective Layer/Drainage Sand Layer - OS	CY	26000	\$	12.50	\$ <u>325,000.00</u>	25000 \$	312,500.00	0 \$	-	25,000.00	\$ 312,500.00
18	Partial Zones 3 & 4 Closure - 18" Protective Layer - OS	CY	5700	\$	15.50	\$ 88,350.00	5200 \$	80,600.00	153.88 \$	2,385.14	5,353.88	\$ 82,985.14
19	Partial Zones 3 & 4 Closure - 6" Topsoil Layer - OS	CY	1900	\$	10.00	\$ 19,000.00	0 \$	- 3	1784.63 \$	17,846.30	1,784.63	\$ 17,846.30
20	Zone 5 Expansion - 12mil Geosynthetic Rain Tarp	SF	344000	\$	0.10	\$ 34,400.00	0 \$	-	0 \$	_	_	<u>\$</u>
21	8-inch HDPE Leachate Collection Pipe (Perf All-in)	LF	1950	\$	125.00	\$ 243,750.00	1950 \$	6 243,750.00	0 \$	-	1,950.00	\$ 243,750.00
22	12-inch HDPE Leachate Collection Pipe (Perf All-in)	LF	370	\$	200.00	\$ 74,000.00	370 \$	5 74,000.00	0 \$		370.00	\$ 74,000.00
23	8-inch HDPE Leachate Detection Pipe (Perf All-in)	LF	170	\$	65.00	\$ 11,050.00	170 \$	5 11,050.00	0 \$		170.00	\$ 11,050.00
24	8-inch HDPE Leachate Collection Cleanouts (Solid All-in)	EA	6	\$2,	500.00	\$ 15,000.00	6 \$	5 15,000.00	0 \$		6.00	\$ 15,000.00
25	24-inch HDPE Leachate Collection/Detection Riser (Perf)	LF	10	<b>\$</b> 1, <sup>-</sup>	750.00	\$ 17,500.00	10 \$	5 17,500.00	0 \$	_	10.00	\$ 17,500.00
26	24-inch HDPE Leachate Collection/Detection Riser (Solid)	LF	180	\$	325.00	\$ 58,500.00	180 \$	58,500.00	0 \$	-	180.00	\$ 58,500.00
27	Leachate Pump Station, Electrical Power (All-in)	LS	1	\$ 210,0	00.00	\$ 210,000.00	0.274 \$	57,540.00	0 \$	-	0.27	\$ 57,540.00
28	4-inch HDPE Foremain & 8-inch HDPE Containment Pipe	LF	1600	\$	58.00	\$ 92,800.00	1350 \$	5 78,300.00	0 \$	-	1,350.00	\$ 78,300.00
29	Grout Existing (Abondoned) Foremain Pipe	LS	1	\$ 8,0	00.00	\$ 8,000.00	0 \$	; -	0\$	-	-	\$-
30	Limerock Maintenance Access Road	SY	4075	\$	15.00	\$ 61,125.00	0 \$	; -	0 \$	-	-	\$-
31	Fabric-Formed Concrete Lining	SF	250	\$	18.00	\$ 4,500.00	0 \$	-	250 \$	4,500.00	250.00	\$ 4,500.00
32	30-inch Diameter ADS HP Downchute w/ 12-in Laterals	LF	270	\$	105.00	\$ 28,350.00	0 \$		270 \$	28,350.00	270.00	\$ 28,350.00
33	6-inch Diameter ADS HP Toe Drain Pipe (Perf All-in)	LF	415	\$	48.00	\$ 19,920.00	0 \$		415 \$	19,920.00	415.00	\$ 19,920.00
34	6-inch Diameter ADS HP Toe Drain Pipe (Solid All-in)	LF	130	\$	38.00	\$ 4,940.00	0 \$		130 \$	4,940.00	130.00	\$ 4,940.00
35	Horizontal Landfill Gas Vent	LF	550	\$	70.00	\$ 38,500.00	550 \$	38,500.00	0 \$		550.00	\$ 38,500.00
36	30-inch Diameter Bore w/ 4-inch HDPE SDR17 Casing	LF	148	\$	265.00	\$ 39,220.00	147 \$	38,955.00	0 \$	-	147.00	\$ 38,955.00

Payment Appl. No. :
Application Date :
For Period Beginning
For Period Ending :

12

6/30/2019

6/1/2019

6/30/2019

ATTACHMENT 1, pg 2: COMANCO Invoice 19563 June 2019 - Section 16 Landfill Zone 3 & 4 Closure

Project Name: Project Number: Contractor : Desoto County Section 16 Landfill Zone 3 & 4 Closure 18-29-00ITB COMANCO Environmental

							WORK PERFORMED							
A	В	С	D	E		F	G	Н	I	J	К	L		
ITEM #	# ITEM DESCRIPTION		•	CONTRACT	ITEMS		PREVIOU	JS PERIODS	тні	S PERIOD	TOTAL	TO DATE		
		UNIT	QTY	\$/Unit		Total Amount	QUANTITY	AMOUNT	QUANTITY	AMOUNT	QUANTITY	AMOUNT		
								(G*E)		(I*E)	(G+I)	(K*E)		
37	Sodding	SY	28960	\$	2.60 \$	75,296.00	0 5	ş -	14584.22	\$ 37,918.97	14,584.22	\$ 37,918.97		
38	Sedding	SY	9680	\$	1.05 \$	10,164.00	0 5	ş -	0	\$-	-	\$-		
39	Edge of Liner Posts - Zone 5 Expansion & Zone 3/4	EA	22	\$ 12	5.00 \$	2,750.00	0 5	5 -	8	\$ 1,000.00	8.00	\$ 1,000.00		
40	Jetclean/Video Inspect and Record Pipe (Collection/Detec)	LS	1	\$ 7,50	0.00 \$	7,500.00	1 5	\$ 7,500.00	0	\$-	1.00	\$ 7,500.00		
41	Unsuitable Soil Excavation and Disposal	CY	1500	\$	5.00 \$	7,500.00	0 \$	ş -	0	\$-	-	\$-		
42	30-inch Diameter Bore Refusal	LF	15	\$ 5	0.00 \$	750.00	15 \$	\$ 750.00	0	\$-	15.00	\$ 750.00		
43	CO#2 - Waste Relocation	CY	425	\$ 1	5.00 \$	6,375.00	425 \$	6,375.00	0	\$-	425.00	\$ 6,375.00		
44	CO#4 - Fill Import/Excavation	CY	72	\$ 7	8.00 \$	5,616.00	72 \$	\$ 5,616.00	0	\$-	72.00	\$ 5,616.00		
45	CO#4 - F/I 4" SDR11 HDPE Perf Pipe	LF	120	\$ 2	4.00 \$	2,880.00	120 \$	\$ 2,880.00	0	\$-	120.00	\$ 2,880.00		
46	CO#4 - F/I 1ft x 1ft Granite Wrap	LF	120	\$ 1	3.50 \$	1,620.00	120 \$	\$ 1,620.00	0	\$-	120.00	\$ 1,620.00		
47	CO#4 - Install 60mil HDPE Flap	SF	600	\$	3.60 \$	2,160.00	600 S	\$ 2,160.00	0	\$ -	600.00	\$ 2,160.00		
48	CO#4 - Install Composite Flap	SF	600	\$	3.50 \$	2,100.00	600 S	\$ 2,100.00	0	\$-	600.00	\$ 2,100.00		
			то	TAL AMOU	INT: \$	2,325,783.50	9	\$ 1,753,131.80		\$ 122,339.38		\$ 1,875,471.18		

Notes:

Attachment 2									
🖬 🕤 🝼 🕈 🛡 = RE: Cost Estimator for Landfill Closure Project - Lena Rd Install - Message (HTML) 🗖 — 🗆	×								
File Message Acrobat Q Tell me what you want to do									
Image: Construction of the sector of the	~								
Thu 8/13/2020 2:31 PM									
John Jacobs <jjacobs@comanco.com></jjacobs@comanco.com>									
RE: Cost Estimator for Landfill Closure Project - Lena Rd Install									
To Radford, Mike; David Scherbaty									
Cc Daniel McRae									
You replied to this message on 8/13/2020 3:03 PM.	~								
Cc: Daniel McRae < <u>dmcrae@comanco.com</u> >; John Jacobs < <u>JJacobs@comanco.com</u> > Subject: RE: Cost Estimator for Landfill Closure Project - Lena Rd Install Just to follow up, here are some estimated quantities I have:									
Final 2D closure surface area over Closure = 6,211,713 SF									
<ul> <li>Factor for 3:1 sideslopes, soil loss, bulking = 1.15, thus 3D area is 7,143,469.95 SF</li> <li>6-in Excavation/unsuitable fill = 132,286 cy - If excavated and disposed of onsite, \$3.50 per CY</li> <li>18-in protective layer = 396,859 cy - Assuming that this is for supply (imported) and placement, \$20.00 per CY</li> <li>6-in topsoil = 132,286 cy - Assuming that this is for supply (import) and placement, \$25.00 per CY</li> <li>12-in Placement and spreading = 264,573 cy - Assuming that this will be the 12" intermediate cover over waste below the liner, \$18.00 per C</li> <li>compaction = 264,573 cy - Assuming that this will be the 12" intermediate cover over waste below the liner, \$18.00 per C</li> </ul>	Y								
<ul> <li>compaction = 264,573 cy - Fine grading/compaction for intermediate cover prior to liner installation, 7,143,670 sf x \$0.15/sf = \$107,154/264,573 = \$0,405 per CY</li> </ul>									

-

• sod = 793,719 sy - Supplied and installed for \$2.70 per SY

Thanks,

**—** 

-

### Radford, Mike

From:	John Jacobs <jjacobs@comanco.com></jjacobs@comanco.com>
Sent:	Friday, September 18, 2020 2:18 PM
То:	Radford, Mike; David Scherbaty
Cc:	Daniel McRae
Subject:	RE: Cost Estimator for Landfill Closure Project - Lena Rd Install

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

### Good afternoon, Mike:

Yes, I think that \$18 would get grading layer material purchased, delivered, and placed for most applications. Typically, Contractors are paid for in-place units on such work, so I was thinking that this would be a decent budget price for the supply and placement of the material measured as in-place cubic yards, depending on the site conditions.

Thanks,



John Jacobs | Vice President COMANCO 4301 Sterling Commerce Dr | Plant City, FL 33566 Office: 813-988-8829 | Fax: 813-988-8779 | Cell: 813-714-2253 E-mail: jjacobs@comanco.com | web: www.comanco.com

From: Radford, Mike 
MRadford@scsengineers.com>
Sent: Friday, September 18, 2020 10:49 AM
To: John Jacobs 
JJacobs@comanco.com>; David Scherbaty 
dscherbaty@comanco.com>
Cc: Daniel McRae 
dmcrae@comanco.com>
Subject: RE: Cost Estimator for Landfill Closure Project - Lena Rd. - Install

### Hi John,

I just talked to Johnny Edwards who said he talked to you. He had said that the \$18/CY cost includes delivery, placement and spreading. From this, I planned to adjust my estimate to the attached red lines edits. Can you confirm this?

Also, please confirm that the unit cost is for loose cubic yard prices – not in place.

Thanks,

## Attachment 3



Estimated Project Total = \$5,874,270.20

### Radford, Mike

From:	David Scherbaty <dscherbaty@comanco.com></dscherbaty@comanco.com>
Sent:	Wednesday, August 12, 2020 8:37 AM
To:	Radford, Mike
Cc:	Daniel McRae; John Jacobs
Subject:	Cost Estimator for Landfill Closure Project - Lena Rd Install

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

### Mike,

Dan forwarded me your email in regards to a few budgetary installation numbers on a future closure project at the Lena Rd. Landfill in Manatee County. Please find below installation only pricing based on the two products SKAPS quoted and the quantities you provided. Please note that the pricing you were provided by SKAPS is a direct price and if it goes through a contractor during the bid process those prices will go up due to markup and indirect/management costs.

Install 40-Mil LLDPE - ~6,211,713 SF - \$.15 per SF Install Geocomposite - ~6,211,713 SF - \$.16 per SF \*If needed. Tie-in to Existing - \$6.00 per LF

Please let me know if you need anything else.

Thanks, David



David Scherbaty | Vice President of Sales 4301 Sterling Commerce Drive | Plant City, FL 33566 Office: 813-988-8829 | Cell: 813-323-3584 E-mail: <u>dscherbaty@comanco.com</u> | web: <u>www.comanco.com</u>

### Attachment 4

Reply Reply All G Forward

Thu 8/27/2020 11:11 AM

John Jacobs <JJacobs@comanco.com>

RE: Cost Estimator for Landfill Closure Project - Lena Rd. - Install

To Radford, Mike

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

#### Good morning, Mike:

Below are budgetary prices in red...

From: Radford, Mike <<u>MRadford@scsengineers.com</u>>
Sent: Thursday, August 27, 2020 11:04 AM
To: John Jacobs <<u>JJacobs@comanco.com</u>>
Subject: RE: Cost Estimator for Landfill Closure Project - Lena Rd. - Install

Hi John,

Could I get prices for the following stormwater items:

- 500 LF 18-inch HDPE pipe for downcomers \$35.00 per LF
- 50 Type C inlets for terraces/downcomers \$3,500 each
- 20 Mitered End Sections/U-endwalls \$2,750 each

#### Thanks,

### Radford, Mike

From: Sent: To: Subject: John Jacobs <JJacobs@comanco.com> Thursday, September 3, 2020 5:00 PM Radford, Mike RE: Cost Estimator for Landfill Closure Project - Lena Rd. - Install

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

#### Mike,

For the 36" HDPE downcomer pipe, I am assuming that you all would use an ADS N-12 type pipe. The budgetary cost for that would be \$55 per LF. For the ditching, figure about \$12.00 per LF.

John



John Jacobs | Vice President COMANCO

4301 Sterling Commerce Dr | Plant City, FL 33566 Office: 813-988-8829 | Fax: 813-988-8779 | Cell: 813-714-2253 E-mail: <u>jjacobs@comanco.com</u> | web: <u>www.comanco.com</u>

### Radford, Mike

From:	Scotty Martone <smartone@comanco.com></smartone@comanco.com>
Sent:	Friday, August 28, 2020 11:44 AM
To:	Radford, Mike
Subject:	FW: Cost Estimator for Landfill Closure Project - Lena Rd Install

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning, Mike:

Below are budgetary prices in red...

From: Radford, Mike <<u>MRadford@scsengineers.com</u>> Sent: Friday, August 28, 2020 9:10 AM To: John Jacobs <<u>JJacobs@comanco.com</u>> Subject: RE: Cost Estimator for Landfill Closure Project - Lena Rd. - Install

Hi John,

Can you also provide budgetary prices for:

- 15,075 LF of Landfill gas collection wells \$135.00 per VF
  284 landfill gas collection well heads \$1,200.00 per EA
- 43,400 LF 8-inch HDPE gas collection pipe laterals \$40.00 per LF 7,700 LF 18-inch HDPE gas collection pipe headers \$75.00 per LF
- 7 condensate pipe tie-ins to manholes with drip leg \$5,000.00 per LF
   1 andreane maintenance (Moving) per arcs per year mowed twice quarterly (8 time)
- Landscape maintenance (Mowing) per acre per year, mowed twice quarterly (8 times per year) \$500.00 per ACRE

Thanks,

Mike Radford, P.E. SCS Engineers Orlando, FL (407) 204-3235 (W) (407) 748-2616 (C) mradford@scsengineers.com

### ATTACHMENT 7 MANPOWER AND FEE ESTIMATE - ITEMS 10 AND 11, FINANCIAL ASSURANCE MANATEE COUNTY - LENA ROAD LANDFILL ESTIMATE FOR EVERY 30 AC OF CLOSURE FY20

Task Key

10 a - Closure Plan Report10 d - Bidding

10 b - FDEP Coordination 10 e - Final Survey

11 a - Contract Management 11 b - CQA

10 c - Certified Engineering Drawings 10 f - Certification of Closure

			Engin	ieering			Professional Services Total R		Rate	Total	
Personnel	10 a	10 b	10 c	10 d	10 e	10 f	11 a	11 b	(hours)	(\$)	(\$)
Office Director						8			8	182	1,456
Project Director	30	16	4	16			64	16	146	179	26,134
Project Manager	200	16	16	40		40	200	100	612	148	90,576
Senior Project Professional I	200	8	16	24		80			328	129	42,312
Project Professional I	180		60	24			40	120	424	110	46,640
Staff Professional I	180		16						196	94	18,424
Associate Staff Professional					24				24	77	1,848
Designer/Drafter	180		80	8		16			284	73	20,732
Drafter	80		30			24			134	55	7,370
Senior Technician 2				16		40	240	960	1,256	55	69,080
Administration/Clerical	40	2	8	8		8	40	40	146	54	7,884
Subtotal Labor (hours)	1,060	26	40	120	24	136	520	1,100	3,558		
Subtotal Labor (\$)	117,190	6,372	21,174	16,416	1,848	22,816	60,816	85,824			332,456
Reimbursables (See Table 2)	2,475	467	1,140	365	40,000	455	1,755	29,591			76,248
G&A, 15 percent reimbursables	371	70	171	55	6,000	68	263	4,439			11,437
Total reimbursables	2,846	537	1,311	420	46,000	523	2,018	34,030			87,685
Subtotal, Fee Estimate	120,036	6,909	22,485	16,836	47,848	23,339	62,834	119,854			420,141
	<b>Closure Plan R</b>	eport			Construction Costs						
	Total =		126,945		_	Total =	270,711				
				Tota	al 10a,b,c,d,e	237,453	Total 11a&11b	182,688	I		

### ATTACHMENT 7 MANPOWER AND FEE ESTIMATE - ITEMS 10 AND 11, FINANCIAL ASSURANCE MANATEE COUNTY - LENA ROAD LANDFILL ESTIMATE FOR EVERY 30 AC OF CLOSURE

### **REIMBURSABLES ESTIMATE (Task Amounts)**

Task Key

10 a - Closure Plan Report110 b - FDEP Coordination1

10 c - Certified Drawings

10 d - Bidding 10 e - Final Survey 10 f - Construction Certification 11 a - Contract Management 11 b - CQA Reimbursable Total = 76,249

	Unit										T	atal.	Total
Reimbursable	(\$)	Unit	10 a	10 b	10 c	10 d	10 e	10 f	11 a	11 b	U	nits	(\$)
Subconsultants, Topographic survey	1	LS					40,000			· · · · ·		40,000	40,000
Subcontractors/Drillers	1	LS		,	í I					ľ		0	0
Laboratory Services	1	EA						í l		14,000		14,000	14,000
Vehicle Mileage (Auto)	0.51	MI	30	30		30		30				120	61
Vehicle Mileage (Truck)	75	DA										0	0
Company Vehicle	55	DA	2	2	í I	1		1	10	10		26	1,430
Truck	55	DA		,	í I	1				96		97	5,335
Parking & Tolls	1	LS						í l				0	0
Meals	36	DA		,	í I					96		96	3,456
Lodging, Hotel	55	DA		,	í I					96		96	5,280
Telephone Calls	5	EA	35	10	í I	5		5	50	75		180	900
Faxes	6	PG	20	7	í I	5		5	25	25		87	522
Postage & Freight	10	LS	25	5	í I	5		5	50	50		140	1,400
Reproduction (Xerox)	0.1	EA	1,550	500	500	200		500	1,550			4,800	480
Reproduction (Graphics) CADD	3	EA	250	50	180	25		50	50			605	1,815
Computer (CADD)	5	HR	180		110	8	0	16	0	0		314	1,570



2019 - 2020 Annual Cost for Surface Water Sampling, Groundwater Sampling, and Leachate Sampling

# Attachment 1 Scope of Services

Environmental Monitoring and Reporting of the Lena Road and Erie Road Landfills October 1, 2019 Through September 30, 2020



090390219 | October 2019

3922 Coconut Palm Drive Suite 102 Tampa, FL 33619 813-621-0080

# 1 DESCRIPTION

Erie Rd Landfill not needed for Lena Rd Landfill Financial Assurance

Manatee County (County) has a goal of maintaining compliance with Florida Department of Environmental Protection (FDEP) solid waste rules and solid waste and air permit conditions at the active Lena Road Landfill and closed Erie Road Landfill by conducting environmental compliance monitoring and reporting.

The Lena Road Landfill is a slurry wall landfill requiring monthly monitoring of the hydraulic gradient across the slurry wall. There are 25 groundwater-monitoring wells and 25 piezometers located along the perimeter of the slurry wall system. The groundwater monitoring wells are located outside the slurry wall to monitor the surficial groundwater aquifer. The piezometers are located inside the slurry wall system to monitor the leachate level in the landfill and determine the gradient direction across the slurry wall. The Erie Road Landfill is a closed landfill located in Palmetto that is currently in long-term care.

The County is required to monitor and report monthly, quarterly and semi-annually for various environmental and operational components at Lena Road and Erie Road Landfills. This includes groundwater, landfill gas, site life, and other attributes related to the solid waste and air permits. There are thirteen gas monitoring probes at the Lena Road Landfill. In addition to the probes, the landfill gas surface emissions from the Lena Road Landfill must be monitored and reported quarterly.

The Lena Road Landfill has an active gas collection system consisting of gas extraction wells, a flare station, and a generator producing electricity. The County is required to inspect, read and adjust the gas extraction wells monthly as the landfill decomposes waste.

SCS will provide professional services for the management of the Lena Road and Erie Road Landfills environmental compliance programs for a period that will commence on October 1, 2019 and terminate on September 30, 2020 for the following tasks.

- Groundwater Support Services
- Landfill Support Services
- Landfill Gas Support Services
- Miscellaneous Services

The following details the services SCS will provide to the County to maintain compliance with their permits. SCS will provide County staff one copy of draft reports for review and comment in electronic format. Upon receipt of comments from the County, SCS will finalize the reports and submit one final hard copy the County and an electronic copy to the County and FDEP

# 2 SCOPE OF SERVICES

# TASK 1 – GROUNDWATER SUPPORT SERVICES

### 1.1 Water Quality Monitoring Data Review and Reporting

The semi-annual water quality monitoring (WQM) data will be provided by the County's contracted laboratory for Lena Road and Erie Road Landfills. SCS will review the data for errors, consistency,

and exceedances of WQM standards. SCS will prepare the transmittal documentation for submittal to FDEP. A draft copy of this information will be provided to the County for review. SCS will upload the data from the laboratory to the FDEP's Automated Data Processing Tool (ADaPT).

SCS recently proposed change to the monitoring program at Erie Road Landfill; we anticipate comments from FDEP regarding the proposed changes. This budget includes a line item to address these anticipated comments through a response to comments/meeting/or minor permit mod.

### 1.2 Landfill Groundwater Contour Mapping

SCS will also prepare the semi-annual groundwater contours maps for the Lena Road and Erie Road Landfills. Manatee County will provide the water elevations at the time the wells are sampled. SCS will use these groundwater elevations to develop a ground water contour map for each landfill. The maps will be submitted to the County as part of the semi-annual WQM reports.

### Milestones

- Draft WQM Report within 30 days of receipt of laboratory electronic data deliverable
- FDEP Submittal of WQM Report within 10 days of receipt of comments from County.

### Deliverables

This 1.3 task is done every 5 years. The hours breakdown is weighted to every 5 years from original contract.

- Draft WQM Report (2nd 2019 Semiannual)
- FDEP Submittal of WQM Report (2nd 2019 Semiannual)
- Draft WQM Report (1st 2020 Semi-annual)
- FDEP Submittal of WQM Report (1st 2020Semiannual)

### 1.3 Technical Water Quality Monitoring Plan for the Lena Road Landfill

The Technical Report is due to FDEP no later than July 15, 2020. SCS will evaluate the water quality data for Lena Road Landfill and prepare the Report as required by Rule 62-701.510 F.A.C. The evaluation will include the previous two and one half years of water quality data. The Report will include the following:

- Statistical analysis of the data by trend analysis.
- Evaluation of groundwater gradient and flow conditions.
- Comparisons between up gradient and down gradient wells.
- Correlations between related parameters.
- Groundwater elevation contour maps and hydrographs.
- Evaluation of the adequacy of the water quality monitoring frequency and sampling locations, and performance of the cover and liner based on the site conditions.

The Report will cover data generated over a two year period to include the first sampling event of 2018 through the first sampling event of 2020. A draft copy of the Report will be sent to the County staff for review and comment. SCS will meet with the County staff to discuss the report and the findings. Upon receipt of County comments, SCS will finalize the report and submit one copy to FDEP, and one final copy to the County.

### Milestones

• FDEP Submittal by July 15, 2020

### Deliverables

- Draft report by July 1, 2020
- Final report by July 15, 2020

# TASK 2 – LANDFILL SUPPORT SERVICES

### 2.1 Landfill Leachate/Groundwater Gradient Report

A slurry wall containment system is in place at the Lena Road Landfill to isolate the surficial groundwater aquifer from solid waste placed in the landfill along its perimeter. The objective of the system is to maintain the leachate elevation inside the slurry wall at a lower elevation than the groundwater level outside the slurry wall, inducing an inward gradient. A series of piezometers and monitoring well pairs (25) located inside and outside of the slurry wall are utilized to monitor this gradient.

Each month, the leachate level in the 25 piezometers and groundwater level in the 25 monitoring wells will be measured by SCS to an accuracy of 0.01 feet and recorded. SCS will review and evaluate the data to determine the status of the groundwater gradient across the slurry wall. SCS will present the data and indicate the direction of gradient flow for each monitoring well and piezometer pair in a letter report. SCS will make recommendations to the County based on the results of the field data evaluation and observations.

### Milestones

- Compliance field monitoring events Monthly prior to the last day of the month
- Draft submittal 10th day of the following month from sampling
- FDEP submittal 15th day of the following month from sampling

### Deliverable

- Draft monthly report
- FDEP submittal of final monthly report

## 2.2 Lena Road Landfill Estimate of Remaining Life

this will go away after closure

Manatee County needs an annual aerial survey and topographic map of the Lena Read Landfill in order to estimate the landfill volume consumed and revise the remaining landfill life estimate. This estimate must be submitted annually to FDEP. SCS will subcontract the aerial survey and confirm it will be completed in the same general time frame as the past events.

Based on the information provided by our subconsultants, SCS will calculate the landfill volume consumed during the reporting period, the landfill volume remaining, and estimate the remaining landfill life. SCS will provide one draft copy of the volume report for County's review and coordinate a meeting with County staff to discuss the report. Based on the comments from that meeting, SCS will

send a copy of the aerial photograph, topographic map, and remaining landfill life calculations to FDEP.

### Milestones

- Receipt of annual tonnages from County February 15, 2020
- Receipt of aerial survey and topographic map March 1, 2020
- Draft submittal of report to County March 15, 2020
- FDEP submittal April 15, 2020
- FDEP Due Date May 1, 2020

### Deliverable

- Draft copy of remaining landfill life calculations
- FDEP submittal of remaining landfill life calculations

### 2.3 Annual Financial Assurance Update

SCS will conduct the annual financial assurance update using annual adjustments for inflation in accordance with the requirements of Rule 62-701.630(3) and (4), FAC.

### Milestones

- Draft Annual Financial Assurance Update January 2020
- Final Annual Financial Assurance Update February 2020
- FDEP Due Date March 1, 2020

### Deliverable

- Draft Annual Financial Assurance Update January 2020
- Final Annual Financial Assurance Update February 2020

# 2.4 Lena Road Landfill Environmental Resource Permits (ERP #41-0224996-001, ERP #41-0224996-002, ERP #41-0224996-003, and 41-0177559011) Inspections

Permit No. 41-0224996-001 was issued on February 25, 2005 for the modification of the existing stormwater management system and is operational. Permit No. 41-0224996-002 was issued on April 17, 2013 for the construction of a restroom and associated stormwater management system and is operational. Permit No. 41-0224996-003 was issued on October 9, 2014 for the construction of an office building and associated stormwater management system and is operational. Permit No. 41-0177559-011-El was approved for operation on April, 24, 2017 for the Stage II Stormwater Improvements.

In accordance with the ERP's for the Lena Road Landfill - Class I solid waste facility, SCS will conduct a site visit to evaluate the surface water management system. During the site visit a Qualified Storm water Management Inspector will perform a thorough observation of facility inlets, swales, outfalls, and other storm water features. The inspector will document existing facility conditions and we will prepare and submit to FDEP the required inspection report for the separate ERPs in one with a copy

this will go away after closure to Manatee County, signed and sealed by a registered Professional Engineer in the State of Florida. SCS will verbally inform the County of the inspection observations prior to submittal of the inspection report to the FDEP.

### Milestones

- Inspection February 2020
- Draft inspection report March 2020
- Final inspection report submittal April 2020

### Deliverable

- Draft inspection report March 2020
- Final inspection report April 2020

# TASK 3 – LANDFILL GAS SUPPORT SERVICES

## 3.1 Landfill Gas (LFG) Collection System Monitoring

SCS will conduct routine monitoring and adjustment of the wellfield to comply with requirements of Title 40 Code of Federal Regulations Part 60, Subpart WWW (NSPS). Our staff will coordinate with County staff prior to and upon completion of routine monitoring events.

Routine GCCS Operations, Monitoring and Maintenance (OM&M) services will be performed at each landfill gas (LFG) extraction well. During these services, SCS will document the following operational data (as appropriate) for each well:

- Static pressure
- Differential pressure
- LFG flow
- LFG composition (i.e., methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>), balance gas)
- LFG temperature
- Wellhead condition

During wellhead monitoring, the technician will listen for leaks. Minor leaks identified during the monitoring will be repaired at the time of discovery. Leaks that cannot be fully repaired (e.g., those requiring replacement parts) will be temporarily mitigated in the field (if possible). Permanent repairs will be performed as "non-routine scheduled services" in accordance with the provisions, specified below.

During our monthly visits, SCS technicians will also visit the flare station and perform monthly inspections of the flare. This will include inspecting the blowers, flame arrestor, knock out pot, propane tanks, data records, and other appurtenances associated with the control device. We will make minor repairs and adjustments as necessary with major items to be performed as "non-routine scheduled services" in accordance with the provisions, specified below. SCS will provide feedback to the site personnel if an issue is discovered during these inspections prior to leaving the site. For routine GCCS OM&M services, SCS will provide a comprehensive data review of the collected data and submit a letter report to Manatee County each month following the month for which wellfield monitoring services were provided.

This report will include the following information:

- Monitoring data collected at individual LFG extraction wells:
  - Methane Concentration
  - Carbon Dioxide Concentration
  - Oxygen Concentration
  - Well vacuum
  - System vacuum
- Pump stoke counter data, if applicable
- Orifice Plate size, if applicable
- Cover integrity issues (if any).
- Flare Station operational conditions.
- Summary of non-routine maintenance services performed.
- · Recommendations of additional non-routine maintenance or repairs needed (if any).
- Recommendations of enhancements to improve collection system operations and performance (if any).

In advance of submitting the above-described report SCS will communicate with the County items that need immediate attention.

SCS will discuss items that need to be addressed from the monthly report with the County in the monthly meeting. SCS will also make any suggested improvements and go over needed maintenance needed for the GCCS to operate optimally.

SCS will complete maintenance and repair activities beyond the ability of Manatee County as specifically authorized under Task 4 – Miscellaneous Services.

### Milestones

• Monthly Landfill gas monitoring and rechecks by the 20th of each month

### Deliverables

• Monthly landfill gas monitoring report by the 15th of month following monitoring.

### 3.2 Landfill Gas Perimeter Probe Monitoring (Quarterly)

Once each quarter SCS will perform monitoring of the sites perimeter methane monitoring probes. Any methane detected in excess of 100% LEL (5% methane) will be reported to Manatee County immediately following the monitoring event. Once each quarter SCS will perform building monitoring of the sites occupied structures. Any methane detected will be reported to Manatee County immediately following the monitoring event.

SCS will measure and record the landfill gas levels in 13 soil probes and five buildings at Lena Road Landfill. The readings will be summarized and submitted to the County in a Draft Report and then finalized and submitted to FDEP in the quarterly report by SCS.

### Milestones

• Quarterly perimeter probe monitoring by the 15th of the second month of the quarter

### Deliverables

- Draft Quarterly report by last day of the quarter.
- FDEP submittal of Quarterly reports by the 15<sup>th</sup> of the month following the quarter

# 3.3 Lena Road Landfill Gas Surface Emissions Monitoring and Reporting (Quarterly)

Once each quarter, SCS will perform surface emissions monitoring (SEM) per §60.755(c) and §60.756(f) of the NSPS. When possible, monitoring will be scheduled in conjunction with site activities such that 15-day rechecks of the wellfield (if required) can be addressed on the same day as the initially scheduled monitoring.

Surface emissions monitoring will include:

- Testing surface emissions at 30 meter intervals along the monitoring path using an organic vapor analyzer per EPA Method 21 as modified for methane;
- Marking and recording areas which exceed 500 ppm emissions;
- Recording and reporting of data collected; and
- Recommending corrective actions to remediate exceedances.

Actions to remediate exceedance areas could involve such activities as gas well vacuum adjustments, header line flow/vacuum adjustments, cover maintenance, or the installation of additional collection devices.

SCS will prepare a written report for each monitoring event. Each written report will include a description of activities conducted during the monitoring event, discussion of the data collected, review of compliance timelines with respect to exceedances, tables summarizing the field data, figures (SEM only), and our recommendations based on our evaluation of the data.

SCS will discuss the report with the County in the appropriate monthly meeting to review findings and discuss any issues or concerns.

### Milestones

- Quarterly surface emission monitoring by the 15th of the second month of the quarter
- System adjustments and recommendations as required

### Deliverables

- Draft copy of Quarterly report by last day of the quarter.
- Submittal of Quarterly reports to the County by the 15<sup>th</sup> of the month following the quarter

## 3.4 Landfill Title V Permit Reporting

### 3.4.1 Semiannual Reports

The semiannual NSPS reports are required under 40 CFR 60.757(f), and will include the information listed below. This Task is for the completion of the 2019 Second and 2020 First Semiannual reports and will include the following:

- Value and length of time for exceedances of applicable monitoring parameters.
- Description and duration of the periods when the control device was not operating for a
  period exceeding one hour and the length of time the control device was not operating.
- List of periods when the collection system was not operating in excess of five days.
- Description and duration of periods when the gas stream was diverted from the control device through a bypass line.
- The location of each exceedance of the 500 parts per million (ppm) surface emission criteria.
- If the landfill gas collection system is expanded, a diagram of the collection system showing the wells and collectors, including the areas excluded from collection and the areas into which the system will be expanded in the future.

### Wellhead Monitoring Data

Exceedances of the regulatory criteria for wellhead pressure, oxygen concentration, and wellhead temperature will be listed and explained, if necessary. This portion of the report will be based on the monthly landfill gas collection and control system (GCCS) monitoring that is performed by SCS.

### Control Device Operation

SCS will examine records of flare, sludge dryer, engine plant, and sludge loadout station and baghouse operations and summarize downtime for each device and the collection and control system per 40 CFR 60.757(f)(3) and (4). In the report, SCS will state that the controls systems are not configured to allow diversion of the gas stream from the flare or other control devices. We will also review site records to confirm that there were no occasions when the flare was offline while the blowers were in operation. Operational downtimes will be calculated for each device and reported as required.

### **Report Submittal**

SCS will provide one draft copy of the NSPS/SSM report for County's review and coordinate a meeting with County staff to discuss the report. Upon receipt of your comments, SCS will submit the NSPS semi-annual reports on behalf of the County to FDEP and provide a hard copy and an electronic copy for the County's records. The reports will be signed and sealed by a Florida Professional Engineer.

### Milestones

Draft copy of Semiannual report 10 days prior to due date

• FDEP submittal of Semiannual reports prior to January 30, 2020 & July 30, 2020 as required. (Note: May move to March 1, 2020 and August 29, 2020 if the new permit is approved)

### Deliverables

Semiannual Reports

### 3.4.2 Annual Operating Reports

The Title V Annual Operating Report (AOR) calculates the annual emissions of criteria air pollutants. For the AOR, SCS will obtain from Manatee County information relevant to the operation of the emission units listed in the Title V permit. Air emission factors will be obtained from past reports or the U.S. Environmental Protection Agency's Compilation of Air Pollutant Emission Factors, commonly known as AP-42. Using this information, SCS will calculate the estimated emissions from the permitted emission units and supply this information in the required report form. The information will be entered into the Florida Department of Environmental Protection (FDEP) Electronic Annual Operating Report (EAOR) software program. SCS will submit the EAOR electronically for County's signature and submittal to FDEP.

### 3.4.3 Annual Emission Estimate and Fee

Based on the site operations data and the Title V requirements, SCS will review the emissions fee estimate generated by the EAOR software for accuracy.

SCS will submit a draft annual emission fee statement for County review via e-mail. Upon receipt of County comments, SCS will finalize the statement and submit it electronically for County's signature. SCS will submit emission form and fee to FDEP on behalf of the County and pay the emissions fee.

### 3.4.4 Annual Statement of Compliance

SCS will review the site's Title V permit and prepare a statement of compliance that documents the compliance status for the various permit conditions. We will prepare this report based on our knowledge of site operations, discussions with County personnel, and a review of records that we will request from County that we do not already possess. SCS will review the operational data and provide a summary of deviations, if any, from the applicable requirements and summarize steps that were or will be taken to regain compliance. Upon receipt of County comments, SCS will finalize the statement for County's signature and then SCS will submit to FDEP and U.S. EPA Region 4 on behalf of the County.

### 3.4.5 2019 Greenhouse Gas Reporting

SCS will prepare and submit the greenhouse gas (GHG) annual report on EPA's e-GRRT on-line system in accordance with 40 CFR 90 Subpart 98. SCS will calculate the GHG being generated from the landfill for the 2019 calendar year using data provided by County and EPA calculation methods. SCS anticipates the data to include:

- Waste accepted during 2019 and how data was collected (assuming scale records);
- Anticipated closure year;

- Overall design capacity;
- Surface area of the landfill containing waste; and
- Landfill cover type (soil, geosynthetic, etc.).

SCS will review data received from County in response to the data request and follow up via email and/or phone with any additional data requests or clarifying questions, as necessary. Upon receipt of all the data, SCS will review the data for completeness and prepare the appropriate forms on-line. After SCS has submitted the forms to County for review, SCS staff will be available to discuss the forms and how they were assembled via conference call. Upon agreement that all data is accurate and correct, SCS will upload the data to the EPA's e-GGRT website and submit the required data on behalf of the County as the County authorized representative.

### 3.5 Lena Road Landfill Gas Annual Testing and Reporting

The annual monitoring and reporting that is required between October 1, 2019 and September 30, 2020 (Note: Deadline moves to December 31, 2020 if new permit is approved) consists of the following:

### 3.5.1 Title V Visual Emissions (VE) Testing

Per Condition B.12 and Condition D.11 of the facility's Title V permit during each federal fiscal year (October 1st to September 30th), each EU shall be tested to demonstrate compliance with the emissions standards for opacity. [Rule 62-297.310(7), F.A.C]. SCS will be responsible to hire a qualified air testing consultant to conduct the annual VE test for the flare, sludge dryer, pellet handling system bag house per the Title V Air Operations Permit.

SCS will provide notice of testing as required 15 days prior to testing and final test report for submittal to FDEP within 45 days of testing.

### 3.5.2 LFG-Fired Engine Generator Set – Annual Compliance Test

Per Condition E.16 of the facility's Title V permit Every 8,760 engine hours or at least once every three years, whichever comes first, the landfill gas engine shall be tested to demonstrate compliance with the applicable emissions standards for CO, NOX and VOC.

SCS will subcontract with a compliance testing company to perform this work and oversee them while on site then prepare a letter to submit the results to FDEP within 45 days of testing.

### Milestones

- Sludge Dryer VE Test by September 30
- Bag House VE Test by September 30
- LFGE Testing prior to 8,760 operating hours from last test

### Deliverables

- Draft copies of report to County within 30 days following test
- Final submittals to County and FDEP/EPA within permitted timeframes

3.5.3 LFG – Mandatory Reporting to Energy Information Administration for Lena Road Class I Landfill

SCS will support the County in completing Form 923. SCS will utilize information readily available from our energy group and will work with County staff to complete the balance of the form. SCS will discuss issues with the United States Energy Information Administration (EIA) support staff regarding items associated with Form 923. SCS will visit with County staff both at the landfill and at the County administration building as necessary to complete Form 923. A draft copy of the Form 923 will be presented to the County for review prior to upload to the EIA

### 3.6 Extraction Well Liquid Level Measurements

Once per year SCS will visit each landfill gas collection well to evaluate the condition of the pneumatic pump if applicable and measure the liquid level in the well. At a minimum, the following will be measured:

- Top of well casing to ground surface;
- Top of well casing to top of liquid (if applicable);
- Top of well casing to bottom of well.

SCS will compile the collected liquid level data and prepare a report that includes graphical representations to indicate the amount of perforations that have been silted in, the amount watered in, the amount available for gas extraction, and water level trends in each well. SCS will evaluate current data and compare it to prior year's date and present to the County in conjunction with the pump counter data any recommended changes for the operation of each well as part of this report.

### Deliverables

- Draft copies of Liquid level report to County within 30 days following data collection
- · Final Report following County review and discussion at monthly meeting

# TASK 4 – ADDITIONAL ENVIRONMENTAL SERVICES (IF REQUIRED)

This task is for additional environmental services, not specified in the other tasks that may be required as a result of State and federal requirements. This task is to assist County staff with general activities associated Manatee County's Solid Waste System. Additional services could include special studies, permit modifications responding to requests from State and federal agencies or any other work required to maintain the landfill environmental permits. Storm water engineering services, surveying and studying of future filling areas, correspondence with regulatory agencies, and certifications are anticipated and included in the task.

The purpose of this task is to provide County Staff the flexibility of assigning work activities that were not included in the above tasks and to provide a vehicle for the rapid execution of services to the County as they relate to solid waste environmental requirements. Assignments under this task assignment will only be provided as authorized by County staff.

### Radford, Mike

From:	Edwards, Johnny
Sent:	Tuesday, September 8, 2020 3:04 PM
То:	Radford, Mike
Subject:	RE: Pace - 10/01/19 - 08/31/20

No attachment..

In short – According to the MPIS, we have 26 GW wells and 2 SW points at Lena. We also have 25 piezometers to monitor the hydraulic gradient across the slurry wall.

The annual compliance costs for the MPIS:

Water Quality = sampling + analytical + reporting = PACE + SCS' Annual reporting expense (include 1/5 of technical report) = \$46K + (what you pulled from our work order for WQ reporting). That's the total annual – you can divide by 28 for the prorated cost per monitoring point.

Also –we have monitoring/reporting for hydraulic gradient – that should come entirely from our work order.

Johnny Edwards SCS Engineers Orlando, FL 407-204-3233 (W) 407-497-3179 (C) wedwards@scsengineers.com

www.scsengineers.com

From: Radford, Mike <MRadford@scsengineers.com> Sent: Tuesday, September 8, 2020 2:09 PM To: Edwards, Johnny <WEdwards@scsengineers.com> Subject: RE: Pace - 10/01/19 - 08/31/20

So is the total reimbursable circled in blue supposed to be \$46k?

Thanks,

Mike Radford, P.E. SCS Engineers Orlando, FL (407) 204-3235 (W) (407) 748-2616 (C) mradford@scsengineers.com

Driven by Client Success www.scsengineers.com

From: Radford, Mike Sent: Tuesday, September 8, 2020 11:07 AM

### ATTACHMENT 2 - Hourly Fee Schedule Work Assignment 16-14 Manatee County

		Ta	Rate	Total			
Personnel	1	2	3	4	(hours)	(\$)	(\$)
Principal/Office Director	5.0	5.0	5.0	5.0	20.0	182	3,640
Project Director	15.0	36.0	44.0	30.0	125.0	179	22,375
Senior Project Manager	16.0	46.0	0.0	30.0	92.0	175	16,100
Project Manager	0.0	0.0	60.0	40.0	100.0	148	14,800
Senior Project Professional	23.5	76.0	86.0	60.0	245.5	129	31,670
Project Professional	32.5	184.0	280.0	100.0	596.5	110	65,615
Staff Professional	63.0	216.0	476.0	120.0	875.0	94	82,250
Associate Staff Professional	21.0	310.0	40.0	150.0	521.0	77	40,117
Designer/Technician	4.5	36.0	0.0	50.0	90.5	73	6,607
Drafter	15.0	0.0	0.0	50.0	65.0	55	3,575
Administrative Assistant	13.0	44.0	20.0	22.0	99.0	54	5,346
Subtotal Labor (hours)	208.5	953.0	1,011.0	657.0	2,829.5		
Subtotal Labor (\$)	22,396	94,626	108,464	66,608	6,340		292,094
Reimbursables	11,599	11,599	11,599	11,599	46,398		46,398
G&A 10 percent on subs	0	7,300	2,150	0			9,450
Total Fee Estimate	\$33,995	\$113,525	\$122,213	\$78,207			\$347,942

Notes:

Task 1 - GW Support

Task 2 - Landfill Support

Task 3 - LFG Support Services Task 4 - Miscellanous Support Services

### **REIMBURSABLE COSTS**

	Unit Cost			Task (O				
Reimbursable	(\$)	Unit	1	2	Units	(\$)		
Subconsultant-VE tests	5,500	ls	0	0	1	0	1	5,500
Subconsultant Engine test	4,000	day	0	0	2	0	2	8,000
Sub - Flare P & M	8,000	ls	0	0	1	0	1	8,000
Surveying (Aerial/Ground)	13,000	ls	0	1	0	0	1	13,000
Vehicle Mileage (Auto)	0.535	mile	0	0	0	0	0	0
Vehicle Mileage (Truck)	0.535	mile	0	0	0	0	0	0
Rental Car	0	day	0	0	0	0	0	0
Truck	75	day	0	24	60	0	84	6,300
SUV/UTV	50	day	0	0	36	0	36	1,800
JetClean	1	ls	0	60,000	0	0	60,000	60,000
Air Fare	0	each	0	0	0	0	0	0
Meal Per Diem	45	day	0	0	0	0	0	0
Lodging, Hotel	130	day	0	0	12	0	12	1,560
Postage & Freight	20	ls	0	0	6	0	6	120
Reproduction (B/W)	0.10	each	0	600	300	0	900	90
Reproduction (Color)	0.15	each	0	120	60	0	180	27
Equipment Rental -FID	185	day	0	0	8	0	8	1,480
Emissions Fee	1	ls	0	0	1,000	0	1,000	1,000
Licenses/Permits	1	T&M	0	10,000	0	0	10,000	10,000
Computer (CAD)	5	hour	24	82	40	0	146	730
CAD prints	5	each	0	0	0	0	0	0

Task 1 - GW Support	Office Director	Proj. Dir	Sr Pr Mgr	Proj. Mgr	Sr. Proj. Prof	Proj Prof	Stf Prof	Ass Staff	Designer/Technician	Drafter	Admin Asst To	otal
Erie Road LF 2nd 2019 Semi-Annual	0	0	0	0	0	0	0	0	0	0	0	
Lena Road LF 2nd 2019Semi-Annual		5	4		5	11	26	8	2	5	4	
Erie Road LF 1st 2020 Semi-Annual	0	0	0	0	0	0	0	0	0	0	0	
Lena Road LF 1st 2020 Semi-Annual		5	4		5	11	26	8	2	5	4	
Lena Technical Report 2020		1	2		1.5	2.5	5	5	0.5	3	1	
Response to comments/meeting/minor mod		4	6	į	12	8	6			2	4	
TOTAL HOURS	0	15	16	0	24	33	63	21	5	15	13	203.5
Task 2 - Landfill Support			1	1	1	1	1	1	Γ	1		
2.1 Landfill Leachate/Groundwater Gradient Report												
Measure levels in 25 piezometers and 25 monitoring wells		4	12		8			180			12	
Data upload, review, letter report preparation					16	100	120	50			12	
2.2 Lena Road Landfill Estimate of Remaining Life												
Coordinate for data from County and others		0	0	0	0	0	0	0	0	0	0	
AutoCAD volumes/drawings		0	0	0	0	0	0	0	0	0	0	
Report and calculations		0	0	0	0	0	0	0	0	0	0	
2.3 Annual Financial Assurance Update												
Draft Annual Financial Assurance Update		0	0	0	0	0	0	0	0	0	0	
Final Annual Financial Assurance Update		0	0	0	0	0	0	0	0	0	0	
2.4 Lena Road Stormwater Inspections												
Site visit/Inspections		4			16		8					
Report		4	2		12	4	8		4		4	
477. N												
2.5 5-Year Permit Update	5	24	22		24	00	90	00	22		16	
Permit app, ops plan, FA, GWMP, closure plan	5	24	32		24	80	80	80	32		16	
		ļ	ļ	ļ								
TOTAL HOUDS	-					104		210			4.4	0.52
TOTAL HOUKS	5	36	46	1 <sup>0</sup>	76	184	216	510	36	0	44	953

Task 3 - LFG Support Services										
3.1 Monthly Monitoring										<u> </u>
Monitoring					6	140				
Data upload/formatting			6	12	6	12				
Follow up readings					6	24				
Monthly report		2	4	6	40					
Monthly meeting/discussions		2	4	6	12	12				
PM		2	4	0						12
3.2 Perimeter probe Monitoring										
Monitoring					0	16				
Follow up readings					4	4				
Quarterly Report		2	6		12					<u> </u>
PM		2	6							<u> </u>
										<u> </u>
3.3 SEM Monitoring										<u> </u>
Monitoring			8		0	36				+
Follow up readings			0		4	6				<u>+</u>
Quarterly Report		2		6	12	0				<u>+</u>
PM		2		6	12					+
1 101		2		0						+
Flare P.M. coordination/oversite										
Thate I wild coordination/oversite										+
										+
2.4 Title V Depenting										+
3.4.1 Somi Annual Deporting										+
5.4.1 Semi Annual Reporting						0				<u>+</u>
		2		0	0	8				<u>+</u>
Draft Report		2	4	8	8	16				<u> </u>
Eidts to Draft		-			4	6				
Final Report and submission		2	2		2	2				
PM		1								
										<u> </u>
3.4.2 Annual Operating Report										<u> </u>
Data compilation						8				<u> </u>
Draft Report		2		2	8	16				<u> </u>
Eidts to Draft					4	6				
Final Report and submission		1	2	4	2	2	ļ			<b></b>
PM		1		4						<u></u>
2 4 2 Annual Emissions for Donouting										+
3.4.3 Annual Emissions fee Reporting						0			1	+
Review fee satement		1			2	0				<u> </u>
Coordinate check and payment		1			2	0		1		2
										<u> </u>
3.4.4 Annual Staement of Compliance										<u> </u>
Data compilation						16				1
				•						·•

Draft Report		2			3	8	16					
Eidts to Draft						4	6				<u> </u>	
Final Report and submission		1		2	3	2	2					
PM		1										
3.4.5 Annual GHG Reporting												
Data compilation				2		8	16					
Draft Report		2			2	8	12					
Eidts to Draft						4	6				<u> </u>	
Final Report and submission		1		2	4	2	2				<u> </u>	
PM		1			4						<u> </u>	
											<u> </u>	
3.5 Annual Testing and reporting												
VE Testing- Bag house- Coordination/Supervision		1		0	0	3	6					
VE Testing Flare Coordination/Supervision		1		2	0	3	6					
VE Testing Sludeg Dryer Coordination/Supervision		2		0	0	3	6					
Performance Testing- Engine- Coordination/Supervision		2		2	4	6	12					
Annual EIA Forms				0	4	8	16					
Reporting of tests		2		2	4	20						
PM		2			4						6	
3.6 Liquid level Testing and Reporting												
Filed prep						4						
Take liquid levels all wells						40	40	40	1			
Compile data and prepare report						20						
Review draft report edits				2		2						
finalize report - deliver	5	1				1						
TOTAL HOURS	5	44	0	60	86	280	476	40	0	0	20	1011
Task 4 - Miscellanous Support Services												
		I	1	1		1	1	I	1	1	<del>.                                    </del>	
unknown	5	30	30	40	60	100	120	150	50	50	22	
Activity Description	_											
Activity Description												
Activity Description	_											
Activity Description	_											
	_											
	_											
					ļ							
					1				i			
TOTAL HOURS	5	30	30	40	60	100	120	150	50	50	22	657

### Attachment 8

# Florida Jetclean - Jetclean America

# 7538 Dunbridge Drive Odessa, FL 33556 800-226-8013

## **Bill To**

SCS Engineers 3922 Coconut Palm Drive Suite 102 Tampa, FL 33619

# Invoice

Svc Date	Due Date	Invoice #
8/10/2020	9/9/2020	13791

	-	_
Sh	lip	То

Manatee County Lena Road Landfill Stages I-III

P.O. No.	Terms	Project Information
SO 09-05540	Net 30	LCS Pipe Jet Video

Date(s)	Description	Amount
8/3/20 - 8/4/20	High-pressure water-jetting of $\sim$ 38,633 lf of existing HDPE leachate collection piping at Stages I – III	27,418.48
8/10/20	Explosion-proof video-inspection of above piping (up to 2,000 LF)	2,500.00
	*** Report Provided Via Email To Johnny Edwards *** *** Video On Flash Drive Left On Site With County Officials ***	
	<b>RECEIVED</b> By 2862pjf at 2:39 pm, Aug 10, 2020	
	Project 09217088.18	
	Project	
	Description	
	VendorVoucher	
	Approved	
Thank you for your bu	siness. APPROVED By 4784wje at 9:17 am, Aug 13, 2020 otal	\$29,918.48

- All major credit cards accepted with 4.5% processing fee.

- Please pay against invoice, no statement will be sent.

Attachment 9: FDOT Type B Fencing and Slide Gate

CESPO05 07/22/2019-07.00.04

### Florida Department of Transportation Item Average Unit Cost From 2019/01/01 to 2019/06/30

Contract Type: CC STATEWIDE Displaying: VALID ITEMS WITH HITS From: 0102 1 To: 9999999

Thom	No. of	Weighted	Total	Total	Unit		Description
		Average		Qualitity	meas		
0550 10218	1	\$15.00	\$3,675.00	245.000	LF	Ν	FENCING, TYPE B, 0.0-5.0', RESET EXIST
0550 10220	8	\$18.26	\$95,699.66	5,242.000	LF	Ν	FENCING, TYPE B, 5.1-6.0', STANDARD
0550 10221	3	\$19.93	\$264,625.00	13,279.000	LF	N	FENCING, TYPE B, 5.1-6.0', W/ BARB ATTMT
0550 10228	1	\$31.50	\$9,135.00	290.000	LF	N	FENCING, TYPE B, 5.1-6.0, RESET EXISTING
0550 10232	1	\$52.00	\$2,236.00	43.000	LF	Ν	FENCING, TYPE B, 6.1-7.0, W/VINYL COATIN
0550 10240	1	\$55.00	\$2,695.00	49.000	$_{ m LF}$	Ν	FENCING, TYPE B, 7.1-8.0', STANDARD
0550 10248	2	\$34.08	\$31,525.00	925.000	LF	Ν	FENCING, TYPE B, 7.1-8.0, RESET EXISTING
0550 10315	1	\$100.00	\$342,700.00	3,427.000	LF	Ν	FENCING, TYPE R, 0-5.0', VERTICAL
0550 10325	1	\$78.75	\$28,980.00	368.000	LF	Ν	FENCING, TYPE R, 5.1-6.0', VERTICAL
0550 10343	1	\$237.00	\$84,846.00	358.000	LF	Ν	FENCING, TYPE R, 7.1-8.0, W/FULL ENCLOS
0550 10344	2	\$134.52	\$315,314.00	2,344.000	LF	Ν	FENCING, TYPE R, 7.1-8.0, W/PART ENCLOS
0550 10353	1	\$173.00	\$162,966.00	942.000	LF	Ν	FENCING, TYPE R, 8.1-10', W/FULL ENCLOS
0550 10918	1	\$20.00	\$1,880.00	94.000	LF	Ν	FENCING,SPECIAL TYP, 0.0-5.0', RESET EXI
0550 60112	1	\$358.00	\$5,012.00	14.000	EA	Ν	FENCE GATE, TYP A, SGL, 6.1-12' OPENING
0550 60123	2	\$2,310.83	\$43,905.69	19.000	EA	Ν	FENCE GATE, TYP A, DBL, 12.1-18' OPENING
0550 60126	1	\$4,355.87	\$4,355.87	1.000	EA	Ν	FENCE GATE, TYP A, DBL, 24.1-30.' OPENING
0550 60211	3	\$1,285.71	\$9,000.00	7.000	EA	Ν	FENCE GATE, TYP B, SGL, 0- 6.0' OPENING
0550 60212	3	\$1,267.67	\$7,606.00	6.000	EA	Ν	FENCE GATE, TYP B, SGL, 6.1-12.0' OPENING
0550 60213	1	\$1,000.00	\$1,000.00	1.000	EA	Ν	FENCE GATE, TYP B, SGL, 12.1-18.0' OPENING
0550 60222	2	\$1,975.00	\$3,950.00	2.000	EA	Ν	FENCE GATE, TYP B, DBL, 6.1-12.0' OPENING
0550 60225	1	\$1,000.00	\$1,000.00	1.000	EA	Ν	FENCE GATE, TYP B, DBL, 20.1-24' OPENING
0550 60232	2	\$6,306.67	\$18,920.00	3.000	EA	Ν	FENCE GATE, TYP B, SLIDE/CANT, 6.1-12'OPEN
0550 60235	1	\$6,050.00	\$24,200.00	4.000	EA	N	FENCE GATE, TYP B, SLIDE/CANT, 20.1-24'OPEN
0550 60400	1	\$1,500.00	\$1,500.00	1.000	EA	N	FENCE GATE, RESET EXISTING
0550 60513	1	\$4,500.00	\$18,000.00	4.000	EA	Ν	FENCE GATE, METAL, SGL, 12.1-18.0' OPENING
0561 1	8	\$1,418.49	\$5,927,855.80	4,179.000	TN	Ν	COATING EXISTING STRUCTURAL STEEL
0561 2	1	\$220.00	\$154,000.00	700.000	SF	Ν	COATING EXISTING STRUCTURAL STEEL
0570 1 1	21	\$.75	\$667,576.08	886,528.000	SY	Ν	PERFORMANCE TURF
0570 1 2	121	\$2.46	\$7,381,842.93	2,998,802.000	SY	Ν	PERFORMANCE TURF, SOD
0571 1 11	5	\$4.64	\$43,639.25	9,406.000	SY	Ν	PLASTIC EROSION MAT, TRM, TYPE 1
0571 1 12	1	\$3.40	\$965.60	284.000	SY	Ν	PLASTIC EROSION MAT, TRM, TYPE 2
0580 1 1	5	\$28,784.32	\$143,921.60	5.000	LS	Ν	LANDSCAPE COMPLETE- SMALL PLANTS
0580 1 2	6	\$37,870.42	\$227,222.50	6.000	LS	Ν	LANDSCAPE COMPLETE- LARGE PLANTS
0580 2 1	1	\$7,000.00	\$14,000.00	2.000	EA	Ν	LANDSCAPE- RELOCATE TREE, PALMS <14'
0580 2 2	4	\$1,749.54	\$31,491.66	18.000	EA	Ν	LANDSCAPE- RELOCATE TREE, PALMS >14'
0580 2 4	2	\$1,008.41	\$18,151.30	18.000	EA	N	LANDSCAPE- RELOCATE TREE, TREES <5"
0580 2 5	2	\$1,331.53	\$62,582.08	47.000	EA	N	LANDSCAPE- RELOCATE TREE, TREES >5"
0580 2 7	2	\$603.19	\$14,476.44	24.000	EA	N	LANDSCAPE- RELOCATE TREE, PALMS <14' SAB
0580 2 8	3	\$527.58	\$19,520.60	37.000	EA	N	LANDSCAPE- RELOCATE TREE, PALMS >14' SAB
0581 1 1	1	\$925.00	\$58,275.00	63.000	EA	Ν	RELOCATE TREES & PALMS, PALM <14'

**Page:** 17

Primary Ref.     EXPENSE     FY     Post Date     PE ID     DR       JL     JL Obj     JL-PR.     FY     Date2     Job Number     PeDB     CR       Transaction Description     CK     ID-No.     2nd Ref.     Misc     Units	
JLJL ObjJL-PR.FYDate2Job NumberPeDBCRTransaction DescriptionCKID-No.2nd Ref.MiscUnits	
Transaction Description CK ID-No. 2nd Ref. Misc Units	
Batch ID     JeACG TrACG     Contract     Sb     Prep     Work Order No	
4800010900 - Landfill Operations	
531000 - Professional services	
1955552/52     05     2020     12/16/2019     V016092     49.00       1     N/A     N/A     12/16/10     02     2020     12/06/2010     9021727     D     0.00	
JL N/AN/A 12/10/19 05 2020 12/00/2019 6021757 P 0.00	
PACE ANALYTICAL 2540C TOTAL DI AP 01091297 B2022083 7.00	
KPC1/19F OH KPRICE	
1935332/32 03 2020 12/16/2019 V018092 40.25	
JL N/AN/A 12/16/19 03 2020 12/06/2019 8021/3/ P 0.00	
PACE ANALYTICAL 300.0 IC ANION AP 01091297 B2022083 7.00	
KPC1719F OH KPRICE	
1935332732 03 2020 12/16/2019 V018092 49.00	
JL N/AN/A 12/16/19 03 2020 12/06/2019 8021737 P 0.00	
PACE ANALYTICAL 350.1 AMMONIA AP 01091297 B2022083 7.00	
KPC1719F OH KPRICE	
1935332732 03 2020 12/16/2019 V018092 40.25	
JL N/AN/A 12/16/19 03 2020 12/06/2019 8021737 P 0.00	
PACE ANALYTICAL 323.2 NITROGE AP 01091297 B2022083 7.00	
KPC1719F OH KPRICE	
1935332732 03 2020 12/16/2019 V018092 285.60	
JL N/AN/A 12/16/19 03 2020 12/06/2019 8021737 P 0.00	
PACE ANALYTICAL 6010 ICP METAL AP 01091297 B2022083 7.00	
KPC1719F OH KPRICE	
1935332732 03 2020 12/16/2019 V018092 119.00	
JL N/AN/A 12/16/19 03 2020 12/06/2019 8021737 P 0.00	
PACE ANALYTICAL 6020 ICPMS MET AP 01091297 B2022083 7.00	
KPC1719F OH KPRICE	
1935332732 03 2020 12/16/2019 V018092 84.00	
19999992792         03         2020         12/10/2019         0010092         010092           11         N/A         12/16/10         03         2020         12/06/2019         9021737         P         0.00	
DACE ANALYTICAL 7470 MEDCUDY AD 01001207 B2022002 7 00	
PACE ANALITICAL 7470 MERCORT AF 01091297 D2022003 OL KDDICE	
NPCI/19F ОП NPRICE	
1935332/32     03     2020     12/16/2019     V018092     154.00	
JL IN/AIN/A 12/10/13 U3 2020 12/00/2013 8021/3/ P 0.00	
PACE ANALYTICAL 8011 CGS EDB D AP 01091297 B2022083 7.00	
KPC1719F OH KPRICE	
1935332732 03 2020 12/16/2019 V018092 469.00	
JL N/AN/A 12/16/19 03 2020 12/06/2019 8021737 P 0.00	
PACE ANALYTICAL 8260 MSV AP 01091297 B2022083 7.00	
KPC1719F OH KPRICE	

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Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
1935332732	03	2020	12/16/2019	V018092			637.50	
JL N/AN/A 12/16/19	03	2020	12/06/2019	8021737	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01091297	B2022083			8.50	
KPC1719F					OH	KPRICE		
2035361653	09	2020	06/19/2020	V018092			21.00	
JL N/AN/A 06/19/20	09	2020	06/09/2020	8321840	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01103006	B2026086			3.00	
KP62320C					OH	KPRICE		
2035361653	09	2020	06/19/2020	V018092			10.20	
JL N/AN/A 06/19/20	09	2020	06/09/2020	8321840	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01103006	B2026086			3.00	
KP62320C					OH	KPRICE		
2035361653	09	2020	06/19/2020	V018092			13.60	
JL N/AN/A 06/19/20	09	2020	06/09/2020	8321840	Р		0.00	
PACE ANALYTICAL 6020 ICPMS MET		AP	01103006	B2026086			4.00	
KP62320C					OH	KPRICE		
2035361653	09	2020	06/19/2020	V018092			712.50	
JL N/AN/A 06/19/20	09	2020	06/09/2020	8321840	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01103006	B2026086			9.50	
KP62320C					ОН	KPRICE		
2035362308	09	2020	06/19/2020	V018092			13.60	
JL N/AN/A 06/19/20	09	2020	06/11/2020	8321840	Р		0.00	
PACE ANALYTICAL 200.7 ICP META		AP	01103006	B2025966			4.00	
KP62320C					OH	KPRICE		
2035362308	09	2020	06/19/2020	V018092			28.00	
JL N/AN/A 06/19/20	09	2020	06/11/2020	8321840	Р		0.00	
PACE ANALYTICAL 2540D TOTAL SU		AP	01103006	B2025966			4.00	
KP62320C					ОН	KPRICE		
JE20001317	10	2020	07/10/2020	V018092			10,577.80	
JL N/AN/A 07/27/20	10	2020	04/28/2020	8378479	Р		0.00	
CORR O/C PACE ANALYTICAL		AP	01099974				0.00	
JERB72420D					JE	RBOTHAS		
JE20001317	10	2020	07/10/2020	V018092			9,260.35	
JL N/AN/A 07/27/20	10	2020	05/26/2020	8378479	Р		0.00	
CORR O/C PACE ANALYTICAL		AP	01101541				0.00	
JERB72420D					JE	RBOTHAS		

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GL Transaction Details (Long)

Primary Ref. JL JL Key Transaction Desc Batch ID	JL Obj cription	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB	Misc Prep		DR CR Units Work Order No	
JE20001317		10	2020	07/10/2020	V018092				1,997.40	
JL N/AN/A	07/27/20	10	2020	06/02/2020	8378479	Р			0.00	
CORR O/C PACE	ANALYTICAL		AP	01101902					0.00	
JERB72420D						JE	RBOTHAS			
						*** Object	Totals ***	DR	24,562.05	
								CR	0.00	
								Net	24,562.05	
	*** EN Net ***	54	40,112.9	96	***	Object Totals	with EN ***		564,675.01	
					Annua profes servic	al costs ur ssional œs	ider			

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### GL Transaction Details (Long)

Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
4800010900 - Landfill Operations								
534000 - Other contractual sci	/ <u>s</u>	2020	04/24/2020	V018002			62.00	
	07	2020	11/20/2010	V010092	р		0.00	
	07	2020	01000074	0237040	P		0.00	
		Ar	01099974	B2023070		KDDICE	9.00	
NP42020J	07	2020	04/24/2020	V019002	ОП	NPRICE	E1 75	
1955551450 11 N/A N/A 04/24/20	07	2020	11/20/2010	8237040	D		0.00	
	07	2020 AD	01000074	B2025070	Г		0.00	
			01099974	D2023070		VDDICE	5.00	
1025221456	07	2020	04/24/2020	V018002	OII	RENICE	62.00	
	07	2020	11/20/2010	VU10092	D		0.00	
	07	2020 AD	01000074	8237040 B2025070	Г		0.00	
		Ar	01099974	B2023070		VDDICE	9.00	
NP42020J	07	2020	04/24/2020	V019002	ОП	NPRICE	E1 75	
1955551450 11 N/A N/A 04/24/20	07	2020	11/20/2010	8237040	D		0.00	
	07	2020 AD	01000074	B2025070	Г		0.00	
KD428201			01055571	02023070	ОH	KDDICE	5.00	
1025221456	07	2020	04/24/2020	V019002	OII	RENICE	207 20	
1955551450 11 N/A N/A 04/24/20	07	2020	11/20/2010	8237040	D		0.00	
	07	2020 AD	01000074	B2025070	Г		0.00	
			01099974	D2023070	ОН	KDDICE	5.00	
1035331456	07	2020	04/24/2020	V/018092	OII	RENICE	153.00	
1 N/A N/A 04/24/20	07	2020	11/30/2019	8237040	P		155.00	
	07	2020 AP	01099974	B2025070	·		9.00	
KP428201		7.4	0100007	52020070	ОН	KPRICE	5100	
1025231//56	07	2020	04/24/2020	V018002	OII	KINCE	108.00	
1955551 <del>4</del> 50 11 N/A N/A 04/24/20	07	2020	11/30/2010	8237040	D		108.00	
	07	2020 AD	01000074	B2025070	Г		0.00	
KP428201			01099974	D2023070	ОН	KPRICE	9.00	
1935331456	07	2020	04/24/2020	V018092	OII	KI KICL	198.00	
1 N/A N/A 04/24/20	07	2020	11/30/2019	8237040	P		0.00	
PACE ANALYTICAL 8011 GCS FDB D	0,	ΔP	01099974	B2025070			9.00	
KP428201		7.4	51033371	0200,0	ОН	KPRICE	5.00	
1035331456	07	2020	04/24/2020	V018092	011		603.00	
	07	2020	0 <del>1</del> /24/2020	8237040	D		00.200	
	07	2020 AD	11/00/2019	B2025070	Г		0.00	
KP428201			010 <i>333</i> 77	22023070	OH	KPRICE	9.00	
						NENICE		

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Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
1935331456	07	2020	04/24/2020	V018092			825.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			70.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			57.50	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 300.0 IC ANION		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			70.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			57.50	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 353.2 NITROGEN		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			442.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			170.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 6020 ICPMS MET		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			120.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 7470 MURCURY		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			220.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01099974	B2025070			10.00	
КР42820Ј					OH	KPRICE		

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Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
1935331456	07	2020	04/24/2020	V018092			670.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			750.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01099974	B2025070			10.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			77.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			63.25	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 300.0 IC ANION		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			77.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			63.25	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL NITROGEN, NO2/		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			486.20	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			187.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 6020 ICPMS MET		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			132.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 7470 MURCURY		AP	01099974	B2025070			11.00	
КР42820Ј					OH	KPRICE		

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Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
1935331456	07	2020	04/24/2020	V018092			242.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01099974	B2025070			11.00	
KP42820J					ОН	KPRICE		
1935331456	07	2020	04/24/2020	V018092			737.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			825.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01099974	B2025070			11.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			416.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 1631E MURCURY,		AP	01099974	B2025070			8.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			28.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			28.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 2540D TOTAL SU		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			28.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01099974	B2025070			4.00	
KP42820J					ОН	KPRICE		
1935331456	07	2020	04/24/2020	V018092			23.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 353.2 NITROGEN		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			34.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 365.4 TOTAL PH		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
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Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
1935331456	07	2020	04/24/2020	V018092			48.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 410.4 COD		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			48.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 5120B BOD		AP	01099974	B2025070			4.00	
КР42820Ј					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			56.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 5310B TOC		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			208.80	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			81.60	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 6020 ICPMS MET		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			88.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			268.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			36.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL 9222D FECAL CO		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			96.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL CHLOROPHYLL &		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		

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Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB	Misc Prep	DR CR Units Work Order No	
1935331456	07	2020	04/24/2020	V018092			450.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01099974	B2025070			6.00	
KP42820J					OH	KPRICE		
1935331456	07	2020	04/24/2020	V018092			60.00	
JL N/AN/A 04/24/20	07	2020	11/30/2019	8237040	Р		0.00	
PACE ANALYTICAL TOTAL NITROGEN		AP	01099974	B2025070			4.00	
KP42820J					OH	KPRICE		
2035337082	07	2020	04/24/2020	V018092			21.00	
JL N/AN/A 04/24/20	07	2020	01/06/2020	8237040	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01099974	B2025066			3.00	
KP42820J					OH	KPRICE		
2035337082	07	2020	04/24/2020	V018092			3.40	
JL N/AN/A 04/24/20	07	2020	01/06/2020	8237040	Р		0.00	
PACE ANALYTICAL 6010 IPC METAL		AP	01099974	B2025066			1.00	
KP42820J					OH	KPRICE		
2035337082	07	2020	04/24/2020	V018092			525.00	
JL N/AN/A 04/24/20	07	2020	01/06/2020	8237040	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01099974	B2025066			7.00	
KP42820J					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			91.00	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			74.75	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 300.0 IC ANION		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			91.00	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			74.75	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 353.2 NITROGEN		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		

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GL Transaction Details (Long)

Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
2035357219	08	2020	05/19/2020	V018092			574.60	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01101541	B2025523			13.00	
KP52620A					ОН	KPRICE		
2035357219	08	2020	05/19/2020	V018092			221.00	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 6020 ICPMS MET		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			156.00	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 7470 MERCURY		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			286.00	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			871.00	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01101541	B2025523			13.00	
KP52620A					OH	KPRICE		
2035357219	08	2020	05/19/2020	V018092			843.75	
JL N/AN/A 05/19/20	08	2020	05/12/2020	8274938	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01101541	B2025523			11.25	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			91.00	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			74.75	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 300.0 IC ANION		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			91.00	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		

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GL Transaction Details (Long)

Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
2035357372	08	2020	05/19/2020	V018092			74.75	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 353.2 NITROGEN		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			574.60	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			221.00	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 6020 ICP METAL		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			156.00	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 7470 MERCURY		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			286.00	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			871.00	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01101541	B2025547			13.00	
KP52620A					OH	KPRICE		
2035357372	08	2020	05/19/2020	V018092			862.50	
JL N/AN/A 05/19/20	08	2020	05/13/2020	8274938	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01101541	B2025547			11.50	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			28.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 254OC TOTAL DI		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			23.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 300.0 IC ANION		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		

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GL Transaction Details (Long)

Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB	Misc Prep	DR CR Units Work Order No	
2035357419	08	2020	05/19/2020	V018092			28.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			23.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 353.2 NITROGEN		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			176.80	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 6010 ICP META		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			68.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 6020 ICMPS MET		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			48.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 7470 MERCURY		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			88.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			268.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01101541	B2025550			4.00	
KP52620A					OH	KPRICE		
2035357419	08	2020	05/19/2020	V018092			412.50	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01101541	B2025550			5.50	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			49.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01101541	B2025552			7.00	
KP52620A					OH	KPRICE		

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GL Transaction Details (Long)

Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB	Misc Prep	DR CR Units Work Order No	
2035357420	08	2020	05/19/2020	V018092			40.25	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 300.0 IC ANION		AP	01101541	B2025552			7.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			49.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01101541	B2025552			7.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			40.25	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 353.2 NITROGEN		AP	01101541	B2025552			7.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			285.60	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01101541	B2025552			7.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			119.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 6020 ICPMS MET		AP	01101541	B2025552			7.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			84.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 7470 MERCURY		AP	01101541	B2025552			7.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			88.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01101541	B2025552			4.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			268.00	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01101541	B2025552			4.00	
KP52620A					OH	KPRICE		
2035357420	08	2020	05/19/2020	V018092			487.50	
JL N/AN/A 05/19/20	08	2020	05/14/2020	8274938	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01101541	B2025552			6.50	
KP52620A					OH	KPRICE		

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GL Transaction Details (Long)

Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB	Misc Prep	DR CR Units Work Order No	
2035358671	08	2020	05/29/2020	V018092			416.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 1631 LOW LEVEL		AP	01101902	B2025734			8.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			28.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 2540C TOTAL DI		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			28.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 2540D TOTAL SU		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			28.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 350.1 AMMONIA		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			23.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 353.2 NITROGEN		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			34.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 365.4 TOTAL PH		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			48.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 410.4 COD		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			48.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 5210B BOD		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			56.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 5310B TOC		AP	01101902	B2025734			4.00	
KP60220E					ОН	KPRICE		

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GL Transaction Details (Long)

Primary Ref. JL JL Key JL Obj Transaction Description Batch ID	GL-PR. JL-PR.	FY FY CK	Post Date Date2 ID-No. JeACG TrACG	PE ID Job Number 2nd Ref. Contract	PeDB Sb	Misc Prep	DR CR Units Work Order No	
2035358671	08	2020	05/29/2020	V018092			208.80	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 6010 ICP METAL		AP	01101902	B2025734			4.00	
KP60220E					ОН	KPRICE		
2035358671	08	2020	05/29/2020	V018092			81.60	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 6020 ICPMS MET		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			88.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 8011 GCS EDB D		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			268.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 8260 MSV		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			36.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL 92222D FECAL C		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			96.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL CHLOROPHYLL &		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
2035358671	08	2020	05/29/2020	V018092			450.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL FIELD TECHNICI		AP	01101902	B2025734			6.00	
KP60220E					ОН	KPRICE		
2035358671	08	2020	05/29/2020	V018092			60.00	
JL N/AN/A 05/29/20	08	2020	05/21/2020	8289887	Р		0.00	
PACE ANALYTICAL TOTAL NITROGEN		AP	01101902	B2025734			4.00	
KP60220E					OH	KPRICE		
JE20001317	10	2020	07/10/2020	V018092			0.00	
JL N/AN/A 07/27/20	10	2020	04/28/2020	8378479	Р		10,577.80	
CORR O/C PACE ANALYTICAL		AP	01099974				0.00	
JERB72420D					JE	RBOTHAS		

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GL Transaction Details (Long)

10/01/2019 to 08/31/2020

Primary Ref. JL JL Key	JL Obj	GL-PR. JL-PR.	FY FY	Post Date Date2	PE ID Job Numb	er PeDB	N.C.		DR CR	
I ransaction Des	scription		СК	ID-NO.	2nd Ref.		MISC		Units	
Batch ID				Jeacg Tracg	Contract	Sb	Prep		Work Order No	
JE20001317		10	2020	07/10/2020	V018092				0.00	
JL N/AN/A	07/27/20	10	2020	05/26/2020	8378479	Р			9,260.35	
CORR O/C PACE	ANALYTICAL		AP	01101541					0.00	
JERB72420D						JE	RBOTHAS			
JE20001317		10	2020	07/10/2020	V018092				0.00	
JL N/AN/A	07/27/20	10	2020	06/02/2020	8378479	Р			1,997.40	
CORR O/C PACE	ANALYTICAL		AP	01101902					0.00	
JERB72420D						JE	RBOTHAS			
						*** Object	t Totals ***	DR	21,835.55	
								CR	21,835.55	
								Net	-0.00	
	*** EN Net ***	21	2,813.9	97		*** Object Totals	with EN ***		212,813.97	
					Annual o	costs under				

contracted services

# MANATEE COUNTY GOVERNMENT INTENT TO NEGOTIATE

NOTICE OF INTENT TO AWARD									
SOLICITATION	RFP 17-2234BLS	AUTHORIZED BY DATE	Theresa Webb 12/10/201						
DEPARTMENT	Utilities, Recycle Division	CONSEQUENCES IF DEFERRED	N/A						
PURCHASING REPRESENTATIVE	Bonnie Sietman, Contracts Negotiator x3046	DATE CONTRACT SHALL BE AWARDED	Upon Completion of Successful Negotiations						
SUBJECT	Collection and Removal of Household Hazardous Waste (HHW)	DATE POSTED	MC x DS x 12/21/17 CC TB						

Notice of Intent to Negotiate with Clean Harbor's Environmental Services - Bartow, Florida.

ENABLING/REGULATING AUTHORITY

Manatee County Code of Laws

#### BACKGROUND/DISCUSSION

#### PROJECT BACKGROUND:

Manatee County issued a Request for Proposal to provide for the Collection and Disposal of Household Hazardous Waste (HHW), as required by Manatee County. Agreement shall provide collection, identification, removal, transportation and proper disposal of Household Hazardous Wastes generated from residents of Manatee County through scheduled collection events.

#### SOLICITATIONS:

The RFP was released on MyManatee, Demand Star and the Manatee County Chamber of Commerce. Three (3) proposals were received from:

- 1) Care Environmental Corporation, Orlando, Florida
- 2) Clean Harbors Environmental Services, Bartow, Florida
- 3) US Ecology, EQ Florida Inc., Tampa, Florida

#### EVALUATION COMMITTEE (VOTING) MEMBERS:

- 1) Sherilyn Burris, Emergency Management Chief, Public Safety Department
- 2) Ivan Groom, Redevelopment Coordinator, Redevelopment & Economic Opportunity Department
- 3) Scott Wood, Recycling & Special Waste Collection Supervisor, Utilities Department

ATTACHMENTS			4800 Term	011000-534000 Agreement
(List in order of attached)	•	FUNDING SOURCE (Acct Number & Name)		Funds Verified Insufficient Funds
COST	Annual estimate: \$400,000 x five (5) years = \$2,000,000	AMT/FREQ OF RECURRING COSTS (Attach Fiscal Impact Statement)	N/A	

#### NON-VOTING MEMBERS:

- 1) Bonnie Sietman, Contracts Negotiator, Financial Management Department, Procurement Division
- 2) Mary DeJesus, Recycling Program Coordinator, Utilities Department

#### **EVALUATION RESULTS:**

The Evaluation Committee convened on November 28, 2017 and reviewed procedural guidelines and responsibilities. Two members of the public were present; Mr. Curt DeBrunner from US Ecology, EQ Florida Inc. and Mr. Ed Gornik from Clean Harbors Environmental Services. The Committee proceeded to discuss the strengths and weaknesses of each of the three proposers. After discussion, the Committee members deemed Care Environmental Corporation to not be acceptable for further consideration:

- Limited collection experience in Florida
- No on-line program
- Ability to staff County event was unclear (if additional personnel needed, 2-hour response time)
- Not completely responsive in their proposal

Based on the content of the two remaining written proposals submitted by US Ecology, EQ Florida Inc. and Clean Harbors Environmental Services the Committee felt it had adequate information and voted 2-1 to recommend an intent to negotiate with Clean Harbors Environmental Services based on the following:

- Emergency collection program procedures
- Recycle program for fuel
- Environmental sustainability
- Substantial Florida experience
- On-line waste tracking at a single location
- Organized re-cycle program for Manatee County

The resulting agreement shall be managed by the Utilities Recycling & Special Waste Collection Division.

#### ESTIMATED ANNUAL COST OF SERVICES:

#### 1) \$400,000

2) Five-year agreement estimate - \$2,000,000

#### FUNDING ACCOUNT:

Utilities Department, Recycle Division - Account Key 4800011000-534000

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#### AMENDMENT NUMBER 3

#### CONTRACT Y17-1035, MOWING OF CLOSED AREAS AT ORANGE COUNTY LANDFILL

Effective date: June 15, 2020

1. The referenced contract is hereby renewed as follows:

From: June 15, 2020 through June 14, 2021.

2. All other specifications, terms and conditions, prices and percentage discounts remain unchanged.

**ARISTOCUTS LAWN & GARDEN** SERVICES, INC. ignature Typed Name inted/

Title

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Date

ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS

Signature

Melisa Vergara, CPPB

Senior Contracting Agent

22 Date

# AMENDMENT NUMBER 2

#### CONTRACT Y17-1035, MOWING OF CLOSED AREAS AT ORANGE COUNTY LANDFILL

Effective date: June 15, 2019

The referenced contract is hereby renewed as follows: 1.

From: June 15, 2019 through June 14, 2020.

All other specifications, terms and conditions, prices and percentage 2. discounts remain unchanged.

**ARISTOCUTS LAWN & GARDEN** SERVICES, INC.

ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS

Signature

Name Printed vped

Title

Date

Signature

Melisa Vergara, CPPB

Senior Purchasing Agent

Date

#### AMENDMENT NUMBER 1

# CONTRACT Y17-1035, MOWING OF CLOSED AREAS AT ORANGE COUNTY LANDFILL

Effective date: June 15, 2018

1. The referenced contract is hereby renewed as follows:

From: June 15, 2018 through June 14, 2019.

2. All other specifications, terms and conditions, prices and percentage discounts remain unchanged.

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Signature

Melisa Vergara, CPPB

Printed/Typed Name

Title

Date

Senior Purchasing Agent

Date



PROCUREMENT DIVISION CARRIE WOODELL, MPA, CFCM, CPPO, C.P.M., APP, Manager 400 E South Street 2<sup>nd</sup> Floor \* Reply To: Post Office Box 1393, Orlando, FL 32802-1393 PH: 407-836-5635 FAX: 407-836-5899

#### TERM CONTRACT NO. Y17-1035-MV MOWING OF CLOSED AREAS AT OC LANDFILL

TO: Aristocuts Lawn & Garden Services, Inc. Attn: Jeanette Aylor 1626 Waterwitch Drive Orlando, FL 32806

This is to inform you that the Orange County Board of County Commissioners hereby enters into a term contract subject to the following:

# TERMS AND CONDITIONS

1. Acceptance:

This contract is our acceptance of your offer in response to our Invitation for Bids No. **Y17-1035-MV, MOWING OF CLOSED AREAS AT OC LANDFILL - Term Contract**, and is subject to all terms and conditions therein.

- 2. Term of Contract:
  - A. This is a term contract for the time period specified in the referenced Invitation for Bids, for the products/services covered by this contract. The County is not obligated to purchase any minimum amount of products or services, unless otherwise stipulated in the Invitation for Bids.
  - B. This contract is effective JUNE 15, 2017, and shall remain in effect through JUNE 14, 2018. The estimated contract award for this period is \$106,500.
  - C. This contract may be renewed upon mutual agreement as provided in the Invitation for Bids. Any amendments to this contract must be in writing and signed by both parties. Such amendment(s) must be signed by the representative of the Orange County Procurement Division to be valid, binding, and enforceable.
  - D. This contract may be cancelled or terminated as provided for in the Invitation for Bids.

- 3. Ordering against Contract:
  - A. Unless otherwise specified in the Invitation for Bids, the County will place orders by issuance of a numbered Delivery Order against this contract. Each Delivery Order will specify the quantity, description and location for delivery.
  - B. The obligations of Orange County under this contract are subject to need and availability of funds lawfully appropriated for its purpose by the Board of County Commissioners.
- 4. Taxes:

The County has the following tax exemption certificates assigned.

- A. Certificate of Registry No. 59-70-004K for tax free transactions under Chapter 32, Internal Revenue Code;
- B. Florida Sales and Use Tax Exemption Certificate No. 85-8012622266C-0.
- 5. Invoicing:
  - A. Invoices must be submitted, in duplicate, referencing this contract number and the Delivery Order to:

Orange County Utilities Solid Waste Division Procurement Coordinator 5901 Young Pine Rd. Orlando, FL 32829 Phone 407 836-6653

- B. Invoices against this contract are authorized only at the prices stated in your bid response, unless otherwise provided in the Invitation for Bids.
- 6. All requirements contained in any addenda to the solicitation for this procurement are part of and hereby incorporated into this contract.

BOARD OF COUNTY COMMISSIONERS ORANGE COUNTY, FLORIDA

ara BY: Melisa Vergara, CPPB **Procurement Division** 10/0/17 DATE:

Includes approximately 316 BID RESPONSE FAC IFB #Y17-1035-MV The Contractor shall provide all labor and other resources necessary to provide the



TOTAL

PRICE

\$106,500.00

\$106,500.00

12 =

The Contractor shall provide all labor and other resources necessary to provide the services in strict accordance with the scope of work/services defined in this solicitation for the amounts specified in this Bid Response Form, inclusive of overhead, profit and any other costs.

PRICE

PER MONTH

\$<u>\$,875+00</u> x 12 =

# ITEM NO. DESCRIPTION

 Exterior Landscape Management at the Orange County Landfill at 12100 Young Pine Road. Orlando, FL as specified.

ESTIMATED TOTAL BID (ITEM 1)

restocuto

Company Name

IMPORTANT NOTE: When completing your bid, do not attach any forms which may contain terms and conditions that conflict with those listed in the County's bid documents(s). Inclusion of additional terms and conditions such as those which may be on your company's standard forms shall result in your bid being declared non-responsive as these changes will be considered a counteroffer to the County's bid.

Performance shall be not later than thirty (30) calendar days After Receipt of Order (ARO) per Special Terms and Conditions.

Inquiries regarding this Invitation for Bids may be directed to Melisa Vergara, Senior Purchasing Agent, at Melisa.Vergara@ocfl.net

#### Bid Response Documents - The following documents constitute your bid:

- A. Bid Response Form, Authorized Signatories/Negotiators, Drug-Free Workplace, Schedule of Sub-contracting, Conflict/Non-Conflict of Interest Form, E-Verification Certification, and current W9, Relationship Disclosure Form and Orange County Specific Project Expenditure Report. Please make sure forms are fully executed where required.
- B. Qualifications of Bidders information, per Special Terms and Conditions.
- C. Completed attached reference documentation.

04/13/17 12:17:26 Procurement Division