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January 20, 2021

VIA EMAIL

Mr. Frederick F. Kocher, P.G.
Solid Waste Section
Florida Department of Environmental Protection
2600 Blair Stone Road, MS #4565
Tallahassee, Florida 32399-2400

Subject: Trail Ridge Class I Landfill
WACS Facility ID No. 33628
Minor Modification to Solid Waste Operation Permit
Response to the First Request for Additional Information
FDEP Application No.: 0013493-031-SO-MM

Dear Mr. Kocher:

On behalf of the City of Jacksonville (COJ), CDM Smith Inc. (CDM Smith) is pleased to submit this response to the Florida Department of Environmental Protection (FDEP) First Request for Additional Information dated January 7, 2021.

Question No. 1: [PDF p. 14] Appendix B – Proposed Edits to Operation Plan, Leachate Treatment and Disposal section, p. 2. Given that leachate evaporator brine is known to have a high solids content, evaluate the impact of the evaporator solids being disposed in a limited area with the possible negative consequence of microbiological toxicity (e.g., inorganic salts) affecting the desired degradation of the placed waste. Regulatory reference: Paragraph 62-701.400(1), F.A.C.

Response No. 1: The leachate evaporator vendor reports that the residual is typically 12 to 14-percent total solids, of which 10 to 12-percent is total dissolved solids. The vendor is not aware of any issues/effects at any other facilities due to returning the residual to the landfill working face. Since the residual is typically spray applied to the working face that continuously moves as waste material is received and placed, disposal in a limited area is not anticipated. The TRLF working face will continue to move from east to west across the landfill as disposal unit six is filled and move north as additional disposal units are constructed and filled. Additionally, this type of evaporator has been in operation at permitted facilities for over 20 years. No adverse

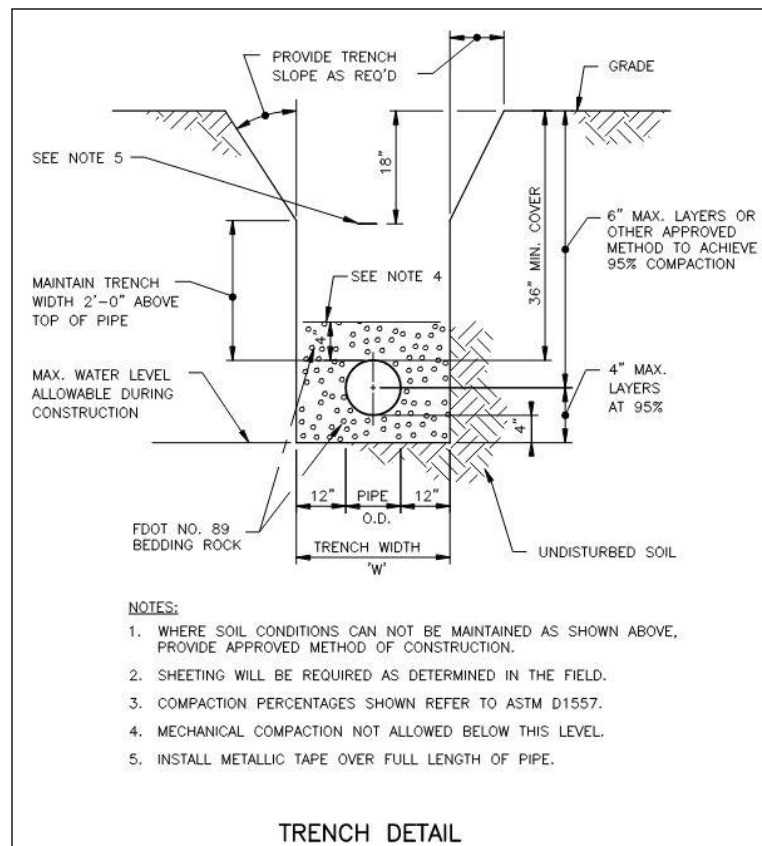


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impacts to microbial activity have been reported by landfill owners and operators.

Question No. 2: [PDF p. 16] Appendix C – Figures, Figure 1 – Site and Grading Plan.
Provide a detail for the proposed double-walled force main. Regulatory reference: Paragraph 62-701.500(8)(b), F.A.C.

Response No. 2: A detail showing how the forcemain pipe will need to be installed is shown below. Additional information on the dual containment piping requirements are in the HDPE for Leachate Piping Systems specification which has been provided as **Appendix A**.





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Question No. 3: [PDF p. 16] Appendix C – Figures, Figure 1 – Site and Grading Plan. Describe how the interstitial space of the proposed double-walled force main will be monitored. Regulatory reference: Paragraph 62-701.500(8)(b), F.A.C.

Response No. 3: A double-walled pipe was not selected with the intent to monitor the annular space. A single-walled pipe could be utilized for the force main, but a double-walled pipe was proposed for a more robust design since the carrier pipe is better protected from potential damage.

Question No. 4: [PDF p. 16] Appendix C – Figures, Figure 1 – Site and Grading Plan. Specify whether the evaporator building will have a containment curb or equivalent to contain any potential leachate discharge, leak, or spill from the process equipment and piping. Regulatory reference: Paragraph 62-701.500(8)(b), F.A.C.

Response No. 4: The evaporator building will have a 2-foot tall concrete containment curb around the perimeter. This secondary containment curb will hold any potential leachate discharge, leak, or spill from the process equipment and piping so that it may then be properly disposed.

Question No. 5: Please provide an electronic copy of the final revised Facility Operation Plan. Regulatory reference: Paragraph 62-701.320(7), F.A.C.

Response No. 5: An electronic copy of the revised Operation Plan is provided as **Appendix B** to this response letter. Note that additional minor administrative (e.g., facility contacts) and formatting changes were made.

We very much appreciate all your input and we trust the provided information is adequate for you to complete your review. Please feel free to call or e-mail me with any questions that you may have, or if you need any additional information.

Sincerely,

A handwritten signature in blue ink that reads "Lisa M Sterling".

Lisa Sterling, P.E., BCEE, PMP
Project Manager
CDM Smith Inc.





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cc: Jeff Foster, City of Jacksonville
Greg Mathes, Waste Management
Wei Liu, CDM Smith
Kurt Westerlund, CDM Smith



APPENDIX A

HDPE Pipe for Leachate Piping Systems Specification

SECTION 310529 - HIGH DENSITY POLYETHYLENE (HDPE) PIPE FOR LEACHATE PIPING SYSTEMS AND LANDFILL GAS COLLECTION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes high density polyethylene leachate and landfill gas pipe, fittings and appurtenances.

1.3 ACTION SUBMITTALS

- A. Submit within 30 days following Effective Date of Agreement:
 - 1. Complete, detailed shop drawings of all polyethylene pipe, including location of all fittings, joints and connections to structures.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, and Cleaning and Video Inspection Contractor.
- B. Material Certificates:
 - 1. Manufacturer quality control manual describing implementation of quality control procedures during pipe manufacturing process.
 - 2. Pipe manufacturer's certification of compliance with these Specifications.
 - 3. For each shipment of pipe, a manufacturer's certification that pipe was manufactured from same resin identified in Part 1 Article "Quality Assurance."
 - 4. Certification demonstrating that joining technician was trained by pipe manufacturer and is qualified to perform heat fusion welding.
 - 5. Manufacturer's recommendations for handling, storing and installing pipe and fittings.
- C. Material Test Reports:
 - 1. List of materials furnished, names of suppliers and date of delivery of materials to site.
 - 2. The origin of resin to be used in manufacturing of pipe including suppliers name and production plant, as well as brand name and number.
 - 3. Documentation from resin's manufacturer showing results of following tests for resin identification:

- a. Melt Flow Index: ASTM D1238.
- b. Density: ASTM D1505.

- D. Source quality-control reports.
- E. Field quality-control reports: Pressure test reports
- F. Sample Warranty: For manufacturer's warranty.

1.5 QUALITY ASSURANCE

- A. Resin Evaluation: Sample incoming resin for conformance testing against test results supplied by resin manufacturer. Take samples from top and bottom of each compartment from every hopper car received. Perform the following conformance tests on sampler:
 - 1. Melt Flow Index: ASTM D1238.
 - 2. Density: ASTM D1505.
 - 3. The results of these tests shall become part of manufacturer's permanent quality control records.
- B. Finished Product Evaluation: Each length of pipe produced shall be checked by production staff for items listed below. Results of all measurements shall be recorded on production sheets which become part of manufacturer's permanent records.
 - 1. Pipe in process shall be checked visually, inside and out for cosmetic defects (grooves, pits, hollows, etc.).
 - 2. Pipe outside diameter shall be measured using a suitable periphery tape to ensure conformance with ASTM F714.
 - 3. Pipe wall thickness shall be measured at twelve equally spaced locations around circumference at both ends of pipe to ensure conformance with ASTM F714.
 - 4. Pipe length shall be measured.
 - 5. Pipe marking shall be examined and checked for accuracy.
 - 6. Pipe ends shall be checked to ensure they are cut square and clean.
 - 7. Subject inside surface to a "reverse bend test" to ensure pipe is free of oxidation (brittleness).
- C. Stress Regression Testing: Polyethylene pipe manufacturer shall provide certification that stress regression testing has been performed on specific polyethylene resin being utilized in manufacture of this product. This stress regression testing shall have been done in accordance with ASTM D2837 and manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis (HDB) of 1600 psi as determined in accordance with ASTM D2837.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store pipe on clean level ground, preferably turf or sand, free of sharp objects, to prevent undue scratching or gouging. Handle pipe in such a manner that pipe is not damaged by dragging it over

sharp and cutting objects. Maximum allowable depth of cuts, scratches or gouges on exterior of pipe is 10 percent of wall thickness. Keep interior pipe surface free of cuts, gouges or scratches.

1.7 WARRANTY

- A. Furnish Owner a written warranty from manufacturer. Manufacturer warrants that pipe shall be of merchantable quality (as defined by the Uniform Commercial Code) for a period of one year. Manufacturer shall guarantee that pipe furnished is suitable for purpose intended and free from defects of material and workmanship. In the event pipe fails to perform as specified, pipe manufacturer shall promptly replace defective pipe without any cost to Owner.
- B. Should a defect occur, which is covered under warranty, Warrantor shall bear all costs for repair and/or relocation and replacement.
- C. Warrant HDPE pipe against defects in installation and workmanship for period of 2 years commencing with date of Final Acceptance. Include services of qualified service technicians and all materials required for repairs at no expense to Owner.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. High-Density Polyethylene Pipe: Suitable for leachate, landfill gas, and condensate. Maximum temperature of liquids will be 120 degrees F.

2.2 HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- A. High Density Polyethylene (HDPE) Pipe Resins: High molecular weight, high density, PE 4710 polyethylene with a cell classification number of 445474C in accordance with ASTM D3350 and a minimum density of 0.955 in accordance with ASTM D1505.
- B. All high-density polyethylene pipe and fittings shall be made from same resin. If rework compounds are required, only those generated in manufacturer's own plant from resin compounds of same class and type from same raw material supplier shall be used.
- C. Pipes Sizing: Nominal dimensions as indicated on Drawings; meet requirements of IPS Standard Dimension Ratio (SDR) 11 and 17 as indicated on Drawings; per ASTM F714.
- D. Joints: Butt, heat fusion joints. Manufacture joints in strict compliance with manufacturer's recommendations.
- E. Lengths: Furnished in standard laying lengths not exceeding 50-feet.
- F. Polyethylene Compound: Suitably protected against degradation by ultraviolet light as required by ASTM D1603.

2.3 PIPE IDENTIFICATION

- A. Continuously indent print on pipe or spaced at intervals not exceeding 5-feet per ASTM F714:
 - 1. Name and/or trademark of pipe manufacturer.
 - 2. Nominal pipe size (outside diameter) in accordance with ASTM F714.
 - 3. Dimension ratio (DR) and pressure rating per ASTM F714.
 - 4. The letters PE followed by polyethylene grade in accordance with ASTM D3350, (e.g., PE 445474C). Where applicable, standard thermoplastic pipe materials designation code may be used as an alternative marking, e.g. PE 4710.
 - 5. Manufacturing standard reference, e.g., ASTM F714.
 - 6. A production code from which date and place of manufacture can be determined.

2.4 DUAL CONTAINMENT PIPE AND FITTINGS

- A. Carrier Pipe, Containment Pipe and Fittings: Provide a continuous annular space to allow for leak monitoring, or installation of an alarm cable system.
- B. Pipes Sizing for Carrier and Containment Pipe: Nominal dimensions as indicated on Drawings
- C. Dual Containment Fittings: Have carrier fitting factory installed within containment fitting, with necessary support spacers installed.
- D. Unless otherwise specified, carrier to carrier joints and containment to containment joints shall be made using thermal fusion procedures. Thermal fusion welds shall be performed as recommended by manufacturer.
- E. Dual Containment to Single Walled Connections: Made using ISCO Dual Containment End Terminations or equal.

2.5 DUAL CONTAINMENT SUPPORT SPACERS

- A. Manufactured from non-metallic, corrosion resistant material, or same HDPE pipe grade material.
- B. Secured to carrier pipe at intervals, as recommended by Manufacturer, to center carrier pipe within containment pipe.
- C. Designed and installed to provide satisfactory performance of carrier and containment piping system due to thermal expansion and contraction.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install High Density Polyethylene (HDPE) Pipe in accordance with instruction of manufacturer, as indicated on Drawings and as specified herein. Provide heat fusion joints by a factory qualified joining technician as designated by pipe manufacturer.
- B. Lay pipe to lines and grade indicated on Drawings with bedding and backfill as indicated on Drawings. Remove the tape covering perforations during installation.
- C. When laying is not in progress, including lunchtime, close open ends of pipe by fabricated plugs, or by other approved means. Provide all plugs as OD fitting type plugs. No plugs will be allowed that require insertion of plug into pipe, unless approved by Engineer.
- D. Remove sections of pipe with cuts, scratches or gouges deeper than allowed completely and ends of pipeline rejoined.
- E. Join pipe by method of thermal butt fusion, as outlined in ASTM F2620 or as recommended by manufacturer. Make all joints in strict compliance with manufacturer's recommendations. In tight locations in which butt fusion equipment cannot be set up, a thermal coupling such as Central Electrofusion Systems, or equal, may be used. Join pipe as outlined in ASTM F1055.
- F. Make mechanical connections of polyethylene pipe to auxiliary equipment such as valves, other pipe materials, pumps and tanks through flanged connections consisting of following:
 - 1. Thermally butt-fuse a stainless-steel back-up, polyethylene flange adapter to stub end of pipe.
 - 2. Use a Type 316 stainless steel back up ring on both sides of connection as approved by Engineer.
 - 3. Use Type 316 stainless steel bolts and nuts coated with anti-seize compound.
- G. Provide flange connections with a full-face 1/8 inch neoprene gasket.
- H. Do not use threaded male or female adapters of any plastic material for adapting polyethylene pipe to systems, fitting or auxiliary equipment of other materials, or for joining installation lengths to each other.
- I. Ensure HDPE pipe is at temperature of surrounding soil at time of backfilling and compaction.
- J. Engineer shall observe and accept installation of pipe by prior to backfilling.

3.2 FORCE MAIN TESTING

- A. Field test all non-perforated pipe (with exception of non-perforated cleanouts). Pressure test each pipe upon completion of pipe laying and backfilling operations, including placement of any required temporary roadway surfacing. Supply all labor, equipment, material, gauges, pumps, meters and incidentals required for testing.

- B. Conduct testing after backfilling has been completed and before placement of permanent surface.
- C. Test all non-perforated pipe in accordance with ASTM F2164 and PPI Handbook of Polyethylene Pipe Chapter 2 (2nd Edition) unless otherwise approved by Engineer. Measure the test pressure at highest point along test section by a recording type pressure gauge and a submit copy of readout to Engineer upon completion of test. Conduct all testing in presence of Engineer and/or their field representative.
- D. Testing Procedure:
 - 1. Fill line slowly with water. Maintain flow velocity less than two feet per second.
 - 2. Expel air completely from line during filling and again before applying test pressure. Expel air by means of taps at points of highest elevation.
 - 3. Apply initial test pressure and allow to stand without makeup pressure for 3 hours, to allow for diametric expansion or pipe stretching to stabilize.
 - 4. After this equilibrium period, apply specified test pressure and turn pump off. Hold final test pressure for 3 hours.
 - 5. Upon completion of test, bleed off pressure from a location other than point where pressure is monitored. Pressure drop shall be witnessed by Engineer at point where pressure is being monitored and shall show on recorded pressure read-out submitted to Engineer.
 - 6. Allowable amount of makeup water for expansion during pressure test shall conform to Table 3 Test Phase Make-up Amount, from Chapter 2 of Handbook of Polyethylene Pipe, published by Plastic Pipe Institute (PPI). If there are no visual leaks or significant pressure drops during final test period, installed pipe passes test.
 - 7. If any test of pipe laid disclosed leakage or significant pressure drop greater than that allowed, at own expense, locate and repair cause of leakage and retest line.
- E. All visible leaks are to be repaired regardless of amount of leakage.

3.3 CLEANING

- A. As pipe laying progresses, and at conclusion of work, thoroughly clean all of new pipelines to remove all dirt, stones, pieces of wood or other material which may have entered during construction period. Remove debris cleaned from lines from job site. If, after this cleaning, any obstructions remain, remove.

3.4 LANDFILL GAS PIPE AIR PRESSURE TESTING

- A. Preparation:
 - 1. Commence test procedures when the following conditions have been met:
 - a. Pipe section to be tested is clean and free of dirt, sand or other foreign material.
 - b. Plug pipe outlets with test plugs. Brace each plug securely to prevent blowouts.
 - c. Add air slowly.
 - d. Include regulator set in pressurizing equipment to avoid over-pressurizing and damaging pipe.

2. Pressure test in accordance with OSEA requirements.
3. Provide necessary piping connections between section of line being tested and air supply, together with test pressure equipment, meters, pressure gauge, and other equipment, materials, and facilities necessary to make specified tests.
4. Furnish and install bulkheads, flanges, valves, bracing, blocking or other temporary sectionalizing devices that may be required.
5. Remove temporary sectionalizing device after tests have been completed.

B. Testing Equipment:

1. Provide equipment for this testing procedure.
 - a. Polyethylene flange adaptor with PVC blind flange.
 - b. Temperature gauge (0 to 100 deg. C) tapped and threaded into blind flange.
 - c. Pressure gauge (0 to 15 psi).
 - d. Tire valve to facilitate air pressure hose.
 - e. Ball valve to release pipe pressure at test completion.
 - f. Polyethylene reducers to be used to adapt test flange to size of pipe being tested.
 - g. Air compressor for adequate air supply for testing.
2. Provide verification and results of gauge calibration prior to (less than 60 days) and after test completion.

C. Pre-Installation Testing:

1. Provide Engineer and Owner 24-hours notification prior to test.
2. Pipe Test Segments:
 - a. Butt weld.
 - b. Less than 2,000-ft. in length.
 - c. Fitted with cap on one end and test apparatus on other end.
3. Environment:
 - a. Lay test segment on ground surface and allow to reach constant or ambient air temperature before test.
 - b. Perform test during period if possible, when pipe segment will be out of direct sunlight to minimize pressure changes as result of temperature fluctuations.
4. Test Procedure:
 - a. Apply test pressure of a minimum 10 psig to test segment.
 - b. Observe test pressure for 1-hr.
 - c. Do not allow pressure drop over 1-hr period to exceed 1 percent.
 - d. Correct pressure drop for temperature.
5. Test Failure Procedures:
 - a. Perform following when pipe segment fails pre-installation test:

- 1) Check entire length of pipe and fusions for cracks, pinholes, perforations or other possible leakage points.
- 2) Check blocked risers and capped and for leakage.
- 3) Verify leaks by applying soap water solution and observe for bubble formation.
- 4) Repair pipe and fused joint leaks by cutting out leaking area and re-bond suitable segments.
- 5) After leaks are repaired, retest.

D. Final Test After Installation:

1. Pressure test in presence of Engineer.
2. Perform final test on installed pipeline.
 - a. Perform final test in accordance with procedures for pre-installation testing.
 - b. Temporarily cap drip legs and perforated segments with fused polyethylene cap.
 - c. Locate test apparatus at inlet for blower.
3. Correct and retest leaks or defects.

E. Test Reporting:

1. Report test in writing on form in Appendix A within 7 days of test completion.
2. Include following information if failure occurs:
 - a. Location of failure segment.
 - b. Nature of leaks.
 - c. Details of repairs performed.
 - d. Retest results.

END OF SECTION 310529
(forms follow)

APPENDIX A: LANDFILL GAS PRESSURE TEST REPORT FORM

PROJECT NAME/NO.: _____ DATE: _____

CONTRACTOR: _____ TIME: _____

PERSON PERFORMING TESTS: _____

DESCRIPTION/LOCATION OF TEST SEGMENT: (Pipe Diameter, Length and SDRs) _____

T_i = Initial temperature in deg. C = _____ deg. C

P_i = Initial test pressure in psig = _____ psig

P_c = Initial pressure in psig corrected for temperature (T_i) at time 't'

t = Time in minutes from initiation of test

T_t = Temperature in deg. C at time 't'

P_t = Test pressure in psig at time 't'

$P_c = \frac{(P_i + 14.7)(T_t + 273)}{(T_i + 273)} - 14.7$

Percent Pressure Drop = $\frac{P_c - P_t}{P_c} \times 100$

TIME (min.)	T_t TEMP. READING (deg. C)	P_t GAUGE READING (psig)	P_c CORRECTED PRESSURE (psig)	PRESSURE DROP (%)
0				
20				
30				
40				
50				
60				

PASS/FAILURE: _____ RETEST (YES/NO) _____

DESCRIPTION/NATURE OF LEAKS AND REPAIRS OF RETEST SEGMENT: _____

EXAMPLE CALCULATION SHEET

GIVEN: $P_i = 10$ psig
 $T_i = 21.1$ deg. $C = 70$ deg. F

and at time $t = 60$ minutes

$P_i = 10.05$ psig
 $T_t = 23.0$ deg. $C = 73$ deg. F

Calculated Corrected Initial Pressure

$$P_c = \frac{(10.0 + 14.7)(23.0 + 273) - 14.7}{(21.1 + 273)}$$

$$P_c = 24.85 - 14.7 = 10.15 \text{ psig}$$

Calculate Percent Pressure Loss

$$\% \text{ Pressure Loss} = \frac{10.15 - 10.05}{10.15} \times 100 = 0.98\% < 1\% \text{ ok}$$

NOTE: The difference between the corrected pressure reading (P_c) and the gauge reading (P_i) cannot differ by more than 1 percent of the corrected pressure reading (P_c) (i.e., .105 @ 10.5 psig) over a time interval of 60 minutes.

END OF SECTION 310529

APPENDIX B

Operation Plan

OPERATION PLAN

Trail Ridge Class I Landfill
WACS Facility ID No. 33628

December 2020

CDM Smith Project No. 9012-228686



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Trail Ridge Landfill

Operation Plan

This section outlines the operation plan for Trail Ridge Landfill Phases 1-5 and Phases 6-14. The Trail Ridge Landfill (TRLF) site is approximately 977 acres in size with 144 acres in Phases 1-5 and an additional 300 acres planned for Phases 6-14. An administrative building, scale house, maintenance facility, and tire processing facility are currently located on the site.

1.1 Operations Personnel and Hours of Operation

The District Manager is responsible for the overall operation of the Trail Ridge Landfill. The District Manager responsibility is to assure that operations at the site are performed in accordance with the procedures outlined in this Operation Plan. The District Manager, the Operations Manager and several operators are trained operators under Rule 62-701.320 (15), F.A.C. At least one trained operator will be on-site during all times when the landfill receives waste. Further, at least one trained spotter (who may also be an equipment operator) will be at the working face at all times waste is being accepted and/or spread out prior to disposal at that respective working face.

Hours of Operation

- Normal Monday -Friday: 6:00AM to 7:00PM
- Normal Saturday: 5:00AM to 1:00PM
- Maximum Hours: Monday-Saturday 5:00AM to 10:00PM

During emergency situations, i.e., after a hurricane, the landfill may operate beyond the above hours. However, the Florida Department of Environmental Protection (FDEP) must be notified at the first available opportunity. The landfill will have lights with at least 3 candle-feet of illumination for operation during non-daylight hours.

Personnel

Personnel generally expected to be at the landfill include:

Table 1 Personnel Matrix for Trail Ridge Landfill

Personnel	Total
District Manager	1
Operations Manager	1
Equipment Operators	8
Mechanic	1
Labors/Spotters	6
Compliance Officer	1
Clerical	1

On a normal basis, the personnel present during operating hours on the landfill will include a trained operator, a trained spotter, a material handler (laborer) and an equipment operator. The trained spotter may also function as an equipment operator. During peak operating hours, the facility will have additional personnel. A work schedule is developed on a weekly basis to ensure that adequate staff is present on the landfill to handle the expected volume of waste.

1.2 Emergencies and Contingency Operations

In accordance with Rule 62-701.320 (16) F.A.C., during emergencies the person responsible for the implementation of the contingency plan is either the District Manager or Operations Manager. The District Manager or Operations Manager shall take reasonable steps to notify the appropriate agencies in cases of emergency. The District Manager or Operations Manager shall notify the FDEP and contact the City of Jacksonville Solid Waste Division Chief (904) 255-7512. For Fire Emergencies, the site manager shall call 911. For a spill or release of hazardous regulated substance, the site manager shall notify the City of Jacksonville Environmental Quality Division at (904) 255-7171. If the Facility needs to be shut down the site manager shall coordinate with the City to notify its customers of such shut down. Also during emergency conditions that may affect neighboring properties, such as fire, the site manager or site operator shall coordinate with the City of Jacksonville to notify neighbors of emergency conditions so as to minimize impacts.

The scale house and the administrative building both have telephones for routine emergency communications. Further, both facilities provide shelter, sanitary facilities and first aid equipment.

The on-site entrance road is an all-weather road. The entrance road and administration area are paved. The pavement extends beyond the ticket office/scale house to the perimeter road around the landfill. The perimeter road is a stabilized limerock road. Haul roads beyond this point are maintained for adverse weather condition usage. Emergency conditions at the facility may be created by a natural disaster (i.e., hurricane or tornado), flooding and fire. Waste is not normally delivered to the site during emergency conditions. The following procedures will be implemented with the imminent threat of a major storm.

1. Initial cover will be applied and compacted over all exposed waste.
2. All landfill equipment will be fueled and parked near natural wind screens, earthen mounds or tree areas.
3. All lightweight signs and equipment will be secured.
4. Work will begin in dry areas only when operations are resumed and waste materials will not be disposed in standing water.

The surface water management system will allow disposal operations to continue during periods of inclement weather. This will include the utilization of temporary berms and ditches to drain stormwater away from the active face. If a failure or breach of the stormwater management system berms were to occur, follow the Emergency Action Plan (EAP) in **Attachment 1**.

In the event of a natural disaster in the area, operational hours will be extended as appropriate to meet the needs of the community and the FDEP will be notified.

For power outages that extend for a period of 24 hours or more, the emergency generators will be mobilized within 48 hours of the time the power outage first occurs. In the interim and for shorter power outages, onsite equipment will be utilized to power the leachate sump pumps.

In the event a hot load is received or a fire occurs at the landfill, the operator will extinguish the fire, as soon as possible. Hot loads will be discharged in an area on the landfill isolated from the current active face, spread out and covered with soil to extinguish the fire. The load will only be discharged onto an area that has a minimum of 12 inches of cover for separation from existing waste. After the load is extinguished, the waste will be moved to the active face for disposal or left in place with intermediate cover placed over it.

If a fire occurs within the working face, the operator will cease operations in the working face until the fire is extinguished. The operator will direct all waste disposal to another operational area that is a safe distance from the fire. The temporary disposal area shall not interfere with fire-fighting equipment. For a subsurface fire that occurs outside the working face, the operator will cordon off the area and determine if the working face should be moved until the fire is extinguished. At no time shall the landfill place waste in a burning area.

When a fire occurs at the landfill, the application of additional compacted cover will be utilized to cut off the flow of oxygen into the burning area. If this does not contain the fire, the affected area will be thoroughly wetted, excavated, and wetted again prior to reconstructing the cells. The chance of fire occurring at a properly run sanitary landfill is minimal.

If the fire cannot be extinguished or controlled within an hour the District Manager or Operations Manager shall immediately implement the contingency plan. Moreover, no waste shall be disposed of those areas impacted by fire. If the fire cannot be extinguished or controlled within 48 hours, the District Manager or Operations Manager shall notify the local fire protection agency and seek its assistance as well as the local agencies listed above as well as the FDEP. Also notifications shall be given to any neighbors likely to be affected by the fire in accordance with Rule 62-701.320 (16)(d) F.A.C.

Instruction in firefighting procedures is routinely provided to site personnel, and portable fire extinguishers are located on each machine and vehicle. Local Fire Departments will be employed to assist the site personal and equipment, if necessary.

Trail Ridge Landfill, Inc. has developed an extensive program regarding safety and accident prevention. As part of this program, employees are trained in proper operation and emergency procedures. Telephone communication and First Aid equipment are provided at the facility. Operating vehicles are in compliance with current OSHA safety requirements, including caging and shields to protect operators. All appropriate equipment has back-up alarms and those alarms are maintained in good repair.

1.3 Waste Control

The waste stream will be monitored by the scale house operator, as each vehicle passes by the ticket office/scale house and then again at the working face by the spotter(s).

There will be at least one trained spotter at each working face to observe the wastes disposed at all times the landfill receives waste to detect unauthorized waste. The spotter will be assisted by additional personnel, including trained operators, equipment operators, laborers, and trained

spotters, when necessary. If any unauthorized wastes are discovered at the landfill, the landfill owner/operator will promptly notify the person responsible for shipping the wastes to the landfill and the generator of the wastes, if known, for subsequent removal off site. If the waste is deemed hazardous, the area where the wastes are deposited will be immediately cordoned off from public access. If the generator or hauler cannot be identified, the landfill owner/operator will assure the cleanup, transportation, and disposal of the waste at an appropriate waste management facility.

In the event unauthorized waste is identified after the hauler has left the facility, the unauthorized waste shall be removed from the working face and placed in close proximity to the working face. At the end of the day, at a minimum, unauthorized waste such as batteries, oil filters, used oil, etc. will be removed from the landfill and stored at the existing concrete storage area adjacent to the waste tire storage and processing area. Within the storage area, the materials shall be placed in a single layer on pallets. (The water level in the storage area will be checked on a weekly basis and accumulated water will be pumped out and treated as leachate). Tires will be placed within the tire storage areas. White goods will be stored in a roll-off box. White goods and batteries will be taken off site by various recyclers on a quarterly basis, at a minimum.

1.4 Weighing Waste

All incoming waste will be weighed and recorded on a daily basis at the on-site scales prior to disposal. The on-site scales include at least one scale for incoming vehicles and one scale for outgoing vehicles.

1.5 Operation Record

The operating record consists of all records, reports, analytical results, demonstrations, and notifications required by Chapter 62-701, F.A.C., any construction, operation, and closure plans and permits, including all modifications to those permits issued by the FDEP, Permit Document Plans, as well as training records required by Chapter 62-701.320(15), F.A.C. The record is considered part of the operation plan and will be kept with the plan at the landfill facility. The operating record will be available for inspection at reasonable times by FDEP personnel.

1.6 Waste Records

The operators will record, in tons per day, the amount of solid waste received and will estimate the amount of each waste listed below. Waste reports will be compiled monthly, and copies provided to the FDEP annually.

Types of waste received:

1. Municipal Solid Waste
2. Class III Waste
3. Ash Residue
4. Yard Waste
5. Other Waste

1.7 Access Control

Access to the landfill is provided by a paved entrance road from U.S. 301.

The entire site is fenced. Access is restricted by a gate near the entrance off U.S. 301 as well as a second gate closer to the site. All gates will be locked at night and whenever the landfill is closed. Public access and receipt of wastes will occur only when an attendant is on duty.

Traffic control on-site is accomplished by signage and site personnel. Spotters will assist with traffic control at the working face by directing in-coming trucks to their final unloading area.

Access to areas restricted from traffic will be controlled by temporary earthen berms and barricades.

1.8 Vehicular Traffic Control

Signs are provided to direct traffic to the disposal area. Further, spotters will direct incoming vehicles to their final disposal area.

1.9 Waste Monitoring

Load Checking

The operations will include a load checking program to detect and discourage attempts to dispose of unauthorized wastes at the landfill. The load checking program consists of the following minimum requirements:

1. The landfill operator will examine at least three random loads of solid waste delivered to the landfill each week. The waste collection vehicle drivers selected by the inspector will be directed to discharge their loads at a designated location within the landfill (near the working face). A detailed inspection of the discharged material will be made for any unauthorized wastes.
2. If unauthorized wastes are found, the facility will contact the generator, hauler, or other party responsible for shipping the waste to the landfill to determine the identity of the waste sources.

Handling Hazardous Wastes

If any regulated hazardous wastes are identified by random load checking, or are otherwise discovered to be improperly deposited at the landfill, the landfill owner/operator will promptly notify the FDEP by telephone, 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 will be immediately cordoned off from public access. If the generator or hauler cannot be identified, the landfill owner/operator will assure the cleanup, transportation, and disposal of the waste at a permitted hazardous waste management facility.

The operator will provide a report of the discovery of hazardous waste to the FDEP within 7 days. The report will include the date of the incident, how the materials were discovered, transferred and transported, the disposal location, and if known, the source of the material. The material will be transferred and disposed off-site in accordance with applicable local, state and federal regulations. The clean-up will include determining the extent of contamination as well as the handling of materials that are contaminated by the hazardous waste.

Subsequent shipments from sources found or suspected to be previously responsible for shipping regulated hazardous waste will be subject to precautionary measure prior to the solid waste management facility accepting wastes.

Recording Inspection Results

Information and observations resulting from each random inspection will be recorded in writing and retained at the landfill for at least 3 years. The recorded information will include: the date and time of the inspection; the names of the hauling firm and the driver of the vehicle; the vehicle license plate number; the source of the waste, as stated by the driver; and observations made by the inspector during the detailed inspection. The written record will be signed by the inspector.

1.10 Waste Handling

The landfill may have two working faces and will be consistent with orderly traffic control, waste spreading, and compaction activities.

All solid waste will be spread in layers of approximately 2 feet in thickness and compacted to approximately 1 foot in thickness or as thin a layer as practical before the next layer is applied. Bulky materials, which are not easily compacted, will be worked into other materials as much as practical.

The first layer of waste placed above the liner and leachate collection system will be a minimum of 4 feet in compacted layer thickness and will consist of selected waste loads containing no large rigid objects that may damage the liner or leachate collection system.

Solid waste will be formed into cells to construct horizontal lifts. The working face of the cell and side grades will be at a slope no greater than 3 feet horizontal to 1 foot vertical rise. Lift depth will normally not exceed 10 feet but may be deeper, depending on specific operations, daily volume of waste, width of working face, and good safety practices.

Each working face will be only wide enough to accommodate vehicles discharging the waste, and to minimize the exposed area and unnecessary use of cover material. The size and dimensions of the working face will vary based upon the location of the working face and waste volume.

A second working face may be necessary due to site specific conditions. The second working face will generally be located near the first working face. The second working face shall have a trained spotter whenever solid waste is being accepted and/or spread out prior to disposal.

The facility will provide a working area within the lined landfill area for the placement of waste during wet weather. This area will be utilized when access to the regular working face is limited due to wet weather. The location of the wet weather area is based on accessibility during wet weather.

Fill Phasing Plan

The sequence of fill operations initially corresponds to the cells expansion phasing plan. The overall sequence of the fill operations is shown on the Trail Ridge Landfill Construction Phase 6-14 Class I Cell Expansion, issued February 2014, Permit Drawing Nos. C-35 through C-42. As shown on the plans, Phase 6 will be subdivided into 4 fill areas labeled 6A to 6D from west to east. Fill activities will begin in 6A Area in the west side of Phase 6 and proceed east as described below:

Access Road

- Operations traffic will access Phase 6 Area via a new access road along the west face of existing fill area Phases 1-5 and proceed down the access road cut into the north face of the hill. A temporary fill road will be constructed on top of the lined slope in Area 6A at approximately 2% slope to the southwest corner at the bottom of Phase 6.

Sequence 1:

- Remove sacrificial liner and sand bags from Area 6A and prepare for filling operation.
- Filling operation begins by establishing a tipping platform at the southwest corner of Phase 6, proceeding north, and to the east of Area 6A.
- Place approximately 5 feet of select waste initially as the bottom lift in Area 6A to approximate elevation 145 (NGVD).
- Add two 10 -foot lifts in Area 6A to elevation 160 (NGVD) in a similar manner. (Sheet C-39 Lifts #1 and #2)

Sequence 2:

- Remove sacrificial liner and sand bags from Area 6B and prepare area for filling operation.
- Remove temporary stormwater diversion berm in Area 6A.
- Place initial select waste layer and two 10-foot lifts in Area 6B to elevation 160 (NGVD). (Sheet C-39 Lifts #3 and #4)
- Add 10-foot lift in Area 6A to elevation 170 (NGVD). (Sheet C-39 Lift #5)

Sequence 3:

- Remove sacrificial liner and sand bags from Area 6C and prepare area for filling operation.
- Remove temporary stormwater diversion berm in Area 6B.
- Place initial select waste layer and two 10-foot lifts in Area 6C to elevation 150 (NGVD). (Sheet C-39 Lifts #6 and #7)

Sequence 4:

- Remove sacrificial liner and sand bags from Area 6D and prepare area for filling operation.
- Remove temporary stormwater diversion berm in Area 6C.
- Place initial select waste layer and two 10-foot lifts in Area 6D to elevation 140 (NGVD). (Sheet C-39 Lifts #8 and #9)
- Add a 10-foot lift in Area 6D to elevation 150 (NGVD). (Sheet c-39 Lift #10)

Sequence 5:

- Place 10 -foot lift in Area 6C to elevation 160 (NGVD). (Sheet C-39 Lift #11)
- Place 10 -foot lift in Area 6D to elevation 160 (NGVD). (Sheet C-39 Lift #12)

- Place 10 –foot lift in Area 6B to elevation 170 (NGVD). (Sheet C-39 Lift #13)
- Place 10 –foot lift in Area 6C to elevation 170 (NGVD). (Sheet C-39 Lift #14)
- Place 10 –foot lift in Area 6D to elevation 170 (NGVD). (Sheet C-39 Lift #15)

Sequence 6:

- Place 10 –foot lift in Area 6A to elevation 180 (NGVD). (Sheet C-39 Lift #16)
- Place 10 –foot lift in Area 6B to elevation 180 (NGVD). (Sheet C-39 Lift #17)
- Place 10 –foot lift in Area 6C to elevation 180 (NGVD). (Sheet C-39 Lift #18)
- Place 10 –foot lift in Area 6D to elevation 180 (NGVD). (Sheet C-39 Lift #19)
- Place 10 –foot lift in Area 6A to elevation 190 (NGVD). (Sheet C-39 Lift #20)

Once Phase 6 reaches elevation 180 to 190 (NGVD), Phase 7 will be filled following a similar pattern. As Phase 7 reaches elevation 190 (NGVD), Phase 6 fill will be filled to its final elevation of 330 (NGVD) as shown in the Trail Ridge Landfill Construction Phase 6-14 Class I Cell Expansion, issued February 2014, Permit Drawing Nos. C-40 through C-42. As Phases 8 through 14 are constructed, the filling sequence for these phases will follow a similar pattern, filling from east to west with completed lifts generally sloping from south to north. Stormwater will normally be shed from finished lifts with cover to the north into a swale along the north side of each phase. A tarp or thin liner will be used to collect stormwater in areas which are lined but in which no waste has been placed. This water will collect to the west of the fill area and be pumped into a stormwater ditch or pond.

Closure Phasing Plan

The closure phasing will correspond to the above fill phasing. When solid waste disposal units have been filled to their final design grade, they will be closed in a “close-as-you-go” fashion.

1.11 Special Waste Handling

Trail Ridge Landfill Inc. will control acceptance and disposal of special and industrial wastes in accordance with the requirements of Chapter 62-701 and internal waste approval procedures of Waste Management Inc. Site-specific management procedures for certain wastes and management of special wastes used for cover are described below:

Contaminated Soil

Contaminated soil that has been contaminated with petroleum products or any other materials that are not hazardous wastes may be disposed of at TRLF, and may be used as initial or intermediate cover material if it meets the criteria of subsections 62-701.200(53) or (55), F.A.C., as appropriate. Contaminated soil that has the potential to leach constituents in excess of Department ground water standards or criteria may be used only in those areas of the landfill where runoff or infiltration is captured by the leachate collection system.

Contaminated soils that are stored on the site for future use as initial cover will be stockpiled on top of the landfill (within the lined landfill footprint). The stockpile will be located at a minimum of 20 feet from side slopes. Other measures will be taken as necessary to minimize the potential for erosion or runoff.

Ash Contaminated Soil

The City of Jacksonville has ash contaminated soil from the Brown's Dump Site and the Jacksonville Ash Site that typically does not exceed Rule 62-777, FAC, Soil Cleanup Target Levels for Direct Exposure Based Industrial/Commercial Levels. Due to the extensive data on this ash contaminated soil, a 5-point composite sample result is required for every 1,000 cubic yards of soil (in lieu of every 500 tons) prior to delivery to the site. The composite sample shall be tested for TCLP for the eight RCRA Metals. If the TCLP testing indicates the soil is non-hazardous, this ash contaminated soil may be accepted at the site and used for initial cover on interior side slopes but not on exterior side slopes. However, if the soil has any visible organics or other material that may attract birds or vermin, has an odor or is saturated, it cannot be utilized as initial cover.

Ash contaminated soil that is stored at the site for future use as initial cover will be managed consistent with other contaminated soils.

1.12 Waste Compaction and Application of Cover

Waste will be spread in layers of approximately 2 feet in thickness and compacted to approximately 1 foot in thickness or as thin a layer as practical before the next layer is applied.

Initial cover will be applied and maintained at the landfill in order to minimize any adverse environmental, safety, or health effects such as those resulting birds, unauthorized wastes, blowing litter, odors, disease vectors, or fires. The minimum frequency for applying initial cover is at the end of each work day. A 6-inch thick initial cover (consisting of soil, shredded tires, contaminated soils, or ash contaminated soil or yard waste mixed 50:50 with soil (including contaminated soils or ash contaminated soil), or the following materials which meet the criteria of subsection 62-701.200(53), F.A.C.:

1. Auto shredder residue, alone or mixed with soil, at Class I landfills.
2. Recovered screen material at Class I or Class III landfills.
3. Street sweepings at Class I landfills. If no significant amount of Class I waste is present in the street sweepings, then they can also be used at Class III landfills.
4. Solid waste combustor ash residue at Class I landfills.

or an FDEP approved alternate daily cover may also be applied at the end of each operating day. A soil/mulch mixture that consists of no more than 50% ground or chipped yard trash mulch (which may contain incidental amounts of shredded plastic yard trash bags) by volume may be used as initial cover provided it meets the definition of initial cover contained in Rule 62-701.200(53).

For those areas where additional solid waste will be deposited within 18 hours, a temporary cover, such as a tarpaulin, may be placed on the working face at the end of the work day and removed prior to deposition of additional waste. Additionally, waste tires that have been cut into sufficiently small parts may be utilized as initial cover on the landfill, in accordance with Rule 62-711.400(3)(a), F.A.C. Shredded tires will not be used on exterior side slope or roadways. A 6-inch thick layer of shredded tires will be placed for initial cover, which will remain in place and be covered with additional waste or intermediate cover. Shredded tires for initial cover will be stored on top of the landfill in the vicinity of the working face.

An intermediate cover, in addition to the 6-inch initial cover, will be applied and maintained within 7 days of cell completion if final cover or an additional lift is not to be applied within 180 days of cell completion. All or part of this intermediate cover may be removed before placing additional waste or installing final cover. The intermediate cover will consist of either a 12-inch compacted layer of soil or a 16-inch compacted layer of 50:50 mixture of soil/mulch. The mulch/soil mixture will be a fairly homogeneous mixture and the mulch will be ground into sufficiently small pieces (approximately 1 inch or less). Any mulch/soil mixture used as intermediate cover on exterior side slopes will be evaluated to verify that it will not affect the stability of the final cover system.

The intermediate cover may consist of either a 12-inch compacted layer of soil or a 16-inch thick layer of a mixture of soil and ground or chipped yard trash mulch (which may contain incidental amounts of shredded plastic yard trash bags) that consists of no more than 50% mulch by volume, provided it meets the definition of intermediate cover contained in Rule 62-701.200(55).

Final cover will be applied to a solid waste disposal unit once it has been filled to its design dimensions. The final cover including permanent vegetation will be placed over the entire surface of each completed solid waste disposal unit within 180 days after final waste placement, or in accordance with the Closure plan. Solid waste disposal units, which are designated by phase, are shown on Permit Drawings.

The final cover system for the side slopes shall consist of the following from bottom to top: a minimum 12-inch intermediate cover layer consisting of only uncontaminated soil material or a 16-inch thick layer of a compacted mixture of uncontaminated soil and ground or chipped yard trash mulch (which may contain incidental amounts of shredded plastic yard trash bags) that consists of no more than 50% mulch by volume¹; a minimum 12-inch compacted clay layer with a maximum permeability of 6.67×10^{-8} cm/sec²; a minimum of 24 inches of loosely compacted soil layer with the top 6 inches capable of sustaining vegetation or 30 inches of a loosely-compacted mixture of uncontaminated soil and ground or chipped yard trash mulch that consists of no more than 50% mulch by volume; and the vegetative cover.

The final cover for the top area shall consist of the following from bottom to top: a minimum 12-inch intermediate cover layer consisting of only uncontaminated soil material or a 16-inch thick layer of a compacted mixture of uncontaminated soil and ground or chipped yard trash mulch (which may contain incidental amounts of shredded plastic yard trash bags) that consists of no more than 50% mulch by volume; a 40 mill LLDPE geosynthetic liner, a minimum 12-inch sand layer with a minimum permeability of 1×10^{-3} cm/sec ; and a minimum 12-inch soil layer with the top 6 inches capable of supporting vegetation or a minimum 15-inch mixture of uncontaminated soil and ground or chipped yard trash mulch (which may contain incidental amounts of shredded plastic yard trash bags) that consists of no more than 50% mulch by volume with the top 6 inches capable of supporting vegetation.

Uncontrolled and unauthorized scavenging is not permitted at the landfill site. Salvaging is also not permitted.

¹ The intermediate cover consisting of ground or chipped yard trash mulch will be analyzed to verify its ability to support the final cover system prior to placement of the final cover system.

² Hydraulic conductivity of compacted clay layer is specified in *Trail Ridge Landfill Side Slope Closure Alternate Closure Design Demonstration* dated February 1997 and included in Attachment 6.

A litter policing operation will be employed to keep litter from leaving the working area of the landfill. Litter outside the working area will be picked up within 24 hours. Some litter located in traffic areas and away from public view may be visible through the initial cover for longer than a 24-hour period.

Erosion control measures will be employed to correct any erosion that exposes waste or causes malfunction of the stormwater management system. Erosion control measures will be implemented within 3 days of occurrences. If the erosion cannot be corrected within 7 days of occurrence, the landfill operator will notify the FDEP and propose a corrective schedule.

1.13 Water Quality Monitoring

Surface water and groundwater monitoring is conducted by qualified TRLF staff as required by the TRLF Water Quality Monitoring Program and NPDES Multi-Sector General Permit monitoring requirements.

If water quality monitoring data indicates that surface water quality standards are being exceeded at stormwater management system outlets, wetland irrigation activities shall be ceased until the stormwater management system is made functional and water quality standards are met. Before the decision to stop irrigating the wetlands is made, the results of initial water quality sampling results will be confirmed or refuted through resampling and analysis of water quality samples.

1.14 Leachate Management

Leachate Collection and Storage System

The primary leachate collection system consists of an 8-inch perforated HDPE collection pipe surrounded by an aggregate encasement, which is covered by a geotextile fabric. This collection system is located in a valley on top of the primary liner. Leachate is collected within each leachate sector (300 feet wide, typical) and directed to the collection system by a geonet drainage blanket located on top of the primary liner.

The primary leachate collection pipes discharge into the riser pipe in the leachate collection sump and is pumped through a force main that terminates at the leachate vault on the east side of the landfill. The leachate collection sump consists of an 18- or 24-inch diameter HDPE pipe (riser pipe) surrounded by an aggregate sump. The riser pipe extends from the sump up to the leachate vault. Both of the 8-inch HDPE leachate collection pipes discharge directly into the riser pipe, which is in the sump for each phase in Phases 6-14. A small submersible pump is located inside each riser pipe. Level sensors in the riser pipe are used to control the pump, which removes leachate as it accumulates. The pumps are mounted on wheels and can easily be removed for maintenance.

The leachate pumps discharge into a leachate force main that transfers the leachate to the six fiberglass storage tanks (20,000 gallons each). The tanks are located inside a secondary containment area. The leachate storage tanks are visually inspected daily, Monday through Friday, by on-site personnel. A daily log (Monday through Friday) is kept outlining leachate generation and storage volumes. Excessive leakage through the primary liner will alert staff that an investigation is needed.

The secondary (detection) leachate collection system is constructed and operates similarly to the primary system. The exceptions for this system include:

1. A layer of geonet collects leachate and directs it to the secondary leachate collection sump in lieu of the 8-inch HDPE perforated pipe.

Leachate System Operations and Maintenance

Each leachate vault box (located at the east end of each leachate collection pipe for Phases 1-5 and at the east end of 1 of the 2 leachate collection pipes for Phases 6-14) has a flow meter for the primary and secondary leachate collection system. The landfill operator will monitor the leachate level in and record the flow from both the leachate collection (primary) and detention (secondary) sumps on a daily basis (in gallons), Monday through Friday.

If the reading in a flow meter is noticeably diminishing or otherwise reduced compared to the other flow meters and daily rainfall records, the flow meter and pump will be checked for proper operation. In the event it is deemed necessary, the leachate collection system will be either videoed to determine if there is a clog or other reason for diminished flow or the leachate collection pipe will be flushed. The leachate collection system will be jet cleaned or inspected by video recording at least once every 5 years. Additionally, the operator will maintain at least one backup pump on site or have access to a backup pump that can be installed within hours of discovery that a pump is not operating.

The operator will operate and maintain the leachate collection system to collect and remove leachate from the landfill. The leachate will be stored in the six 20,000-gallon leachate storage tanks before being sent to an on-site leachate evaporator or transported off-site for treatment and disposal.

A recording rain gauge is operated and maintained to record precipitation at the landfill. These precipitation records will be maintained and used to compare with leachate generation rates.

Leachate Treatment and Disposal

Leachate treatment and disposal will be accomplished through the thermal evaporation of leachate at on-site leachate evaporator(s). Leachate will be pumped to the evaporator(s) through a dual contained HDPE leachate force main from the leachate storage tanks. The leachate evaporator, residuals clarifier, and associated piping are located inside secondary containment. After most of the water has been evaporated from the leachate, the remaining residual is pumped to a tanker truck. The truck load-out area is paved with concrete and curbed to contain any spillage. The residual is then transported to the active face or it may be hauled off-site for disposal. The amount of leachate sent to be evaporated will be recorded daily.

As a secondary disposal option, the leachate can be pumped into tanker trucks and hauled to off-site wastewater treatment facilities for disposal including JEA's Buckman Wastewater Treatment Facility or the next closest permitted disposal facility. The amount of leachate transported off-site will be recorded daily.

1.15 Combustible Gas Monitoring Program

The combustible gas monitoring locations as shown in **Attachment 2** will be monitored quarterly with the results submitted to the FDEP. Quarterly gas monitoring shall be conducted by March 31, June 30, September 30 and December 31 of each year of this permit. The Permittee shall record these gas monitoring results and shall submit a summary report to FDEP within 15 days of the end of the quarter, specifically, by April 15, July 15, October 15, and January 15, respectively, of each year of this permit. Combustible gas meters shall be calibrated to methane. The routine gas-monitoring program shall monitor concentrations of combustible gases at ambient monitoring points and in gas monitoring wells.

If combustible gas levels exceed 25% of the lower explosive limit in structures (excluding gas control or recovery components) or the lower explosive limits at or beyond the property boundary, Trail Ridge Landfill will:

1. Immediately take all necessary steps to ensure protection of human health and notify the FDEP within 24 hours of detection.
2. Within 7 days of detection, submit to the FDEP for approval a remediation plan for the gas releases. The plan will describe the nature and extent of the problem and the proposed remedy. The remedy will be completed within 60 days of detection unless otherwise approved by the FDEP.

1.16 Stormwater Management

Stormwater Handling

The Stormwater Management System was designed in accordance with Rule 62-330, F.A.C. for both treatment and peak flow attenuation. The stormwater treatment is provided by wet detention.

All stormwater is collected and directed into the stormwater basin. The landfill prevents erosion by directing stormwater in a controlled manner by way of temporary and permanent stormwater controls. Stormwater from the top of the landfill is typically collected in swales and directed to HDPE downcomer pipes (both temporary and permanent), which brings the water down to the existing drainage inlets and perimeter ditch. The collection system includes terraces on the final landfill slopes in conjunction with downcomer piping. This system will control runoff and minimize erosion on the landfill side slopes. When erosion occurs, it is repaired within 3 days and the reason for the erosion is evaluated to eliminate the source. Details of this system are shown on the Permit Drawings. The existing wetland discharge of treated stormwater occurs through two methods. First, during small discharges such as mean annual storm events, two wetland irrigation systems are in place to discharge stormwater through perforated spreader pipes around the perimeter of the stormwater management basins. The proposed wetland irrigation systems for Phases 6-14 is designed to work in the same way that the existing system operates. Second, during larger storm events, the stormwater ponds will discharge treated stormwater through control structures to conveyance channels within the surrounding wetlands. This discharge of water is designed to continue hydrating the wetland areas and utilize the natural conveyance channels associated with the existing wetlands.

The stormwater management system was installed as part of the initial construction and is operated and maintained in accordance with the requirements of the FDEP Solid Waste permit. The stormwater management system includes the wet detention basin as well as the swales, drainage ditches and culverts, discharge structures, downcomer pipes and other appurtenances as required. Pertinent features of the stormwater handling system include:

1. Potentially contaminated stormwater will be segregated from clean stormwater and contaminated stormwater will not be discharged from the site.
2. A 24-hour, 25-year rainfall event is detained on-site.
3. Stormwater is treated to meet the requirements of Rule 62-330, F.A.C.
4. The maximum discharge rate following a 25-year, 24-hour storm event does not exceed the pre-development discharge from this design storm.

The discharge structure was designed to effectively prevent floating materials from being released from the site.

Stormwater Treatment

Stormwater is collected and routed through an internal ditch and culvert network to the wet detention basins for treatment. One stormwater wet detention basin serves Phases 1-5 and one wet detention basin serves Phases 6-14. These basins are designed to treat 2.5 inches of runoff from the impervious surfaces and detain a 25-year, 24-hour storm event. The discharge structure for each wet detention facility releases the stormwater at the control rate to a dispersion pond, which ultimately discharges to the adjacent wetlands and conveyance channels. In addition, there is a wetland discharge of treated stormwater through perforated spreader pipes around the perimeter of each of the stormwater management basins. The wetland irrigation systems must be inspected on an annual basis to ensure that no pipes are clogged, broken, or otherwise rendered non-functional. Any non-functioning pipes shall be repaired within 14 days of discovery.

Offsite stormwater is collected on the western side of the site in a stormwater ditch running along the west side of Phase 6-14 and is routed around the north end of the landfill to a bypass pond. The bypass pond provides attenuation before discharging the stormwater to a concrete flume which then discharges to a natural conveyance area within the existing wetland systems to the east. The bypass pond also includes wetland irrigation pumping, header pipe and perforated pipe system. This system must be inspected on an annual basis and any non-functioning pipes or erosion due to the irrigation system shall be repaired within 14 days of discovery.

Stormwater Maintenance

The stormwater management system, stormwater bypass attenuation system, and two wetland irrigation systems shall be inspected periodically, especially after heavy rain. 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 shall be retained onsite. Sample inspection forms are provided in **Attachment 3**. Regular inspections shall include:

1. Removal of trash and debris.
2. Inspection of inlets and outlets.
3. Removal of sediments when the storage volume or conveyance capacity of the system is below design levels.
4. Stabilization and restoration of eroded areas.
5. Inspection of pump stations for structural integrity and leakage of fuel or oil to the ground or surface water.
6. Inspection of monitoring equipment, including pump hour meters and staff gauges, for damage and operational status.
7. Inspection of the dispersal system, including the sprayheads or perforated pipe for damage or clogging.
8. Mowing of grassed areas and removal of grass clipping from stormwater conveyance and treatment areas.

9. In accordance with the site Environmental Resource Permit (ERP), the stormwater management system and stormwater bypass attenuation system berms will be inspected annually by a registered Florida Professional Engineer experienced in the investigation, design, construction and operation of dams, applying the disciplines of hydrologic, hydraulic, soils and structural engineering and engineering geology. All field inspections should be conducted by qualified engineers, engineering geologists and other specialists, knowledgeable in the investigation, design, and construction of earthen berm. Within 30 days of the inspection, a report shall be submitted electronically or in writing to the FDEP using Form 62-330.311(1), "Operation and Maintenance Inspection Certification"; inspection details of stormwater berms shall be submitted and information included in the Florida National Inventory of Dams shall be updated.
10. On a quarterly basis, the stormwater irrigation pumping systems will be inspected to: confirm pump operability, check intake valves, check irrigation piping to ensure that no pipes are clogged, broken or otherwise rendered non-functional, confirm there is no erosion due to the irrigation system, check skimmers at pond outfalls for vegetation, and check emergency overflows at ponds. Any non-functioning pipes or erosion shall be repaired within 14 days of discovery.
11. On an annual basis, the stormwater management system, stormwater bypass attenuation system, and two wetland irrigation systems, shall be inspected by a registered Florida Professional Engineer. A report shall be submitted electronically or in writing to the FDEP using Form 62-330.311(1), "Operation and Maintenance Inspection Certification." This inspection shall demonstrate that the pumping system is capable of maintaining the flow rates listed below to meet the permitted drawdown rate or a plan to provide the required drawdown rate:
 - Wetland Irrigation system for Phases 1-5: maintain flow rate between 2.5 cubic feet per second (cfs) (1,122 gallons per minute [gpm]) and 2.1 cfs (947 gpm)
 - Wetland Irrigation system for Phases 6-14: maintain flow rate between 1.22 cfs (550 gpm) and 1.0 cfs (450 gpm)
 - Wetland Irrigation system for Bypass Pond: maintain flow rate between 0.37 cfs (165 gpm) and 0.30 cfs (135 gpm)

In instances when serious problems are identified during inspections or other operations and maintenance activities, the Department shall be notified immediately by telephone. Notification shall be made to the Northeast District Office at (904) 256-1700. Within 7 days of telephone notification, a report shall be submitted electronically or in writing to the Department using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the extent of the problem, its cause, the remedial actions taken to resolve the problem.

Erosion Control

Stormwater terraces will be constructed on the side slopes of the completed landfill. These berms will route surface water flow to downcomer pipes buried in the final cover, and ultimately to the perimeter drainage ditch. This system of terraces and pipes will minimize erosion of the final cover. Vegetative cover will be established and maintained, as soon as practical, after finish contours are completed.

When erosion occurs, repair will begin within 3 days and the reason for the erosion will be evaluated to eliminate the source. Should the repair require more than 7 days, the FDEP will be notified as required by Rule 62-701.500(7)(k), F.A.C.

1.17 Equipment

Sufficient equipment (generally including but not necessarily limited to three compactors, two dozers, an excavator, a loader, a grader, a water wagon, three trucks, a service truck and a tractor) is provided to ensure proper operation of the landfill and for spreading, compacting and covering waste. In addition, for tractor trailers disposing at the landfill, a tipper may be utilized. Substitutions, reductions, and additions to the equipment described above and typically maintained at the landfill may occur, provided it does not prevent proper operation of the landfill or spreading, compacting, and covering the waste in such a way as to comply with the performance standards found in Chapter 62-701, FAC. Backup and additional equipment is available within 24 hours from other operations and vendors should any situation dictate the requirement for replacement or additional equipment.

1.18 Records Keeping

The landfill operator will:

1. Keep records of all information used to develop or support the permit applications and any supplemental information pertaining to construction of the landfill will be kept for the design period of the landfill.
2. Retain records of all monitoring information, including calibration and maintenance records, all original chart recordings for continuous monitoring instrumentation, and copies of all reports required by permit, for at least 10 years. Background water quality records will be kept for the design period of the landfill. Weight tickets shall be kept for 5 years.
3. Maintain an annual estimate of the remaining life and capacity in cubic yards of the existing, constructed landfill and an annual estimate of the life and capacity in cubic yards of other permitted areas not yet constructed. The estimate shall be made and reported annually to the FDEP.

Records that are more than 5 years old and which are required to be retained may be archived, provided that the landfill operator can retrieve them for inspection within 7 days.

1.19 Waste Tire Processing

The landfill includes a waste tire processing facility. Trail Ridge Landfill, Inc. intends to continue operation of a waste tire processing facility in accordance with the requirements of Rule 62-711.530, F.A.C. within the property boundaries of TRLF, a solid waste management facility.

Design

The waste tire processing facility is located south of the non-contract drop off area and east of the operations building. A site plan for this area is provided in **Attachment 4**. In compliance with Rule 62-711.540(3)(a), F.A.C., the facility is designed with a stormwater management system (since it is located within 200 feet of wetlands). The stormwater control methods meet the stormwater requirements of Rule 62-25, F.A.C. and help maintain water quality standards specified in Chapters

62-302 and 62-520, F.A.C. The stormwater management system for the waste tire processing facility is incorporated into the stormwater management facility for the ancillary facility.

The facility is paved with asphalt and graded away from the wetlands toward a ditch, which drains to the ancillary facility stormwater pond. A 12-inch concrete header curb was constructed at the southeast corner to prevent discharge to the adjacent wetlands. This curb also prevents liquid runoff from a potential fire from entering the wetlands.

Operations and Maintenance

The waste tires brought into the landfill site will be either homogenous loads or incidental to the solid waste loads. Those loads containing strictly waste tires will be directed to the waste tire processing facility and unloaded. Those tires discovered during unloading at the landfill active face will be picked out and taken to the waste tire storage area.

The tires will be stored in accordance with Rule 62-711.540, F.A.C. The storage of the aggregate of whole waste tires, processed waste tires and residuals will be limited to 60 times the daily through-put of the processing equipment. In addition, whole waste tires will be limited to 30 times the daily through-put of the processing equipment. The daily through-put of the processing equipment is estimated to be 3.33 tons per day and therefore, the maximum storage of whole waste tire is 100 tons. At least 75 percent of both the whole waste tires and processed tires that are delivered to or are contained on the site at the beginning of each calendar year will be processed and disposed of on-site or transported off-site to a permitted facility for recycling/disposal.

The waste tire storage facility will be operated and maintained in accordance with Rule 62-711.540, F.A.C. The site was constructed and will be operated and maintained to divert stormwater or floodwaters around and away from the storage piles. Curbs along both concrete and asphalt shall be maintained and the area will be swept and maintained so debris does not accumulate at the curbs.

Each storage pile will be no wider than 50 feet with an area no greater than 10,000 square feet and a height no greater than 15 feet. A 50-foot wide fire lane will be maintained around the perimeters of each waste tire pile. Access to the fire lane for emergency vehicles will be unobstructed at all times. Mosquitoes and rodents will be controlled in a manner to protect the public health and welfare.

On a weekly basis, the facility will visually check the limits and height of the waste piles to ensure compliance. Waste tires are either transported off site for processing and disposal/beneficial reuse, or shredded on site and then disposed on site or transported off site for disposal/beneficial reuse. When the tires are shredded, the shredding will be conducted by an independent Contractor, who will bring the necessary equipment to the site to process the tires on the site. Once the tires are shredded, the shredded tire wastes will be taken up to the landfill for disposal (or for use as alternate initial cover, if the tire is shredded to meet the requirements of Rule 62-711.400(3)(a), F.A.C.) or transported off site for disposal or beneficial reuse. Typically, the facility does not store shredded tire waste on site but if necessary, it will be stored in Tire Pile Area.

An attendant will be present at the waste tire site to observe the unloading of waste tires to ensure mixed loads are not deposited. The processed tires will be disposed or recycled at the Class I permitted landfill. The processed tires will meet the size requirements specified under Rule 62-711.400(3) (b), F.A.C. (the tire will be cut into at least eight substantially equal pieces for purposes of disposal).

A mobile tire shredder will be utilized to process the tires at TRLF on a quarterly basis or the tires will be transported off-site to a permitted facility for disposal or, if economically feasible, transported off-site for beneficial reuse.

Access, Signs and Security

The waste tire processing facility is accessed off the main access road to the landfill. The access is beyond the scale house through the citizens' drop-off area. The access road will be kept passable for any type of motor vehicle at all times.

Signs are posted at the entrance to the solid waste management facility stating operating hours, costs of disposal, and site rules.

The property boundaries of the solid waste management facility that encompass the waste tire processing facility are fully fenced with a locking gate at the entrance and exit to prevent unauthorized access to the site.

Record Keeping

Records will be maintained for 3 years of the quantity of waste tires and processed tires received at the site, stored at the site, and shipped from the site. Records will include the following:

1. For all waste tires shipped from the facility, the name and waste tire collector registration number of all waste tire collectors who accepted the waste tires for transport, and the quantity of waste tires shipped with each collector; and if the waste tires were shipped with a person who is not a waste tire collector, the number of tires shipped, the person's name, address and telephone number; and the place where the waste tires were deposited.
2. For all waste tires received at the facility, the name and waste tire collector registration number of the collector who delivered waste tires to the facility, and the quantity of waste tires received from that collector; and if more than five waste tires are delivered by a person who is not a waste tire collector, the number of tires delivered and the person's name, address and telephone number.
3. For all waste tires removed for recapping, the quantity and type removed, and the name and location of the recapping facility receiving the tires.

Quarterly reports will be submitted to the FDEP by the 20th of the month following the close of each calendar quarter on Form 62-701.900(21). The information required by Rule 62-711.530(4) and (5), F.A.C. will be included in the report.

Fire Protection

The tire site will be kept free of grass, underbrush, and other potentially flammable vegetation. Fire protection for the site will be assured through notification to local fire protection authorities. A fire safety survey will be conducted at least annually and the survey report will be made a part of the next quarterly report. Recommendations in the annual surveys will be implemented when possible.

Communication equipment will be maintained at the site to assure the site personnel can contact local fire protection authorities in case of fire. Fire extinguishers will be conveniently assessable to the tire pile. No operation utilizing an open flame will be conducted within 25 feet of the waste tire site.

If necessary, due to a fire, the equipment and cover soil on site will be used to fortify the curb to contain any liquid runoff.

Emergency Preparedness Manual

In the event of a fire or other emergency, the following persons/agencies will be contacted:

City of Jacksonville, Solid Waste Division
Mr. Jeff Foster; (904) 381-8205

Trail Ridge Landfill Personnel
Mr. Greg Mathes; (904) 269-3986 (Office); (904) 591-6113 (Cell)
Mr. Allen Rhodes; (904) 748-6014 (Office); (352) 266-9789 (Cell)

Fire Department, if necessary
Phone: 911

Department of Environmental Protection
8800 Baymeadows Way West, Suite 100
Jacksonville, Florida 32256
(904) 256-1700

The tire storage processing facility is located at a Class I sanitary landfill, TRLF, which is fully equipped with bulldozers, front end loaders, scrapers, and other such equipment available at all times for any emergency. There is an ample stockpile of soil on site for use in smothering a fire, if one occurs.

In the event of a fire, the following procedures will be immediately implemented:

1. Notify the persons/agencies listed above.
2. Reinforce the area with soil to contain any runoff and use to extinguish fire, if necessary.
3. Extinguish the fire with on-site equipment and stockpile dirt. Only personnel trained in fire safety procedures will be utilized to fight fires.
4. A special and/or hazardous waste contractor will be contacted for cleanup and disposal of any residue generated by the fire.

Within 2 weeks of the emergency, a written report describing the event will be sent to the FDEP. The report will include the origins of the emergency, the actions taken to remedy the situation, the results of the action that was taken, and an analysis of the success or failure of the actions.

1.20 Yard Waste Processing

The landfill includes a yard waste recycling/processing operation. A copy of the registration application for Trail Ridge Yard Trash Processing Facility is included in **Attachment 5**. Unprocessed yard trash may also be disposed of in the landfill.

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Attachment 1
Stormwater Berm
Emergency Action Plan

Attachment 2
Gas Probe
Monitoring Plan

Attachment 3
Sample Inspection
Forms

Trail Ridge Landfill Inspection Checklist

Name of Inspector:		Date of Inspection:	
If answered yes, attach additional comment pages or site plan s needed.			
Section A: Fencing and Security			
	Yes	No	NA
1. Damage to fences, gates, or locks			
2. Gates unlocked/locks missing			
3. Signs of forced entry detected			
Section B: Access Roads			
	Yes	No	NA
1. Access and site roads in poor condition			
Section C: Final Cover System			
	Yes	No	NA
1. Settlement of cover			
2. Evidence of erosion, cracks, gullies			
3. Holes or damage to cover			
4. Patches of dead grass on cover			
5. Evidence of leachate seeps			
6. Impacts due to settlement			
7. Ponding of water in terraces			
Section D: Gas Management System			
	Yes	No	NA
1. Visible damage to system components			
2. Excessive release of odors			
3. Gas flare operating			
Section E: Stormwater Management System			
	Yes	No	NA
1. Ponding of water			
2. Excessive silting due to lack of vegetation			
3. Inlet repair required			
4. Perimeter ditch or swale damage			
5. Downcomer pipe repair required			
6. Leachate breakouts affecting WQ			
7. Ditches/Inlets/Culverts need cleaning			

Trail Ridge Landfill Inspection Checklist

	Yes	No	NA
Pond Phase 1-5			
8. Retention pond damage			
9. Outlet structure damage			
10. Excessive silting or clogging			
11. Wetland irrigation pumps operating			
12. Pump control panels operating			
13. No visible leaking or dripping from pump station			
14. No clogging or leaking of sprayheads or pipe			
Pond Phase 6-14			
15. Retention pond damage			
16. Outlet structure damage			
17. Excessive silting or clogging			
18. Wetland irrigation pumps operating			
19. Pump control panels operating			
20. No visible leaking or dripping from pump station			
21. No clogging or leaking of sprayheads or pipe			
Bypass Pond			
22. Retention pond damage			
23. Outlet structure damage			
24. Excessive silting or clogging			
25. Wetland irrigation pumps operating			
26. Pump control panels operating			
27. No visible leaking or dripping from pump station			
28. No clogging or leaking of sprayheads or pipe			
Section F: Monitoring Devices			
	Yes	No	NA
1. Damage to groundwater monitoring wells			
2. Damage to gas wells			
3. Locks missing			
4. Damage to gas monitoring probe			
Section G: leachate Collection and Storage			
	Yes	No	NA
1. Leachate pumps operational			
2. Leachate flow meters operating			
3. Leachate control panel operating			
4. Control panel alarms operating			
5. Leachate storage tank leaking			
6. Leachate containment area leaking			

[illegible]

Trail Ridge Landfill
Irrigation System for Wetlands
Quarterly Inspection Form

Name of Inspector _____

Date of Inspection_____

Weather Conditions:

Test Pumps to Drop the Water Level in wet well

Comments:

Test wet well to verify gravity flow of water

Comments:

Check intake valves and adjust if needed between 947gpm and 1122gpm

Comments:

Check irrigation piping and clean and repair as needed

Comments:

Check irrigation piping discharge area in wetlands and ensure erosion is not occurring

Comments:

Check skimmer at pond outfall for vegetation and remove as needed

Comments:

Check Pond Outfall and note if it is discharging

Comments:

Check gate valve at emergency overflow of pond and ensure it is locked or handle removed

Comments:

Attachment 4
Waste Tire Processing
Permit Application



Department of Environmental Protection

DEP Form # 82-701.900(23)
Waste Tire Processing Facility
Form Title <u>Permit Application</u>
Effective Date <u>3/22/00</u>
DEP Application No. _____
(Filled in by DEP)

Waste Tire Processing Facility Permit Application

Permit No. 0013493-002-SC

Renewal ☐ Modification ☐ Existing unpermitted facility ☐ Proposed new facility ☐

Part I-General Information:

A. Applicant Information:

1. Applicant Name: Trail Ridge Landfill, Inc.
2. Applicant Street Address: 5110 U.S. Highway 301
3. City: Baldwin County: Duval Zip: 32234
4. Applicant Mailing Address: 5110 U.S. Highway 301
5. City: Baldwin County: Duval Zip: 32234
6. Contact person: Greg Mathes Phone: (904) 289-9100 FEID No: _____
7. Have any enforcement actions been taken by the Department against the applicant relating to the operation of any solid waste management facility in this state? This includes any Complaint, Notice of Violation, or revocation of a permit or registration, as well as any Consent Order in which a violation of Department rules is admitted. It does not include a Warning Letter, Warning Notice, Notice of Noncompliance, or other similar document which does not constitute agency action.
Yes _____ No ☒ If yes, attach a history and description of the enforcement actions.

B. Facility Information:

1. Facility Name: Trail Ridge Landfill, Inc.
2. Facility Street Address (Main Entrance): 5110 U.S. Highway 301
3. City: Baldwin County: Duval Zip: 32234
4. Facility Mailing Address: 5110 U.S. Highway 301
5. City: Baldwin State: Florida Zip: 32234
6. Contact Person: Greg Mathes Phone: (904) 289-9100
7. Facility Location Coordinates:
Section: 18, 19, 20, 21 Township: 3 South Range: 23 East
Latitude: 30° 14' 00" Longitude: 82° 02' 30"
8. Anticipated date for starting construction existing and for completion of construction existing
9. Anticipated date for receipt of tires on-going and for start of processing on-going

Mail completed form to
appropriate district office listed below

Northwest District
160 Governmental Center
Pensacola, FL 32501-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. 200 B
Jacksonville, FL 32256-7590
904-448-4300

Central District
3318 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767
407-894-7555

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
813-744-6100

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33902-2549
813-332-6875

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6800

DEP Form # 62-701.900(23)
Waste Tire Processing Facility
Form Title <u>Permit Application</u>
Effective Date <u>3/22/00</u>
DEP Application No. _____ (Filled in by DEP)

C. Land Owner Information (if different from applicant):

- Owner's name: City of Jacksonville
- Land owner's mailing address: 1031 Superior Street
- City: Jacksonville State: Florida Zip: 32202
- Authorized Agent: Chris Pearson Agent's phone: (904) 387-8981
- Current lease expires: N/A

D. Facility Operator Information (if different from applicant):

- Operator's name: Same as applicant
- Operator's mailing address: _____
- City: _____ State: _____ Zip: _____
- Contact person: _____ Phone: ()

E. Preparer of Application:

- Name of person preparing application: Juanitta Clem, P.E.
- Mailing address: 14775 Old St. Augustine Road
- City: Jacksonville State: Florida Zip: 32258
- Phone: (904) 265-3181
- Affiliation with facility: Consultant

Part II-Operations:

A. Facility type (check appropriate box):

- ☐ Waste tire processing facility.
- ☐ Waste tire processing facility with on-site disposal of processed tires or processing residuals.
See Attachment _____
- ☐ Waste tire processing facility with on-site consumption of waste tires or processing residuals.
See Attachment F
- ☒ Permitted solid waste management facility ^{including} ~~modification to allow~~ waste tire site and processing.

B. Type of processing facility (check as many as apply):

- ☒ Shredder ☐ Cutter ☐ Chopper ☐ Incinerator only ☐ Incinerator with energy recovery
- ☐ Pyrolysis ☐ Supplemental fuel user ☐ Other, explain _____

C. Storage: Indicate the maximum quantities of whole waste tires, processed waste tires, and processing residuals, expressed in tons, to be stored at the facility, in accordance with Rule 62-711.530(2), F.A.C.

	Outdoor Storage(tons)	Outdoor Storage (sq.ft)	Indoor Storage (tons)	Indoor Storage (sq.ft)	Total Storage (tons)
Whole waste tires:	<u>3,900</u>	_____	_____	_____	<u>3,900</u>
Processed tires:	_____	_____	_____	_____	_____
Processing residuals:	_____	_____	_____	_____	_____
TOTALS:	<u>3,900</u>	_____	_____	_____	<u>3,900</u>

DEP Form # 62-701.900(23)
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Form Title <u>Permit Application</u>
Effective Date <u>3/22/00</u>
DEP Application No. _____ (Filled in by DEP)

- D. For reporting quantity of tires in tons, tires will be: weighed on site ☐ weighed off site ☒ weights will be calculated ☐
- E. Facilities that will not be disposing of processed tires or processing residual on the facility site must indicate the permitted solid waste management facility where processed tires or residuals will be disposed.
1. Name of facility N/A Disposal is provided on site
2. Street address: _____
3. City: _____ County: _____ Zip: _____
- F. Facilities that will be delivering processed tires to consuming facilities must describe the existing or proposed markets for those processed tires.
If recycling becomes available, the tires will be recycled.

Part III-Attachments:

A. Facility design The facility is existing and there are no proposed changes.

NOTE: All maps, plan sheets, drawings, isometrics, cross sections, or aerial photographs shall be legible; be signed and sealed by a registered professional engineer responsible for their preparation; be of appropriate scale to show clearly all required details; be numbered, referenced to narrative, titled, have a legend of symbols used, contain horizontal and vertical scales (where applicable), and specify drafting or origination dates; and use uniform scales as much as possible, contain a north arrow and use NGVD for all elevations.

1. A topographic or section map of the facility, including the surrounding area for one mile, no more than one year old, showing land use and zoning within one mile of the facility
2. A plot plan of the facility on a scale of not less than one inch equals 200 feet. At a minimum, the plot plan shall include
 - a. The facility design, including the location and size of all storage and processing areas for used tires, unprocessed waste tires, processed waste tires, and waste tire processing residuals;
 - b. All wetlands and water bodies within the facility or within 200 feet of any storage area;
 - c. Stormwater control measures, including ditches, dikes, and other structures;
 - d. Boundaries of the facility, legal boundaries of the land containing the facility, and any easements or rights of way that are within the facility or within 200 feet of any storage area;
 - e. Location, size, and depth of all wells within the facility or within 200 feet of any storage area;
 - f. All structures and buildings that are, or will be, constructed at the facility; include those used in storage and processing operations;
 - g. All areas used for loading and unloading;
 - h. All access roads and internal roads, including fire lanes;
 - i. Location of all fences, gates, and other access control measures; and
 - j. Location of all disposal areas within the facility.

B. Facility operation. The facility is existing and there are no proposed changes. See Operation Plan.

1. A description of the facility's operation, process and products including how waste tires will be received and stored.
2. A description of the equipment used for processing tires. This description shall include the make, model, and hourly capacity of each piece of equipment.
3. Description of the waste from the process, the amount of waste expected and how and where this waste will be disposed of.
4. Statement of the maximum daily throughput and the planned daily and annual throughput.
5. A description of how the operator will maintain compliance with each of the storage requirements of Rule 62-711.540, F.A.C.
6. A copy of the emergency preparedness manual for the facility with a statement of the on site and off site locations where that manual will be maintained.
7. A copy of the fire safety survey
8. A description of how 75% of the annual accumulation of waste tires will be removed for disposal or recycling.

C. Completed closing plan for the facility as required by Rule 62-711.700(2) and (3), F.A.C.

DEP Form # 62-701.900(23)
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Effective Date <u>3/22/00</u>
DEP Application No. _____ (Filled in by DEP)

- D. Attach proof of financial responsibility as requirement by Rule 62-711.500(3) OR a calculation showing that financial assurance documents, currently on file with the Department, are sufficient to assure closing of the waste tire site as well as any other solid waste management facility at that location.
- E. A letter from the land owner (if different from applicant) authorizing use of the land as a waste tire processing facility.
- F. If waste tires will be consumed at the facility, attach a description of the other environmental permits that the applicant has for this use, including, permit number, date of issue, and name of issuing agency
- G. The permit fee as required in Rule 62-4, F.A.C.

Part IV-Certification:

A. Applicant:

The undersigned applicant or authorized representative of Trail Ridge Landfill, Inc.
 is aware that statements made in this form and attached information are an application for a
Waste Tire Processing Facility 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 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 Department will be notified prior to the sale or
 legal transfer of the facility.

[Signature]
 Signature of Applicant or Authorized Agent

Greg Mathes, Dir. of Landfill Ops.

Name and Title

10/15/08
 Date

B. Professional Engineer registered in Florida.

This is to certify that the engineering features of this waste tire processing facility have been
 Designed/examined by me and found to conform to engineering principals 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 for proper maintenance and operation of the facility.

[Signature]
 Signature

Juanitta Clem, P.E., Principal

Name and Title

43245
 Florida Registration Number

14775 Old St. Augustine Road

Mailing Address

Jacksonville, Florida 32258

City, State, Zip

904.265.3181

Telephone number

(please affix seal)

10/15/08
 Date

TRAIL RIDGE LANDFILL WASTE TIRE PROCESSING FACILITY

1. Introduction

Trail Ridge Landfill, Inc. intends to continue operation of a waste tire processing facility in accordance with the requirements of Rule 62-711.530, F.A.C. within the property boundaries of Trail Ridge Landfill, a solid waste management facility.

2. Design

The waste tire processing facility is located south of the non-contract drop off area and east of the operations building. A site plan for this area is provided in Exhibit A. In compliance with Rule 17-711.540(3)(2) (a), F.A.C., the facility is designed with a stormwater management system (since it is located within 200 feet of wetlands). The stormwater control methods meet the stormwater requirements of Rule 62-25, F.A.C. and help maintain water quality standards specified in Chapters 62-302 and 62-520, F.A.C. The stormwater management system for the waste tire processing facility is incorporated into the stormwater management facility for the ancillary facility.

The facility is paved with asphalt and graded away from the wetlands toward a ditch, which drains to the ancillary facility stormwater pond. A twelve-inch concrete header curb was constructed at the southeast corner to prevent discharge to the adjacent wetlands. This curb also prevents liquid runoff from a potential fire from entering the wetlands.

3. Operations and Maintenance

The waste tires brought into the landfill site will be either homogenous loads or incidental to the solid waste loads. Those loads containing strictly waste tires will be directed to the waste tire processing facility and unloaded. Those tires discovered during unloading at the landfill active face will be picked out and taken to the waste tire storage area.

The tires will be stored in accordance with Rule 62-711.540, F.A.C. The storage of the aggregate of whole waste tires, processed waste tires and residuals will be limited to 60 times the daily through-put of the processing equipment. In addition, whole waste tires will be limited to 30 times the daily through-put of the processing equipment. The daily through-put of the processing equipment is estimated to be 3.33 tons per day and therefore, the maximum storage of whole waste tire is 100 tons. At least 75 percent of both the whole waste tires and processed tires that are delivered to or are contained on the site at the beginning of each calendar year will be processed and disposed of on site or transported off-site to a permitted facility for recycling/disposal.

The waste tire storage facility will be operated and maintained in accordance with Rule 62-711.540, F.A.C. The site was constructed and will be operated and maintained to divert stormwater or floodwaters around and away from the storage piles. Curbs both concrete and asphalt shall be maintained and the area will be swept and maintained so debris does not accumulate at the curbs.

Each storage pile will be no wider than 50 feet with an area no greater than 10,000 square feet and a height no greater than ~~10~~ 15 feet. A 50-foot wide fire lane will be maintained around the perimeters of each waste tire pile. Access to the fire lane for emergency vehicles will be unobstructed at all times. Mosquitoes and rodents will be controlled in a manner to protect the public health and welfare.

There are pavement markers (painted lines) on the pavement to outline the limits of the storage areas. On a weekly basis, the facility will visually check the limits and height of the waste piles to ensure compliance.

Waste tires are either transported off site for processing and disposal/beneficial reuse, or shredded on site and then disposed on site or transported off site for disposal/beneficial reuse. When the tires are shredded, the shredding will be conducted by an independent Contractor, who will bring the necessary equipment to the site to process the tires on the site. Once the tires are shredded, the shredded tire wastes will be taken up to the landfill for disposal (or for use as alternate initial cover, if the tire is shredded to meet the requirements of Rule 62-711.400(3)(a), F.A.C.) or transported off site for disposal or beneficial reuse. Typically, the facility does not store shredded tire waste on site but if necessary, it will be stored in Tire Pile Area.

An attendant will be present at the waste tire site to observe the unloading of waste tires to ensure mixed loads are not deposited. The processed tires will be disposed or recycled at the Class I permitted landfill. The processed tires will meet the size requirements specified under Rule 62-711.400(3) (b), F.A.C. (the tire will be cut into at least eight substantially equal pieces for purposes of disposal).

A mobile tire shredder will be utilized to process the tires at Trail Ridge Landfill on a quarterly basis or the tires will be transported off-site to a permitted facility for disposal or if economically feasible, transported off-site for beneficial reuse to a recycling facility.

4. Access, Signs and Security

The waste tire processing facility is accessed off the main access road to the landfill. The access is beyond the scale house through the citizens' drop-off area. The access road will be kept passable for any type of motor vehicle at all times.

Signs are posted at the entrance to the solid waste management facility stating operating hours, costs of disposal, and site rules.

The property boundaries of the solid waste management facility which encompasses the waste tire processing facility are fully fenced with a locking gate at the entrance and exit to prevent unauthorized access to the site.

5. Record Keeping

Records will be maintained for three years of the quantity of waste tires and processed tires

received at the site, stored at the site, and shipped from the site. Records will include the following: ~~also be maintained of~~

- a. For all waste tires shipped from the facility, the name and waste tire collector registration number of all waste tire collectors who accepted the waste tires for transport, and the quantity of waste tires shipped with each collector; and if the waste tires were shipped with a person who is not a waste tire collector, the number of tires shipped, the person's name, address and telephone number; and the place where the waste tires were deposited.
- b. For all waste tires received at the facility, the name and waste tire collector registration number of the collector who delivered waste tires to the facility, and the quantity of waste tires received from that collector; and if more than five waste tires are delivered by a person who is not a waste tire collector, the number of tires delivered and the person's name, address and telephone number.
- c. For all waste tires removed for recapping, the quantity and type removed, and the name and location of the recapping facility receiving the tires.

Quarterly reports will be submitted to the Department by the 20th of the month following the close of each calendar quarter on Form 62-701.900(21) ~~17-711.900(4)~~. The information required by Rule 62-711.530(4) and (5) ~~17-711.530(4) (b) and (5)~~, F.A.C. will be included in the report.

6. Fire Protection

The tire site will be kept free of grass, underbrush, and other potentially flammable vegetation. Fire protection for the site will be assured through notification to local fire protection authorities. A fire safety survey will be conducted at least annually and the survey report will be made a part of the next quarterly report. Recommendations in the annual surveys will be implemented when possible.

Communication equipment will be maintained at the site to assure the site personnel can contact local fire protection authorities in case of fire. Fire extinguishers will be conveniently assessable to the tire pile. No operation utilizing an open flame will be conducted within 25 feet of the waste tire site.

If necessary, due to a fire, the equipment and cover soil on site will be used to fortify the curb to contain any liquid runoff.

7. Emergency Preparedness Manual

An Emergency Preparedness Manual is attached as Exhibit B. A copy of the manual will be maintained at a designated off-site location. This manual will be updated at least once a year and upon changes in operation of the facility.

8. Closure

Closure of the waste tire processing facility will be in accordance with Rule 62-711.700, F.A.C.

When the Waste Tire Processing Facility ceases to accept waste tires, the operator will:

1. Post a notice indicating that the site is closed and provide the phone number of the City of Jacksonville, Department of Public Works, Solid Waste Division;
2. Notify the Department and City of the closing;
3. Remove all waste tires and residual to a waste tire processing facility, solid waste management facility authorized to accept waste tires, or a legitimate user of waste tires;
4. Remove any solid waste to a permitted solid waste management facility; and
5. Notify the Department when closing is complete.

At this time, the facility does not propose to close until the landfill is closed.

9. Financial Assurance

Financial responsibility for closure of the solid waste management facility includes closure costs associated with the waste tire site. Therefore, no new documentation is submitted.

10. ~~Permit Fee~~

~~No permit fee is required, as specified in Rule 17-711.300(5), F.A.C.~~

EXHIBIT B

EMERGENCY PREPAREDNESS MANUAL

TRAIL RIDGE LANDFILL WASTE TIRE PROCESSING FACILITY

1. In the event of a fire or other emergency, the following persons/agencies will be contacted:

City of Jacksonville, Solid Waste Division
Mr. Jeff Foster; (904) 381-8205

Fire Department, if necessary
Phone: 911

Trail Ridge Landfill Personnel

Mr. Greg Mathes; (904) 269-3986 (Office); (904) 591-6113 (Cell)
Mr. Allen Rhodes; (904) 748-6014 (Office); (352) 266-9789 (Cell)

Department of Environmental Protection
8800 Baymeadows Way West, Suite 100
Jacksonville, Florida 32256
(904) 256-1700

2. The tire storage processing facility is located at a Class I sanitary landfill, Trail Ridge Landfill, which is fully equipped with bulldozers, front end loaders, scrapers, and other such equipment available at all times for any emergency. There is an ample stockpile of soil on site for use in smothering a fire, if one occurs.
3. In the event of a fire, the following procedures will be immediately implemented:
- A. Notify the persons/agencies listed in Part 1.
 - B. Reinforce the area with soil to contain any runoff and use to extinguish fire, if necessary.
 - C. Extinguish the fire with on-site equipment and stockpile dirt. Only personnel trained in fire safety procedures will be utilized to fight fires.
 - D. A special and/or hazardous waste contractor will be contacted for cleanup and disposal of any residue generated by the fire.
4. Within two weeks of the emergency, a written report describing the event will be sent to the Department of Environmental Protection. The report will include the origins of the emergency, the actions taken to remedy the situation, the results of the action that was taken, and an analysis of the success or failure of the actions.

Attachment 5

Yard Waste

Processing

Registration

**FLORIDA DEPARTMENT OF
Environmental Protection**

Ron DeSantis
Governor

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

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

**Source-Separated Organics Processing Facility Registration
Confirmation of Submission**

06/23/2020

Waste Registration Section

WASTE MANAGEMENT INC. OF FL

TRAIL RIDGE LANDFILL, INC.

5110 US Highway 301 S Jacksonville, FL 32234 3606

Dear **WASTE MANAGEMENT INC. OF FL**

Your application for Registration of a Source-Separated Organics Processing Facility (SOPF) for TRAIL RIDGE LANDFILL, INC. (located at 5110 US Highway 301 S , Jacksonville) in Duval County is complete. Your facility identification number (WACS ID) is 33628. This registration is valid until August 1, 2021. The receipt number for the registration fee you paid is 34212

You must comply with the requirements specified in Chapter 62-709, Florida Administrative Code (F.A.C.) in order to maintain qualification for the registration program. A summary of the operating requirements is attached.

If you have any questions or need further assistance, please contact Waste Registration Section at (850) 245-8707 or by e-mail at Waste.Registration@dep.state.fl.us.

Please retain a copy of this confirmation for your records.

Sincerely,

Waste Registration Section

cc: Brian Durden; Northeast District



Florida Department of Environmental Protection

Solid Waste Section, Mail Station 4565
2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form # 62-709.901(3)
Appl for Reg. and Ann Rep for a YT Trans
Form Title <u>Station or SW Organic Recycling Facility</u>
Effective Date <u>February 15, 2010</u>
DEP Facility ID No. <u>33628</u>
(Filled in by DEP)
DEP WACS ID No. <u>33628</u>
(Filled in by DEP)
This form is adopted by reference in subsection 62-709.901(3), F.A.C.

Application for Registration and Annual Report for a Yard Trash Transfer Station or a Solid Waste Organics Recycling Facility

PART A - GENERAL INFORMATION

1. Type of Application: New ☐ Renewal (due July 1) ☒ Annual report only for facility operating under permit: ☐
2. Type of Facility: Yard trash recycling ☒ Manure blending ☐
Yard trash transfer station ☐ Vegetative, animal byproducts or manure composting ☐
3. Type of Waste Processed: Yard trash ☒ Manure ☐ Animal byproducts ☐ Pre-consumer Vegetative ☐
Vegetative (could/did come into contact with animal products or byproducts or end user) ☐
4. Facility Name: TRAIL RIDGE LANDFILL, INC.
5. Registrant Name (or Permittee if annual report only): TRAIL RIDGE LANDFILL, INC.
6. Federal Employer Identification Number: 591094518
7. Mailing Address: 5110 US Highway 301 S
City Jacksonville State FL Zip 32234 3606
Street Mailing Address (if different): _____
City _____ State _____ Zip _____
8. Facility Location - Street Address or Property Number: 5110 US Highway 301 S
City Jacksonville County Duval
9. Contact Person: PARKER, ERIC Telephone: (904) 748-6006

PART B - ADDITIONAL INFORMATION REQUIRED FOR REGISTRATION APPLICATION

10. Records required by Rule 62-709.320, F.A.C., will be kept at the facility? Yes ☒ No ☐
If no, please indicate where these records will be kept and made available upon Department request to review the records:

11. Does the registrant own the facility site? Yes ☐ No ☒
If you answered no, please attach evidence that the facility owner or operator has permission from the landowner to operate a yard trash transfer station or a solid waste organics recycling facility at this site.
12. Has the organic recycling facility begun operations? Yes ☒ No ☐
If this facility was operating in the previous calendar year, the annual report in Part C must be completed.
13. ~~Include a check or money order for the \$35.00 registration fee made payable to the Florida Department of Environmental Protection. Payment of \$35.00 for this registration was received via online transaction.~~

I affirm that I have read Rules 62-709.320, 62-709.330 and 62-709.350, F.A.C., and shall comply with the requirements specified in those rules. I also affirm that the information provided in the application is true, accurate, and correct to the best of my knowledge. I have attached all documents and/or authorizations that are required.

Eric Parker, Environmental Manager

Eric Parker

06/23/2020

Print Name and Title of Registrant or Authorized Agent

Signature

Date

Email address (if available): eparker1@wm.com

PART C - ANNUAL REPORT

2019

14. Calendar Year (January 1 through December 31) Covered by this Report:

15. Values used in this report are in (SELECT ONE):

Tons



Cubic Yards



16. **For Existing Facilities that have not reported this information in the past**, Amount of

a. Unprocessed Material On Site at Beginning of Report Year:

0

b. Processed Material On Site at Beginning of Report Year (total):

0

17. Total Quantity of Material Received During Report Year:

82418.00

18. Total Quantity of Material Lost Due to Processing (e.g. grinding, drying, shrinkage, fires, etc.) During Report Year:

1.00

19. Total Quantity of Material Removed from Site for:

a. Use (e.g., landfill cover, fuel, mulch, compost, etc.):

82417.00

b. Disposal:

0

c. Other (transfer stations)

0

20. Total Quantity On Site at End of Report Year of:

a. Unprocessed Material:

0

b. Processed Material:

0

Note that the total sum of items 16 a and b plus 17 must equal to sum of items 18, plus 19 a, b and c, plus 20 a and b.

Total of items 16 and 17

82418.00

Total of Items 18, 19 and 20

82418.00

I affirm that the information provided in the annual report is true, accurate, and correct to the best of my knowledge.

Eric Parker, Environmental Manager

Eric Parker

06/23/2020

Print Name and Title of Registrant/Permittee or
Authorized Agent

Signature

Date

Email address (if available): eparker1@wm.com

~~PART D - MAILING INSTRUCTIONS~~

This registration was completed and payment of \$35.00 (if applicable) was received via online transaction.

~~Remember to include the \$35.00 fee if this is also a registration application. Mail completed form to:~~

~~Department of Environmental Protection
Solid Waste Section, MS 4565
2600 Blair Stone Road
Tallahassee, Florida 32399-2400~~

Attachment 6
Alternate Closure
Demonstration

TRAIL RIDGE LANDFILL SIDE SLOPE CLOSURE ALTERNATE CLOSURE DESIGN DEMONSTRATION

This analysis is based upon "Municipal Solid Waste Alternate Design Closure Guidance" Document dated February 10, 1995, prepared by the Department of Environmental Protection, Solid Waste Section.

A. FINAL CLOSURE - MINIMUM DESIGN

1. DETERMINE IMPINGEMENT RATE

Use the HELP Model, Version 3 and the following:

- a. Default Rainfall and Temperature Data for Jacksonville
- b. Maximum Leaf Area Index of 2.0 - Fair Gross
- c. Evaporative Zone Depth at 22 Inches
- d. Growing Season - 365 Days.

From the HELP Model Results - Average Annual

Precipitation - 46.43 IN

Runoff - 0.179 IN

Evapotranspiration - 36.93 IN

Thus:

$$\begin{aligned}\text{IMPINGEMENT RATE (e)} &= \text{Precipitation} - \text{Runoff} - \text{Evapotranspiration} \\ &= 46.34 \text{ IN} - 0.179 \text{ IN} - 36.93 \text{ IN/YR} \\ &= 9.23 \text{ IN/YR} \\ &= 0.025 \text{ IN/DAY} = 7.44 \times 10^{-9} \text{ m/sec}\end{aligned}$$

2. DETERMINE MAXIMUM HEAD OVER LINER - T_{MAX}

Moore's Equation:

$$T_{\text{MAX}} = C \times L \left[\left(4(e/k) + (\tan B)^2 \right)^{1/2} - \tan B \right] / 2 \cos B$$

Where:

- | | | |
|------|---|---|
| L | = | Length of horizontal projection of the leachate collection layer from top to collector, m |
| e | = | Impingement rate, m/sec |
| k | = | Saturated hydraulic conductivity of the drainage layer, m/sec |
| tanB | = | Slope to collection pipe, dimensionless |
| C | = | Constant, 39.37 in/m |

Therefore:

$$\begin{aligned} L &= 110 \text{ FT} = 33.52 \text{ m} \\ e &= 7.44 \times 10^{-9} \text{ m/sec} \\ k &= 1 \times 10^{-3} \text{ cm/sec} = 1 \times 10^{-5} \text{ m/sec} \\ \tan B &= 0.04 \end{aligned}$$

Thus:

$$\begin{aligned} T_{\text{MAX}} &= 39.37 \times 33.52 [(4(7.44 \times 10^{-9} / 1 \times 10^{-5}) + (0.04)^2)^{1/2} - 0.04] / 2 \times 0.999 \\ T_{\text{MAX}} &= 18.25 \text{ IN} = 0.46 \text{ m} \end{aligned}$$

3. DETERMINE LEAKAGE RATE - Q

$$Q = 0.6 \times C \times a^{0.1} \times h^{0.9} \times k^{0.74}$$

Where:

$$\begin{aligned} Q &= \text{Leakage rate, gal/acre/day} \\ a &= \text{Area of hole for leakage, } 0.0001 \text{ m}^2 \\ h &= \text{Head of liquid over hole, m} \\ k &= \text{Hydraulic conductivity of soil under liner, m/sec} \\ C &= \text{Constant, } 2.282 \times 10^7 \text{ gal-sec/day/m}^3 \end{aligned}$$

Therefore:

$$\begin{aligned} h &= T_{\text{MAX}} = \cancel{232 \text{ m}} 0.46 \text{ m} \\ k &= 1 \times 10^{-4} \text{ cm/sec} = 1 \times 10^{-6} \text{ m/sec} \end{aligned}$$

Thus:

$$\begin{aligned} Q &= 0.6 \times 2.282 \times 10^7 \times (0.0001)^{0.1} \times (0.46)^{0.9} \times (1 \times 10^{-6})^{0.74} \\ Q &= 99.1 \text{ gal/acre/day} \end{aligned}$$

B. FINAL CLOSURE - ALTERNATE DESIGN

1. DETERMINE IMPINGEMENT RATE

$$e = 7.44 \times 10^{-9} \text{ m/sec (Same as minimum design, See Page 1)}$$

2. DETERMINE MAXIMUM HEAD OVER LINER - T_{MAX}

Moore's Equation:

$$T_{\text{MAX}} = C \times L [(4(e/k) + (\tan B)^2)^{1/2} - \tan B] / 2 \cos B$$

Where:

$$L = 67.5 \text{ FT} = 20.57 \text{ m}$$

$$k = 1 \times 10^{-5} \text{ m/sec}$$

$$\tan B = 0.333$$

$$\cos B = 0.9487$$

Thus:

$$T_{\text{MAX}} = 39.37 \times 20.57 [(4(7.44 \times 10^{-9} / 1 \times 10^{-5}) + (0.333)^2)^{1/2} - 0.333] / 2 \times 0.9487$$

$$T_{\text{MAX}} = 1.88 \text{ IN} = 0.157 \text{ FT}$$

3. DETERMINE LEAKAGE RATE - Q

Using Darcy's Law:

$$Q = C \times k (h+H)/H$$

Where:

$$h = \text{Head of liquid above soil liner, ft}$$

$$H = \text{Thickness of soil liner, ft}$$

$$k = \text{Hydraulic conductivity of soil liner, cm/sec}$$

$$C = \text{Constant, } 9.239 \times 10^8 \text{ gal-sec/cm/acre/day}$$

Therefore:

$$h = T_{\text{MAX}} = 0.157 \text{ FT}$$

$$H = 1 \text{ FT}$$

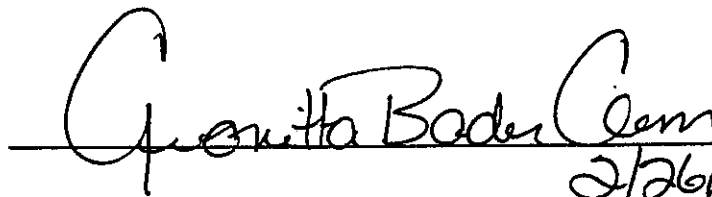
$$k = 6.67 \times 10^{-8} \text{ cm/sec}$$

Thus:

$$Q = 9.239 \times 10^8 \times 6.67 \times 10^{-8} \times (0.157 + 1) / 1$$

$$Q = 71.3 \text{ gal/acre/day}$$

Since the leakage rate for alternate design (71.3 gal/acre/day) is less than the leakage rate for the minimum design (99.1 gal/acre/day), the alternate design is acceptable based on "Municipal Solid Waste Alternate Design Closure Guidance" Document dated February 10, 1995 prepared by the Department of Environmental Protection, Solid Waste Section.


2/26/97

I certify that this analysis is in accordance with "Municipal Solid Waste Alternate Design Closure Guidance" Document dated February 10, 1995 as prepared by the Department of Environmental Protection, Solid Waste Section.

