

Permit No.	Date	DIN
06-03	March 21, 2016	25749

RECEIVED
March 14, 2016
Solid Waste Section
Asheville Regional Office

PERMIT RENEWAL APPLICATION

Avery County Solid Waste Facility
Ingalls, North Carolina
Permit No. 06-03

Prepared for:



Avery County
Newland, North Carolina

March 2016

Prepared by:

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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PERMIT RENEWAL APPLICATION

Avery County Solid Waste Facility
Ingalls, North Carolina
Permit No. 06-03

Prepared For:



Avery County
Newland, North Carolina

S+G Project No. Avery 15-7

DocuSigned by:

Joan A. Smyth

3/10/2016

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Joan A. Smyth, P.G.
Senior Geologist



DocuSigned by:

Stacey A. Smith

3/10/2016

FB482DF1A09436...

Stacey A. Smith,
Senior Engineer

March 2016

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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Applicant Certification

Name of Facility: Avery County Solid Waste Management Facility
Application: Permit Renewal Application

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision and that the information provided in this application is true, accurate, and complete to the best of my knowledge.

I understand that North Carolina General Statute 130A-22 provides for administrative penalties of up to fifteen thousand dollars (\$15,000.00) per day per each violation of the Solid Waste Management Rules. I further understand that the Solid Waste Management Rules may be revised or amended in the future and that the facility siting and operations of this solid waste management facility will be required to comply with all such revisions or amendments.

<u></u>	<u>Eric Foster</u>	<u>3-2-16</u>
Signature	Name	Date
<u>Director</u>	<u>Avery County Landfill</u>	
Title	Business or Organization Name	

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**Avery County Solid Waste Facility
Ingalls, North Carolina
Permit No. 06-03**

Permit Renewal Application

Table of Contents

A guide to specific North Carolina Solid Waste Management (15A NCAC 13B.0531 –.0547) rules, Application Guidance for Construction and Demolition (C&D) Landfills and Transfer Stations, and the North Carolina General Assembly Session Law (SB 1492/SL 2007-500) addressed in each updated section of this document is shown in italics after each section.

Executive Summary

Attachment A Permit Documentation

Attachment B Operations Plan
(15A NCAC 13B. 0542)

Attachment C Water Quality Monitoring Plan
(15A NCAC 13B. 0544)

Attachment D Landfill Gas Monitoring Plan
(15A NCAC 13B. 0544)

Attachment E Financial Assurance
(SL 2007-550 §13A-295.2)

Attachment F Project Drawings

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EXECUTIVE SUMMARY

GENERAL

The following is a Permit Renewal Application submitted on behalf of Avery County for the Solid Waste Facility containing a Construction and Demolition (C&D) landfill and Transfer Station covered under NC Solid Waste Permit No. 06-03 located in Ingalls, North Carolina. This renewal application has been prepared for a **5-year term**. The current permit expires on April 13, 2016. A copy is provided in **Attachment A**. It is the intent of Avery County to continue with the facility operations following approval of this application.

CONTACT INFORMATION

Correspondences and questions concerning the operation of the Avery County Solid Waste Facility should be directed to the appropriate site management listed below.

Avery County Solid Waste Landfill (Physical Address)
2175 Brushy Creek Road
Ingalls, North Carolina 28657
Scalehouse Phone: (828) 765-7852

Avery County Solid Waste Landfill (Mailing Address)
2175 Brushy Creek Road
Spruce Pine, North Carolina 28777

Avery County Solid Waste Office
175 Linville Street
Newland, North Carolina 28657
Phone: (828) 737-5420

Contact: Eric Foster, Solid Waste Director
avery.sw@averycountync.gov

REGULATORY REFERENCES

This submission has been prepared in general accordance with the requirements of the North Carolina Solid Waste Management Rule 15A NCAC 13B .401-.402 & .0531-.0547, and applicable sections of the North Carolina General Assembly's Session Law 2007-500 (Solid Waste Management Act of 2007).

CONTENTS

Included in this document are the following attachments (*with applicable rule(s) in italics*):

Permit Documentation (**Attachment A**)
Operations Manual (**Attachment B**) (*15A NCAC 13B .0542*);
Monitoring Plans (**Attachments C & D**) (*15A NCAC 13B .0544*); and
Financial Assurance (**Attachment E**) (*General Statutes Article 9, Chapter 130A-295.2*).
Engineering Drawings (**Attachment F**)

HIGHLIGHTED UPDATES

Operations Plan

The operations plan has been updated with the National Fire Protection Association (NFPA) Fire Tetrahedron to better understand fire properties and methods of how to extinguish one. An Asphalt Shingle Recycling Plan has also been added. A copy of the Operations Manual is provided in **Attachment B**.

Water Quality Monitoring Plan

The WQMP has been updated to reflect current conditions and is presented in **Attachment C**.

Landfill Gas Monitoring Plan

The Landfill Gas (LFG) Monitoring Plan has been updated to reflect current conditions and is presented in **Attachment D**.

Financial Assurance

Financial assurance has been updated to reflect present values and monitoring frequencies and is provided in **Attachment E**.

Project Drawings

The project drawings have been updated for this submittal to represent current conditions and are provided as **Attachment F**.

The estimated gross and net operating capacities, life expectancies, and areas of existing and planned C&D landfill units are shown in **Table 1**

Table 1 Total Operating Capacity and Life Expectancy

Landfill Unit	Area (Acres)	Gross Capacity (CY) ²	Net (Waste) Capacity (CY) ³	Life Expectancy (Years) ⁴
Phase 1 ¹	2.95	39,750	0	Closed
Phase 2 ¹	2.06	65,500	0	Closed
Phase 3 – Cell 1	0.84	49,000	0	0
Phase 3 – Cell 2	0.36	47,000	16,320	1.1
Phase 3 – Cell 3	0.90	33,000	27,192	1.7
Total:	7.11	234,250	43,512	2.8

Notes:

1. Closure of Phases 1 and 2 occurred in November 2011 and is documented in the Construction Quality Assurance report prepared by Smith Gardner, Inc. (formerly Richardson Smith Gardner and Associates) dated November 2011.
2. Gross capacity is defined as volume of the landfill from elevation of subgrade through the top of final cover. Volumes obtained from AutoCAD from 2008 Phase 3 PTC.
3. Net waste capacity is defined as the remaining tonnage to be placed in cell negating final cover.
4. Life expectancy for the active Phase 3 unit shown above is from 01/14/16. Life expectancies are based on a disposal rate of 4,300 tons/year at a density of 0.3 tons/cubic yard.

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Attachment A

Permit Documentation

**Permit Renewal Application
Avery County Solid Waste Facility
Ingalls, North Carolina**

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Facility Permit No: 06-03
Permit to Construct and Operate
Construction & Demolition Debris Landfill
Transfer Station
Avery County
April 13, 2011
Doc ID: 13546
Page 1 of 13

North Carolina Department of Environment and Natural Resources
Division of Waste Management

Beverly Eaves Perdue
Governor

Dexter R. Matthews
Director

Dee Freeman
Secretary

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION

SOLID WASTE MANAGEMENT FACILITY
Permit No. 06-03

AVERY COUNTY
is hereby issued a

PERMIT TO OPERATE
CONSTRUCTION & DEMOLITION DEBRIS LANDFILL PHASE 3
AND TRANSFER FACILITY

Located at 2175 Brushy Creek Road, Spruce Pine, North Carolina in Avery County, in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit. The legal description of the site is identified on the deeds recorded for this property listed in Attachment No. 1 of this permit.

Edward F. Mussler, III, P.E.,
Permitting Branch Supervisor
Solid Waste Section

ATTACHMENT 1

PART I: PERMITTING HISTORY

1. On October 25, 1996 a Permit to Construct/Operate was issued for a Construction and Demolition Debris landfill.
2. On October 16, 2009 an amendment was made to the permit for construction of Phase 3 and continued operation of Phases 1 and 2 for waste mitigation and relocation purposes.
3. On August 12, 2010 a modification was made to the permit for operation of Phase 3.
4. On April 13, 2011 an amendment was made to the permit for the addition and operation of the Transfer Facility.

Permit Type	Date Issued	DIN
Original Permit to Construct/Operate	October 25, 1996	
Permit Amendment	October 16, 2009	8705
Permit Modification	August 12, 2010	11315
Permit Modification	April 13, 2011	13546

PART II: LIST OF DOCUMENTS FOR THE APPROVED PLAN

NO.	DOCUMENT DESCRIPTION	DOCUMENT ID NO.
1.	<i>Trout Stream Buffer Variance Request and 401/404 Nationwide Permit No. 39 Application, Avery County C&D Landfill Expansion.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. September 2008.	5911
2.	<i>Transition Application, Avery County Landfill.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. October 23, 2008.	6095
3.	<i>Waste Relocation and Mitigation Plan, Avery County C&D Landfill.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. October 2008.	6097
4.	<i>Response to Comments-Transition Application.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. January 9, 2009.	6625
5.	<i>Permit To Construct Application, Phase III, Avery County C&D Landfill.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. February 2009.	6894
6.	<i>Letter of Approval with Modifications, Avery County C&D Landfill-Stormwater Management Plan.</i> Prepared by: Starr Silvis. Prepared for: Division of Land Resources, Land Quality Section. June 9, 2009.	7943

7.	<i>Response to Engineering Technical Review, Permit To Construct, Construction and Demolition Landfill Phase III.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. August 7, 2009.	8220
8.	<i>Stormwater Management Plan Modification, Permit To Construct, Avery County C&D Landfill Expansion.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. August 31, 2009.	8557
9.	<i>Operations Manual.</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. February 2009.	11333
10.	<i>Operating Permit Renewal-Response to Comments (revised Operations Manual).</i> Prepared by: Richardson, Smith, Gardner & Associates. Prepared for: Avery County. April 1, 2011	13455

PART III: PROPERTIES APPROVED FOR THE SOLID WASTE FACILITY

Avery County, N.C. Register of Deeds				
Book	Page	Acreage	Grantee	Parcel No.
266	646	±78.12	Avery County	182100088310
Total Site Acreage: ±78.12 acres				

Notes:

- Deed book references are from the Avery County Register of Deeds office GIS website (<http://arcims.webgis.net/nc/avery/default.asp>) accessed September, 2009.

PART IV: GENERAL PERMIT CONDITIONS

- This permit is issued by the North Carolina Department of Environment and Natural Resources, Division of Waste Management, Solid Waste Section (Section). In accordance with North Carolina Solid Waste Management Rule 15A NCAC 13B .0201(d), a solid waste management facility permit shall have two parts: a Permit to Construct and a Permit to Operate. The Permit to Construct must be implemented in accordance with Attachment 2 of this permit. The Permit to Operate must be implemented in accordance with Attachment 3 of this permit.
- The persons to whom this permit is issued (“permittee”) are the owners and operators of the solid waste management facility.
- (Intentionally blank)
- When this property is sold, leased, conveyed, or transferred in any manner, the deed or other instrument of transfer shall contain in the description section in no smaller type than that used in the body of the deed or instrument, a statement that the property has been

used as a sanitary landfill and a reference by book and page to the recordation of the permit.

5. By initiating construction or receiving waste at this facility the permittee shall be considered to have accepted the terms and conditions of this permit.
6. Construction and operation of this solid waste management facility must be in accordance with the Solid Waste Management Rules, 15A NCAC 13B, Article 9 of the Chapter 130A of the North Carolina General Statutes (NCGS 130A-290, et seq.), the conditions contained in this permit; and the approved plan. Should the approved plan and the rules conflict, the Solid Waste Management Rules shall take precedence unless specifically addressed by permit condition.
7. This permit is issued based on the documents submitted in support of the application for permitting the facility including those identified in Attachment 1, "List of Documents for Approved Plan," and which constitute the approved plan for the facility. Where discrepancies exist, the most recent submittals and the Conditions of Permit shall govern.
8. This permit may be transferred only with the approval of the Section, through the issuance of a new or substantially amended permit in accordance with applicable statutes and rules. In accordance with NCGS 130A-295.2(g) the permittee must notify the Section thirty (30) days prior to any significant change in the identity or business structure of either the owner or the operator, including but not limited to a proposed transfer of ownership of the facility or a change in the parent company of the owner or operator of the facility.
9. The permittee is responsible for obtaining all permits and approvals necessary for the development of this project including approval from appropriate agencies for a General or Individual NPDES Stormwater Discharge Permit. Issuance of this permit does not remove the permittee's responsibilities for compliance with any other local, state or federal rule, regulation or statute.

- End of Section -

ATTACHMENT 2
CONDITIONS OF PERMIT TO CONSTRUCT

PART I: GENERAL FACILITY CONDITIONS

Not Applicable

PART II: MUNICIPAL SOLID WASTE LANDFILL UNIT SPECIFIC CONDITIONS

Not Applicable

PART III: CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

Not Applicable

PART IV: LAND CLEARING AND INERT DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

Not Applicable

PART V: MISCELLANEOUS SOLID WASTE MANAGEMENT SPECIFIC CONDITIONS

Not Applicable

ATTACHMENT 3
CONDITIONS OF PERMIT TO OPERATE

PART I: GENERAL FACILITY CONDITIONS

1. The Permit to Operate shall expire **April 13, 2016**. Pursuant to 15A NCAC 13B .0201(g), no later than **October 13, 2015**, the owner or operator must submit a permit amendment application prepared in accordance with 15A NCAC 13B.0535(b) to the Section for review.
2. All sedimentation and erosion control activities must be conducted in accordance with the Sedimentation Control Act N.C.G.S. 113A-50, et seq., and rules promulgated under 15A NCAC 4.
3. The edge of the waste footprint for all disposal units must be identified and maintained with permanent physical markers.
4. The permittee must not knowingly dispose of any type or form of municipal solid waste that is generated within the boundaries of a unit of local government that by ordinance:
 - a. Prohibits generators or collectors of municipal solid waste from disposing of that type or form of municipal solid waste.
 - b. Requires generators or collectors of municipal solid waste to recycle that type or form of municipal solid waste.
5. Copies of this permit, the approved plans, and all records required to be maintained by the permittee must be maintained at the facility and made available to the Section upon request during normal business hours.
6. Financial assurance as required by NCGS 130A-295.2 must be continuously maintained for the duration of the facility in accordance with applicable rules and statutes. Closure and Post-Closure cost estimates and financial instruments must be updated annually pursuant to 15A NCAC 13B.0543.
7. Closure or partial closure of any CDLF unit must be in accordance with the Closure Plans described in the approved plans and 15A NCAC 13B.0543. Any revisions to the Closure Plans must be submitted to the Division at least 90 days prior to implementation for approval.

Operational Requirements

8. This facility is permitted to receive solid waste generated within the following counties:
North Carolina – Avery, Burke, Caldwell, McDowell, Mitchell, Watauga;
Tennessee – Carter, Johnson, Unicoi;

consistent with the local government waste management plan and with local government approval except where prohibited by the N. C. General Statues Article 9 of Chapter 130A, and the rules adopted by the Commission for Health Services. Proposed changes to the service area must be approved by the Section and will constitute a permit modification and be subject to the applicable permitting fee.

9. The facility operator must complete an approved operator training course in compliance with G.S. 130A-309.25.
 - a. A responsible individual certified in landfill operations must be on-site during all operating hours of the facility at all times while open for public use to ensure compliance with operational requirements.
 - b. All pertinent landfill-operating personnel must receive training and supervision necessary to properly operate the landfill units in accordance with G.S. 130A-309.25 and addressed by memorandum dated November 29, 2000.
10. The use of different alternative daily cover requires approval, prior to implementation, by the Solid Waste Section. Requests for alternative daily cover approval must include a plan detailing the comprehensive use and a demonstration of the effectiveness of the alternative daily cover. The plan must be developed according to Section guidelines. Plans which are approved by the Section will be incorporated into, and made a part of, the approved documents listed in Attachment 1.
11. The facility must maintain records for all solid waste materials accepted as alternative cover material and used as alternate daily cover. The records must include: the date of receipt, weight of material, general description of the material, identity of the generator and transporter, and county of origin. Such records must be made available to the Solid Waste Section upon request.

Monitoring and Reporting Requirements

12. Groundwater, surface water, and landfill gas monitoring locations must be established and monitored as identified in the approved plans.
13. A licensed geologist must be present to supervise installation of groundwater and landfill gas monitoring wells and probes. The location, screen interval, spacing, diameter, depth, seal, cap, clustering and nesting, and other criteria for the wells must be established after consultation with the SWS Hydrogeologist at the time of well installation.
14. Ground water monitoring wells and surface water sampling locations must be sampled for Appendix I constituents at least semi-annually according to the specifications outlined in the approved water quality monitoring plan and the current policies and guidelines of the Section in effect at the time of sampling.

15. Landfill gas monitoring wells must be sampled for explosive gases at least quarterly and according to specifications outlined in 15A NCAC 13B .544(d), entitled "Gas Control Plan", and current policies and guidelines of the Section in effect at the time of sampling.
16. Reports of the analytical data for each monitoring event must be submitted to the Section within 120 days of the respective sampling event. Analytical data must be submitted in a manner prescribed by the Section. Records of all groundwater, surface water, landfill gas, and leachate analytical data must be kept as part of the permanent facility record.
17. A readily accessible unobstructed path must be cleared and maintained so that four-wheel vehicles may access monitoring well locations at all times.
18. A field log book which details all development, sampling, repair, and all other pertinent activities associated with each monitoring well and all sampling activities associated with each groundwater, surface water, landfill gas, and leachate sampling location must be kept as part of the permanent facility record.
19. All well construction records and soil boring logs for new wells and probes must be submitted to the Solid Waste Section Hydrogeologist for review within 30 days of completion.
20. The owner or operator must maintain a record of the amount of solid waste received at the landfill unit, compiled on a monthly basis. Scales must be used to weigh the amount of waste received.
21. On or before August 1 annually, the Permittee must submit an annual facility report to the Solid Waste Section, on forms prescribed by the Section.
 - a. The reporting period shall be for the previous year beginning July 1 and ending June 30.
 - b. The annual facility report must list the amount of waste received and landfilled in tons and be compiled:
 - i) On a monthly basis.
 - ii) By county, city or transfer station of origin.
 - iii) By specific waste type.
 - iv) By disposal location within the facility.
 - v) By diversion to alternative management facilities.
 - c. A measurement of volume utilized in the landfill cells must be performed during the second quarter of the calendar year. The date and volumes, in cubic yards, must be included in the report.
 - d. The amount of waste, in tons from scale records, disposed in landfill cells from October 8, 1993 through the date of the annual volume survey must be included in the report.

- e. The completed report must be forwarded to the Regional Waste Management Specialist for the facility by the date due on the prescribed annual facility report form.
- f. A copy of the completed report must be forwarded to each county manager for each county from which waste was received at the facility. Documentation that a copy of the report has been forwarded to the county managers must be sent to the Regional Waste Management Specialist by the date due on the prescribed annual facility report form

PART II: MUNICIPAL SOLID WASTE LANDFILL UNIT SPECIFIC CONDITIONS

Not Applicable

PART III: CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

- 22. This permit approves the operation of Phase 3, as well as the onsite environmental management and protection facilities as described in the approved plans.
- 23. This permit is for operational approval of a remaining gross capacity of 96,000 cubic yards. The facility is approved for an average annual disposal rate of approximately 10,000 tons per year (approximately 40 tons per day based on 260 operating days per year) as set forth in Attachment 1, Part II: "List of Documents for the Approved Plan". The maximum variance should be in accordance with GS 130A-294(b1)(1) and consistent with local government approval.
- 24. The following table lists the details for the landfill units. Gross capacity is defined as the volume of the landfill calculated from the elevation of the initial waste placement through the top of the final cover, including any periodic cover.

MSW Unit	Acres	Gross capacity (cubic yards)	Status
Phase 1	2.95	39,750	Closed
Phase 2	2.06	65,500	Closed
Phase 3, Cell 1	0.84	49,000	Operational
Phase 3, Cell 2	0.36	47,000	Operational
Phase 3, Cell 3	0.90	27,200	Future
Total	7.11	228,450	

Note: Phase 3, Cell 3 has not been constructed.

- 25. The following, at a minimum, must not be accepted for disposal at the facility: hazardous waste, yard trash, liquid wastes, regulated medical waste, sharps not properly packaged,

PCB waste as defined in 40 CFR 761, and wastes banned from disposal in North Carolina by G.S. 130A-309.10(f).

26. The C&D landfill units are permitted to receive the following waste types:
- a. "Construction or demolition debris" as defined in NCGS 130A-290 (a)(4) means solid waste resulting solely from construction, remodeling, repair or demolition operations on pavement, buildings, or other structures, but does not include inert debris, land-clearing debris or yard debris.
 - b. "Inert debris" as defined in NCGS 130A-290 (a)(14) means solid waste that consists solely of material such as concrete, brick, concrete block, uncontaminated soil, rock, and gravel.
 - c. "Land-clearing debris" as defined in NCGS 130A-290 (a)(15) means solid waste that is generated solely from land-clearing activities, such as stumps and tree trunks.
 - d. "Asphalt" in accordance with NCGS 130-294(m).

PART IV: LAND CLEARING AND INERT DEBRIS LANDFILL UNIT SPECIFIC CONDITIONS

Not Applicable

PART V: MISCELLANEOUS SOLID WASTE MANAGEMENT SPECIFIC CONDITIONS

General Conditions

- 27. Wastes received and product stored shall be maintained in reasonably sized piles with adequate fire breaks and lanes in accordance with the approved operational plans and the pertinent rules.
- 28. Surface water shall be diverted from all operational and storage areas to prevent standing water in operational areas and under or around storage piles. Water that comes in contact with solid waste shall be contained on-site or properly treated prior to discharge.
- 29. These areas shall be operated and maintained with sufficient dust control measures to minimize airborne emissions and to prevent dust from becoming a nuisance or safety hazard.
- 30. These areas shall be operated and maintained in a manner so as to minimize odors, prevent the creation of a nuisance, potential health hazard, or a potential fire hazard.
- 31. Effective vector control measures shall be applied as necessary to control flies, rodents, insects, or vermin.

Operational Conditions – Transfer Facility

- 32. The facility is permitted to receive solid waste as defined in NCGS 130A -290 (35).

33. The facility must meet the requirements of 15A NCAC 13B.0105. In addition, the following, at a minimum, must not be accepted at the facility; hazardous waste, liquid wastes, regulated medical waste, sharps not properly packaged, regulated-asbestos containing material as defined in 40 CFR 61, PCB waste as defined in 40 CFR 761.
34. The facility must transport waste to one of the following facilities for disposal:
- Bristol Integrated Waste management Facility, Bristol, VA – Permit No. 588,
 - Iris Glen Environmental Center, Johnson City, TN – Permit No. SNL-901040262,
 - Caldwell County Foothills Landfill, Lenoir, NC – Permit No. 14-03 (*NC originated wastes only*).
- Proposed changes to the disposal facility must be approved by the Section and will constitute a permit modification and be subject to the applicable permitting fee.
35. A responsible individual trained and certified in facility operations must be on-site at all times during all operating hours of the facility, in accordance with G.S. 130A-309.25.
36. The permittee must develop, and use, a training and screening program at the facility for detecting and preventing unauthorized wastes from being accepted at the facility. At a minimum, the program must include:
- Random inspections of incoming loads or other comparable procedures.
 - Records of all inspections.
 - Training of personnel to recognize hazardous, liquid and other excluded waste types.
37. The facility must not cause nuisance conditions.
- The tipping floor and transfer trailer loading area must be maintained in a clean, sanitary condition at all times and must be cleaned at least daily in accordance with the approved Operational Plan.
 - Waste must only be deposited on a “tipping floor” or directly into a transfer container. Waste must not be stored on the “tipping floor” after operating hours.
 - Waste may be stored on-site, in leak proof transfer trailers, with watertight covers, a maximum of 24 hours except that a minimal amount of waste may be stored for a maximum of 72 hours when the facility is closed during a weekend or holiday. Storage of the waste must not cause any nuisance, such as odor or attraction of vectors.
 - Effective vector control measures must be applied at all times to control any potential vectors including flies, rodents, insects, and other vermin.
 - Control measures must be utilized to minimize and eliminate visible dust emissions and blowing litter.

- i) Fugitive dust emissions are prohibited.
 - ii) Windblown materials must be collected by the end of the day and no windblown material may be allowed to leave the facility boundary.
- 38. All water that comes in contact with solid waste, including vehicle wash-down water, is leachate and must be captured and properly treated before release to the environment.
 - a. The leachate control system, such as floor drains, leachate collection devices, sanitary sewer connections and leachate storage tanks, must be operational during facility operations.
 - b. The tipping floor must drain away from the building entrance and into the leachate collection system.
- 39. The permittee must maintain a record of the amount of solid waste received at the facility, including daily records of waste received and origins of the loads. Scales must be used to weigh the amount of waste received. The daily records are to be summarized into a monthly report for use in the required annual reports.
- 40. On or before August 1 annually, the Permittee must submit an annual facility report to the Solid Waste Section, on forms prescribed by the Section.
 - a. The reporting period shall be for the previous year beginning July 1 and ending June 30.
 - b. The annual facility report must list the amount of waste received in tons and be compiled:
 - i) On a monthly basis.
 - ii) By county, city or transfer station of origin.
 - iii) By specific waste type.
 - iv) By receiving disposal facility.
 - v) By diversion to alternative management facilities.
 - c. The completed report must be forwarded to the Regional Environmental Specialist for the facility by the date due on the prescribed annual facility report form.
 - d. A copy of the completed report must be forwarded to each county manager for each county from which waste was received the facility. Documentation that a copy of the report has been forwarded to the county managers must be sent to the Regional Environmental Specialist by the date due on the prescribed annual facility report form.

Operational Conditions – White Goods

- 41. The facility is permitted to receive white goods as defined in North Carolina General Statute Article 9, Chapter 130A-290(44).

42. The facility must manage white goods according to the Operation Plan included in Attachment 1, Part II "List of Documents for the Approved Plan". This document is included in the approved plan. Any revisions to the approved plan shall be approved by the North Carolina Division of Waste Management (DWM), Solid Waste Section, prior to implementation.
43. White goods collection areas shall provide for the proper removal of chlorofluorocarbon refrigerants.

Operational Conditions – Scrap Tires

44. The facility is permitted to receive tires and scrap tires as defined in North Carolina General Statute Article 9, Chapter 130A-309.53(6) & (7).
45. Scrap tire collection areas shall be operated in accordance with the requirements of 15A NCAC 13B.1107.
46. The facility must manage tires according to the Operation Plan included in Attachment 1, Part II, "List of Documents for the Approved Plan". This document is included in the approved plan. Any revisions to the approved plan shall be approved by the North Carolina Division of Waste Management (DWM), Solid Waste Section, prior to implementation.

- *End of Permit Conditions* -



North Carolina Department of Environment and Natural Resources
Division of Land Resources
Land Quality Section

James D. Simons, PG, PE
Director and State Geologist

Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

September 14, 2009

LETTER OF APPROVAL WITH MODIFICATIONS

Avery County
ATTN: Henry C. Norris, Solid Waste Director
Post Office Box 640
Newland, North Carolina 28657

RE: Project Name: Avery County C&D Landfill –
Stormwater Management Plan – Modification

Acres Approved: 15
Project ID: AVERY-2009-003
County: Avery
Street and City: Brushy Creek Road, Toe River
River Basin: Catawba
Stream Classification: c, Tr
Latitude: 35.9619 Longitude: -81.9719
Submitted By: Richardson, Smith, Gardner & Associates, Inc
Date Received by LQS: 5/20/2009 and 9/1/2009
Plan Type: Revision

Dear Mr. Norris:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable with modifications and hereby issue this letter of Approval With Modifications. The Modifications Required for Approval are listed on the attached page. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0129.

Please be advised that Title 15A NCAC 4B .0118(a) requires that a copy of the approved erosion control plan be on file at the job site. Also, you should consider this letter to give the Notice required by G.S. 113A-61.1(a) of our right of periodic inspection to insure compliance with the approved plan.

2090 US Highway 70, Swannanoa, North Carolina, 28778-8211
Telephone 828-296-4500 Fax 828-299-7043
www.enr.state.nc.us

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North Carolina
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Letter of Approval with Modifications
Henry C. Norris, Solid Waste Director, Avery County
September 14, 2009
Page 2 of 3

North Carolina's Sedimentation Pollution Control Program is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

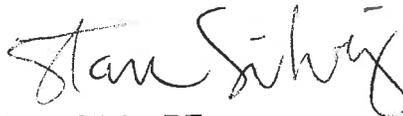
Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCG010000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you have provided. You are requested to file an amended form if there is any change in the information included on the form. In addition, it would be helpful if you notify this office of the proposed starting date for this project. Please notify **William Beck** or myself if you plan to have a pre-construction conference.

Your cooperation is appreciated.

Sincerely,



Starr Silvis, PE
Land Quality Section

Enclosures: Certificate of Approval
Modifications Required for Approval
NPDES Permit

cc: Richardson, Smith, Gardner & Associates, Inc

Letter of Approval with Modifications
Henry C. Norris, Solid Waste Director, Avery County
September 14, 2009
Page 3 of 3

MODIFICATIONS REQUIRED FOR APPROVAL

Project Name: Avery County C&D Landfill - Stormwater Management Plan - Modification
Project ID: AVERY-2009-003
County: Avery
Reviewed By: Starr Silvis, PE

1. Diversions are necessary to direct flow into Sediment Basin 4. All flow must be directed into the inlet of the sediment basin.
2. Appropriate sediment control measures in accordance with *The State of North Carolina Erosion and Sediment Control Planning and Design Manual* shall be constructed in the area between the creek and Phase 2 upslope of the road crossing and in the vicinity of the road crossing.
3. This plan approval is valid for portions of the project outside the required trout buffer zone. Work may not be initiated inside the trout buffer zone without written approval from the director of the Division of Land Resources. A copy of Trout Buffer Zone Waiver dated May 1, 2009, is on file in the Asheville Regional Office.
4. All silt fence shall be designed and constructed in accordance with *The State of North Carolina Erosion and Sediment Control Planning and Design Manual Practice Standards and Specification 6.62*.
5. Rolled erosion control fabric is required on all slopes completed between the dates of October 15th and March 15th.
6. Skimmer sediment basins shall be designed and constructed in accordance with *The State of North Carolina Erosion and Sediment Control Planning and Design Manual Practice Standards and Specification 6.64*.

CERTIFICATE OF PLAN APPROVAL



The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environment and Natural Resources in accordance with North Carolina General Statute 113A - 57 (4) and 113A - 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

Avery County C&D Landfill -

Stormwater Management Plan - Modification Avery

Project Name and Location

AVERY-2009-003

September 14, 2009

Date of Plan Approval



Janet S. Bayl
Regional Engineer

Town of Boone



REC'D APR 24 2008

April 18, 2008

Mr. Stacey Smith
Richardson, Smith, Gardner & Associates
14 N Boylan Avenue
Raleigh, NC 27603

Dear Mr. Smith:

I have received and reviewed the Industrial User Permit Application that Richardson Smith Gardner & Associates submitted on behalf of Avery County Transfer Station on April 17, 2008. It has been determined that Avery County Transfer Station Leachate may be discharged at the Jimmy Smith Wastewater Treatment Plant at this time in the amounts indicated in the application and by phone (maximum batch volume discussed by phone was 2500 gallons). Avery County Transfer Station will not require an industrial user permit at this time.

Any waste hauler that pumps the tank and brings it to the Jimmy Smith WWTP must first contact Rudy Broschinski, Plant Superintendent, to gain authorization to bring wastes to the plant in general. He can be reached at 828/268-6270. A-1 Appalachian Pumping Inc, the waste hauler indicated on the application, has already acquired authorization to bring wastewater to the WWTP and, therefore, may bring the Avery County Transfer Station Leachate to the facility.

If you have any questions or comments about this or other wastewater issues, please feel free to contact me by email at karen.reece@townofboone.net or by phone at 828/268-6270.

Sincerely,

A handwritten signature in cursive script that reads "Karen W. Reece".

Karen W. Reece
Pretreatment Coordinator

cc: Mr. Rudy Broschinski, Plant Superintendent

**U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT**

Action ID. 2008-03130County: AveryUSGS Quad: Linville Falls

GENERAL PERMIT (REGIONAL AND NATIONWIDE) VERIFICATION

Property Owner / Authorized Agent: Avery County Solid Waste / Attn: Buddy NorrisAddress: P.O. Box 305Newland, NC 28657Telephone No.: 828-737-5420Size and location of property (water body, road name/number, town, etc.): The site is located at 2175 Brushy Creek Road, near Ingles, Avery County, North Carolina.

Description of projects area and activity: This permit authorizes placement of fill and culverts for the expansion of an existing landfill. Impacts to stream channels authorized by this permit total 408 linear feet (0.03 acre) of intermittent stream channel and 0.01 acre of wetland. The N.C. Wildlife Resource Commission recommended that the trout moratorium be waived along with other recommendations which are attached for your review. The mitigation plan as proposed exceeds our regulatory requirements to mitigate for 408 linear feet of channel that exhibits little aquatic function, therefore we are only including a portion of the mitigation plan as a condition of this authorization. Any additional stream channel preservation and stream buffer enhancement/restoration is voluntary but also encouraged as best management practices. Special Condition: 1) The permittee will enhance 569 linear feet of perennial stream channel on-site through sediment removal techniques. 2) The permittee will also remove 40 linear feet of culvert and restore the channel to pre-construction conditions. 3) All required mitigation work shall be completed by November 9, 2009.

Applicable Law: Section 404 (Clean Water Act, 33 USC 1344)
 Section 10 (Rivers and Harbors Act, 33 USC 403)Authorization: Regional General Permit Number:
Nationwide Permit Number: 39

Your work is authorized by the above referenced permit provided it is accomplished in strict accordance with the attached conditions and your submitted plans. Any violation of the attached conditions or deviation from your submitted plans may subject the permittee to a stop work order, a restoration order and/or appropriate legal action.

This verification will remain valid until the expiration date identified below unless the nationwide authorization is modified, suspended or revoked. If, prior to the expiration date identified below, the nationwide permit authorization is reissued and/or modified, this verification will remain valid until the expiration date identified below, provided it complies with all requirements of the modified nationwide permit. If the nationwide permit authorization expires or is suspended, revoked, or is modified, such that the activity would no longer comply with the terms and conditions of the nationwide permit, activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon the nationwide permit, will remain authorized provided the activity is completed within twelve months of the date of the nationwide permit's expiration, modification or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend or revoke the authorization.

Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Quality (telephone (919) 733-1786) to determine Section 401 requirements.

For activities occurring within the twenty coastal counties subject to regulation under the Coastal Area Management Act (CAMA), prior to beginning work you must contact the N.C. Division of Coastal Management.

This Department of the Army verification does not relieve the permittee of the responsibility to obtain any other required Federal, State or local approvals/permits.

If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact Amanda Jones at 828-271-7980.

Corps Regulatory Official Amanda Jones

Date: **November 9, 2008**

Expiration Date of Verification: **November 24, 2010**

Determination of Jurisdiction:

- A. Based on preliminary information, there appear to be waters of the US including wetlands within the above described project area. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331).
- B. There are Navigable Waters of the United States within the above described project area subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- C. There are waters of the US and/or wetlands within the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- D. The jurisdictional areas within the above described project area have been identified under a previous action. Please reference jurisdictional determination issued _____. Action ID _____

Basis of Jurisdictional Determination: The site contains wetlands as indicated by the 1987 USACE Wetland Delineation Manual and also contains stream channels that exhibit indicators of ordinary high water marks. The stream channel on the property is an unnamed tributary to Brushy Creek which ultimately flows into the French Broad River and ultimately flows to the Atlantic Ocean through the Gulf of Mexico.

Appeals Information: (This information does not apply to preliminary determinations as indicated by paragraph A. above).

Attached to this verification is an approved jurisdictional determination. If you are not in agreement with that approved jurisdictional determination, you can make an administrative appeal under 33 CFR 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

District Engineer, Wilmington Regulatory Program
Attn: Amanda Jones, Project Manager
151 Patton Avenue, Room 208
Asheville, North Carolina 28801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address within 60 days from the *Issue Date* below.

****It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.****

Corps Regulatory Official: Amanda Jones

Issue Date: **November 9, 2008**

Expiration Date: Five years from *Issue Date*

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at <http://regulatory.usacesurvey.com/> to complete the survey online.

SURVEY PLATS, FIELD SKETCH, WETLAND DELINEATION FORMS, PROJECT PLANS, ETC., MUST BE ATTACHED TO THE FILE COPY OF THIS FORM, IF REQUIRED OR AVAILABLE.

Copy Furnished:

Carolina Ecosystems, Inc., Attn: Phil May, 8208 Brian Court, Garner, NC 27529

Permit Number: 2008-03130
Permit Type: NW39
Name of County: Avery
Name of Permittee: Avery County Solid Waste / Attn: Buddy Norris
Date of Issuance: November 9, 2008
Project Manager: Amanda Jones

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers
Attention: CESAW-RG-A
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: Avery County Solid Waste / Attn: Buddy Norris File Number: 2008-03130 Date: November 9, 2008

Attached is: See Section below

	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Amanda Jones, Project Manager
USACE, Asheville Regulatory Field Office
151 Patton Ave, Room 208
Asheville, NC 28806
828-271-7980

If you only have questions regarding the appeal process you may also contact:

Mr. Michael F. Bell,
Administrative Appeal Review Officer
CESAD-ET-CO-R
U.S. Army Corps of Engineers, South Atlantic Division
60 Forsyth Street, Room 9M15
Atlanta, Georgia 30303-8801

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

<p>_____</p> <p>Signature of appellant or agent.</p>	<p>Date:</p>	<p>Telephone number:</p>
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For appeals on Initial Proffered Permits and approved Jurisdictional Determinations send this form to:

District Engineer, Wilmington Regulatory Division, Attn:Amanda Jones, Project Manager, Asheville Regulatory Field Office, 151 Patton Avenue, Room 208, Asheville, NC 28801.

For Permit denials and Proffered Permits send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Mike Bell, Administrative Appeal Officer, CESAD-ET-CO-R, 60 Forsyth Street, Room 9M15, Atlanta, Georgia 30303-8801



⊠ North Carolina Wildlife Resources Commission ⊠

Gordon Myers, Executive Director

MEMORANDUM

TO: Amanda Jones, USACOE
Asheville Regulatory Field Office

Gray Hauser, NC Division of Land Resources
NC Department of Environment and Natural Resources

FROM: Ron Linville, Regional Coordinator 
Habitat Conservation Program

DATE: October 7, 2008

SUBJECT: Avery County C&D Landfill Expansion, Headwater Tributary Brushy Creek,
Avery County

The applicant proposes to expand an existing landfill. Biologists with the North Carolina Wildlife Resources Commission are familiar with habitat values in the area. These comments are provided in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d) and the North Carolina Environmental Policy Act (G.S. 113A-1 through 113A-10; NCAC 25).

The expansion project will impact 408 linear feet of intermittent jurisdictional stream and 0.01 (0.004) acres of headwater forest wetland. Removal of waste and restoration of a 50' buffer will be provided to enhance buffer functions. Current site conditions are poor and no trout are known for these waters. Mitigation is proposed through on-site perennial buffer restoration and sediment removal within the same reach. The total mitigation package includes 5,045 linear feet of preservation, 569 linear feet of sediment removal (enhancement) plus 40 linear feet of crossing removal (daylighting). In addition to this Clean Water Act mitigation, the project's proponents indicate that trout buffer impact mitigation will be provided for 0.524 acres of impact. This mitigation includes 4.20 acres of preservation, future preservation of 7.4 acres and restoration of 0.66 acres of buffer on perennial waters. Project proponents are requesting our concurrence with Clean Water Act permits and certifications as well as concurrence with a trout buffer waiver.

Based on our review of the submittal, we will not object to the project as proposed. We believe the project as proposed should improve aquatic ecosystems below the site. It is possible that repopulation by aquatic life could occur once the project is completed and stabilized. Accordingly, 404 Permits and 401 Certifications should include the proposed mitigation measures. Additionally, we recommend that the NCDLR allow a trout waiver for the project.

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

The following non-prioritized recommendations are provided for permit and certification considerations:

1. Stringent erosion control measures should be installed where soil is disturbed and maintained until project completion. If appropriate, sediment and erosion control measures should adhere to the design standards for sensitive watersheds (15A NCAC 4B .0024).
2. If any concrete will be used, work must be accomplished so that wet concrete does not contact stream water.
3. Heavy equipment should be operated from banks rather than in the stream channel in order to minimize sedimentation/turbidity and to reduce potential introduction of petroleum pollutants into area streams. If practicable, suction dredging and filter bags should be used for sedimentation removal. If this is not practicable or feasible, appropriate erosion control measures should be used.
4. Native plants should be used for stream buffer vegetation. Temporary or permanent native herbaceous vegetation should be established on all bare soil within five (5) days of ground disturbing activities in the twenty-five (25) foot trout buffer to provide long-term erosion control. In addition to the trees and shrubs proposed, we recommend using annual oats or wheat for temporary vegetation. Natural fiber matting is recommended over plastic matting that can impinge and entrap small animals.
5. Stormwater and infiltration management should be provided to intercept landfill drainage using bio-filters or similar devices such as Low Impact Development (LID) measures and techniques. Information on LID practices and techniques can be found at www.lowimpactdevelopment.org, <http://www.epa.gov/owow/nps/lid/lidnatl.pdf> and <http://www.stormwatercenter.net/>.

Thank you for the opportunity to review and comment on this project during the early planning stages. If you have any questions regarding these comments, please contact me at 336/769-9453.

E-copy: Kevin Barnett, Linda Wiggs, DWQ-ARO



North Carolina Department of Environment and Natural Resources

Division of Land Resources

Land Quality Section

James D. Simons, P.G., P.E.
Director and State Geologist

Beverly Eaves Perdue, Governor
Dee Freeman, Secretary

May 1, 2009

Avery County
Attention: Henry C. Norris, Jr.
P.O Box 640
175 Linville Street
Newland, NC 28657

Subject: Trout Buffer Zone Waiver
Avery County C&D Landfill
Avery County

Dear Mr. Norris:

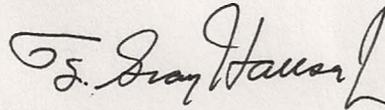
This office has received your plan for Avery County C&D Landfill, in Avery County, North Carolina. Your plan was submitted to this office for approval because of the proposed encroachments into the buffer zone of designated trout waters. In accordance with NCGS 113A-57(1) and Title 15A NCAC 4B .0125(c) this letter will serve as written approval to encroach on the buffer zone of Unnamed Tributary of Brushy Creek, Class C Trout. This authority has been delegated to me by the Director, Division of Land Resources, James D. Simons, in accordance with NCGS 143B-10. The following conditions will apply to this approval:

1. This approval is based on the plans received April 30, 2009.
2. This approval does not absolve the permittee from compliance with the surface water quality turbidity standard. More protective erosion and sedimentation control measures may be required in order to comply with this water quality standard.

Avery County
May 1, 2009
Page 2 of 2

Your cooperation in protecting our environment is most appreciated. If you have any questions about this approval, please contact me at gray.hauser@ncmail.net or (919) 733-4574.

Sincerely,

A handwritten signature in black ink, appearing to read "T. Gray Hauser, Jr.", written in a cursive style.

T. Gray Hauser, Jr., PE
State Sedimentation Specialist

cc: Janet Boyer, PE, Asheville Regional Engineer
Thomas B. Maier, PE, Richardson Smith Gardner & Associates

Attachment B

Operations Plan

**Permit Renewal Application
Avery County Solid Waste Facility
Ingalls, North Carolina**

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OPERATIONS MANUAL

Avery County Solid Waste Facility Ingalls, North Carolina Permit No. 06-03

Prepared for:



**Avery County
Newland, North Carolina**

March 2016

Prepared by:

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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This document is intended for the sole use of the client for which it was prepared and for the purpose agreed on by the client and Smith Gardner, Inc.

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Avery County Solid Waste Facility
Ingalls, North Carolina
Permit No. 06-03

Operations Manual

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1.0 GENERAL FACILITY OPERATION

1.1 Overview

This Operations Manual was prepared for the Avery County Solid Waste Facility, which operates a construction and demolition debris (C&D) landfill and a transfer station under Permit No. 06-03. The Avery County Solid Waste Facility is located at 2275 Brushy Creek Road, in Ingalls, NC as shown on the Site Vicinity Map, included as **Figure 1**. The landfill facility is located on approximately 80 acres owned by Avery County. This document discusses the operations of the landfill unit and other solid waste management activities:

- Scales and scale house facilities;
- Construction and Demolition Debris (C&D) landfill;
- Mobile home deconstruction Area;
- White Goods Area;
- Recycling Recovery Areas;
- Asphalt Shingles
- Asbestos-Containing Material (ACM) handling and
- Transfer Station.

Refer to the facility map, **Figure 2**, for the location of existing and proposed landfill units and other solid waste management activities.

The information contained herein was prepared to provide the facility with a clear understanding of how the Design Engineer assumed that the completed facility would be operated. While deviations from the operations outlined here may be acceptable, they should be reviewed and approved by the Design Engineer. Please refer to the appropriate permit application for a detailed discussion and calculations for the individual components of each landfill unit, including phasing plans.

1.2 Contact Information

Correspondence and questions concerning the operation of the Avery County Solid Waste Facility should be directed to the appropriate Operator and State personnel listed below. For fire or police emergencies, dial 911.

1.2.1 Avery County

Avery County Landfill and Scalehouse

Physical Address: 2175 Brushy Creek Road
Ingalls, North Carolina 27610

Mailing Address: 2175 Brushy Creek Road
Spruce Pine, North Carolina 28777

Scale House Phone: (828) 765-7852

Avery County Solid Waste Department (Office)
Address: 175 Linville Street
Newland, North Carolina 28657
Phone: (828) 737-5420

Solid Waste Director: Eric Foster
Email: avery.sw@averycountync.gov

1.2.2 North Carolina Department of Environmental Quality

North Carolina DEQ - Raleigh Central Office (RCO)

217 West Jones Street
1646 Mail Service Center
Raleigh, North Carolina 27699-1646
Phone: (919) 707-8200
Fax: (919) 707-8200

North Carolina DEQ - Asheville Regional Office (ARO)

2090 U.S. Highway 70
Swannanoa, North Carolina 28778
Phone: (828) 296-4500
Fax: (828) 299-7043

Division of Waste Management (DWM) - Solid Waste Section:

Permitting Branch Head: Edward Mussler III, P.E. (RCO)
Email: ed.mussler@ncdenr.gov
Environmental Engineer: Allen Gaither (ARO)
Email: allen.gaither@ncdenr.gov
Field Operations Branch Head: Jason Watkins (WSRO)
Email: jason.watkins@ncdenr.gov
Western District Supervisor: Deb Aja (ARO)
Email: deborah.aja@ncdenr.gov
Environmental Senior Specialist: Bill Wagner (ARO)
Email: bill.wagner@ncdenr.gov
Hydrogeologist: Perry Sugg (RCO)
Email: perry.sugg@ncdenr.gov

Division of Energy, Mineral and Land Resources- Land Quality Section

Address: 800 Barrett Drive
Raleigh, North Carolina 27609
Phone: (919) 791-4200
Fax: (919) 571-4718

Regional Engineer: Stan Aiken, P.E. (ARO)
Email: stan.aiken@ncdenr.gov

1.3 Facility Operations

1.3.1 Facility Operating Hours

Normal hours of operation are 8:00 A.M. and 4:30 P.M. Monday to Friday and 9:00 A.M. to 1:00 P.M. Saturday. The facility will be closed on Sundays and holidays designated by the County.

In the event of disaster or other emergency situations the supervisor will request approval from the commission's regional office to allow additional temporary operating hours.

1.3.2 Operating Capacity

The operating capacity for the solid waste facility is estimated to be approximately 15,000 tons per year (~50 tons per day based on 312 operating days per year) for the transfer station, 10,000 tons per year of C&D waste, and an allowance of up to two mobile homes on-site at one time for deconstruction purposes.

1.3.3 Service Area

The service area for the facility includes both North Carolina and Tennessee counties as shown in **Figure 3**.

North Carolina counties: Avery County, Burke County, Caldwell County, McDowell County, Mitchell County, and Watauga County.

Tennessee counties: Carter County, Johnson County, and Unicoi County.

1.3.4 Disposal Facility

The anticipated disposal facilities for the transfer station (subject to change) include the following facilities:

1. Bristol Integrated Waste Management Facility, Bristol, VA - Permit No. 588
2. Iris Glen Environmental Center, Johnson City, TN –
Permit No. SNL-901040262
3. Caldwell County Foothills Landfill, Lenoir, NC - Permit No. 14-03
(NC Originated Wastes Only)

In the event that new disposal facility agreements are negotiated other than the list (above), the facility will provide a notice to the DWM within 30 calendar days and a permit modification may be required.

1.4 Access Control

Limiting access to the Avery County Solid Waste Facility is important for the following reasons:

- Unauthorized and illegal dumping of waste materials is prevented.
- Trespassing, and injury resulting therefrom, is discouraged.
- The risk of vandalism is greatly reduced.

Access to active areas of the landfill will be controlled by a combination of fences and natural barriers, and strictly enforced operating hours. A scalehouse attendant will be on duty at all times when the landfill facility is open for public use to enforce access restrictions. Visitors to the facility will be requested to check-in at the scale house and are required to remain with site visit during their visit to ensure their safety.

1.4.1 Physical Restraints

The site will be primarily accessed by the existing entrance on Brushy Creek Road. Each entrance will have a gate which will be securely locked during non-operating hours. Scales, scale house and office are provided at this entrance. All waste will be initially screened and weighed prior to being placed in the landfill or directed to the recycling recover area or the transfer station facility. Mobile homes scheduled for deconstruction will not be weighed but will be directed to the mobile home deconstruction area.

1.4.2 Security

The Avery County solid waste facility is secured by fencing, security gates and natural buffers. Frequent inspections of gates and fences will be performed by landfill personnel. The County will arrange for a random security patrol of the main gate to further discourage trespassing. Evidence of trespassing, vandalism, or illegal operation will be reported to the County Solid Waste Director to coordinate the repair or replacement of damaged property and ensure the integrity of the facility's security.

1.5 Signage

A prominent sign(s) containing the information required by the DWM is located immediately inside the main entrance to the facility. This sign(s) will provide information on operating hours, operating procedures, acceptable wastes and/or information as required under the facility permit. Additional signage will be provided as necessary within the waste disposal complex to distinguish the roadways to the active waste disposal areas, manage and direct traffic, regulate speed limits, identify groundwater monitoring wells, and define waste boundaries. Service and maintenance roads for use by operations personnel will be clearly marked and barriers (e.g., traffic cones, barrels, etc.) will be provided as required. Landfill personnel will routinely inspect the conditions

of the posted signage to ensure they are clearly visible and intact. Damaged or missing signage will be replaced.

1.5.1 Waste Limit Markers

During construction of new phases, expansion of the facility, or following closure of areas, waste limit markers will be used to identify the permitted limits of waste. The waste markers will be constructed of non-degradable material and will clearly state “waste limit” or “edge of liner” in bold lettering. Offsets are acceptable such that all wording is clear to DWM and operational staff. The waste markers will be maintained and replaced when damaged.

1.6 Communications

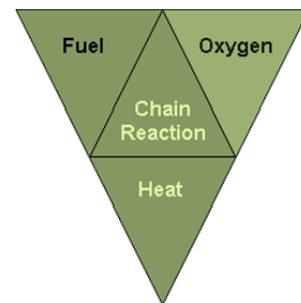
Two way radio communications is maintained between the active landfill unit, the scale house and office. The scale house and office have telephones in case of emergency and for the conduct of day-to-day business. Emergency telephone numbers are displayed in these locations. Cellular phones are available for key operating staff (i.e. managers, operators).

1.7 Fire Control

No open burning of waste is allowed at the facility; however, the possibility of fire within the processing and storage areas, the landfill, or on a piece of equipment must be anticipated in the daily operation of the facility. Potential fire hazards include both surface conditions and subsurface conditions. Surface conditions include equipment operations and newly placed waste. Subsurface conditions include existing waste previously landfilled.

1.7.1 Fire Tetrahedron¹

To better understand the fire’s properties we examine the fundamental methods to extinguish it. The fire “tetrahedron” illustrates the rule that to ignite and burn, each component represents a property of flaming fire; fuel, oxygen, heat, and chemical chain reaction. A fire is prevented or extinguished by removing any one of them. A fire naturally occurs when the elements are combined in the right mixture (e.g., more heat needed for igniting some fuels, unless there is concentrated oxygen). The fire tetrahedron is a more modern adaptation of the traditional fire “triangle” recognizing the chemical reactions that may occur as a component – “the uninhibited chain reaction”. This chain reaction is the feedback of heat to the fuel to produce the gaseous fuel used in the flame. In other words, the chain reaction provides the heat necessary to maintain the fire. These



¹ National Fire Protection Association (www.nfpa.org)

principles are integral in the prevention and management of potential fire situations. *Please note this information is considered as a basis of understanding and may be superseded by the direction and skill of the local Fire Marshall.*

1.7.2 Equipment

A combination of factory installed fire suppression systems and/or portable fire extinguishers will be operational on all pieces of heavy equipment at all times. Potential fire hazards are created from the build-up of fine, dry dust particles on and around operational motors and control panels. The presence of these build-ups can cause overheating and potential fire if periodic equipment cleaning and maintenance are not practiced. Portable fire extinguishers should be maintained in a state of readiness on each piece of moving equipment and equipment should be cleaned periodically.

1.7.3 General Fire Management Strategies

Each fire situation is site specific; however, general strategies for active fire management include the following (in no particular order):

- Accelerated high temperature combustion (displacing fuel);
- Covering of the landfill burn area with soil (reduce oxygen);
- Covering of the burn area with foams (reduce oxygen);
- Flooding the burn area with water (reduce heat);
- Injecting an inert gas such as CO₂ (reduce oxygen);
- Excavating the burning material (displacing fuel) and then extinguishing it in small controlled areas; and
- Applying extinguishing agents that will interfere with and inhibit the combustion process at the molecular level (break the chemical reaction).

1.7.4 Fires Within Disposal Areas

Sources of fire within the transfer station can result from "hot" loads or combustible materials being discharged within the facility, the build-up of fine particulates inside the facility, or from the mixing of incompatible materials during the transfer process.

Fires within the landfill disposal areas will be limited by the use of periodic cover as a fire break and control of "hot" loads entering the landfill. Trained personnel at the scale house will turn away all trucks containing waste that is suspected to be hot. If a hot load is placed on the working face, then the load will be spread as thin as possible and cover soil will be immediately placed on the waste to extinguish the fire.

In general, fires that break out close to the surface of the disposal area should be excavated and smothered with cover material. Deep fires should be smothered out by placing moist soil on the surface and by constructing soil barriers around the fire. Where the smothering technique fails, the burning material must be excavated and smothered or quenched with water once the burning material is brought to the surface. Note that water is usually not effective unless it can be directly applied to the burning material.

1.7.5 Notification

The County will verbally notify the DWM (see **Section 1.2.2**) within 24 hours of fire discovery within any landfill disposal area. In addition, written documentation describing the fire, the actions carried out to extinguish the fire, and a strategy for preventing future occurrences will be provided to the DWM within 15 days following any such occurrence on the **Fire Occurrence Notification Form** included in **Appendix A**.

1.7.6 Coordination With Local Fire Department

A copy of this Operations Manual will be filed with the local fire department including all contact information for the facility.

1.8 **Severe Weather Conditions**

Inclement weather conditions can directly affect the operation of the facility. Some of these weather conditions and recommended operational responses are as follows.

1.8.1 Ice Storms

An ice storm can make access to the landfill dangerous, prevent movement or placement of periodic cover, and, thus, may require closure of the facility until the ice is removed or has melted. The determination to discontinue activities due to inclement weather conditions will be made by the Site Manager.

1.8.2 Heavy Rains

Exposed soil surfaces can create a muddy situation in some portions of the landfill during rainy periods. Drainage control and use of crushed stone on unpaved roads should provide adequate all-weather access for the site and promote drainage away from critical areas. In areas where the aggregate surface is washed away or otherwise damaged, new aggregate should be used for repair.

Intense rains can affect newly constructed drainage structures such as swales, diversions, cover soils, and vegetation. After such a rain event, inspection by landfill personnel will be initiated and corrective measures implemented to repair any damage found before the next rainfall.

1.8.3 Electrical Storms

The open area of a landfill is susceptible to the hazards of an electrical storm. If necessary, landfilling activities will be temporarily suspended during such an event. To guarantee the safety of all field personnel, refuge will be available in the on-site buildings or in rubber tired vehicles.

1.8.4 Windy Conditions

Landfill operations during a particularly windy period may require that the working face be temporarily shifted to a more sheltered area. When this is done, the previously exposed face will be immediately covered with cover materials. In addition, laborers will pick up wind-blown debris as needed after episodes of strong wind.

Transfer station activities conducted during windy conditions may result in waste escaping the confines of the building and tunnel areas. Results of such weather events may result in the halting of the processing activities until waste can be contained.

1.8.5 Violent Storms

In the event of hurricane, tornado, or severe winter storm warning issued by the National Weather Service, disposal and processing operations may be temporarily suspended until the warning is lifted. Cover material will be placed on exposed waste and buildings and equipment will be properly secured.

1.9 Equipment Requirements

The Operator will make available as needed the equipment required to perform the necessary facility activities. Periodic maintenance of all equipment and minor and major repair work will be performed at designated maintenance zones.

The anticipated equipment requirements for operation and maintenance of the site are listed in the following table. These may vary based on volume coming into the facility for disposal.

Table 1: Equipment Requirements

Description	Primary Function (Allocation)
1) Dozer (1)	C&D operations, soil cover loading, and site maintenance
2) Solid Rubber-tired Front End Loader (1)	Loading, site cleanup, and transfer operations
3) Trackhoe (1)	C&D operations, excavation, and site maintenance.

4) Off-road Truck (1)	Site transportation and hauling.
5) Other Equipment	As needed.

1.10 Personnel Requirements

An attendant will be present to oversee the unloading of waste. At least one member of the supervisory staff will be certified as a Manager of Landfill Operations (MOLO) by the Solid Waste Association of North America (SWANA) or other NCDEQ approved training program. Each employee will participate in an annual training course (lead by supervisory personnel). As part of this training, personnel learn to recognize loads which may contain prohibited wastes, address emergency events, and review general operation procedures and requirements.

The anticipated personnel requirements for operation and maintenance of the site are listed in the following table. The numbers of site personnel can be adjusted based on volume of waste received for disposal.

Table 2: Personnel Requirements

Description	Primary Function (Allocation)
1) Site Manager (1)	Overall facility management
2) Scalehouse Attendant (1)	Receiving and weight for incoming loads
3) Operators (2)	Management of transfer station and landfill areas
4) Labor (1)	General labor and operational staff around the site

1.11 Health and Safety

All aspects of the facility operations were developed with the health and safety of the operating staff, customers, and neighbors in mind. Prior to commencement of operations of the facility, a member of the operating staff will be designated site safety officer. This individual, together with the facility's management will modify the site safety and emergency response program to remain consistent with SWANA and Occupational Safety and Health Administration (OSHA) guidance.

Safety equipment provided includes equipment rollover protective cabs, seat belts, audible reverse warning devices, hard hats, safety shoes, and first aid kits. Facility personnel will be encouraged to complete the American Red Cross Basic First Aid Course. Other safety requirements as designated by the County will also be implemented.

Facility employees will go through an annual training course in health and safety lead by supervisory staff. All training will be documented and attested to by signatures of the trainer and trainee. The following are some general recommendations for the health and safety of workers:

1.11.1 Personal Hygiene

The following items are recommended as a minimum of practice:

- Wash hands before eating, drinking, or smoking.
- Wear personal protective equipment as described in **Section 1.11.2**.
- Wash, disinfect, and bandage ANY cut, no matter how small it is. Any break in the skin can become a source of infection.
- Keep fingernails closely trimmed and clean (dirty nails can harbor pathogens).

1.11.2 Personal Protective Equipment

Personal Protective Equipment (PPE) must be evaluated as to the level of protection necessary for particular operating conditions and then made available to facility employees. The list below includes the PPE typically used and/or required in a solid waste management facility workplace.

- Safety shoes with steel toes.
- Noise reduction protection should be used in areas where extended exposure to continuous high decibel levels is expected.
- Disposable rubber latex or chemical resistant gloves for handling and/or sampling of waste materials.
- Dust filter masks.
- Hard hats (in designated areas)
- Portable eyewash.
- Safety goggles.
- Safety vests.

Following use, PPE's should be disposed of or adequately cleaned, dried, or readied for reuse.

1.11.3 Mechanical Equipment Hazard Prevention

Equipment should be operated with care and caution. All safety equipment such as horns, backup alarms, and lights should be functional. A Lockout-Tagout program will be used to identify equipment in need or under repair and insure that operation is "off-limits" prior to maintenance or repair. All operators will be trained in the proper operation of equipment.

1.11.4 Employee Health and Safety

Some general safety rules are:

- Consider safety first when planning and conducting activities.

- Review the equipment O&M manual(s) prior to attempting repairs/changes.
- Remember the buddy system for repair of mechanical equipment.
- Post emergency contact phone numbers.
- Provide easy and visible access to the Right to Know materials.
- Provide easy and visible access to first aid kits and fire extinguishers.

1.11.5 Physical Exposure

Facility personnel may come in contact with the fluids, solids, and airborne constituents found at the facility. Routine training should be conducted regarding the individual and collective materials used at the facility and their associated hazards. Training concerning safe work practices around these potential exposures should cover equipment use and proper disposal procedures.

1.11.6 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) will be collected on every waste (if available and appropriate) that enters the facility. Information will also be made available for all chemicals stored on site for use at the facility. MSDS sheets will be stored in a location with all other Right to Know information for the site.

1.12 Utilities

Electrical power, water and telephone are provided at the scale house and office; a restroom will be provided at the transfer station.

1.13 Recordkeeping Program

The Operator will maintain the following records in an operating record at the facility:

- A. Current permit(s) (Permit to Construct, Permit to Operate, etc.);
- B. Current operations manual/plan and engineering plan;
- C. Inspection reports;
- D. Audit and compliance records;
- E. Annual landfill reports (including survey and other documentation related to airspace usage);
- F. Waste inspection records (**Section 2.4.1**);
- G. Daily tonnage records and disposal records maintained at the scale house - including source of generation;
- H. Waste determination records;
- I. Quantity, location of disposal, generator, and special handling procedures for all special wastes disposed of at the site (if applicable);
- J. List of generators and haulers that have attempted to dispose of restricted wastes;

- K. Employee training procedures and records of training completed;
- L. Ground water monitoring and surface water quality information (See the current **Water Quality Monitoring Plan**) including:
 - 1. Monitoring well construction records;
 - 2. Sampling dates and results;
 - 3. Results of inspections, repairs, etc.
- M. LFG monitoring results and remedial measures as required (see the current **LFG Monitoring Plan**);
- N. Closure and post-closure information, where applicable, including:
 - 1. Notification of intent to close;
 - 2. Testing;
 - 3. Certification; and
 - 4. Recording.
- O. Cost estimates or financial assurance documentation;
- P. A notation of the date and time of final cover placement (where applicable);
- Q. OSHA 300 logs;
- R. Asbestos disposal records;
- S. Mobile Home Acceptance Records;
- T. Laboratory Testing identifying soil or mulch properties such as density and gradation (if performed);
- U. Documentation of Asphalt Shingle Recycling (see **Section 2.5.4.3** and **Appendix E**)

The operating record will be kept up to date by the Solid Waste Director or his designee. It will be presented on request to the DWM for inspection. A copy of this Operations Manual will be kept at the facility and will be available for use at all times.

2.0 WASTE HANDLING OPERATIONS

2.1 Overview

This section describes the required waste handling operations for the Avery County Solid Waste Facility including: the C&D landfill, the mobile home deconstruction area, the solid waste transfer station facility and the recycling recovery areas.

On or before August 1st of every year (or at an earlier date as requested by the Division), the owner or operator shall report to the NC DWM Section, for the previous year beginning July 1st and ending June 30th, the amount by weight of the solid waste that was received at the facility and disposed of in the landfill. To the maximum extent practicable, such reports shall indicate by weight the COUNTY of origin of all solid waste. The owner or operator shall transmit a copy of the report to the county in which the facility is located and to each county in which waste originated. A waste placement grid is provided as **Figure 4**.

2.2 Acceptable Waste

2.2.1 C&D Landfill

The Avery County C&D landfill only accepts wastes generated within the approved service area (**Section 1.3.3**). C&D waste is landfilled on-site within the waste disposal permitted boundaries. C&D waste materials must satisfy the following definitions to be accepted.

Land Clearing and Inert Debris: as defined in 15A NCAC 13B.0101(22) means a facility for the disposal of land-clearing waste, concrete, brick, concrete block, uncontaminated soil, gravel and rock, untreated and unpainted wood, and yard trash.

Land Clearing Waste: as defined in 15A NCAC 13B.0101(23) means solid waste which is generated solely from land-clearing activities, limited to stumps, trees, limbs, brush, grass, and other naturally occurring vegetative material.

Asphalt: in accordance with NCGS 130A-294(m).

Construction and Demolition Debris: as defined in NCGS 130A-290(a)(4) means solid waste resulting solely from construction, remodeling, repair, or demolition operations on pavement, buildings, or other structures, but does not include inert debris, land-clearing debris, or yard debris.

Other Wastes as Approved by the Solid Waste Section of the Division of Waste Management.

2.2.2 Transfer Station

The Avery County transfer station only accepts waste that is generated from the approved service area (**Section 1.3.3**), is consistent with the North Carolina solid waste regulations and the general conditions established in the operating permit. The acceptance of waste materials must satisfy the following definitions:

Municipal solid waste as defined by the North Carolina General Statutes 130A-290(a)(18a) means any solid waste resulting from the operation of residential, commercial, industrial, governmental, or institutional establishments that would normally be collected, processed, and disposed of through a public or private solid waste management service. Municipal solid waste does not include hazardous waste, sludge, industrial waste managed in a solid waste management facility owned and operated by the generator of the industrial waste for management of that waste, or solid waste from mining or agricultural operations.

Solid waste as defined by the North Carolina General Statutes 130A-290(a)(35) means any hazardous or nonhazardous garbage, refuse or sludge from a waste treatment plant, water supply treatment plant or air pollution control facility, domestic sewage and sludges generated by the treatment thereof in sanitary sewage collection, treatment and disposal systems, and other material that is either discarded or is being accumulated, stored or treated prior to being discarded, or has served its original intended use and is generally discarded, including solid, liquid, semisolid or contained gaseous material resulting from industrial, institutional, commercial and agricultural operations, and from community activities.

2.2.3 Recycling Recovery Areas

Only the following wastes may be received at the facility recycling area or as separated in the landfill or transfer area(s):

- White goods;
- Whole Scrap Tires;
- Pallets (damaged and un-damaged);
- Glass;
- Asphalt Shingles;
- Non-treated; non-painted clean lumber;
- Brick and block (undamaged and un-painted); and
- Metal (ferrous and non-ferrous).

2.2.4 Mobile Home Deconstruction Area

Mobile homes are staged, deconstructed, and recycled on-site in accordance with the deconstruction procedures. Waste resulting from the mobile home deconstruction is described in **Appendix D**.

2.2.5 Asbestos Waste Disposal

Special wastes (regulated asbestos only) described in **Section 2.5.4 Special Waste Management** may also be disposed in the C&D landfill unit.

2.3 Prohibited Wastes

2.3.1 C&D Landfill Unit

Only wastes as defined in **Section 2.2.1** above may be accepted for disposal in the C&D landfill unit. Prohibited wastes include waste exclusions listed in 15A NCAC 13B .0542 as follows:

- Wastewater treatment sludge. Wastewater treatment sludge may be accepted, with the approval of the DWM, for utilization as a soil conditioner and incorporated into or applied onto the vegetative soil layer component of the final cover system. In this case, the sludge will be applied at no greater than agronomic rates and to a maximum depth of six inches.
- Containers such as tubes, drums, barrels, tanks, cans, and bottles unless they are empty and perforated to ensure that no liquid, hazardous, or municipal solid waste is contained therein;
- Garbage as defined in G.S. 130A-290(a)(7);
- Hazardous waste as defined in G.S. 130A-290(a)(8), to also include hazardous waste from conditionally exempt small quantity generators;
- Industrial solid waste unless a demonstration has been made and approved by the DWM that the landfill meets the requirements of Rule .0503(2)(d)(iii)(A);
- Liquid wastes;
- Medical waste as defined in G.S. 130A-290(a)(18);
- Municipal solid waste as defined in G.S. 130A-290(a)(18a);
- Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761;
- Radioactive waste as defined in G.S. 104E-5(14);
- Septage as defined in G.S. 130A-290(a)(32);
- Sludge as defined in G.S. 130A-290(a)(34);
- Special wastes as defined in G.S. 130A-290(a)(40);
- White goods as defined in G.S. 130A-290(a)(44); and
- Yard trash as defined in G.S. 130A-290(a)(45).

The following wastes cannot be received if separate from C&D waste:

- lamps or bulbs including but not limited to halogen, incandescent, neon or fluorescent;
- lighting ballast or fixtures;
- thermostats and light switches;

- batteries including but not limited to those from exit and emergency lights and smoke detectors;
- lead pipes;
- lead roof flashing;
- transformers;
- capacitors; and
- copper chrome arsenate (CCA) and creosote treated woods.

Waste accepted for disposal in the C&D landfill unit must be readily identifiable as C&D waste and must not have been shredded, pulverized, or processed to such an extent that the composition of the original waste cannot be readily ascertained except as specified as follows:

C&D waste that has been shredded, pulverized, or otherwise processed may be accepted for disposal from a facility that has received a permit from an authorized regulatory authority which specifies such activities are inspected by the authority, and whose primary purpose is recycling and reuse of the C&D material. For this case, a waste screening plan and waste acceptance plan will be prepared and made available to the DWM on request.

The County shall not dispose of C&D waste that is known to be generated within the boundaries of a unit of local government that by ordinance:

- (A) Prohibits generators or collectors of C&D waste from disposing that type or form of C&D waste.
- (B) Requires generators or collectors of C&D waste to recycle that type or form of C&D waste.

2.3.2 Transfer Station

Only wastes as defined in **Section 2.2.2** above may be accepted in the transfer station. No other wastes may be accepted including the following wastes, otherwise considered under NC Landfill Bans (G.S. 130A-309.10):

- Whole Scrap Tires (Except as diverted to the recovery area);
- Used Oil;
- White Goods (Except as diverted to the recovery area);
- Lead Acid Batteries;
- Yard Waste;
- Construction and Demolition Debris (C&D) (Except as allowed in the C&D landfill);
- Discarded computer equipment and televisions;
- Oyster Shells;
- Rigid plastic containers;
- Aluminum Cans;

In addition, operating criteria prohibit other materials from receipt within the transfer station. These materials include:

- Hazardous waste as defined by NC General Statute 130A-290 (a) (8), including hazardous waste from conditionally exempt small quantity generators.
- Polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761 with the exception of trace amounts found in materials such as consumer electronics.
- Bulk or non-containerized liquid wastes unless the waste is household waste other than septic waste and waste oil. A liquid determination will be performed by the paint filter test.
- Containers holding liquid wastes unless the waste is household waste.

2.3.3 Recycling Area

Only wastes, as defined in **Section 2.2.3** above may be accepted in the Recycling and Recovery Areas. No asbestos containing wastes will be accepted.

2.4 Waste Screening Programs

To assure prohibited wastes are not entering the landfill facility, screening programs have been implemented. Waste received at the scale house entrance and directed to the transfer station floor, the mobile home deconstruction area, recovery area, or working face of the C&D landfill is inspected by trained personnel. These individuals have been trained to spot indications of unacceptable and suspicious wastes, including: hazardous placarding or markings, liquids, powders or dusts, sludges, bright or unusual colors, drums or commercial size containers, and "chemical" odors. Screening programs for visual and olfactory characteristics of prohibited wastes are an ongoing part of the facility operation.

2.4.1 Waste Receiving and Inspection

All vehicles must stop at the scale house located at the main entrance of the facility and visitors are required to sign-in. All waste transportation vehicles are weighed and the content of the load assessed. The scale attendant(s) requests from the vehicle driver a description and origin of the waste it is carrying to ensure that unacceptable waste is not allowed onto the site. The attendant(s) then visually checks the vehicle as it crosses the scale. Signs informing users of the acceptable and unacceptable types of waste are posted at the scale house. Once passing the scales, vehicles are routed to the C&D landfill, the transfer station, the mobile home deconstruction area or recover area as appropriate.

Vehicles are randomly selected for screening on a regular basis, depending on personnel availability. Site personnel will ensure that each waste stream received at the site is equitably inspected. At least one vehicle per week, but not

less than 1% by weight of the waste stream entering the facility (based on the previous week's total), will be randomly selected by inspection personnel. A random truck number and time will be selected (e.g., the tenth load after 10:00 a.m.) on the day of inspections. However, if something looks suspicious is spotted in any waste load, that load is inspected further.

Selected vehicles are directed to the inspection area located inside the transfer station or to an area of intermediate cover adjacent to the working face of the landfill as appropriate. The vehicle is unloaded and the waste is carefully spread using suitable equipment. An attendant trained to identify wastes that are unacceptable at the landfill inspects the waste discharged at the screening site. If unacceptable waste is found, including wastes generated from outside of the service area, the load will be isolated from other waste receipts and secured within the transfer station or bermed from the landfill.

For unacceptable wastes that are nonhazardous the Solid Waste Director will notify the Waste Management Specialist of the DWM (see **Section 1.2.2**) within 24 hours of attempted disposal of any waste the facility is not permitted to receive to determine the proper course of action. In most cases, the transporter will be responsible for the removal of the non-hazardous, unacceptable materials.

For unacceptable wastes that are hazardous, the Hazardous Waste Contingency Plan outlined in **Section 2.4.2** will be followed. To determine the liquid content of the waste, a liquid determination will be performed by the paint filter test (see **Appendix B** for apparatus and procedures). The hauler is responsible for removing unacceptable waste from the landfill property.

If no unacceptable material is found, the load will be commingle with other waste receipts and processed through the transfer station or pushed into the working face and incorporated into the waste cell. All random waste inspections will be documented by staff using the waste screening form provided in **Appendix C**.

In addition to the random waste screening described above, waste unloaded onto the transfer station floor or into the active face of the landfill will be inspected by the equipment operators, trained to spot unacceptable wastes, before and during the processing, spreading, or compaction operations. Any suspicious looking waste is reported immediately to the designated primary inspector for further evaluation.

2.4.2 Hazardous Waste Contingency Plan

In the event that identifiable hazardous waste or waste of questionable character is detected at the transfer station or landfill, appropriate equipment, protective equipment, personnel, and materials as necessary will be employed to isolate the wastes. DWM will be notified immediately (see **Section 1.2.3**) that an attempt was made to dispose of hazardous waste at the facility. If the vehicle

attempting disposal of such waste is known, all attempts will be made to prevent that vehicle from leaving the site or, if the vehicle has left the site, immediate notice will be served on the owner of the vehicle that hazardous waste, for which they have responsibility, has been disposed of at the transfer station or the landfill.

The County will assist the DWM as necessary and appropriate in the removal and disposition of the hazardous waste and in the prosecution of responsible parties. If needed, the hazardous waste will be covered with either on-site soils or other tarping material until such time when an appropriate method can be implemented to properly handle waste removal. The cost of removal and disposal of the hazardous waste will be charged to the owner of the vehicle involved. Any vehicle owner or operator who knowingly dumps hazardous waste in the landfill may be barred from future disposal services.

Should an incident where hazardous waste is found at the transfer station or landfill occur, the event will be documented by landfill staff using the waste screening form provided in **Appendix C**.

Records of information gathered as part of the waste screening programs will be maintained on site during its active life and as long as required by the County and DWM.

2.5 Waste Disposal

2.5.1 Access

Following the completion of the initial waste screening procedures, access to the processing areas and disposal location will be granted by the scale house attendant. The scale house attendant will provide overall site instructions and directions to the drivers of the waste transportation vehicles to ensure that the waste receipts are transported to the appropriate processing or disposal area. Additional directional signage will assist the drivers with the identification of these areas.

2.5.2 General Procedures

Waste transportation vehicles will arrive at the scales and scale house and be directed to the appropriate area such as the transfer station, white goods area, or the working face of the C&D landfill at random intervals. There may be a number of vehicles unloading waste at the same time, while other vehicles are waiting. To maintain control over the unloading of waste, only a certain number of vehicles will be allowed on the tipping floor of the transfer station or working face of the landfill at a time. The actual number will be determined by the truck spotter. This procedure will be used to minimize the potential of unloading unacceptable waste and to control disposal activity. Operations at the working

face will be conducted in a safe manner which will encourage the efficient movement of transportation vehicles to and from disposal locations, and to expedite the unloading of waste.

2.5.3 C&D Landfill Disposal Procedures

The approach to the working face will be maintained such that two or more vehicles may safely unload side by side. A vehicle turn-around area large enough to enable vehicles to arrive and turn around safely with reasonable speed will be provided adjacent to the unloading area. The vehicles will back to a vacant area near the working face to unload. Following the unloading operation, the transportation vehicles will immediately leave the working face area. Personnel will direct traffic necessary to expedite safe movement of vehicles.

Waste unloading at the landfill will be controlled to prevent disposal in locations other than those specified by site management. Such control will also be used to confine the working face to a minimum width, yet allow safe and efficient operations. The width and length of the working face will be maintained as small as practical to maintain the appearance of the site, control windblown waste, and minimize the amount of cover required each day. Normally, only one working face will be active on any given day, with all deposited waste in other areas covered by either periodic or final cover, as appropriate.

The procedures for placement and compaction of solid waste include: unloading of vehicles, spreading of waste into adequately sized lifts, and compaction on relatively flat slopes (i.e. 5H:1V max.), in two-foot intervals, using a minimum number of three full passes.

Portable signs with directional arrows and portable traffic barricades will facilitate waste unloading at the designated disposal locations. These signs and barricades will be placed along the access route to the working face of the landfill or other designated disposal areas which may be established.

Wind screens adjacent to the working face may be used as needed to control windblown waste.

2.5.3.1 Periodic Cover

At the completion of waste placement each week or sooner, a 6 inch layer of earthen material or other material as approved by the DWM will be placed over the exposed waste. Cover will be placed sooner if the area of exposed waste exceeds one-half acre in size, or as necessary to control vectors, fire, odors, and blowing debris. The date and time of cover placement will be recorded by landfill employees.

2.5.3.2 Intermediate Cover

A 12 inch layer of soil cover should be placed on all waste surfaces that have not received waste in 30 days but are below final elevation. This intermediate cover should be seeded immediately and graded such that precipitation run-off is channeled to the surface water systems.

2.5.3.3 Height Monitoring

On a weekly basis, the landfill staff will monitor landfill top and side slope elevations. When such elevations approach design grades, shown on the **Permit Drawing 3/S2 (Final Grading Plan)**, the final top of waste grades will be staked to limit over placement of waste.

2.5.4 Special Waste Management

2.5.4.1 Asbestos Management

The County may dispose of regulated asbestos within the C&D landfill. Regulated asbestos-containing material (RACM) means:

- (a) Friable asbestos material;
- (b) Category I nonfriable asbestos-containing material (ACM) that has become friable;
- (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or
- (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

Asbestos containing materials are further defined as:

- Category I nonfriable asbestos-containing material (ACM) means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy.
- Category II ACM means any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

- Asbestos-containing material means any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. *This material is non-regulated.*

Asbestos will only be accepted if it has been processed and packaged in accordance with State and Federal (40 CFR 61) regulations. Asbestos will arrive at the site in vehicles that contain only the asbestos waste and only after advance notification by the generator.

Once the hauler brings the asbestos to the landfill, the hauler will be directed to the designated asbestos disposal area by operations personnel. The designated disposal area will be prepared by operations personnel by leveling a small area using a dozer or loader. Prior to disposal, the landfill operators will stockpile cover soil near the designated asbestos disposal area. The volume of soil stockpiled will be sufficient to cover the waste and to provide any berms, etc. to maintain temporary separation from other landfill traffic.

Once placed in the prepared area, the asbestos waste will be covered with a minimum of 18 inches of daily cover soil placed in a single lift. The surface of the cover soil will be compacted and graded using a tracked dozer or loader.

Asbestos wastes will be buried in accordance with applicable North Carolina and NESHAP requirements. The landfill staff will record the approximate location and elevation of the asbestos waste once cover is in-place. The Solid Waste Director or other supervisory staff will review pertinent disposal and location information to assure compliance with regulatory requirements and enter the information into the Operating Record.

Once disposal and recording for asbestos waste is completed, the disposal area may be covered with waste. No excavation into designated asbestos disposal areas will be permitted.

2.5.4.2 Deconstruction of Mobile Homes

The deconstruction of mobile homes is handled in an area adjacent to the C&D landfill unit. A description of the process is provided in **Appendix D**.

2.5.4.3 Asphalt Shingles

Asphalt shingles may be recovered for recycling in a dedicated container. A process description is provided in **Appendix E**.

2.5.4.4 Animal Carcasses

Methods approved by the State Veterinarian include the disposal of domesticated animal carcasses in landfills. Animal carcasses are handled in an area adjacent to the C&D landfill unit as identified on **Figure 2**. In accordance with 02 NCAC 52C .0102, animal carcasses will be buried three feet beneath the surface of the ground.

2.5.5 Transfer Station Management

2.5.5.1 Access

Traffic will be clearly directed to the transfer station by the scale house and be directed by the spotter on the tipping floor. Traffic speed on the site should be less than 7 MPH.

2.5.5.2 Building Features

The transfer station and tipping floor area includes the features listed in the following table.

Table 3: Transfer Station Features

Description	
1) Roof	Yes
2) Sides (3)	Yes
3) Concrete Floor	Yes
4) Bi-Level Direct Push	Yes
5) Leachate Collection and Storage	Yes
6) Ventilation	Yes
7) Water Supply	Yes
8) Lighting	Yes
9) Interior Office & Bathrooms	Yes
10) Explosive Gas Monitoring	No
11) Communications (Telephone, Radios, Cell Phones)	Yes
12) Built In Fire Suppression/Sprinkler System	No
13) Odor Control Equipment	Yes

2.5.5.3 General Procedures

The transfer operations will be conducted in accordance with the approved Operation Plan and conditions of the Solid Waste Permit issued by the DWM.

Facility operations are anticipated as follows:

1. Collection vehicles delivering waste to the facility will enter through the main entrance;
2. Pass by and over the scales and scale house for weight;
3. Continue along the access road until reaching the transfer station tipping area;
4. The tipping area has “push” walls running along the interior of the building that direct the waste to feed “hoppers” overlying the transfer trailers and/or equipment on the lower level of the building. The attendant (“spotter”) will direct vehicles, waiting to unload, to back into the facility through the entrance. Adequate area is available in front of the transfer area for drivers to queue their vehicles into a backing maneuver. Station operating personnel will be on the station floor to direct and guide the vehicles.
5. The vehicles will back onto the tipping floor to an area designated by the attendant.
6. Once the vehicle is in position, the waste load will be discharged directly onto the tipping floor.
7. The spotter will inspect the discharged waste before it is mixed with other waste on the tipping floor and pushed by a rubber-tired loader into the open top transfer trailers, specifically designed for hauling wastes located in the lower level of the Transfer Station. All waste will stay in the covered area of the transfer station.
8. The equipment operator will complete a secondary visually screening of the waste and, if acceptable, direct the driver of the waste collection vehicle to exit the transfer facility. If unaccepted waste is identified, the driver of the vehicle will be instructed to retrieve and remove the prohibited waste from the site.

Documentation of the event will follow the procedures outlined in **Section 2.4 Waste Screening Program**. Subsequent vehicles will be directed to the transfer area and similar procedures will be completed.

2.5.5.4 Storage

Waste volume is allowed to accumulate on the tipping floor only to facilitate adequate waste placement into the transportation hauling vehicles. The equipment operator will mix the waste with the front-end loader, conduct a tertiary waste screening and remove any prohibited

waste, and distribute the material types and weights prior to pushing the waste into the tractor trailers located toward the rear of the building and beneath the tipping floor.

2.5.5.5 Transfer Truck Loading

The placed waste is compacted inside the trailers by gently tamping with the interchangeable bucket attachment. The equipment operator is responsible for loading each transportation vehicle in a fashion to comply with the Department of Transportation's roadway weight limits. Once the tractor trailer is filled with compacted waste, the vehicle is moved to an exterior location to allow the placement of the vehicle's tarp and ensure containment of the waste inside the trailer body.

2.5.5.6 Transfer Area Maintenance

At the end of each operating day, the transfer station will be cleared of waste inside and around the facility. Windblown materials resulting from the operation will be collected and returned to the site and disposed. The tipping floor will be maintained in a sanitary fashion by washing the entire floor and discharging the wash water into the leachate collection drainage system and holding tank. The tarps for the loaded but not transported trailers will be securely fastened to each tractor trailer remaining on site. Barricades will be erected around the hopper to prevent falling hazards.

2.5.5.7 Leachate Management

Liquids are generated from waste receipt and floor washing activities. The transfer station's floor is sloped in a fashion to promote drainage toward the sump and to two floor drains located in the lower level loading area. Leachate generated from waste processing activities is collected in floor drains and discharged to an exterior, 3,000-gallon holding tank. The liquid volume of the holding tank is inspected on a weekly basis to ensure that adequate capacity is available.

As needed, the contents of the leachate holding tank are pumped and transported to the Jimmy Smith Wastewater Treatment Plant (WWTP) located in the Town of Boone. The WWTP conditionally approved the acceptance of batch volumes (2,500 gallons) from the Avery County facility with prior notification.

Additionally, any full transfer trailers that are stored on-site will be inspected for leaks and, if present, the leaks will be contained and cleaned.

3.0 RECYCLING AND RECOVERY AREA OPERATIONS

The facility's recycling and material recovery areas are located around the transfer station and are used to store, separate and contain recyclable materials. These materials are generated from separated waste from the transfer station and/or pre-sorted materials such as tires, white goods, or other materials off-loaded into an appropriate container. Recycling and recovery operation areas are shown on **Figure 2**.

3.1 White Goods Handling Area

A white goods handling area is located adjacent to and north of the existing transfer station (**Figure 2**). Within the white goods handling area, white goods and scrap metal are stockpiled up to about 10 feet high over an approximate 100 foot by 200 foot area. Once the stockpile reaches capacity (typically once per quarter), a recycler removes Freon and hauls the white goods and scrap metal off-site to be recycled. A certificate of disposal for the removed Freon is provided to Avery County by the subcontractor.

3.2 Used Tire Storage Area

Used tires are collected at an area adjacent to and south of the existing transfer station (**Figure 2**) and placed in a tire trailer. Once the trailer is full, the trailer is picked up by a recycling contractor.

3.3 Mobile Home Deconstruction Area

Mobile homes are staged, deconstructed, and recycled on-site in accordance with the deconstruction procedures. Recycling resulting from mobile home deconstruction is described in **Appendix D**.

3.4 Asphalt Shingles

Asphalt shingles may be recovered for recycling in a dedicated container. A process description is provided in **Appendix E**.

3.5 Other Storage Areas

- Glass: A glass recovery and recycling area for clear, brown, and green glass is located just west and behind the transfer station (**Figure 2**). This area contains three (3) bays constructed of concrete masonry unit (CMU) walls and are periodically removed for recycling when they reach capacity.
- Pallets: A pallet recovery area is located adjacent just southwest of the transfer station (**Figure 2**). Once a truckload is generated, the pallets will be picked up by a recycling contractor.
- Brick and Block Area: A undamaged and unpainted brick and block area is located adjacent to and southwest of the existing transfer station (**Figure 2**) for utilization for site access roads and the active face area of the landfill.

3.6 Markets

The final destination of the recyclable materials separated from the waste may vary depending on market prices for such materials. Contracts are established with subcontractors to facilitate processing and product removal. Subject to contract renewal, the final markets are anticipated as follows:

- a. Metals: State Line Scrap Metal
- b. Pallets: To be determined and as needed.
- c. Glass: Strategic Materials, Inc.
- d. Tires: U.S. Tire

3.7 Safety

The recycling area will generally be located contiguous to the active, operating C&D disposal face. The recycling area will be partitioned from the active C&D area with physical barriers (i.e. fencing, earthen materials, etc.) for safety and protection of site personnel who are segregating materials within the recycling area. All equipment operating in the recycling area will be equipped with back-up alarms. All appropriate Personal Protective Equipment will be worn by workers in the recycling area, including two-way radios between the workers and equipment operators.

Asbestos Containing Waste (ACW) or suspected ACW will not be hauled to, or dumped into, the sorting area.

3.8 Operations

Only those C&D waste loads delivered to the site that contain predominantly recoverable materials will be diverted to the recycling area for segregation handling. Materials that are not recoverable, but which were dumped within the sorting area, will be pushed and/or loaded and hauled to the adjacent active area for proper disposal on a daily basis.

The landfill (intermediate) cover will be maintained at 12 inches in thickness in the recycling/sorting area. Additional material will be added as needed to maintain this buffer.

3.9 Equipment

Anticipated equipment to be used in and around the recycling area will include:

- one small rubber-tired loader, skid-steer, or bobcat; and
- one small excavator.

Other equipment may be added as needed.

3.10 Personnel

Based the amount received, up to four (4) site personnel, including equipment operators, are anticipated for operations within the recycling area of the site.

3.11 Recovered Material Management

Only waste loads which are predominantly recyclable materials will be diverted to the sorting area. Materials will be weighed on the site scales prior to being used on site.

3.12 Recordkeeping

As a result of the recovered material management practices, there will be accurate records and reporting of the weight of waste and the weight of recycled/reused materials. The net weight of waste equals the total weight of material entering the site minus the weight of recovered materials removed from the waste stream.

4.0 ENVIRONMENTAL MANAGEMENT

4.1 Overview

This section reviews the overall environmental management tasks required for the successful operation of the landfill facility.

4.2 Erosion and Sedimentation Control

A separate erosion and sedimentation control plan is provided in the Erosion and Sedimentation Control Plan of the Permit Application. This plan describes the engineered features and practices for preventing erosion and controlling sedimentation at this site. The erosion and sediment control system consists of the following major components:

1. Drainage Channels,
2. Diversion Berms (Side Slope Swales and Cap Diversion Berm),
3. Down Pipes, and
4. Sediment Basins/Traps.

The landfill side slopes are designed with 3H:1V slopes and diversion berms placed along the slope. The berms are designed to keep water volumes and velocities low enough to minimize erosion of the landfill cover. Maintenance of the cover system will involve periodic mowing and repair of any erosion problems and bare spots. These items will be inspected at least once a month and after any significant rainfall events.

The down pipes are designed to carry concentrated flows of surface water off of the landfill. The down pipes will be inspected at least once a month and after any significant rainfall event.

Additional erosion control measures have been implemented within the drainage channels and at points of stormwater discharge. All final cover should be inspected regularly for erosion damage and promptly repaired.

Stormwater run-off from the LCID landfill is conveyed to sediment basins and traps. These structures should be inspected regularly for sediment build-up or erosion damage and should be cleaned out when sediments fill the lower half of each structure.

4.3 Water Quality Monitoring

The monitoring program and procedures outlined in the current Water Quality Monitoring Plan will be followed for the monitoring of site groundwater monitoring wells and surface water monitoring locations. The results of the water quality monitoring program will be placed in the facility operating record as described in **Section 1.13**.

4.4 Landfill Gas Control

Monitoring shall be performed to identify (if any) subsurface migration of landfill gas at explosive levels are present in on-site structures and/or at the property boundary in gas monitoring probes. Methane or other explosive gas concentration shall not exceed 25% of the lower explosive limit (LEL) (1.25% of CH₄) in on-site structures, such as the scale house or 100% if the LEL (5% CH₄) at the facility property boundary. All landfill gas monitoring will be performed in compliance with the Landfill Gas Monitoring Plan.

If landfill gas levels exceed these limits, the following will be performed:

- Immediately implement steps necessary for the protection of personnel, staff and neighboring properties and notify the DWM.
- Within 7 days, place in the operating record a description of events/actions performed following the detection event.
- Within 60 days, implement a remediation plan for the explosive gas releases, place a copy in the operating record, and notify the DWM that the plan has been implemented.

Subsurface methane monitoring wells are installed between the landfill perimeter and the property line, as shown in the Landfill Gas Monitoring Plan.

4.5 Litter Control

The vegetative trees/bushes act as a barrier to keep litter contained within the site. Landfill personnel pick up litter within the site daily and respond to weather and heavy wind conditions that may compromise the property appearance. The litter control crew picks up litter outside the site and on access roads each weekday.

Customers are encouraged to contain and cover all waste within their vehicles/trailers prior to entering the facility in an effort to reduce litter. Any load that is not secured in a manner that would prevent material from leaving the vehicle while it is in motion is subject to an additional fee. Also, trailers are covered by heavy tarp lids to minimize litter and potential for birds to enter the trailer and spread litter.

4.6 Vector Control

Vector control within and around the transfer station will be managed by removing all waste from the facility on a daily basis. All transfer station waste deposits will be removed from the tipping floor by the end of each working day. At the end of each operating day, the tipping floor will be cleaned and washed in a manner to remove all waste remnants or liquids that could promote or attract vectors to the facility. Portable, forced air odor control equipment is utilized as needed. Routinely, the entire interior of the transfer station will be pressure-washed to remove the accumulation of dust, dirt, and waste particles. Leachate generated from the routine washing activities will be discharged to the leachate holding tank and pumped to the WWTP as needed.

Due to the nature of the waste disposed in the C&D landfill, vector control is not expected to be of concern. Note periodic cover will discourage animals from nesting in the waste.

4.7 Odor Control

Odor control within the transfer station will be managed by minimizing the volume of waste accumulated on the tipping floor and by transferring waste into the tractor trailers as soon as practical. Portable, forced air odor control equipment is utilized as needed. Staff will routinely inspect the floor drainage system to ensure that the leachate collection system remains free-flowing and stagnant water does not persist. Additional housekeeping efforts employed at the facility to reduce and eliminate the occurrence of odor will include inspecting exterior stormwater downspouts, removing litter, cleaning the tunnel area, maintaining the appearance of the access areas and roadways, and ensuring that the tractor trailer tarps are in good condition.

Due to the nature of the waste disposed in a C&D landfill, odor is not expected to be of concern. However, if odors do occur, additional cover will be placed or other mitigation alternatives will be provided.

4.8 Dust Control

If required, a water truck will be utilized to limit dust on the gravel portion of the access roadways. Dust accumulation inside the transfer station will be eliminated by routinely pressure washing the interior of the facility as needed. Dust generated by excavation of cover soil will be limited by watering the cut soil areas if accessible to the water truck.

4.9 Interim Cover

In addition to the occasional placement of the 6 inches of earthen material over the exposed waste, an additional 12 inches of earthen cover should be placed on all waste surfaces that have not received waste in three (3) months or more but are below final elevation. This intermediate cover should be graded and seeded such that precipitation run-off is channeled to the stormwater collection system.

4.10 Interim Cover Monitoring

Routine inspections of the site will include monitoring any interim cover to ensure the adequacy of the vegetative protective cover and to identify potential erosion concerns. Corrective actions will address any identified concerns.

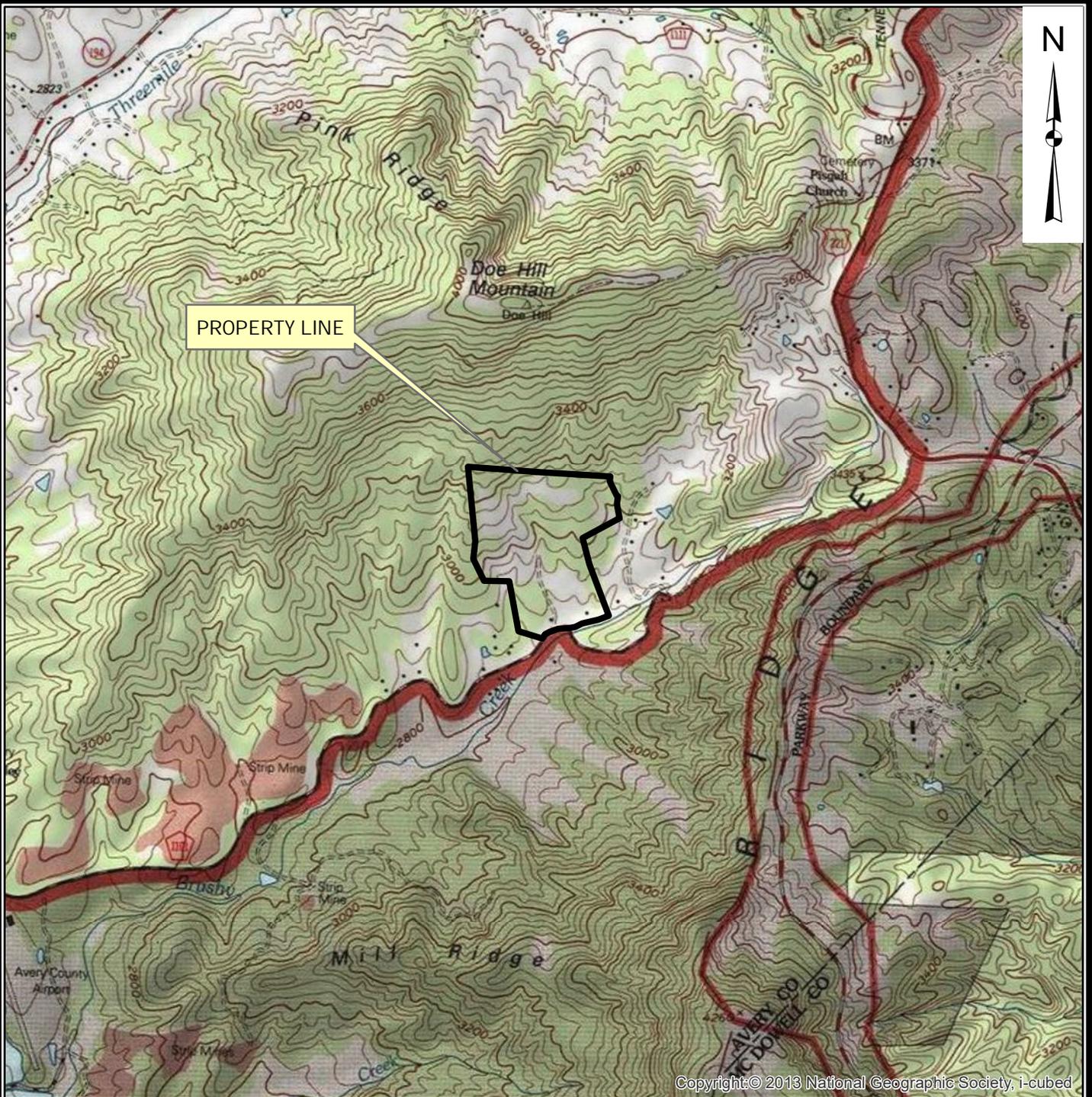
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Figures

**Operations Manual
Avery County Solid Waste Facility
Ingalls, North Carolina**

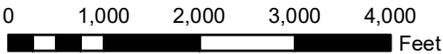
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PROPERTY LINE

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- REFERENCES
1. U.S.G.S. 7.5 MIN. QUADRANGLE MAP "LINVILLE FALLS, NC" DATED 1994.
 2. SITE PROPERTY LINE FROM FIELD SURVEY DATED 1/14/08, BY SURVEYING SOLUTIONS, PC.

**AVERY COUNTY SOLID WASTE FACILITY
SITE VICINITY MAP**

NC LIC. NO. C-0828 (ENGINEERING)

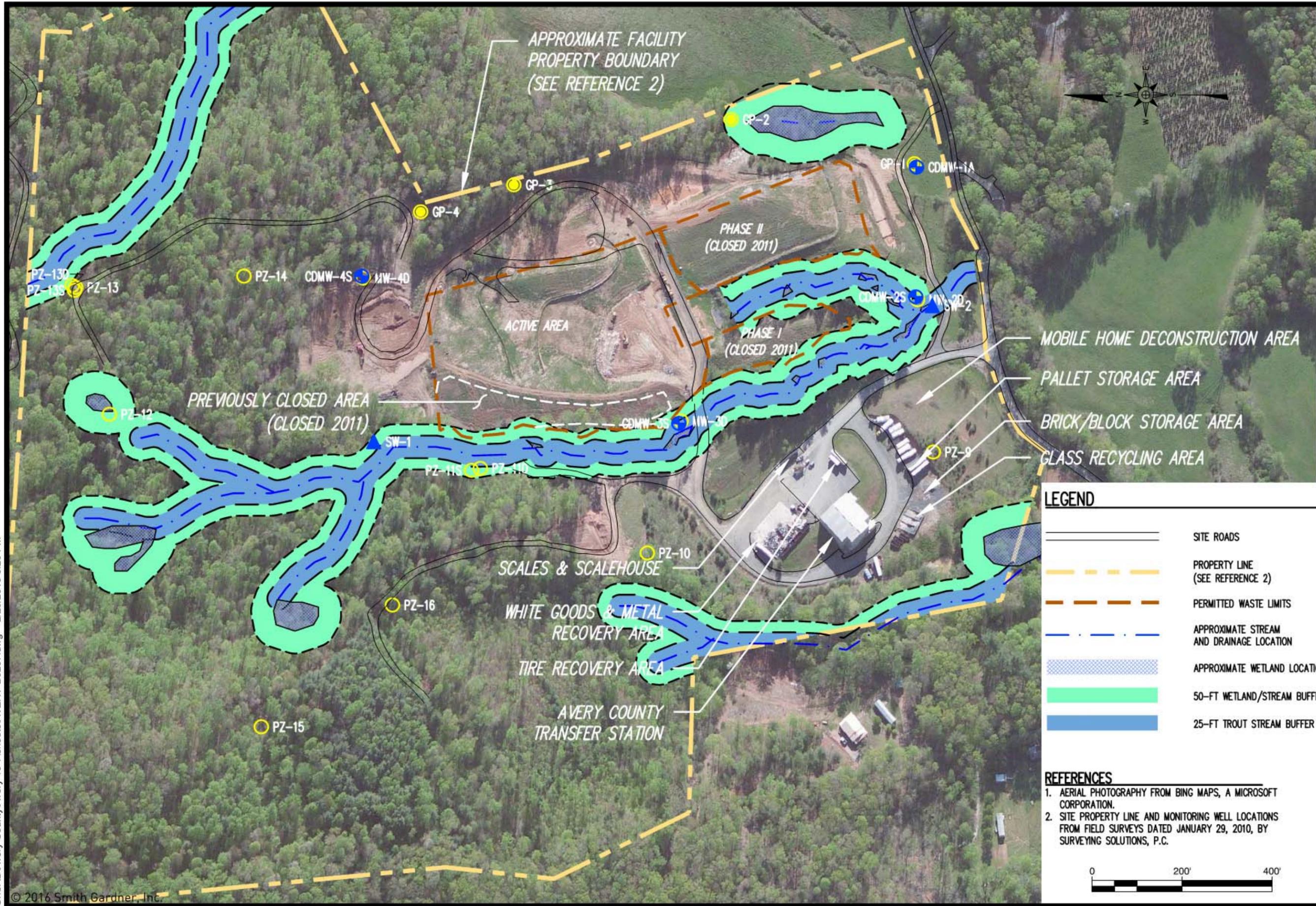
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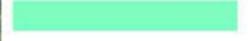
DRAWN: C.T.J.	APPROVED: M.M.G.	SCALE: AS SHOWN	DATE: Jan. 2016	PROJECT NO.: AVERY 15-7	FIGURE NO.: 1
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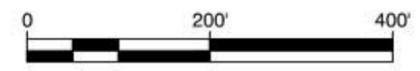


LEGEND

-  SITE ROADS
-  PROPERTY LINE (SEE REFERENCE 2)
-  PERMITTED WASTE LIMITS
-  APPROXIMATE STREAM AND DRAINAGE LOCATION
-  APPROXIMATE WETLAND LOCATION
-  50-FT WETLAND/STREAM BUFFER
-  25-FT TROUT STREAM BUFFER

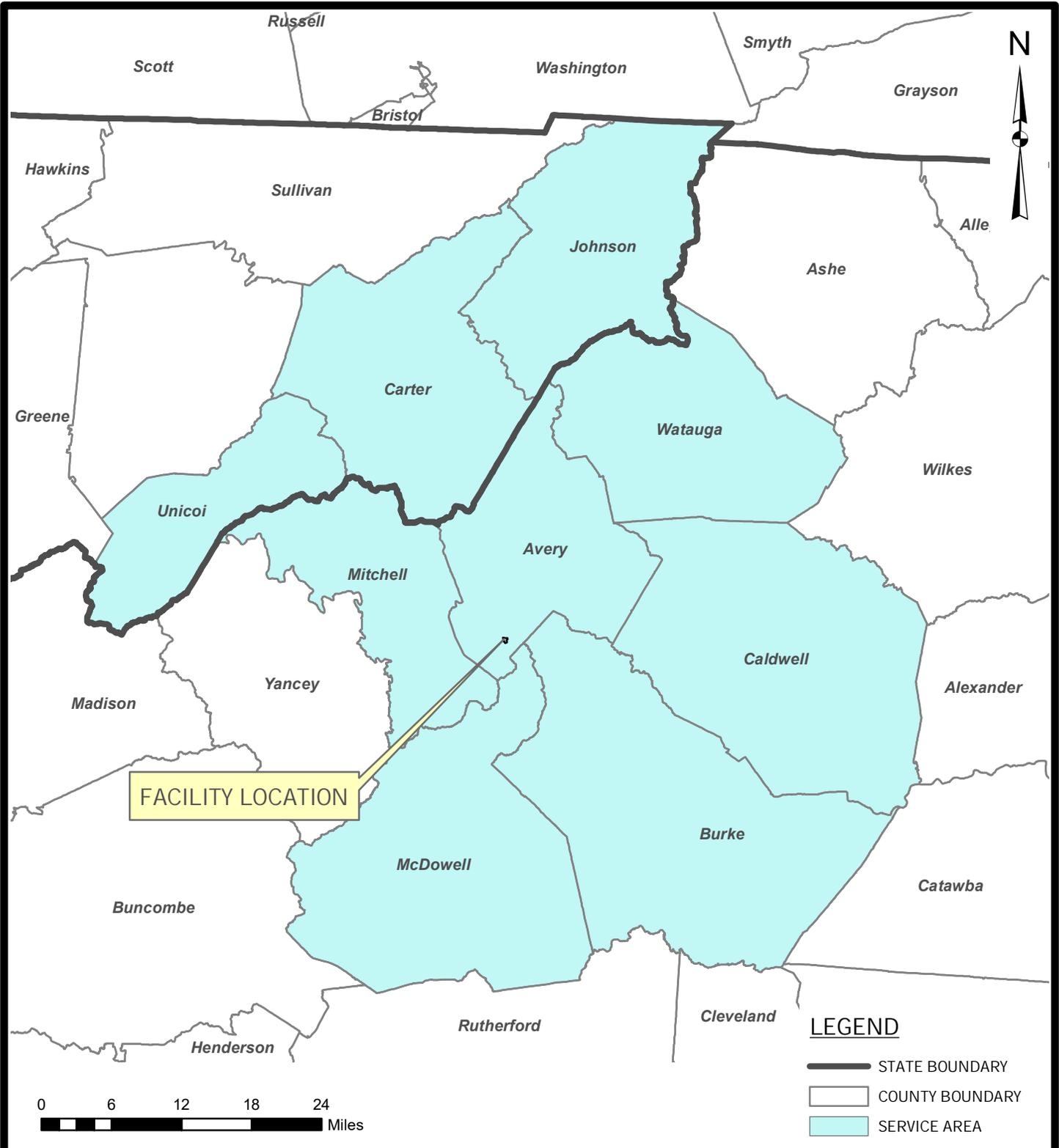
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1. AERIAL PHOTOGRAPHY FROM BING MAPS, A MICROSOFT CORPORATION.
2. SITE PROPERTY LINE AND MONITORING WELL LOCATIONS FROM FIELD SURVEYS DATED JANUARY 29, 2010, BY SURVEYING SOLUTIONS, P.C.



PREPARED BY: SMITH+GARDNER <small>NC LIC. NO. C-0833 (ENGINEERING)</small> <small>14 N. Boylan Avenue, Raleigh NC 27603 919.838.0577</small>			
APPROVED: J.A.L.	C.T.S.	SCALE: AS SHOWN	FIGURE NO.: 2
DRAWN: J.A.L.		PROJECT NO.: AVERY 15-7	
PREPARED FOR: AVERY COUNTY CGO LANDFILL MANAGEMENT FACILITY		FILENAME: AVERY-B0257	
DATE: Feb 2016		AVERY-B0257	

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**AVERY COUNTY SOLID WASTE FACILITY
FACILITY SERVICE AREA**

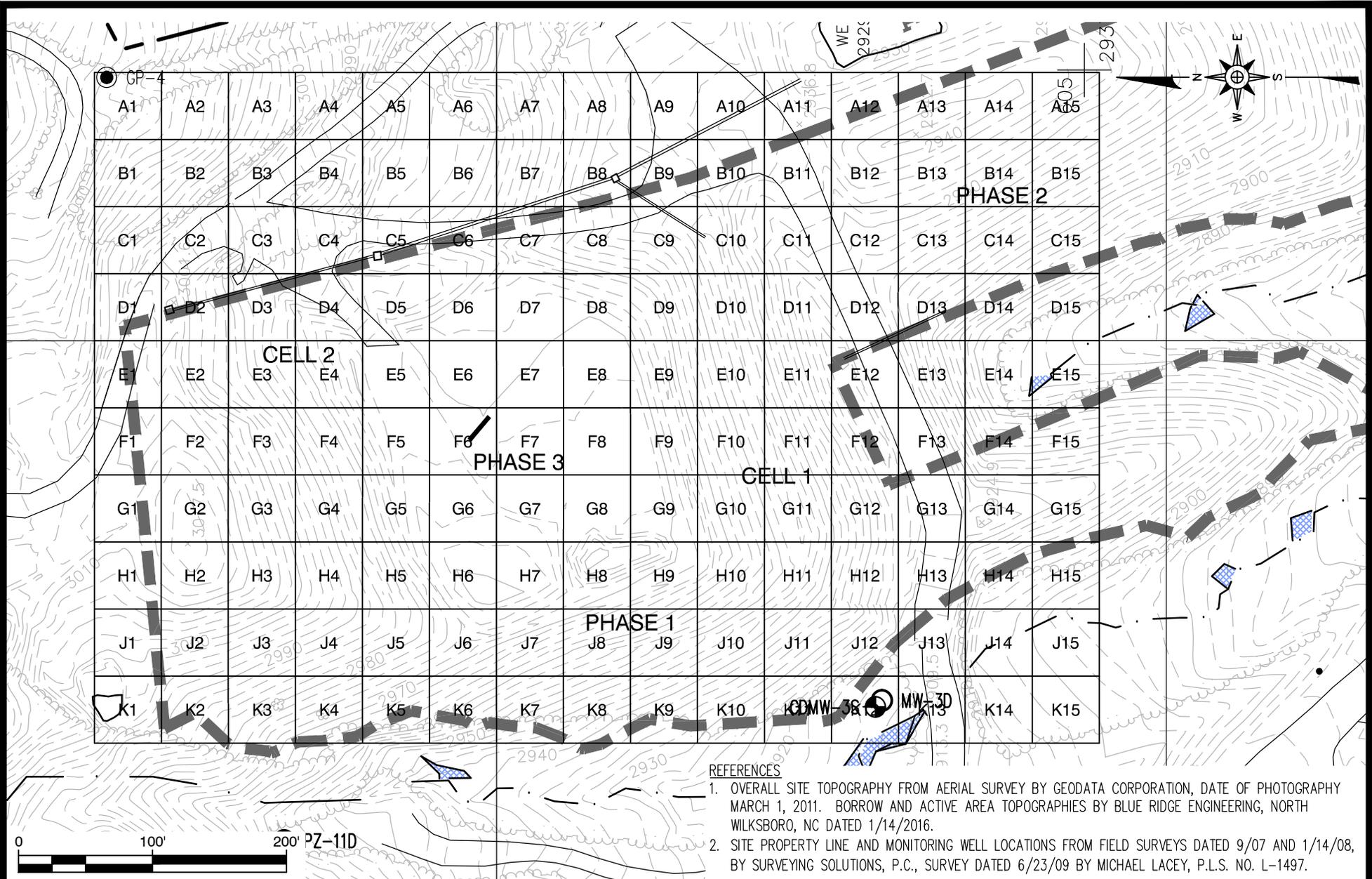
NC LIC. NO. C-0828 (ENGINEERING)

SMITH + GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DRAWN: C.T.J.	APPROVED: M.M.G.	SCALE: AS SHOWN	DATE: Jan. 2016	PROJECT NO.: AVERY 15-7	FIGURE NO.: 3
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- REFERENCES**
1. OVERALL SITE TOPOGRAPHY FROM AERIAL SURVEY BY GEODATA CORPORATION, DATE OF PHOTOGRAPHY MARCH 1, 2011. BORROW AND ACTIVE AREA TOPOGRAPHIES BY BLUE RIDGE ENGINEERING, NORTH WILKSBORO, NC DATED 1/14/2016.
 2. SITE PROPERTY LINE AND MONITORING WELL LOCATIONS FROM FIELD SURVEYS DATED 9/07 AND 1/14/08, BY SURVEYING SOLUTIONS, P.C., SURVEY DATED 6/23/09 BY MICHAEL LACEY, P.L.S. NO. L-1497.

G:\CAD\Avery County\Avery 15-7\sheets\AVERY-A0244.dwg - 1/18/2016 2:34 PM

PREPARED FOR: AVERY COUNTY SOLID WASTE FACILITY C&D LANDFILL WASTE PLACEMENT GRID	DRAWN: J.A.L.	APPROVED: _____	SCALE: AS SHOWN	DATE: Jan 2016	PREPARED BY: _____ NC LIC. NO. C-0828 [ENGINEERING]
	PROJECT NO.: AVERY 15-7	FIGURE NO.: 4	FILENAME: AVERY-A0244	SMITH+GARDNER 14 N. Boylan Avenue, Raleigh NC 27603 919.828.0577	

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Appendix A

Fire Occurrence Notification Form

**Operations Manual
Avery County Solid Waste Facility
Ingalls, North Carolina**

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SOLID WASTE MANAGEMENT FACILITY FIRE OCCURRENCE NOTIFICATION NC DENR Division of Waste Management Solid Waste Section



Notify the Section verbally within 24 hours and submit written notification within 15 days of the occurrence.
(If additional space is needed, use back of this form.)

NAME OF FACILITY: _____ PERMIT # _____

DATE AND TIME OF FIRE: _____ @ _____

HOW WAS THE FIRE REPORTED AND BY WHOM:

LIST ACTIONS TAKEN:

WHAT WAS THE CAUSE OF THE FIRE:

DESCRIBE AREA, TYPE, AND AMOUNT OF WASTE INVOLVED:

WHAT COULD HAVE BEEN DONE TO PREVENT THIS FIRE:

DESCRIBE PLAN OF ACTIONS TO PREVENT FUTURE INCIDENTS:

NAME: _____ TITLE: _____ DATE: _____

THIS SECTION TO BE COMPLETED BY SOLID WASTE SECTION REGIONAL STAFF
DATE RECEIVED _____

List any factors not listed that might have contributed to the fire or that might prevent occurrence of future fires:

FOLLOW-UP REQUIRED:
 NO PHONE CALL SUBMITTAL MEETING RETURN VISIT BY: _____ (DATE)

ACTIONS TAKEN OR REQUIRED:

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Appendix B

Paint Filter Liquids Test

EPA Method 9095

**Operations Manual
Avery County Solid Waste Facility
Ingalls, North Carolina**

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METHOD 9095

PAINT FILTER LIQUIDS TEST

From EPA SW-846

1.0 SCOPE AND APPLICATION

This method is used to determine the presence of free liquids in a representative sample of waste and determine compliance with 40 CFR 264.314 and 265.314.

2.0 METHOD SUMMARY

A predetermined amount of material is placed in a paint filter. If any portion of the material passes through and drops from the filter within the 5 minute test period, the material is deemed to contain free liquids.

3.0 INTERFERENCES

Filter media were observed to separate from the filter cone on exposure to alkaline materials. This development causes no problem if the sample is not disturbed.

4.0 APPARATUS AND MATERIALS

Conical paint filter: Mesh number 60 (fine meshed size). Available at local paint stores such as Sherwin-Williams and Glidden for an approximate cost of \$0.07 each.

Glass funnel: If the paint filter, with the waste, cannot sustain its weight on the ring stand, then a fluted glass funnel or glass funnel with a mouth large enough to allow at least 1 inch of the filter mesh to protrude should be used to support the filter. The funnel is to be fluted or have a large open mouth that supports the paint filter but does not interfere with the movement, to the graduated cylinder, of the liquid that passes through the filter mesh.

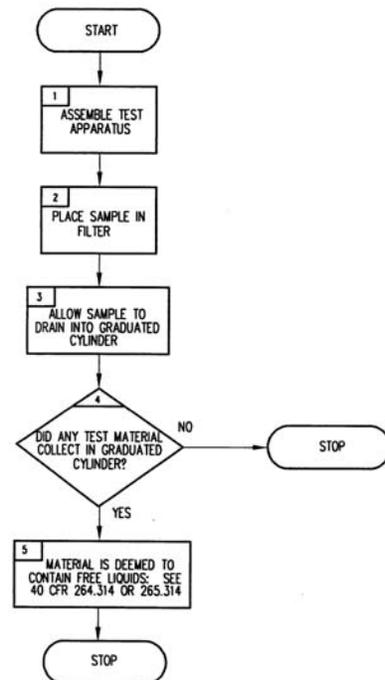
Ring stand and ring or tripod.

Graduated cylinder or beaker: 100-mL.

5.0 REAGENTS

None.

METHOD 9095
PAINT FILTER LIQUIDS TEST



6.0 SAMPLE COLLECTION, PRESERVATION AND HANDLING

Samples must be collected according to the directions in Chapter Nine of EPA SW-846.

A 100 mL or 100 g representative sample is required for the test. If it is not possible to obtain a sample of 100 mL or 100 g that is sufficiently representative of the waste, the analyst may use larger size samples in multiples of 100 mL or 100 g, i.e., 200, 300, 400 mL or g. However, when larger samples are used, analysts shall divide the sample into 100-mL or 100-g portions and test each portion separately. If any portion contains free liquids, the entire sample is considered to have free liquids.

7.0 PROCEDURE

1. Assemble test apparatus as shown in Figure 1.
2. Place sample in the filter. A funnel may be used to provide support for the paint filter.
3. Allow sample to drain for 5 minutes into the graduated cylinder.
4. If any portion of the test material collects in the graduated cylinder in the 5-min. period, then the material is deemed to contain free liquids for purposes of 40 CFR 264.314 and 265.314.

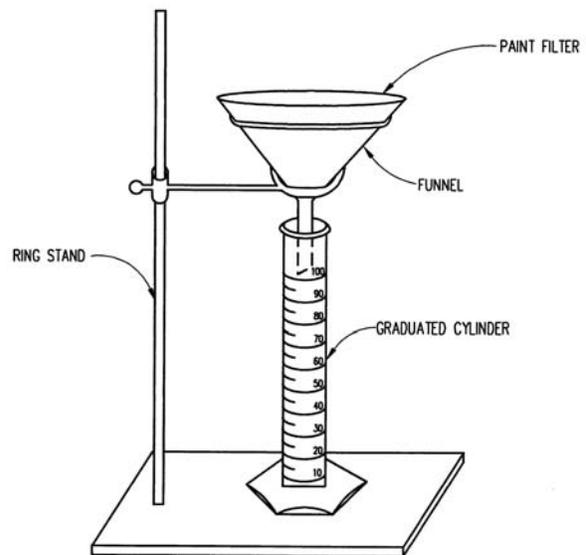


FIGURE 1. PAINT FILTER TEST APPARATUS.

8.0 QUALITY CONTROL

Duplicate samples should be analyzed on a routine basis.

9095-3

9.0 METHOD PERFORMANCE

No data provided.

10.0 REFERENCES

None required.

Appendix C

Waste Screening Form

**Operations Manual
Avery County Solid Waste Facility
Ingalls, North Carolina**

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Avery County Solid Waste Facility
C&D Landfill & Transfer Station Permit No. 06-03

WASTE SCREENING FORM

Day / Date: _____ Time Weighed in: _____
Truck Owner: _____ Driver Name: _____
Truck Type: _____ Vehicle ID / Tag No: _____
Weight: _____ Tare: _____
Waste Generator / Source: _____

Reason Load Inspected: Random Inspection _____ Staff Initials _____
Detained at Scales _____ Staff Initials _____
Detained by Operating Staff _____ Staff Initials _____

Inspection Location: _____

Approved Waste Determination Form Present? Yes _____ No _____ N/A _____

Description of Load: _____

Load Accepted (signature) _____ Date _____
Load Not Accepted (signature) _____ Date _____

Reason Load Not Accepted (complete only if load not accepted)

Description of Suspicious Contents:
Color: _____ Hazardous Waste Markings: _____
Texture: _____ Smell: _____
Drums Present: _____
Est. Cubic Yards in Load: _____
Est. Tons in Load: _____

Avery County Emergency Management Contacted? Yes _____ No _____

Company or Authority Contacted? _____
Hazardous Materials Present: _____

Hauler Notified (if waste not accepted) Phone: _____ Time Contacted: _____
Other Observations: _____

Final Disposition
Signed: _____ Date _____
Waste Screening Inspector or Landfill Manager

Attach related correspondence to this form.
File completed form in Operating Record.

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Appendix D

Mobile Home Deconstruction

**Operations Manual
Avery County Solid Waste Facility
Ingalls, North Carolina**

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1.0 OVERVIEW

This portion of the Operations Manual was prepared for the Mobile Home Deconstruction Area located adjacent to the Avery County Construction and Demolition Debris (C&D) Landfill unit. The Mobile Home Deconstruction Area is strictly for the deconstruction of mobile homes to recycle materials from the mobile homes. Avery County plans to recycle as many varieties of materials as possible as end users are available. Initially, scrap metal recycling will be conducted. Once an end-user of another material (i.e. glass) is located, these other materials may be recycled. Any non-recyclable material will be disposed of appropriately by the County following completion of the deconstruction process.

2.0 MOBILE HOME DECONSTRUCTION PROCESS

Mobile homes will be deconstructed using the following processes.

2.1 Access

Mobile home owners seeking disposal will contact the landfill facility and be placed on a waiting list. No more than TWO (2) mobile homes will be allowed on-site for deconstruction at one time. Once space is available for a mobile home, landfill personnel will contact the next owner on the waiting list. The owner will have a 48 hour window in which to contact the landfill facility with information regarding the delivery date and hauler. If the owner cannot arrange delivery within this initial 48 hour period, the owner may make alternate arrangements for delivery and must notify the landfill facility a minimum of 48 hours prior to the planned delivery. The delivered mobile home will not be weighed on the scales at time of delivery, but the owner will be charged based on the size and dimensions of the mobile home.

If delivery is not made within 48 hours of the scheduled delivery date, the owners name will be placed back on the waiting list and the owner will be notified. If an owner has more than one mobile home, they will be rotated with others on the waiting list.

2.2 Waste Disposal

All mobile homes must be free of garbage, household hazardous waste, and other non-construction and demolition waste prior to landfill acceptance.

2.3 White Goods

White goods present inside the mobile home will be accepted with mobile home delivery. White goods will be removed and handled in accordance with State and Federal regulations. CFC contained within any white goods will need to have the CFC's managed properly prior to removal of the white goods and deconstruction of the mobile home.

2.4 Asbestos

Since asbestos may be located in the building materials of mobile homes constructed prior to 1983, all mobile homes built before 1/1/1983 will be thoroughly sprayed with water (both interior and exterior) to minimize dust. Following demolition of any mobile home constructed prior to 1983, the waste generated will be placed in the C&D landfill and covered with six inches of soil or approved alternate cover.

2.5 Deconstruction of Mobile Homes

Once accepted, the mobile home will be placed in the mobile home deconstruction area. Mobile home deconstruction will be dependent on weather conditions and manpower availability and will ONLY take place in the deconstruction area. Prior to deconstruction, mobile homes constructed before 1983 will be thoroughly sprayed with water to minimize dust (as noted above). Any mercury containing equipment (thermostats, etc) will be removed before deconstruction and properly managed as universal waste. The home will then be deconstructed using a track-hoe. The track-hoe will tear the trailer apart and lay the pieces on the ground to be separated by landfill personnel. The personnel will separate the non-recyclable materials from the recyclable materials. Initially, scrap metal is planned for recycling. As other end-users for other materials are available, other materials may be separated for recycling. All material not planned for recycling will be weighed at the scale house and placed in the C&D landfill before the end of the day in which the deconstruction transpires. Material from mobile homes constructed prior to 1983 will be covered prior to the end of the day. All recyclable materials will be stockpiled in the deconstruction area for future recycling. **NO OPEN FLAMES OR CUTTING WITH TORCHES WILL BE ALLOWED WITHIN 100 FEET OF THE C&D LANDFILL.**

2.6 Holding Time for Mobile Homes

Mobile homes must be deconstructed within 45 days following acceptance in the deconstruction area. When received at the landfill, the date shall be painted on the side, end or on the frame of the mobile home, for identification purposes for Solid Waste Section personnel.

2.7 Holding Time for Recyclables

Once recyclable material is removed from the mobile home, it may be stockpiled in the mobile home deconstruction area for up to 45 days. No materials shall be kept in this area for more than 45 days, nor shall they be stockpiled in other recycling areas.

3.0 RECORD KEEPING PROGRAM

The County shall maintain the following records related to the Mobile Home Deconstruction in the landfill operating record (**Section 1.13** of the Operations Manual):

- A. Mobile Home Acceptance records including dates and description;
- B. Owner and hauler information for each mobile home;
- C. Deconstruction date for each mobile home and materials to be recycled;
- D. Date and disposal information for recycled materials including location, vendor/ recipient of recycled materials.
- E. Date and certification of CFC's removed.

Appendix E

Asphalt Shingles

**Operations Manual
Avery County Solid Waste Facility
Ingalls, North Carolina**

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1.0 OVERVIEW

This portion of the Operations Manual was prepared to describe the plan for the recycling of asphalt shingles at the facility. Asphalt shingle recycling will occur in an area located at the transfer station. The Asphalt Shingle Recycling Area is strictly for the management of tear-off asphalt shingles to provide a “clean” material that can be used in the production of asphalt. This plan describes the criteria for waste acceptance, material receipt, inspection, stockpiling, material transport and record keeping.

2.0 WASTE ACCEPTANCE

Asphalt roofing shingles contain asphalt cement, mineral aggregate, and mineral filler which are raw materials used in asphalt production. Asbestos was used in shingle manufacture until the mid-1970’s and in other roofing materials such as roof felt, roof putty, surface coating, and mastic until the mid 1980s. Due to the potential for the presence of asbestos, the following source separation and certification requirements will be followed. These practices help ensure that only recyclable tear-off shingles are sent for asphalt production while minimizing sorting at the facility.

2.1 Source Separation

Shingles will be accepted only when appropriately separated prior to delivery to the facility. Materials from flat and built-up roofing system are not acceptable and must be disposed rather than accepted for recycling due the higher use of asbestos roofing materials in those systems. Shingle suppliers are instructed to separate tear-off shingles into either a dedicated trailer or to layer their waste when loading so that the shingles can be easily separated from the unacceptable debris. A list of acceptable and unacceptable material is provided in **Appendix E1**.

2.2 Certification

Shingle suppliers are required to complete a supplier certification form (**Appendix E2**). Asbestos handling and disposal during demolition and renovation is regulated under the National Emissions Standards for Hazardous Air Pollution (NESHAP). NESHAP-regulated facilities are required to submit a notification of demolition and renovation prior to starting work. The notification includes an inspection by a North Carolina accredited asbestos inspector or roofing supervisor and analysis for asbestos. The supplier of shingles from a NESHAP-regulated facility must present documentation that the shingles do not contain greater than 1% asbestos. This documentation is a letter from the accredited asbestos inspector or roofing supervisor that sampled the shingles and the analytical test results. A copy of the documentation is kept with the supplier certification form. Shingles from a NESHAP-regulated facility that do not have the required documentation or that are documented to contain greater than 1% asbestos are properly disposed.

Shingles from single family homes or residential buildings containing four or fewer dwelling units are generally not regulated under NESHAP. In this case, only the source of shingles is required on the certification form.

3.0 MATERIAL RECEIPT, INSPECTION, AND STOCKPILING

Shingles will be visually inspected when entering the facility to determine whether the shingles have been separated or if it is a mixed load. The supplier is then asked for a completed certification form including documentation when required (**Appendix E2**). Mixed loads, shingles from a NESHAP-regulated facility that contain greater than 1 percent asbestos, and shingles from a NESHAP-regulated facility without the proper documentation are directed to the C&D landfill unit (or alternately the transfer station) for disposal. Loads that were source-separated into dedicated containers are sent directly to the sorting area and unloaded. Loads that were separated into layers usually have the asphalt shingles on the bottom and other material on the top. These loads are first directed to the C&D landfill unit (or alternately the transfer station) to remove the non-shingle roofing waste and then to the sorting area for unloading the shingles. Shingles are not unloaded into an area with standing water and sorted and unsorted materials are kept separate.

Source-separation by the supplier eliminates most unacceptable materials that cannot be used in tear-off shingle recycling. The unloaded tear-off shingles are examined for unacceptable materials and any unacceptable materials are removed. The remaining sorted shingles are stockpiled in the recycling area until there is a sufficient amount to transport to a facility that will grind and use or sell the ground shingles for asphalt production.

4.0 MATERIAL TRANSPORT

Following the transport of shingles to the receiving facility, the County will provide copies of supplier certification forms and other documentation. When requested (and as agreed to prior to material transport), the County will follow any additional requirements of the receiving facility.

5.0 RECORD KEEPING PROGRAM

The County will maintain the following records related to asphalt shingle recycling in an operating record at the landfill (**Section 1.13** in the Operations Manual):

- A. Supplier certification forms and supporting documents;
- B. Waste and recyclable disposal (quantity of materials disposed and disposal location; quantity of recycled shingles and receiving facility information).

Appendix E1

List of Acceptable and Unacceptable Materials

**Operations Manual - Appendix E: Asphalt Shingle Recycling
Avery County Solid Waste Facility
Ingalls, North Carolina**

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TEAR-OFF ASPHALT SHINGLE RECYCLING

List of Acceptable and Unacceptable Materials

“YES”

Include these items:

- Shingles
- Felt attached to shingles

“NO”

Do NOT include these items:

- Wood
- Metal flashings, gutters, etc.
- Nails (best effort)
- Rolls of sheets of felt paper
- Plastic wrap, buckets
- Paper waste
- No garbage, trash, or other waste materials
- Built-up asphalt roofing
- Asbestos-containing materials
- Shingles containing mastics

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Appendix E2

Shingle Supplier Certification Form

**Operations Manual - Appendix E: Asphalt Shingle Recycling
Avery County Solid Waste Facility
Ingalls, North Carolina**

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SHINGLE SUPPLIER CERTIFICATION FORM

Supplier of Whole Tear-off Asphalt Shingles

Supplier Name: _____
Address: _____
Contact Name: _____
Phone: _____

We the undersigned certify that (check appropriate boxes):

The tear-off shingles are from a NESHAP regulated facility and documentation stating that the shingles do not contain >1% asbestos is attached. (Documentation is a letter from the North Carolina accredited asbestos inspector or roofing supervisor that collected the samples with the analytical results attached.)

The tear-off shingles are from a single family home or residential building having four or fewer dwelling units that is not regulated under NESHAP.

Tear-off shingles were removed from the following addresses:

(Please attach additional sheets as needed to record each building address.)

Shingle Supplier (signature)

Date

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Attachment C

Water Quality Management Plan

**Permit Renewal Application
Avery County Solid Waste Facility
Ingalls, North Carolina**

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Water Quality Monitoring Plan

Avery County Solid Waste Facility Ingalls, North Carolina

Permit No: 06-03

Prepared for:



**Avery County
Newland, North Carolina**

March 2016

Prepared by:

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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Water Quality Monitoring Plan

Avery County Solid Waste Facility Ingalls, North Carolina

Permit No. 06-03

Prepared For:

**Avery County
Newland, North Carolina**

S+G Project No. AVERY-15-7



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Project Geologist

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March 2016

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Avery County Solid Waste Facility Water Quality Monitoring Plan

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1.0 INTRODUCTION

This Water Quality Monitoring Plan (WQMP) is written for the Avery County C&D Landfill Facility (Permit 06-03) and specifies the procedures and requirements to satisfy North Carolina Solid Waste Management Rule 15A NCAC 13B .0544 (b) and (c). The WQMP addresses the following two (2) major elements; monitoring/sampling of the groundwater system and monitoring/sampling of the surface water.

The WQMP will meet the following requirements:

- *Establish division approved background groundwater data that has not been affected by leakage from the unit (.0544 (b)(1)(A)).*
- *Represent the groundwater quality passing the relevant point of compliance as approved by the Division (.0544 (b)(1)(B)).*
- *The groundwater monitoring programs must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and down-gradient wells (.0544 (b)(1)(C)).*
- *Detection Groundwater monitoring program (.0544 (b)(1)(D)).*
- *The sampling procedures and frequency must be protective of human health and the environment (.0544 (b)(1)(E)).*
- *Responsibility of sample collection and analysis must be defined as a part of the monitoring plan (.0544 (c)(2)).*

This WQMP also addresses the following procedures that will be implemented to ensure the sampling event integrity:

- Sample preservation and shipment;
- Laboratory analytical procedures;
- Sample Chain-of-custody control; and
- Quality assurance/quality control programs.

The methods and procedures described in the WQMP are intended to facilitate the collection of true and representative samples and test data. Field procedures are presented in **Section 2.2** in their general order of implementation. Equipment requirements for each field task are presented within the applicable section. Laboratory procedures, quality assurance methods and record keeping requirements are presented in **Sections 3.0 through 8.0**.

Strict adherence to the procedures stipulated in this plan is required. Any variations from these procedures should be thoroughly documented and may require prior DWM approval.

1.1 Site Contact Information

In case of emergencies, or if questions arise during the implementation of this program, please contact the following:

1.1.1 Avery County Solid Waste Department

Avery County C&D Landfill (Physical Address)
2175 Brushy Creek Road
Ingalls, North Carolina 28657
Scalehouse Phone: (828) 765-7852

Avery County C&D Landfill (Mailing Address)
2175 Brushy Creek Road
Spruce Pine, North Carolina 28777

Avery County Solid Waste Department (Office)
175 Linville Street
Newland, North Carolina 28657
Phone: (828) 737-5420

Mr. Eric Foster, Solid Waste Director
Email: avery.sw@averycountync.gov

1.1.2 Engineer

Smith Gardner, Inc.
14 N. Boylan Avenue
Raleigh, North Carolina 27603
Phone: (919) 828-0577
Fax: (919) 828-3899

Ms. Joan A. Smyth, P.G., Senior Hydrogeologist
Email: joan@smithgardnerinc.com
Mr. Stacey A. Smith, P.E., Senior Engineer
Email: stacey@smithgardnerinc.com

1.1.3 NC Division of Waste Management (DWM) – Solid Waste Section

North Carolina DEQ – Raleigh Central Office (RCO)
1646 Mail Service Center
Raleigh, NC 27699
Phone: (919) 707-8200

North Carolina DEQ – Asheville Regional Office (ARO)

2090 U.S. Highway 70
Swannanoa, North Carolina 28778
Phone: (828) 296-4500
Fax: (828) 299-7043

Mr. Perry Sugg, Hydrogeologist
Email: perry.sugg@ncdenr.gov
Phone: (919) 707-8258

Mr. Bill Wagner (ARO), Environmental Senior Specialist
Email: bill.wagner@ncdenr.gov

1.2 Site Background

The Avery County C&D Landfill facility (Permit 06-03), located at 2175 Brushy Creek Rd, Ingalls, NC was in operation from 1996 to 2008. The Facility is located approximately 1.8 miles northeast of the intersection of Highway 19 East and Brushy Creek Road or 1.5 miles northeast from the Avery County Airport. The site location is shown on **Figure 1**. In general the area is sparsely populated with little development. There is residential development in the site vicinity (within 2000 feet) and commercial development within two (2) miles. The landfill facility is approximately 80 acres with the C&D footprint utilizing 5.4 acres. The site is bounded by forested, undeveloped land to the north and by low density residential development to the south, east and west. The site and monitoring network are shown on **Figure 2**.

1.2.1 Geology

The Avery County C&D landfill is located in the Blue Ridge Province of North Carolina, approximately 12 miles from the Brevard Fault zone. Local bedrock is comprised of the Alligator Back formation which is a finely laminated gneiss. Micaceous conglomerate, schist and phyllite are also found within this formation. Amphibolite was noted in central to northern portions of the site. The site has been investigated with a total of 16 monitoring wells and piezometers that range in depth from approximately 20 feet below grade to 88 feet below grade. Bedrock at the site was encountered at depths that ranged from 31 feet below grade to 88 feet below grade.

Unconsolidated sediments at the site consist of variably micaceous clayey silt to silty sand weathered from the underlying bedrock. The unconsolidated sediments are grouped into two lithological units. Unit 1A consists of sediments exhibiting a standard penetration test of less than 100 blows per foot, while Unit 1B consists of sediments exhibiting a standard penetration test of greater than 100 blows per foot. The monitoring network and analytical parameters are further discussed in **Section 1.3** and are summarized in **Tables 1 and 2**.

1.2.2 Hydrogeology

Groundwater flows from north to south toward the discharge points on-site streams and Brushy Creek (located across Brushy Creek Road). Depth to groundwater ranges from approximately 5 feet (measured from top of casing (BTOC)) to approximately 47 feet BTOC, with an average gradient of 0.12 ft/ft and an average groundwater velocity of 1.57 ft/day. Lithological Unit 1A has an average hydraulic conductivity of 1.40 ft/day, while Unit 1B has an average hydraulic conductivity of 2.05 ft/day. The bedrock aquifer (Unit 2) has an average hydraulic conductivity of 4.65 ft/day.

Several nested pairs of monitoring wells/piezometers were installed at the site to evaluate vertical gradients at the site. In general, vertical gradients across the site were found to move in a downward direction with the exception of the pairs located near the discharge point of Brushy Creek (MW-1s/1d and MW-2s/2d). These pairs indicated upward gradients which are typically associated with groundwater discharge points.

This Water Quality Monitoring Plan (WQMP) has been prepared to meet the field sampling and laboratory analysis requirements of ongoing monitoring at the site. The WQMP details field and laboratory protocols that must be followed to meet the data objectives of semiannual groundwater monitoring.

2.0 MONITORING PROGRAM

This Water Quality Monitoring Plan section addresses individual monitoring program components. At a minimum, Avery County will monitor the groundwater quality on a semi-annual basis.

2.1 Monitoring Network and Analytical Parameters

The monitoring network for the C&D landfill includes three (3) compliance groundwater monitoring wells (MW-1S, MW-2S, and MW-3S) and a background (upgradient) well (MW-4S) which was installed in November 2007. These four (4) wells are monitored for constituents referenced in 15A NCAC 13B 0.544(b)(1)(D) on a semi-annual basis. One (1) on-site potable well will be monitored along with the groundwater monitoring wells listed above. Monitoring well locations are shown on **Figure 2**.

There are two (2) surface water monitoring points (SW-1, SW-2) that will be sampled on a semi-annual basis. These surface water monitoring points are also shown on **Figure 2**.

Additionally, applicable local, state, and federal health and safety requirements will be followed. Requirements for the disposal of any investigation derived wastes will also be followed.

The proposed monitoring network is summarized in the table below.

Well	Location	Analytical Parameters
MW-1S	Downgradient	Appendix I + Field + C&D
MW-2S	Downgradient	Appendix I + Field + C&D
MW-3S	Downgradient	Appendix I + Field + C&D
MW-4S	Upgradient	Appendix I + Field + C&D
SW-1	Upgradient	Appendix I + Field
SW-2	Downgradient	Appendix I + Field
Office	Potable	Appendix I

Note: Appendix I and C&D parameters are listed in **Table 1**.

The aforementioned wells are installed to monitor groundwater in the uppermost aquifer. This monitoring system is shown on **Figure 2** and is adequate to detect any releases from the landfill unit. Well construction details are provided in **Table 1**. Analytical parameters for sampling locations are outlined in **Table 2**. Well logs for the monitoring network are presented in **Appendix A**.

2.2 Groundwater Sample Collection

Details regarding the procedures and equipment required to perform groundwater field measurements and sampling from monitoring wells during each monitoring event are presented in this section. **Where possible, work will**

proceed from the upgradient (background) wells to downgradient (compliance) wells.

2.2.1 Guidance Documents

Sampling, analysis, and submittals will be performed in accordance with this plan and the following guidance documents:

1. Groundwater, Surface Water and Soil Sampling for Landfills - NCDENR Guidance updated April 2008.
2. October 27, 2006 Memo from NCDENR entitled "New Guidelines for Electronic Submittal of Environmental Monitoring Data."
3. February 23, 2007 Memo from NCDENR entitled Addendum to October 27, 2006, North Carolina Solid Waste Section Memorandum Regarding New Guidelines for Electronic Submittal of Environmental Data.
4. October 16, 2007 Memo from NCDENR entitled Environmental Monitoring Data for North Carolina Solid Waste Management Facilities.

2.2.2 Fuel Powered Equipment

Fuel-powered equipment, such as generators for pumps must be situated away and downwind from site activities (i.e. purging and sampling). If field conditions prevent such placement, then the fuel source must be placed as far away as possible from the sampling activities. The sampling conditions must be described in detail in the field notes.

If fuel must be handled, it should be done the day before sampling. Effort should be made to avoid handling fuels on the day of sampling. If fuels must be dispensed during sampling activities, dispense fuel downwind and well away from any sampling locations. Wear gloves while working with fuel and dispose of the gloves away from sampling activities. Wash hands thoroughly after handling any fuels.

2.2.3 Equipment Decontamination

Non-dedicated equipment that will come in contact with the well casing and water will be decontaminated between wells. The procedure for decontaminating non-dedicated equipment is as follows:

1. Don new powder-free surgical gloves.

2. Clean item with tap water and phosphate-free laboratory detergent (Liqui-Nox or equivalent), using a brush if necessary to remove particulate matter and surface films.
3. Rinse thoroughly with pesticide grade isopropanol and allow to air dry.
4. Rinse with organic-free water (Milli-Q water or other ultra-pure water) and allow to air dry.
5. Wrap with commercial-grade aluminum foil, if necessary, to prevent contamination of equipment during storage or transport.

It should be noted that Liqui-Nox detergent solutions will be stored in a clearly marked High Density Polyethylene (HDPE) or Polypropylene (PP) container. Containers for pesticide-grade isopropanol will be made of inert materials such as Teflon, stainless steel, or glass.

Sampling will be planned and conducted in such a way as to minimize the need for decontamination in the field by using dedicated sampling equipment, or a new disposable Teflon bailer at each well. Unclean equipment will be segregated from clean equipment during field activities. Clean equipment will remain in the manufacturer's packaging until use, or will be wrapped in commercial-grade aluminum foil or untreated butcher paper.

2.2.4 Water Level Measurements

2.2.4.1 Static Water Levels

Static water level and depth to the well bottom will be measured in each well prior to any purging or sampling activities. Static water level and well depth measurements are necessary to calculate the stagnant water volume in the well prior to purging. Additionally, these measurements provide a field check on well integrity, degree of siltation, and are used to prepare potentiometric maps, calculate aquifer flow velocities, and monitor changes in site hydrogeologic conditions.

Groundwater depths will be measured to a vertical accuracy of 0.01 feet relative to established wellhead elevations. Each well will have a permanent, easily identified reference point on the well riser lip from which water level measurements will be measured. The reference point elevation will be established by a Registered Land Surveyor.

2.2.4.2 Contamination Prevention

After opening each well, new powder-free surgical gloves will be donned. Appropriate measures will be performed during measurement activities to minimize the potential for soils, decontamination supplies, precipitation, and/or other potential contaminants from entering the well or contacting clean equipment.

2.2.4.3 Equipment

An electronic water level indicator will be used to measure depth to groundwater in each well and/or piezometer. The electronic water level indicator will be constructed of inert materials, such as stainless steel and Teflon. **Between each well, the device will be thoroughly decontaminated by washing with non-phosphate (Liqui-Nox) soap and rinsing with organic-free water to prevent cross contamination from one well to another.**

The following measurements will be recorded in a field book prior to sample collection (see **Section 5.0** for detailed description of field notes to be collected):

- Depth to static water level and well bottom (to the nearest 0.01 foot);
- Water column height in the riser (based on measured well depth);
- Wellhead protective casing, base pad and riser condition; and
- Changes in well and surrounding conditions.

2.2.5 Well Monitor Evaluations

Water accumulated in each well may be stagnant and unrepresentative of surrounding aquifer conditions and therefore must be removed to insure that fresh formation water is sampled. Each well will be purged of standing water in the well casing following recording the static water level measurement. Monitoring well evacuation should be performed in upgradient wells first, and by systematically moving to downgradient well locations.

2.2.5.1 Contamination Prevention

New powder-free, surgical gloves will be donned for well purging and sampling activities and whenever handling decontaminated

field equipment. Appropriate measures will be executed during measurement, purging, and sampling activities to minimize the potential for surface soils, decontaminated supplies, precipitation, and/or other potential contaminants from entering the well or contacting cleaned equipment.

2.2.5.2 Calculations

The volume of standing water in the well riser and screen will be calculated immediately before well evacuation during each monitoring event. A standing water volume will be calculated for each well using measured static water level, well depth and well casing diameter according to the following equation:

$$V = (TD - SWL) \times C$$

Where:

- V = One well volume (gallons)
- TD = Total depth of the well (feet)
- SWL = Static water level (feet)
- C = Volume constant for well diameter (gallons/foot)
 - C = 0.163 gal/ft for two-inch wells.
 - C = 0.653 gal/ft for four-inch wells.

2.2.5.3 Well Purging

Several options for well purging are used at this site including:

- Bailers;
- Low Flow Pumps; and
- Grundfos Redi-flo Pumps.

Bailers – Where bailers are used, new, disposable bailers with either double or bottom check-valves will be used to purge each well. Disposable bailers will be constructed of fluorocarbon resin (Teflon) or inert plastic suitable for the well and ground conditions. Each bailer will be factory-clean and remain sealed in a plastic sleeve until use. A new Teflon-coated stainless steel, inert mono-filament line or nylon cord will be used for each well to retrieve the bailers. Where bailers are used, a minimum of three well volumes will be purged unless the well runs dry.

Low Flow Pumps – Monitoring wells may be purged and sampled using the low-flow sampling method in accordance with the *Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling* (NCDENR, 2008).

Depth-to-water measurements will be obtained using an electronic water level indicator capable of recording the depth to

an accuracy of 0.01 foot. This measurement will determine if the water table is located within the screened interval of the well. If the water table is not within the screened interval, the drawdown amount that can be achieved before intersecting with the screen will be calculated. If the water table is within the screened interval, total drawdown should not exceed 1 foot to minimize the amount of aeration and turbidity. If the water table is above the top of the screened interval, the drawdown amount should be minimized to keep the screen from being exposed.

If the purging equipment is non-dedicated, the equipment will be lowered into the well, using care to minimize the disturbance to the water column. If conditions (i.e., water column height and well yield) allow, the pump will be placed in the uppermost portion of the water column (minimum of 18 inches of pump submergence is recommended).

The minimum volume/time period for obtaining independent Water Quality Parameter Measurements (WQPM) will be determined. The minimum volume/time period is determined based on the stabilized flow rate and the amount of volume in the pump and the discharge tubing (alternatively, the volume of a direct read flow-cell can be used, provided it is greater than the calculated volume of the pump and discharge tubing). The bladder pump volume should be obtained from the manufacturer. Volume from the discharge tubing is as follows:

3/8-inch inside diameter tubing:	20 milliliters per foot
1/4-inch inside diameter tubing:	10 milliliters per foot
3/16-inch inside diameter tubing:	5 milliliters per foot

Once the flow-cell or the pump and discharge tubing volume has been calculated, the well purge will begin. The flow rate should be based on historical data for that well (if available) and should not exceed 500 milliliters per minute. The initial WQPM should be recorded and the flow rate adjusted until drawdown in the well stabilizes. Water levels should be measured periodically to ensure a stabilized water level is maintained. The water level should not fall within 1 foot of the top of the well screen. If the purge rate has been reduced to 100 milliliters or less and the head level in the well continues to decline, the required water samples should be collected following stabilization of the WQPM, based on the criteria presented below.

If neither the head level nor the WQPM stabilize, a passive sample should be collected. Passive sampling is defined as sampling before WQMP have stabilized if the well yield is low enough that

the well will purge dry at the lowest possible purge rate (generally 100 milliliters per minute or less).

WQPM stabilization is defined as follows: pH (+/- 0.2 S.U.), conductance (+/- 5% of reading), temperature (+/- 10% of reading or 0.2°C), and dissolved oxygen (DO) [+/- 20% of reading or 0.2 mg/L (whichever is greater)]. Oxidation reduction potential (ORP) will be measured and ideally should also fall within +/- 10mV of reading; however, this is not a required parameter. At a minimum, turbidity measurements should also be recorded at the beginning of purging, following the stabilization of the WQPM, and following sample collection. The optimal turbidity range for micropurging is 25 Nephelometric Turbidity Units (NTU) or less. Turbidity measurements above 25 NTU are generally indicative of an excessive purge rate or natural conditions related to excessive fines in the aquifer matrix.

WQPM stabilization should occur in most wells within five to six rounds of measurements. If stabilization does not occur following the removal of a purge volume equal to three well volumes, a passive sample will be collected.

The direct-reading equipment used at each well will be calibrated in the field according to the manufacturer's specifications prior to each day's use and checked at a minimum at the end of each sampling day. Calibration information should be documented in the instrument's calibration logbook and the field book.

Each well is to be sampled immediately following stabilization of the WQPM. The sampling flow rate must be maintained at a rate that is less than or equal to the purging rate. For volatile organic compounds, lower sampling rates (100 - 200 milliliters/minute) should be used. Final field parameter readings should be recorded prior to and after sampling.

Grundfos Redi-Flo Pumps – Where Redi-Flo pumps are used, the same low flow techniques for sampling will be used. Please see above for detailed summary of purging/sampling techniques.

2.2.5.4 Purge Rate

Wells will be purged at a rate that will not cause recharge water to be excessively agitated or cascade through the screen. Care to minimize disturbance to the well sidewalls and bottom, which could result in silt and fine particulate matter suspension. The water volume purged from each well, and the relative recharge rate will be documented in sampling field notes. Wells which have

very low recharge rates will be purged once until dry. Damaged, dry, or low yielding and high turbidity wells will be documented for reconsideration before the next sampling event.

2.2.5.5 Purge Water Disposal

Purge water will be managed to prevent possible soil and surface water contamination. Well site management options may include temporary containment and disposal as leachate or portable activated carbon filtration if warranted by field characteristics.

2.2.5.6 Non-Dedicated Equipment

Durable, non-dedicated equipment that is lowered into the well or which may come in contact with the water samples will be thoroughly decontaminated before each use. Equipment will be disassembled to the degree practical, washed with (non-phosphate) soapy potable tap water, and triple rinsed using de-ionized water. Detailed equipment decontamination procedures are detailed in **Section 2.2.3**.

2.2.6 Sample Collection

After purging the appropriate volume, groundwater samples will be collected for laboratory analysis. Samples should be collected from the least contaminated location(s) first, followed by locations of increasing contamination across the site. Prior to sample collection, sample labels should be properly filled-out with permanent, waterproof ink. At a minimum, the label should identify the sample with the following information:

- Site Name;
- Sample Location or Well Number;
- Date and Time of Collection;
- Analysis Required;
- Sampler's Initials;
- Preservative Used (if any); and
- Other Pertinent Information As Necessary.

Affix a label with the written information to the sample bottle prior to sampling.

Sampling will occur within 24-hours of purging each well and as soon after well recovery as possible. Wells which fail to recharge or produce an adequate sample volume within 24 hours of purging will not be sampled.

2.2.6.1 Field Parameters

Field measurements for temperature, pH, and specific conductance will be made immediately prior to sampling each monitoring point. Turbidity measurements should be collected for detected metals evaluation. The field test specimens will be collected with the sampling bailer and placed in a clean, non-conductive glass or plastic container for observation. Temperature, pH, conductivity and turbidity meter calibration will be performed according to the manufacturers' specifications and will be consistent with Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846). A pocket thermometer and litmus paper will be available in case of meter malfunction.

2.2.6.2 Sample Equipment

Several options for sample collection are used at this site including:

- Teflon Bailers;
- Low Flow Pumps; and
- Grundfos Redi-flo Pumps.

Teflon Bailers – Where bailers are used, each well will be sampled using a new, factory-cleaned, disposable Teflon bailer with bottom check-valve and sample discharge mechanism. A new segment of Teflon-coated stainless steel wire, inert monofilament line or nylon cord will be used to lower and retrieve each bailer. The bailer will be lowered into each well to the point of groundwater contact and then allowed to fill as it sinks below the water table. Bottom contact will be avoided, preventing suspended sediment in the samples. The bailer will be retrieved and emptied in a manner which minimizes sample agitation.

Low Flow Pumps – Following purging with the low flow pump systems, samples may be collected immediately from the pumping system. Samples are to be collected in the order outlined in **Section 2.2.6.4**.

Redi-Flo Pumps - Following purging three well volumes of water, samples may be collected from the Redi-Flo pumps. Samples will be collected in the order outlined in **Section 2.2.6.4**.

2.2.6.3 Sample Transference

Samples will be transferred directly from the Teflon bailer into a sample container that has been specifically prepared for the preservation and storage of compatible parameters. A bottom emptying device provided will be used to transfer samples from the bailer to sample container. The generation air bubbles and sample agitation will be minimized during bailer discharge.

2.2.6.4 Sample Collection Order

Groundwater samples will be collected and contained in the order of volatilization sensitivity. When collected, the following sampling order will be observed:

- Volatile Organics and Volatile Inorganics;
- Extractable Organics, Petroleum Hydrocarbons, Aggregate Organics, and Oil and Grease;
- Total Metals;
- Inorganic Nonmetallics, Physical and Aggregate Properties, and Biologicals;
- Wet Chemistry; and
- Measurements of pH, Temperature, Conductivity, and Turbidity Measurements.

Note: If the pump used to collect groundwater samples is not suitable to collect volatile or extractable organics then collect all other parameters and withdraw the pump and tubing. Then collect the volatile and extractable organics.

Samples will be collected and analyzed in an **unfiltered** state during sampling events. Samples for dissolved metal analysis, if subsequently required, will be prepared by field filtration using a disposable 0.45 micron filter cartridge specifically manufactured for this purpose.

2.2.6.5 Decontamination

Reusable sampling equipment including water level probes, water quality meters, interface probes, and filtering pumps which might contact aquifer water or samples will be thoroughly decontaminated between wells by washing with non-phosphate soapy, de-ionized water and rinsing with isopropanol and organic-

free water (MilliQ or equivalent). Equipment decontamination procedures are detailed in **Section 2.2.3**.

2.2.6.6 Sample Preservation

Following sampling at each location, the sample bottles will be placed in Ziploc bags inside a cooler with ice for preservation.

2.2.6.7 Field Quality Assurance

Equipment and trip blanks will be prepared, handled, and analyzed as groundwater samples to ensure cross-contamination has not occurred. One set of trip blanks, will be prepared before leaving the laboratory to ensure that the sample containers or handling processes have not affected the quality of the samples. One set of equipment blanks will be created in the field at the time of sampling to ensure that the field conditions, equipment, and handling during sampling collection have not affected sample quality. This sample will be collected using the same equipment utilized for well sampling. A duplicate groundwater sample may be collected from a single well to check laboratory accuracy. Blanks and duplicate containers, preservatives, handling, and transport procedures for surface water samples will be identical to those noted for groundwater samples. Blank samples are discussed in detail in **Section 3.1**.

2.2.6.8 Sample Containers

Sample containers will be provided by the laboratory for each sampling event. Containers must be either new, factory-certified analytically clean by the manufacturer, or cleaned by the laboratory prior to shipment for sampling. Laboratory cleaning methods will be based on the bottle type and analyte of interest. Metal containers are thoroughly washed with non-phosphate detergent and tap water, and rinsed with (1:1) nitric acid, tap water, (1:1) hydrochloric acid, tap water, and non-organic water, in that order. Organic sample containers are thoroughly washed with non-phosphate detergent in hot water and rinsed with tap water, distilled water, acetone, and pesticide quality hexane, in that order. Other sample containers are thoroughly washed with non-phosphate detergent and tap water, rinsed with tap water, and rinsed with non-organic water. The laboratory will provide proper preservatives in the sample containers prior to shipment [see **Section 4.0**].

2.3 Surface Water Sample Collection

This section presents the procedures and equipment required to perform surface water field measurements and sampling from springs, streams, and ponds during each monitoring event.

2.3.1 Surface Water Level Observations

Surface water quality analyses are particularly sensitive to site hydrologic conditions and recent precipitation events. Water levels may fluctuate significantly in comparison the groundwater table and may result in either diluting or increasing contaminant loadings. Recent weather and sampling station conditions should be considered when scheduling the sampling event and interpreting the surface water data.

2.3.1.1 Monitoring Conditions

Surface water level and sampling station conditions should be observed and recorded during each sampling event if warranted by site conditions. Surface water observations will include the flood stage in streams, seasonal base flow conditions, and confirm location and timing for meaningful surface water quality sampling. The following objective observations will be recorded in a dedicated field book prior to sample collection:

- Relative stream water level;
- Surface water clarity; and
- Changes in surface monitoring station conditions and surroundings.

2.3.1.2 Sampling Station Modifications

Modifications to surface water sampling station conditions may be required prior to each sampling event. These modifications may include surface and submerged debris removal, slightly deepening the station to allow sample container immersion, or channeling/piping to consolidate local discharge. When modifications are required, sufficient time will be allowed for settlement of suspended solids between the disturbance and sample collection. A minimum a settling period of four hours prior to sampling will be observed.

2.3.2 Sample Collection

2.3.2.1 Collection Procedure

Surface water samples will be obtained from areas with minimal turbulence and aeration. Samples will only be collected if flowing water is observed during the sampling event. New non-powdered, surgical gloves will be donned prior to sample collection. The following procedure will be implemented regarding surface water sampling:

1. Put on new non-powdered, surgical gloves.
2. Hold the bottle by the bottom with one hand, and with the other, remove the cap.
3. Push the sample container slowly into the water and tilt up toward the current to fill. A water depth of six inches is generally satisfactory. Breaching the surface or losing sample preservatives while filling the container will be avoided.
4. If there is little current movement, the container should be moved slowly, in a lateral, side to side direction, with the container mouth pointing upstream.

2.3.2.2 Field Parameters

Temperature, pH, specific conductivity, and turbidity will be measured at the start of sampling as a record of field conditions and check on the water sample stability over time. Temperature, pH, specific conductivity and turbidity measurements will be recorded for surface water samples. Temperature, pH, conductivity, and turbidity meter calibration will be completed at the beginning of each sampling event, according to the manufacturers' specifications and consistent with Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846).

2.3.2.3 Sample Collection Order

Surface water samples will be collected in the order of volatilization sensitivity. When collected, the following sampling order will be observed:

- Volatile Organics and Volatile Inorganics;
- Extractable Organics, Petroleum Hydrocarbons, Aggregate Organics and Oil and Grease;
- Total Metals;
- Inorganic Nonmetallics, Physical /Aggregate Properties, Biologicals;
- Wet Chemistry; and

- Measurements of pH, Temperature, DO, ORP, Conductivity, and Turbidity.

Samples will be collected and analyzed in an **unfiltered** state during sampling events. Samples for dissolved metal analysis, if subsequently required, will be prepared by field filtration using a decontaminated peristaltic pump and a disposable 0.45 micron filter cartridge specifically manufactured for this purpose.

2.3.2.4 Decontamination

Field meters which might contact surface water samples will be thoroughly decontaminated between stations by washing with non-phosphate soapy, de-ionized water and rinsed with isopropanol and organic-free water (MilliQ or equivalent). Detailed equipment decontamination procedures are detailed in **Section 2.2.3**.

2.3.2.5 Sample Preservation

Following sampling at each location, the sample bottles will be placed in Ziploc bags inside a cooler with ice for preservation.

2.3.2.6 Field Quality Assurance

Equipment and trip blanks will be prepared, handled, and analyzed as groundwater samples to ensure cross-contamination has not occurred. One set of trip blanks, will be prepared before leaving the laboratory to ensure that the sample containers or handling processes have not affected the quality of the samples. One set of equipment blanks will be created in the field at the time of sampling to ensure that the field conditions, equipment, and handling during sampling collection have not affected sample quality. This sample will be collected using the same equipment utilized for well sampling. **Duplicate samples will not be collected for surface water samples.** Blanks and duplicate containers, preservatives, handling, and transport procedures for surface water samples will be identical to those noted for groundwater samples. Blank samples are discussed in detail in **Section 3.1**.

2.3.2.7 Sample Containers

Sample containers will be prepared and provided by the laboratory for each surface water sampling event. Each container's preparation and preservatives will be the same as those utilized for groundwater sampling and addressed previously in **Section 2.2.6.8**.

3.0 FIELD QA/QC PROGRAM

Field Quality Assurance/Quality Control (QA/QC) requires the routine collection and analysis of trip blanks to verify that the handling process has not affected the quality of the samples. Any contaminants found in the trip blanks could be attributed to:

1. Interaction between the sample and the container;
2. Contaminated source water; and/or
3. A handling procedure that alters the sample.

3.1 Blank Samples

3.1.1 Trip Blanks

The laboratory will prepare a trip blank by filling each sample bottle type with laboratory grade distilled or deionized water. Trip blanks will be placed in bottles of the specific type required for the analyzed parameters, bottle packs will be specifically assembled by the laboratory for each sampling event. Trip blanks will be packaged by the laboratory prior to the sampling event and transported with the empty bottle packs. These bottles return to the laboratory in an untampered state. The trip blanks will be analyzed for volatile and purgeable organics only.

3.1.2 Equipment Blanks

Where wells are sampled with non-dedicated equipment, equipment blank samples shall be collected at a rate of one sample per day. To collect an equipment blank, a bailer shall be filled with non-organic water (Milli-Q or equivalent). Handling the bailer in a manner identical to well sampling, the water is to be transferred into the sample collection jars for the equipment blanks. These samples are packed in the field and sent to the laboratory with the other samples.

3.1.3 Field Blanks

To collect a field blank, deionized water from the lab or non-organic (Milli-Q or equivalent) water will be poured at the sampling location into laboratory provided sample collection jars. These samples are packed and sent to the laboratory with the other samples.

3.2 Blank Concentrations

The contaminant concentration levels found in any blank samples will be reported but will not be used to correct the groundwater data. In the event that elevated parameter concentrations are found in a blank, the analysis will be flagged for future evaluation and possible re-sampling.

3.3 Field Instruments

Field instruments utilized to measure groundwater characteristics will be calibrated prior to entering the field, and recalibrated in the field as required, to insure accurate sample measurements. The specific conductivity and pH meter will be recalibrated utilizing two prepared solutions of known pH concentration in the range of anticipated values (between 4 and 10). A permanent thermometer, calibrated against a National Bureau of Standards Certified thermometer, will be used for temperature meter calibration. Other field equipment should be calibrated at least daily using the manufacturer's recommended specifications.

4.0 SAMPLE PRESERVATION AND SHIPMENT

Sample preservation, shipment, and Chain-of-Custody procedures to be observed between sampling and laboratory analysis are presented in the following sections.

4.1 Sample Preservation

Pre-measured chemical preservatives will be provided by the analytical laboratory. Hydrochloric acid will be used as a chemical stabilizer and preservative for volatile and purgeable organic specimens. Nitric acid will be used as the preservative for samples for inorganic metals analysis.

4.2 Storage/Transport Conditions

Proper storage and transport conditions must be maintained to preserve the sample integrity between collection and analysis. Ice and chemical cold packs will be used to cool and preserve samples, as directed by the analytical laboratory. Samples will be maintained at a maximum temperature of 4° C. **Dry ice is not to be used.** Samples will be packed and/or wrapped in plastic bubble wrap to inhibit breakage or accidental spills.

Chain-of-Custody control documents will be placed in a waterproof pouch and sealed inside the cooler with the samples for shipping. Tape and/or custody seals will be placed on the outside of the shipping coolers, in a manner to prevent and detect sample tampering.

4.3 Sample Delivery

Samples shall be delivered to the analytical laboratory within a reasonable period of time in person or using an overnight delivery service to insure hold times are not exceeded. If samples are not shipped the same day, the ice used to keep the samples cool will be replenished to maintain the required maximum temperature of 4° C. Shipment and sample receipt will be coordinated with the laboratory. Do NOT store or ship highly contaminated samples (concentrated wastes, free product, etc.) or samples suspected of containing high contaminant concentrations in the same cooler or shipping container with other environmental samples.

4.4 Chain of Custody

Chain-of-Custody control will be maintained from sampling through analysis to prevent tampering with analytical specimens. Chain-of-Custody control procedures for samples will consist of the following:

1. Chain-of-Custody will originate at the laboratory with the shipment of prepared sample bottles and a sealed trip blank(s) in sealed coolers. Container kits will be shipped by express carrier to the sampler or site or picked up at the laboratory.

2. Following sample kit receipt, the sampler will inventory the container kit, and check its consistency with number and type of containers indicated in the Chain-of-Custody forms and required for the sampling event.
3. Labels for individual sample containers will be completed in the field, indicating the site name, sampling time and date, sample location/well number, analysis required, sampler's initials, and preservation methods used for the sample.
4. Collected specimens will be placed in the iced coolers and will remain in the continuous possession of the field technician until shipment or transferal as provided by the Chain-of-Custody form has occurred. If continuous possession cannot be maintained by the field technician, the coolers will be temporarily sealed and placed in a secured area.
5. Following laboratory delivery, samples will be issued a laboratory sample number and recorded into a logbook indicating client, sample location/well number, and delivery date and time. The laboratory director or his designee will sign the Chain-of-Custody control forms and formally receive the samples.
6. Filled-in Chain-of-Custody form copies will be placed in the laboratory's analytical project file and attached to the laboratory analysis report following analysis.

Chain-of-Custody forms will be used to transfer direct deliveries from the sampler to the laboratory. A coded, express delivery shipping bill shall constitute the Chain-of Custody between the sampler and laboratory for overnight courier deliveries.

5.0 FIELD LOGBOOK

The field technician will keep an up-to-date logbook documenting important information pertaining to the technician's field activities. The field logbook will document the following:

- Site Name and Location;
- Sampling Date and Time;
- Climatic Conditions During Sampling Event;
- Sampling Location/Well Identification Number;
- Sample Collection Time;
- Field Technician Signature;

Groundwater Sample Collection

- Well Static Water Level;
- Water Column Height in Well;
- Purged Water Volume and Well Yield (High or Low);
- Observations on Purging and Sampling Event;
- Temperature, pH, Temperature, DO, ORP, Turbidity, and Conductivity Readings;

Surface Water Sample Collection

- Relative stream water level;
- Surface water clarity; and
- Changes in surface monitoring station conditions and surroundings.

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6.0 LABORATORY ANALYSIS

The ground and surface water parameters will be analyzed for field water quality indicators (pH, conductivity, temperature and turbidity) and those constituents listed in **Table 2**. Analytical methods will follow Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846) or Methods for the Chemical Analysis of Water and Wastes and will be consistent with the DWM's policies regarding analytical methods and reporting limits. Analysis will be performed by a laboratory certified by the North Carolina DWM for the analyzed parameters.

6.1 Laboratory Quality Assurance/Quality Control

Formal environmental laboratory Quality Assurance/Quality Control (QA/QC) procedures are to be utilized at all times. The owner/operator of the landfill is responsible for selecting a laboratory contractor and insuring that the laboratory is utilizing proper QA/QC procedures. The laboratory must have a QA/QC program based on specific routine procedures outlined in a written laboratory Quality Assurance/Quality Control Manual. The QA/QC procedures listed in the manual shall provide the lab with the necessary assurances and documentation that accuracy and precision goals are achieved in analytical determinations. Internal quality control checks shall be undertaken regularly by the lab to assess the precision and accuracy of analytical procedures.

6.2 Data Review

During analyses, quality control data and sample data shall be reviewed by the laboratory manager to identify questionable data and determine if the necessary QA/QC requirements are being followed. If a portion of the lab work is subcontracted, it is the contracted laboratory's responsibility to verify that subcontracted work is completed by certified laboratories, using approved QA/QC procedures.

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7.0 RECORD KEEPING AND REPORTING

This section addresses the documentation and reporting requirements associated with the WQMP implementation.

7.1 Groundwater System Evaluations

After each monitoring event, the potentiometric surface will be evaluated to determine whether the monitoring system is adequate to provide early detection of a release from the landfill unit and to determine the rate and direction of groundwater flow at the site. The groundwater flow direction will be determined by comparing groundwater surface elevations across the site through the using a potentiometric surface map. Groundwater flow rate will be determined using the following equation:

$$V=Ki/n$$

Where:

- V = Velocity (feet/day)
- K = Hydraulic Conductivity (feet/day)
- i = Hydraulic Gradient (foot/foot)
- n = Effective Porosity of aquifer soils (unit less)

If these evaluations indicate the groundwater monitoring system requires modification to meet rule requirements, a work plan and revised WMQP will be submitted to NCDWM for review prior to modifications to enhance the monitoring system.

7.2 Reporting

A report summarizing the monitoring event and the analytical data from the event will be submitted to the DWM within 120 days of completion of the event.

Monitoring reports will include the following:

1. An discussion of site geology and hydrogeology;
2. A discussion of the monitoring event procedures and results;
3. An potentiometric surface map;
4. Analytical laboratory reports and summary tables;
5. Graphical analysis of analytical data may be reported but is not required;
6. Solid Waste Environmental Monitoring Reporting Form (**Appendix A**); and
7. Laboratory Data (in Electronic Data Deliverable Format – see **Section 2.2.1**).

Monitoring reports may be submitted electronically by e-mail or in paper copy form. Copies of the reports will be kept at the landfill office.

This page intentionally left blank.

8.0 MONITORING PROGRAM MODIFICATIONS

8.1 Overview

This section addresses the procedures that should be followed with respect to any water quality program modifications.

8.2 Well Abandonment/Rehabilitation

After each water quality monitoring event, the potentiometric surface will be evaluated to determine whether the monitoring system is still effective at detecting an early release from the landfill, and to determine the groundwater flow rate and direction at the site. If the potentiometric maps reveal the depths, locations, or well number is insufficient to monitor for a potential releases of solid waste constituents from the solid waste management area, new well locations and depths will be submitted to the DWM for approval.

Should wells become irreversibly damaged or require rehabilitation, the DWM will be notified. If monitoring wells and/or piezometers are damaged irreversibly they will be abandoned under DWM direction following 15A NCAC 02C .0113. The abandonment procedure in unconsolidated materials involves over-drilling and/or pulling the well casing and plugging the well with a sealant such as neat cement grout and/or bentonite clay. For bedrock well completions the abandonment encompasses plugging the interior well riser and screen with a sealant such as neat cement grout and/or bentonite clay sealant.

8.3 Additional Well Installations

Additional well installations will be carried out in accordance with DWM directives. Monitoring wells will be installed under the supervision of a geologist or engineer who is registered in North Carolina and who will certify to the DWM that the installation complies with the North Carolina Regulations. For future well installation, the documentation for well construction will be submitted by the registered geologist or engineer to the DWM within sixty (60) days after well construction.

8.4 Implementation Schedule

The Monitoring Program proposed herein will be implemented following approval of this Water Quality Monitoring Plan by the DWM.

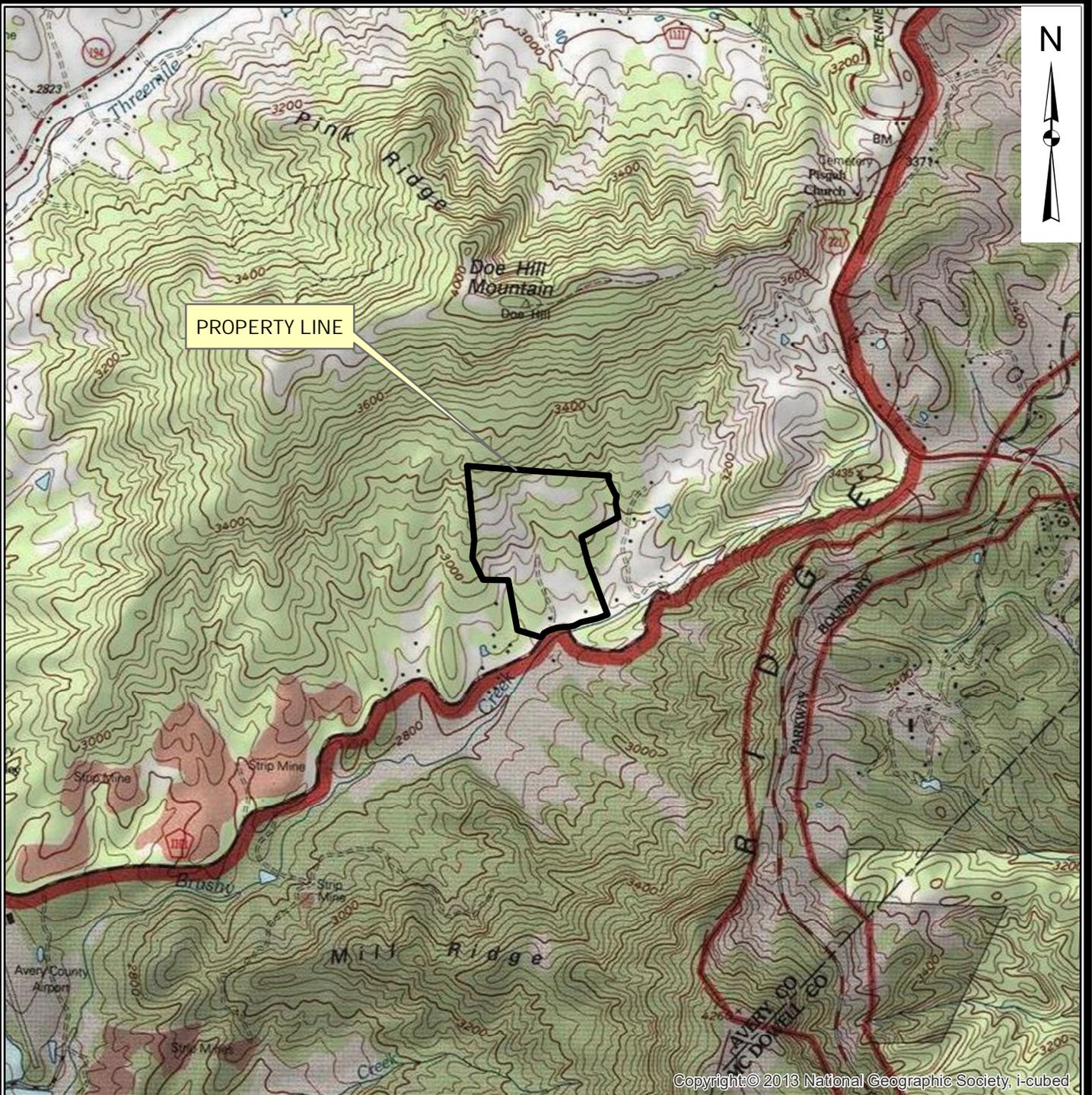
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Figures

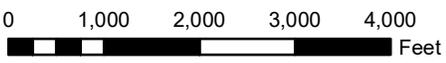
**Water Quality Monitoring Plan
Avery County Solid Waste Facility
Ingalls, North Carolina**

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G:\CAD\Avery County\Avery 15-7\sheets\AVERY-A0242.mxd



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- REFERENCES
1. U.S.G.S. 7.5 MIN. QUADRANGLE MAP "LINVILLE FALLS, NC" DATED 1994.
 2. SITE PROPERTY LINE FROM FIELD SURVEY DATED 1/14/08, BY SURVEYING SOLUTIONS, PC.

**AVERY COUNTY C&D LANDFILL
SITE VICINITY MAP**

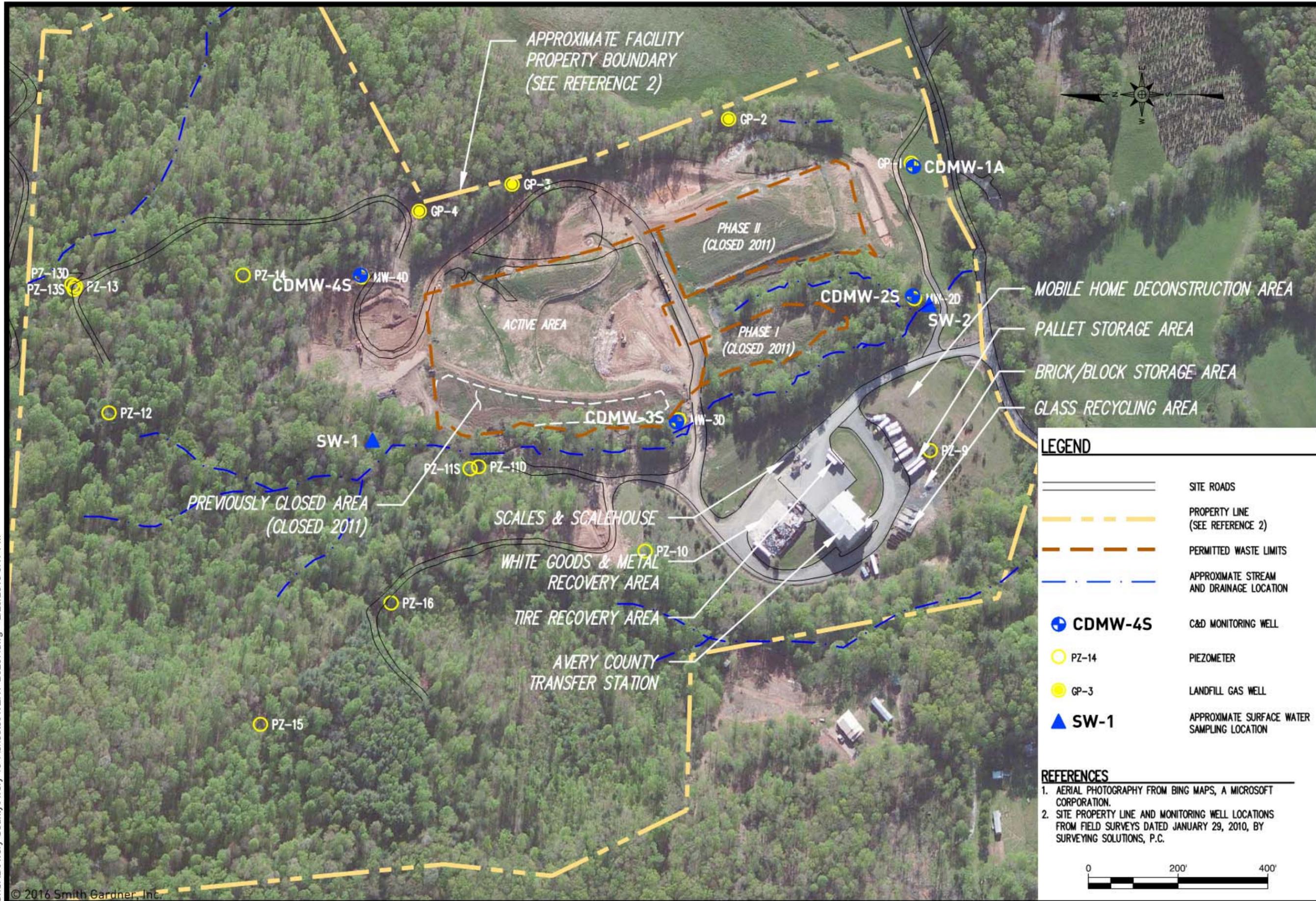
NC LIC. NO. C-0828 (ENGINEERING)

SMITH + GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DRAWN: C.T.J.	APPROVED: M.M.G.	SCALE: AS SHOWN	DATE: Jan. 2016	PROJECT NO.: AVERY 15-7	FIGURE NO.: 1
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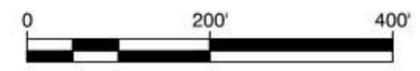


LEGEND

- SITE ROADS
- PROPERTY LINE (SEE REFERENCE 2)
- PERMITTED WASTE LIMITS
- APPROXIMATE STREAM AND DRAINAGE LOCATION
- CDMW-4S** C&D MONITORING WELL
- PZ-14 PIEZOMETER
- GP-3 LANDFILL GAS WELL
- SW-1** APPROXIMATE SURFACE WATER SAMPLING LOCATION

REFERENCES

1. AERIAL PHOTOGRAPHY FROM BING MAPS, A MICROSOFT CORPORATION.
2. SITE PROPERTY LINE AND MONITORING WELL LOCATIONS FROM FIELD SURVEYS DATED JANUARY 29, 2010, BY SURVEYING SOLUTIONS, P.C.



PREPARED BY: **SMITH+GARDNER**
 NC LIC. NO. C-0833 (ENGINEERING)
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

FIGURE NO.	2
SCALE:	AS SHOWN
APPROVED:	C.T.S.
DRAWN:	J.A.L.
PROJECT NO.:	AVERY 15-7
DATE:	Feb 2016
FILENAME:	AVERY-B0257

PREPARED FOR:
**AVERY COUNTY CG&D LANDFILL
 WATER QUALITY MONITORING LOCATION MAP**

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Tables

**Water Quality Monitoring Plan
Avery County Solid Waste Facility
Ingalls, North Carolina**

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Table 1
Well Construction Details
Avery County C&D Landfill

Well	Well Installation Date	Latitude	Longitude	Well Diameter (inches)	Total Well Depth (ft. bgs)	Ground Surface Elevation (ft. amsl)	TOC Elevation (ft. amsl)	Depth to Water (ft. bgs)	Groundwater Elevation (ft. amsl)	Screen Interval (ft. bgs)	Screen Geology
CDMW-1a	10/29/2009	35.95919	81.96956	2	13.00	2870.32	2874.13	8.7	2865.43	4' - 12'	clayey sandy silt
CDMW-2s	NA	35.95917	81.97053	2	22.65	2866.54	2869.16	7.55	2861.61	10' - 20'	NA
CDMW-3s	NA	35.96060	81.97153	2	23.00	2912.77	2914.76	9.85	2904.91	10' - 20'	NA
CDMW-4s	11/19/2007	35.96256	81.97050	2	32.00	3033.03	3035.85	18.01	3017.84	22' - 32'	saprolite

Note:

- Survey data from 9/2007 and 1/14/2008 by Surveying Solutions, P.C. and 1/11/2010 by Appalachian Professional Land Surveyors, and Consultants, PA.
- Depth to Water measured from Top of Casing on September 3, 2015
- Data for CDMW-1a and CDMW-4s is from boring logs (Appendix A)
- No boring logs available for CDMW-2s and CDMW-3s
- Screened interval for CDMW-2s and CDMW-3s assumed based on depth to bottom measurements

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Constituents	Synonyms
Antimony	
Arsenic	
Barium	
Beryllium	
Cadmium	
Chromium	
Cobalt	
Copper	
Lead	
Nickel	
Selenium	
Silver	
Thallium	
Vanadium	
Zinc	
Temperature	
pH	
Turbidity	
Specific Conductance	
Acetone	2-Propanone
Acrylonitrile	2-Propenenitrile
Benzene	
Bromochloromethane	Chlorobromomethane
Bromodichloromethane	Dibromochloromethane
Bromoform	Tribromomethane
Carbon Disulfide	
Carbon Tetrachloride	Tetrachloromethane
Chlorobenzene	
Chloroethane	Ethyl chloride
Chloroform	Trichloromethane
Dibromochloromethane	Chlorodibromomethane
1,2-Dibromo-3-chloropropane	DBCP
1,2-Dibromoethane	Ethylene dibromide, EDB
1,2-Dichlorobenzene	o-Dichlorobenzene
1,4-Dichlorobenzene	p-Dichlorobenzene
trans-1,4-Dichloro-2-butene	
1,1-Dichloroethane	Ethylidene chloride
1,2-Dichloroethane	Ethylene dichloride
1,1-Dichloroethylene	Vinylidene chloride
cis-1,2-Dichloroethylene	
trans-1,2-Dichloroethylene	
1,2-Dichloropropane	Propylene dichloride
cis-1,3-Dichloropropene	
trans-1,3-Dichloropropene	
Ethylbenzene	
2-Hexanone	Methyl butyl ketone

Constituents	Synonyms
Methyl bromide	Bromomethane
Methyl chloride	Chloromethane
Methyl ethyl ketone	2-Butanone
Methyl iodide	Iodomethane
4-Methyl-2-pentanone	Methyl isobutyl ketone
Methylene bromide	Dibromomethane
Methylene chloride	Dichloromethane
Styrene	Ethenylbenzene
1,1,1,2-Tetrachloroethane	
Tetrachloroethylene	Perchloroethylene
Toluene	Methyl benzene
1,1,1-Trichloroethane	Methyl chloroform
1,1,2-Trichloroethane	
Trichloroethylene	
Trichlorofluoromethane	CFC-11
1,2,3-Trichloropropane	
Vinyl acetate	Acetic acid, ethenyl ester
Vinyl chloride	Choroethene
Xylenes	Dimethyl benzene
C&D Landfill Additional Parameters:	
Mercury	
Chloride	
Manganese	
Sulfate	
Iron	
Alkalinity	
Total Dissolved Solids	
Tetrahydrofuran	

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Appendix A

Available Well Records

**Water Quality Monitoring Report
Avery County Solid Waste Facility
Ingalls, North Carolina**

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FIELD BOREHOLE LOG

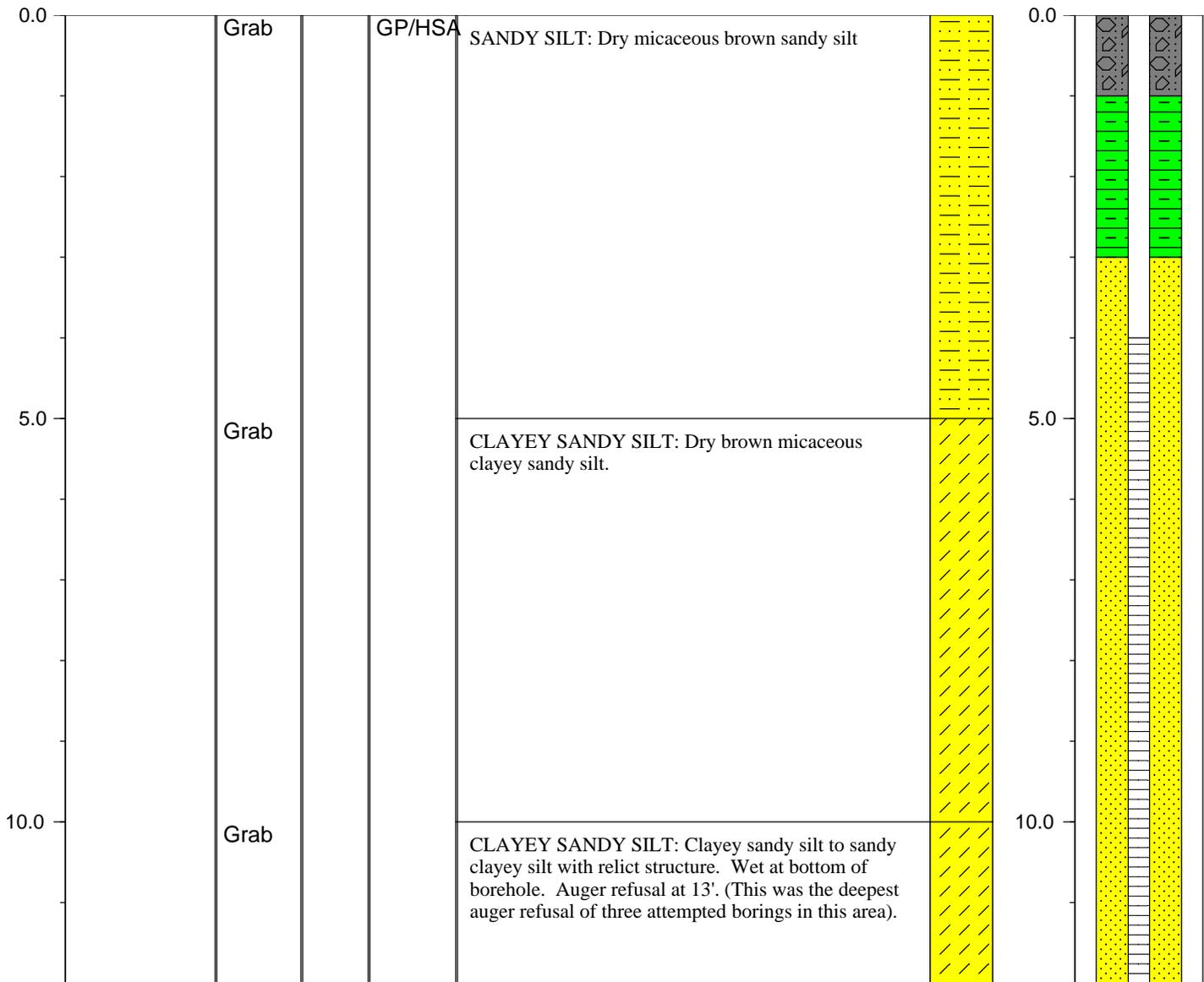
BOREHOLE NUMBER **MW-1a** Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Joan Smyth**
 DATE BEGUN: **10/26/09** COMPLETED: **10/26/09**

TOTAL DEPTH: **13**
 TOP OF CASING ELEV.: GROUND ELEV.:
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)	--	--
Time	--	--
Date	--	--

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
---------------	----------------------	-----------------	--------------------	--------------	-------------	-----------	---------------	----------------------



David Garrett and Associates

Engineering and Geology

Depths in feet, referenced b.g.s.

Boring No. MW-4s

Page 1 of 1

Client and Project **Avery County C&D Expansion**

Ground Elevation **3032.72**

Equipment **Dietrich D-50 ATV**

Drilling Method **HSA**

Water Level, TOB **20.00** \sphericalangle

Date Started **11/19/07**

Date Ended **11/19/07**

Water Level, 24 Hr. **15.78**

Drilling Firm **Red Dog Drilling, Inc.**

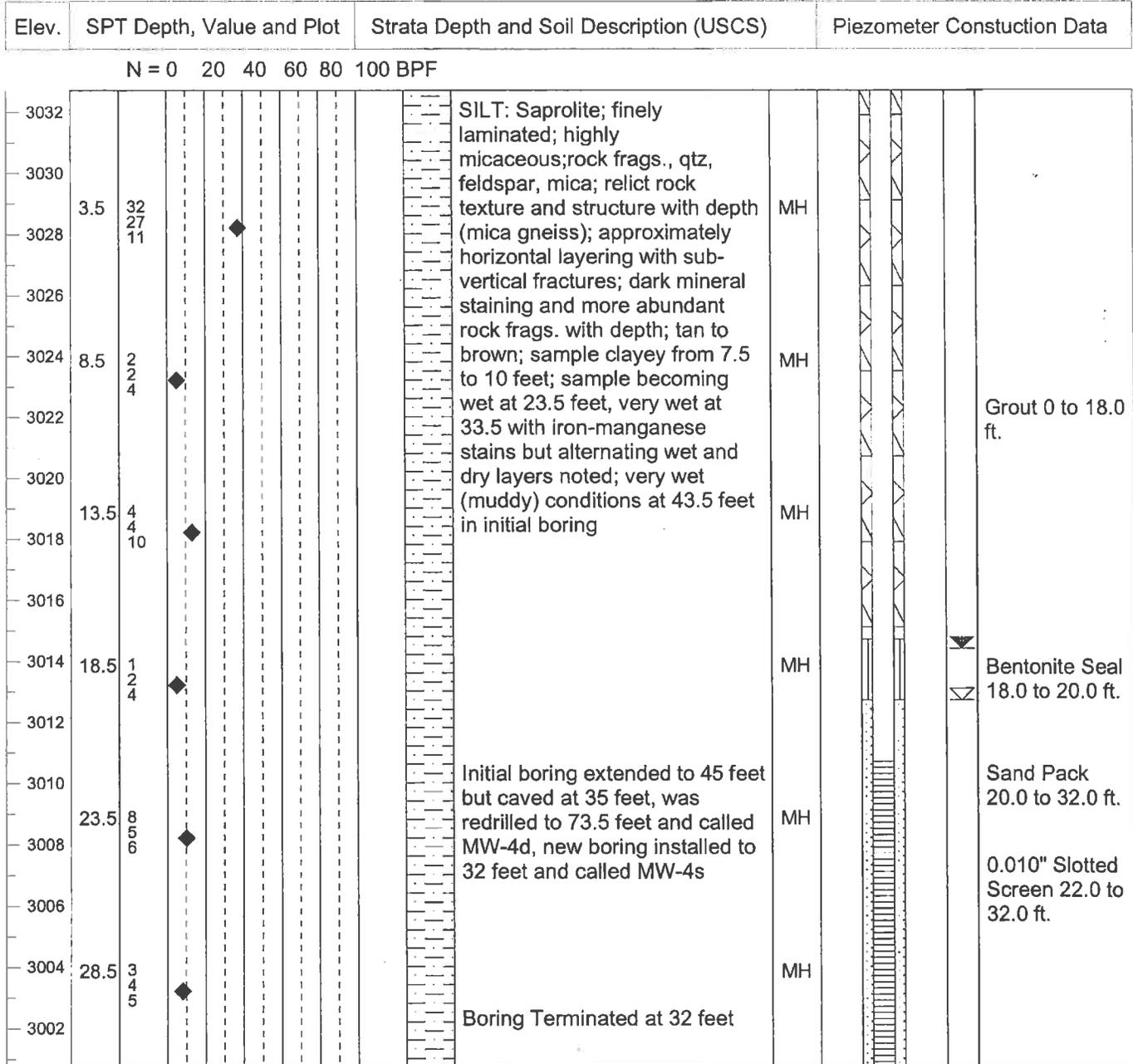
Logged by **Joan Smythe**

Stabilized Level **18.30** \sphericalangle

Comments **Immediately north of landfill**

Total Depth **32.0**

Observation Date **2/7/08**



Appendix B

Environmental Monitoring Report Form

**Water Quality Monitoring Report
Avery County Solid Waste Facility
Ingalls, North Carolina**

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DENR USE ONLY:

Paper Report Electronic Data - Email CD (data loaded: Yes / No)

Doc/Event #:

NC DENR

Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i)).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: _____ Phone: _____

E-mail: _____

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)

Environmental Status: (Check all that apply)

- Initial/Background Monitoring
 Detection Monitoring
 Assessment Monitoring
 Corrective Action

Type of data submitted: (Check all that apply)

- Groundwater monitoring data from monitoring wells
 Methane gas monitoring data
 Groundwater monitoring data from private water supply wells
 Corrective action data (specify) _____
 Leachate monitoring data
 Surface water monitoring data
 Other(specify) _____

Notification attached?

- No. No groundwater or surface water standards were exceeded.
 Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
 Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Facility Representative Name (Print) _____ Title _____ (Area Code) Telephone Number _____
 Affix NC Licensed/ Professional Geologist Seal

Signature _____ Date _____

Facility Representative Address _____

NC PE Firm License Number (if applicable effective May 1, 2009) _____

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Attachment D

Landfill Gas Monitoring Plan

**Permit Renewal Application
Avery County Solid Waste Facility
Ingalls, North Carolina**

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Landfill Gas Monitoring Plan

Avery County Solid Waste Facility
Ingalls, North Carolina
Permit No. 06-03

Prepared for:

Avery County
Newland, North Carolina

March 2016

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577



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Landfill Gas Monitoring Plan

Avery County C&D Landfill Facility
Ingalls, North Carolina
Permit No. 06-03

Prepared For:
Avery County Solid Waste Department
Newland, North Carolina

S+G Project No. AVERY 15-7



DocuSigned by:

Madeline German

Madeline German, P.G.
Project Geologist



DocuSigned by:

Joan A. Smyth

Joan A. Smyth, P.G.
Senior Hydrogeologist

March 2016

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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Avery County Solid Waste Facility Landfill Gas Monitoring Plan

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FIGURES

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- Figure 2 Flowchart of Methane Monitoring Requirements

APPENDIX

- Appendix A Well Logs
- Appendix B Reporting Forms

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1.0 INTRODUCTION

This Landfill Gas (LFG) Monitoring Plan (plan) was prepared by Smith Gardner, Inc. (S+G) to describe the LFG monitoring program at the Avery County C&D Landfill (NC Solid Waste Permit 06-03), which is located at 2175 Brushy Creek Road, Ingalls, North Carolina. This plan describes the necessary procedures to satisfy applicable regulatory requirements (**Section 1.1**) for landfill gas monitoring.

The best available site data, practices, experience, and judgment were utilized to develop this plan. However, the plan may require modifications over time to accommodate changing landfill conditions, changing receptors in areas adjacent to and around the landfill, or other conditions that cannot be fully anticipated.

Uncontrolled migration of LFG (particularly methane (CH₄)) can result in, loss of life, injury, loss of property, vegetative damage, and intolerable odors. Landfill monitoring includes exposure to explosive gases. Monitoring personnel should be specifically trained in the management and response for situations such as fire or explosion and confined space entry and possess an awareness of changing conditions around the landfill.

Note that this plan does not address landfill gas collection and control, air quality, or other related landfill gas regulations or requirements which may be applicable to this site at present or in the future.

1.1 Regulatory Requirements – C&D Landfills

Rule 15A NCAC 13B.0544(d) of the North Carolina Solid Waste Management Rules requires the following for facilities having a C&D landfill:

- *Owners or operators of C&D landfill units must ensure that:*
 - *the concentration of methane gas or other explosive gases generated by the facility does not exceed 25 percent of the lower explosive limit in on-site facility structures (excluding gas control or recovery system components);*
 - *the concentration of methane gas or other explosive gases does not exceed the lower explosive limit for methane or other explosive gases at the facility property boundary; and*
 - *the facility does not release methane gas or other explosive gases in any concentration that can be detected in off-site structures.*
- *Owners or operators of C&D landfill units must implement a routine methane monitoring program and perform monitoring on at least a quarterly basis.*
- *If regulatory limits for methane gas concentrations are exceeded, a contingency plan must be implemented for the protection of human health and safety.*

1.2 Guidance Document

This plan was developed generally following the Landfill Gas Monitoring Guidance document prepared by the North Carolina Department of Environment Quality (NC DEQ), Division of Waste Management (DWM)¹.

1.3 Contact Information

Correspondence and questions concerning this plan should be directed to the appropriate contact below:

1.3.1 Owner

Avery County

Avery County C&D Landfill
2175 Brushy Creek Road
Ingalls, North Carolina 28657
Scalehouse Phone: (828) 765-7852

Avery County C&D Landfill (Mailing Address)
2175 Brushy Creek Road
Spruce Pine, North Carolina 28777

Avery County Solid Waste Department (Office)
175 Linville Street
Newland, North Carolina 28657
Phone: (828) 737-5420

Contact: Eric Foster, Solid Waste Director
avery.sw@averycountync.gov

1.3.2 Engineer

Smith Gardner, Inc.

14 N. Boylan Avenue
Raleigh, North Carolina 27603
Phone: (919) 828-0577

Contacts: Joan A. Smyth, P.G., Senior Hydrogeologist
joan@smithgardnerinc.com
Stacey A. Smith, P.E., Senior Engineer
stacey@smithgardnerinc.com

¹ NC DENR DWM (2010), "Landfill Gas Monitoring Guidance", NC DENR DWM Solid Waste Section, November 2010.

1.3.3 North Carolina Department of Environmental Quality

North Carolina DEQ - Raleigh Central Office (RCO)
217 W Jones Street
Raleigh, North Carolina 27603
Phone: (919) 707-8200

Contact: Mr. Perry Sugg
perry.sugg@ncdenr.gov

1.4 Existing Site Conditions

The Avery County C&D Landfill facility (Permit 06-03), located at 2175 Brushy Creek Rd, Ingalls, NC was in operation from 1996 to 2008. The Facility is located approximately 1.8 miles northeast of the intersection of Highway 19 East and Brushy Creek Road or 1.5 miles northeast from the Avery County Airport. There is residential development in the site vicinity (within 2000 feet) and commercial development within two (2) miles. The C&D landfill is approximately 5.4 acres; the site is bounded by forested, undeveloped land to the north and by low density residential development to the south, east and west. The site and monitoring network are shown on **Figure 1**.

1.4.1 Site Geology

The Avery County C&D landfill is located in the Blue Ridge Province of North Carolina, approximately 12 miles from the Brevard Fault zone. Local bedrock is comprised of the Alligator Back formation which is a finely laminated gneiss. Micaceous conglomerate, schist and phyllite are also found within this formation. Amphibolite was noted in central to northern portions of the site. The site has been investigated with a total of 16 monitoring wells and piezometers that range in depth from approximately 20 feet below grade to 88 feet below grade. Bedrock at the site was encountered at depths that ranged from 31 feet below grade to 88 feet below grade.

Unconsolidated sediments at the site consist of variably micaceous clayey silt to silty sand weathered from the underlying bedrock. The unconsolidated sediments are grouped into two lithological units. Unit 1A consists of sediments exhibiting a standard penetration test of less than 100 blows per foot, while Unit 1B consists of sediments exhibiting a standard penetration test of greater than 100 blows per foot.

1.4.2 Local Groundwater Regime

Groundwater flows from north to south toward the discharge points on-site streams and Brushy Creek (located across Brushy Creek Road). Depth to

groundwater ranges from approximately 2865 feet amsl² to approximately 3020 feet amsl; with an average gradient of 0.12 ft/ft and an average groundwater velocity of 1.57 ft/day. Lithological Unit 1A has an average hydraulic conductivity of 1.40 ft/day, while Unit 1B has an average hydraulic conductivity of 2.05 ft/day. The bedrock aquifer (Unit 2) has an average hydraulic conductivity of 4.65 ft/day.

² amsl = above mean sea level

2.0 MONITORING PROGRAM

The landfill gas monitoring plan contained herein includes landfill gas monitoring wells to monitor for subsurface landfill gas migration as well as landfill gas monitoring in on-site structures.

2.1 Perimeter Monitoring Wells

The monitoring wells and structures are shown on **Figure 1**.

2.1.1 Existing Network

The perimeter LFG monitoring system is designed to intercept potential migrating LFG. The existing LFG monitoring network for the Avery County C&D Landfill includes four wells (GP-1, GP-2, GP-3 and GP-4).

GP-1 is located south of the C&D Phase 2 unit, near CDMW-1A. GP-2 is positioned inside the property line at the southeastern corner of the C&D landfill. GP-3 is located approximately north of Sediment Basin 3 on the eastern side of the C&D Phase 2 unit. GP-4 is located on the eastern side of the C&D landfill near the junction of Phase 2 and 3. Streams and wetland, natural barriers to LFG migration, are preset along the western side of the C&D as well as at the property line north of the C&D unit. Landfill gas monitoring locations are shown on **Figure 1**.

Landfill gas monitoring points are focused along the eastern property line where natural barriers are less prevalent to possible migration pathways. Available well logs are provided in **Appendix A**. The landfill gas monitoring network includes the wells summarized below:

LFG Monitoring Location	Screened Interval (ft bgs)	Total Depth (ft bgs)
GP-1	4-12	12
GP-2	5-9	9
GP-3	5-20	20
GP-4	5-20	20

2.1.2 LFG Monitoring Well Construction

The LFG monitoring wells were installed above groundwater in accordance with 15A NCAC 2C by Mad Dawg Drilling, Inc. in October 2009. Wells were advanced using hollow stem auger (has) drilling technology and constructed of two-inch diameter, manufactured PVC well screens with 10-slot per inch intake spacing and solid PVC riser pipe. A sand filter pack was placed around the screened interval, to a height of one to three feet above the screen and a hydrated bentonite plug of two to five feet in thickness was positioned above the sand pack

to seal each well. A protective anodized aluminum casing and a cement pad for surface protection were also installed. Quick-connect fittings or stop-cock valves were installed in the cap as a monitoring port in accordance with SWS guidance.

2.2 Monitoring of Facility Structures

Occupied structures on the property will be monitored quarterly. The following facility structures will be monitored:

- Scalehouse

If desired, a dedicated methane monitor may be installed within one or more of these structures. Otherwise, monitoring will be conducted quarterly with the landfill gas monitoring wells.

2.3 Monitoring and Reporting

Monitoring and reporting of LFG concentrations will be performed as outlined below.

2.3.1 Frequency

Routine LFG monitoring will be conducted on a quarterly basis.

2.3.2 Personnel

LFG monitoring will be performed by personnel who are familiar with the requirements of this plan and who are trained in LFG hazards and explosive gas meter use. As practical, a designated technician will be assigned to regular LFG monitoring duty.

2.3.3 Equipment

A portable gas analyzer will be used to monitor LFG probes. This analyzer, which is calibrated to methane (CH₄), operates using the infrared spectral property of methane to measure concentrations in air. Measurements of oxygen (O₂) and carbon dioxide (CO₂) will also be made with this meter. This meter may be used in oxygen deficient areas (less than 10% O₂) since oxygen is not required for a chemical combustion of flammable gases within the meter.

On the day of monitoring, prior to monitoring activities, this meter will be field calibrated. Additionally, all monitoring equipment should be regularly calibrated in accordance with manufacturer's specifications and operated only as instructed.

2.3.4 Procedures

Prior to each monitoring event, the portable gas analyzer will be calibrated with a known calibration standard in accordance with manufacturer's recommendations. General information related to the monitoring event, equipment used, calibration procedures, weather conditions, and results for each monitoring event will be recorded on the landfill gas monitoring data form (**Appendix B**).

The following steps outline the procedure for the monitoring of LFG wells and facility structures:

- Check calibration date on the meter and calibrate according to manufacturer's instructions; allowing equipment to warm up properly prior to use, per manufacturer's direction.
- Purge sample tube for one minute before monitoring.

LFG Monitoring Wells:

- Connect instrument tubing to sample port on the monitoring well without removing the cap.
- Open the valve and record both the initial and stabilized methane concentrations. A stabilized concentration will not vary more than 0.5 percent by volume on the instrument's scale. Also record the oxygen concentration (at two percent per volume or less to indicate air is not being drawn into the system and providing false readings) and the carbon dioxide concentration.
- Close the valve and disconnect the tubing.
- Record monitoring data on the LFG monitoring data form provided in **Appendix B**.
- If any methane concentration is **greater than 50% of the LEL (2.5% CH₄)**, monitoring personnel should implement the Precautionary Action Plan (Section 2.3.5).
- If both initial and stabilized methane concentrations are less than 50% of the LEL (2.5% CH₄), move to next LFG monitoring well.

Structures:

- Walk through the facility structure with a portable methane analyzer and monitor the perimeter wall interface of the structure, the floor to wall interface in hallways and rooms, and any floor penetrations in the structure. Record the initial and stabilized methane concentrations, oxygen concentration, and carbon dioxide concentration.
- Record monitoring data on the LFG monitoring data form provided in **Appendix B**.
- Notify the Landfill Manager, Operations Manager and the Engineer for any methane concentration greater than 0% of the LEL.

IF A STABILIZED METHANE CONCENTRATION IS GREATER THAN 100% OF THE LEL IN A LFG MONITORING WELL OR GREATER THAN 25% OF THE LEL IN A FACILITY STRUCTURE, THE FOLLOWING ACTIONS WILL BE IMPLEMENTED:

- 1) Recalibrate monitoring equipment and confirm results.
- 2) If results are confirmed, **IMMEDIATELY** contact the Landfill Manager and the Engineer.
- 3) Implement the Action Plan located in **Section 3.1**.

A flowchart of potential actions if exceedances are noted, is included as **Figure 2**.

2.3.5 Precautionary Action Plan

If an initial or stabilized methane concentration is equal to or greater than 50% of the LEL in a LFG monitoring well, monitoring personnel should perform the following additional steps at this location:

- Measure gas pressure in the well head (in inches of water) using magnehelic gauge or other appropriate metering device.
- Record at least one additional methane concentration measurement, inside the well just below the top of casing.
- Evaluate the surrounding area for potential receptors to or signs of LFG migration. LFG can stress vegetation and can kill trees and grass by root asphyxiation. Note stressed/dead vegetation areas on the monitoring form.
- Notify the Landfill Manager and the Engineer for further evaluation.

2.3.6 Record Keeping

Routine LFG monitoring events will be documented on the LFG monitoring data form provided in **Appendix B**. Completed forms will be placed in the landfill operating record. These forms will be available for review by DWM personnel on request.

Documentation of any contingency plan actions (**Section 3.0**) will also be kept in the operating record.

2.4 Maintenance

Periodic maintenance and site observations will be conducted routinely to address monitoring program components (at a minimum):

- Maintain access to LFG monitoring locations.

- Perform LFG monitoring well maintenance (maintain well locks, steel casing, concrete pad, etc.).
- Observe landfill cover conditions, areas of dead vegetation, leachate seeps, odors, etc. as indications of potential LFG-related problems.

Note deficiencies on the monitoring forms and report to the Solid Waste Operations Manager for repair or replacement as necessary.

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3.0 CONTINGENCY PLAN

If a stabilized methane concentration is **greater than 100% of the LEL in a LFG monitoring well or greater than 25% of the LEL in a facility structure**, the technician will perform the actions in the immediate action plan and prepare a remediation plan as described below.

3.1 Immediate Action Plan

The Solid Waste Operations Manager will perform the following actions for the protection of human health and safety:

- 1) Evacuate affected facility structures and the immediate surrounding area.
- 2) Determine nearby potential receptors (facility and off-site structures).
- 3) Perform monitoring in any other facility structure near the monitoring location having the high concentration.
- 4) Contact the County Fire Department (911). Coordinate evaluation of potentially affected off-site structures with the Fire Department.
- 5) Verbally notify the Landfill Manager.
- 6) Verbally notify the NCDEQ DWM (**Section 1.1**) as soon as practical.
- 7) Investigate and identify the potential source(s) and conduit(s) for LFG migration that may have caused the high concentration (i.e. the migration path that the LFG may be following to the monitoring location).
- 8) Identify the LFG extent using bar hole punch sampling methodology or other applicable alternative method as practical.
- 9) As appropriate, begin corrective action to control methane concentrations in structures surrounding the landfill site.

3.1.1 Reporting and Documentation

Within seven days of the detection of a high methane concentration, the Facility will prepare and submit an Environmental Monitoring Reporting Form (**Appendix B**) with the results of the monitoring event to the DWM. The facility will place a description of the actions performed to protect human health in the operating record.

3.2 Remediation Plan

Within sixty days of the detection of a high methane concentration, a remediation plan describing the problem nature, extent, and proposed remedy will be submitted to NCDEQ for approval. Following approval the plan will be implemented and a copy will be placed in the operating record. The DWM will also be notified the plan has been implemented.

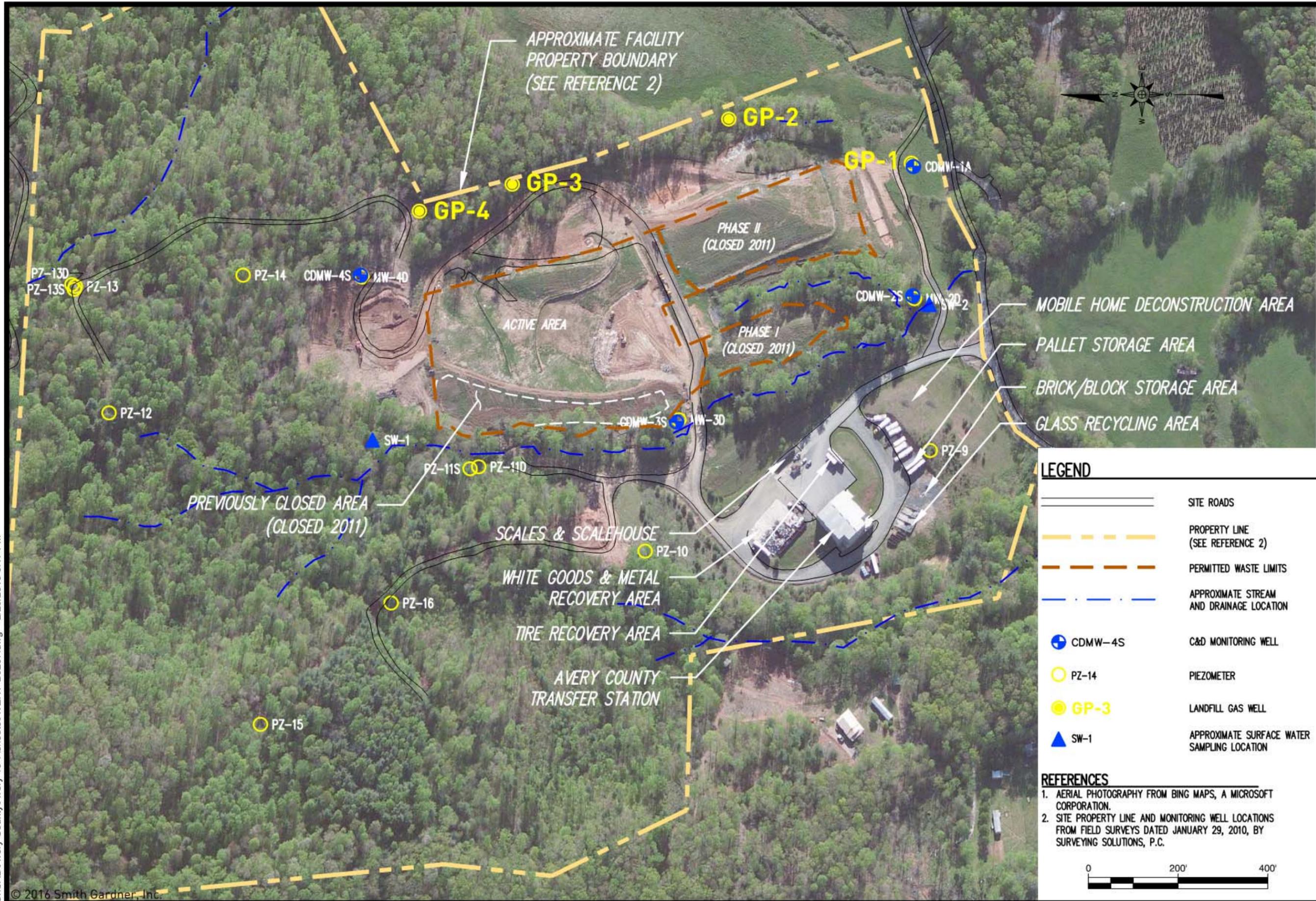
An extension may be granted by the DWM on written request and depending on severity of the situation.

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Figures

**Landfill Gas Monitoring Plan
Avery County Solid Waste Facility
Ingalls, North Carolina**

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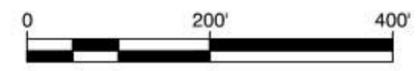


LEGEND

- SITE ROADS
- PROPERTY LINE (SEE REFERENCE 2)
- PERMITTED WASTE LIMITS
- APPROXIMATE STREAM AND DRAINAGE LOCATION
- CDMW-4S C&D MONITORING WELL
- PZ-14 PIEZOMETER
- GP-3 LANDFILL GAS WELL
- SW-1 APPROXIMATE SURFACE WATER SAMPLING LOCATION

REFERENCES

1. AERIAL PHOTOGRAPHY FROM BING MAPS, A MICROSOFT CORPORATION.
2. SITE PROPERTY LINE AND MONITORING WELL LOCATIONS FROM FIELD SURVEYS DATED JANUARY 29, 2010, BY SURVEYING SOLUTIONS, P.C.



PREPARED BY: **SMITH+GARDNER**
 NC LIC. NO. C-083 (ENGINEERING)
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.826.0577

APPROVED:	C.T.S.	FIGURE NO.:	1
DRAWN:	J.A.L.	SCALE:	AS SHOWN
DATE:	Feb 2016	PROJECT NO.:	AVERY 15-7
PREPARED FOR:	AVERY COUNTY CGD LANDFILL LANDFILL GAS MONITORING LOCATION MAP		
		FILENAME:	AVERY-B0257

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MONITORING FREQUENCY IS QUARTERLY

METHANE CONCENTRATION MUST NOT EXCEED:
 1. 25% OF THE LEL IN FACILITY STRUCTURES; AND
 2. 100% OF THE LEL AT THE FACILITY PROPERTY BOUNDARY.

IF METHANE CONCENTRATION EXCEEDS EITHER OF THE ABOVE, THE OWNER MUST:

RECALIBRATE METER AND CONFIRM READINGS
 (SEE SECTION 2.3.4 OF LFG MANAGEMENT PLAN)

IF CONFIRMED READINGS EXCEED LIMITS,
 (SEE SECTION 3.0 OF THE LFG MANAGEMENT PLAN) AND:

1. IMMEDIATELY:
 TAKE STEPS TO ENSURE PROTECTION OF HUMAN HEALTH AND SAFETY

2. WITHIN 7 DAYS:
 PLACE THE METHANE READINGS AND STEPS TAKEN TO PROTECT HUMAN HEALTH IN THE OPERATING RECORD

3. WITHIN 60 DAYS:
 PREPARE A REMEDIATION PLAN. SUBMIT PLAN TO NCDENR FOR APPROVAL. UPON APPROVAL, IMPLEMENT PLAN.

SMITH+GARDNER ENGINEERS NOTIFY THE ENGINEER AND DIVISION WITHIN 24 HOURS 

PLACE A COPY OF THE REMEDIATION PLAN IN THE OPERATING RECORD, AND

EVALUATE THE NEED FOR ADDITIONAL MONITORING

NOTIFY THE DIVISION THAT THE PLAN HAS BEEN IMPLEMENTED

PREPARED FOR:
FLOWCHART OF METHANE MONITORING REQUIREMENTS
AVERY COUNTY C&D LANDFILL

PREPARED BY: _____ NC LIC. NO. C-0828 [ENGINEERING]
SMITH+GARDNER
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DRAWN: J.A.L.	APPROVED: J.A.S.	SCALE: N.T.S.	DATE: Jan 2016	PROJECT NO.: AVERY 15-7	FIGURE NO.: 2	FILE NAME: AVERY-A0249
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Appendix A

Well Logs

**Landfill Gas Monitoring Plan
Avery County Solid Waste Facility
Ingalls, North Carolina**

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FIELD BOREHOLE LOG

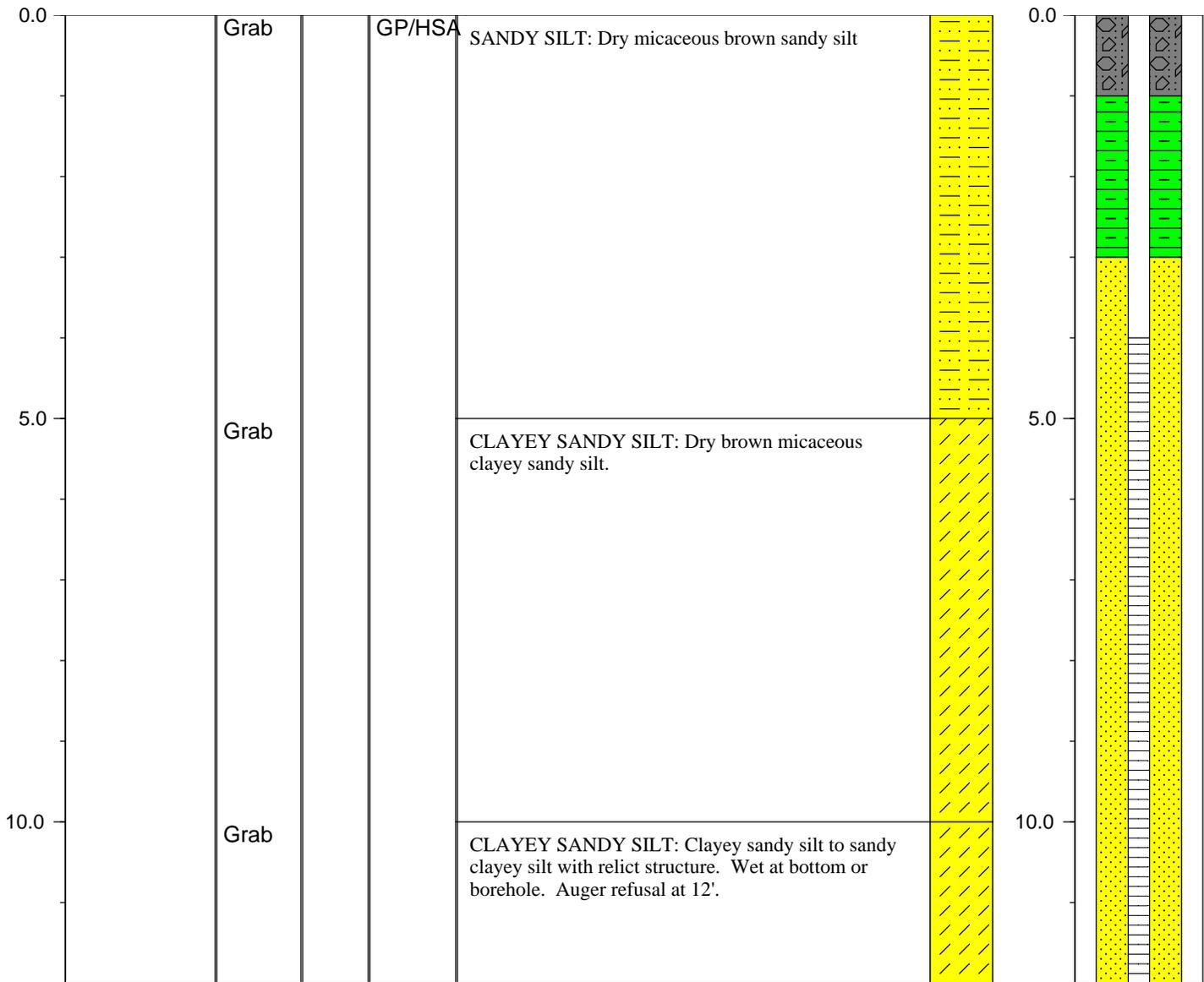
BOREHOLE NUMBER **GP-1** Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **10/26/09** COMPLETED: **10/26/09**

TOTAL DEPTH: **12**
 TOP OF CASING ELEV.: GROUND ELEV.:
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)	--	--
Time	--	--
Date	--	--

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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Richardson Smith Gardner & Assoc
 14 North Boylan Avenue, Raleigh NC 27603
 (919) 828-0577

FIELD BOREHOLE LOG

BOREHOLE NUMBER **GP-2**

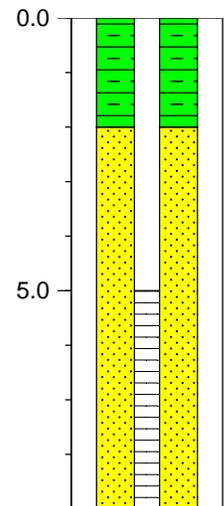
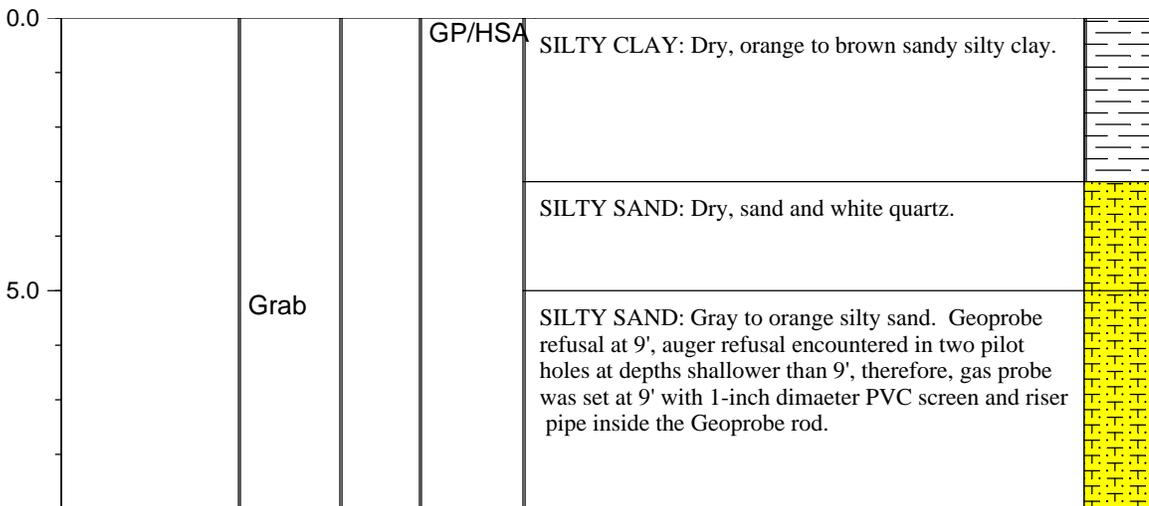
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **10/29/09** COMPLETED: **10/29/09**

TOTAL DEPTH: **9**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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FIELD BOREHOLE LOG

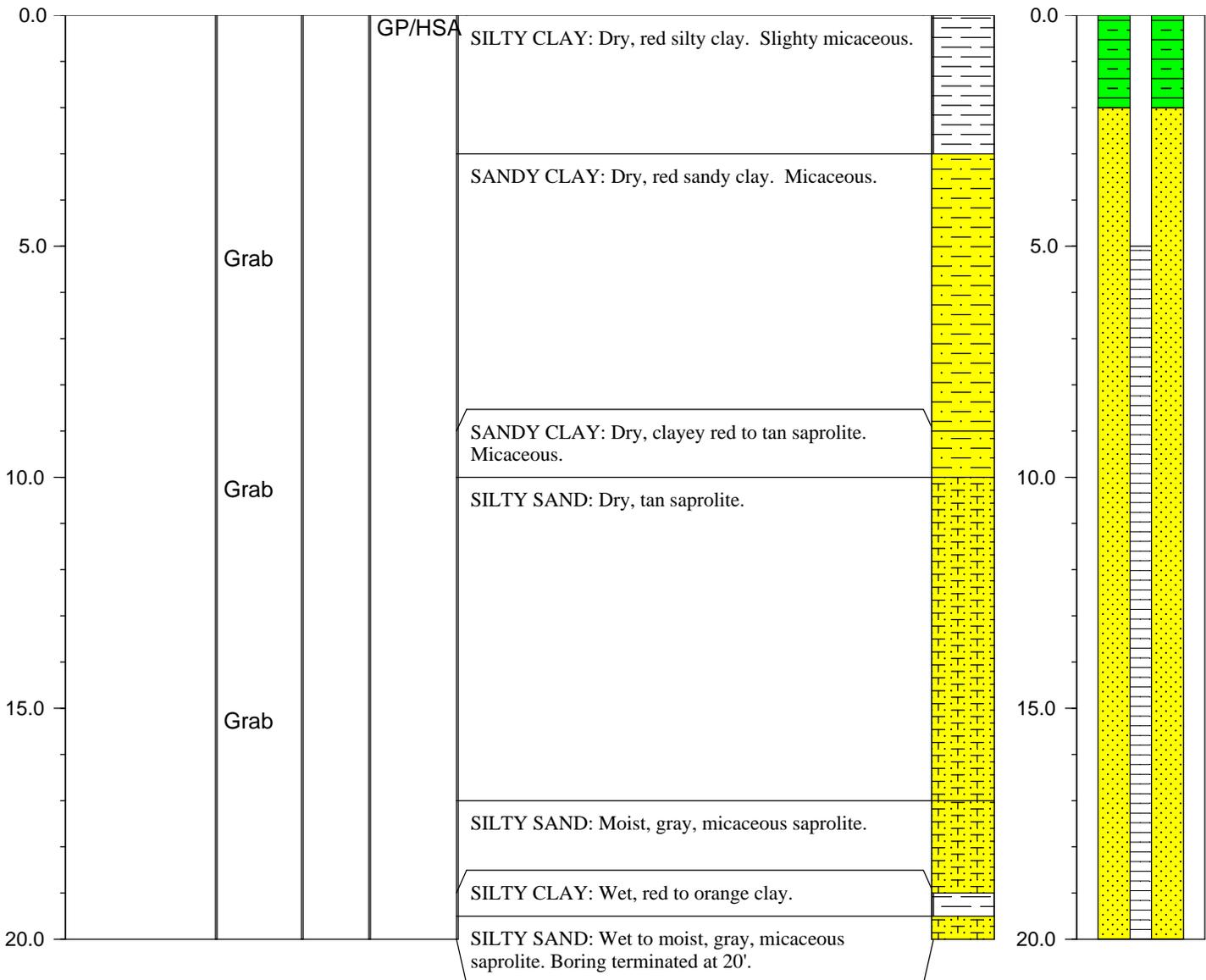
BOREHOLE NUMBER **GP-3** Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **10/26/09** COMPLETED: **10/26/09**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: GROUND ELEV.:
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)	--	--
Time	--	--
Date	--	--

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
---------------	----------------------	-----------------	--------------------	--------------	-------------	-----------	---------------	----------------------



FIELD BOREHOLE LOG

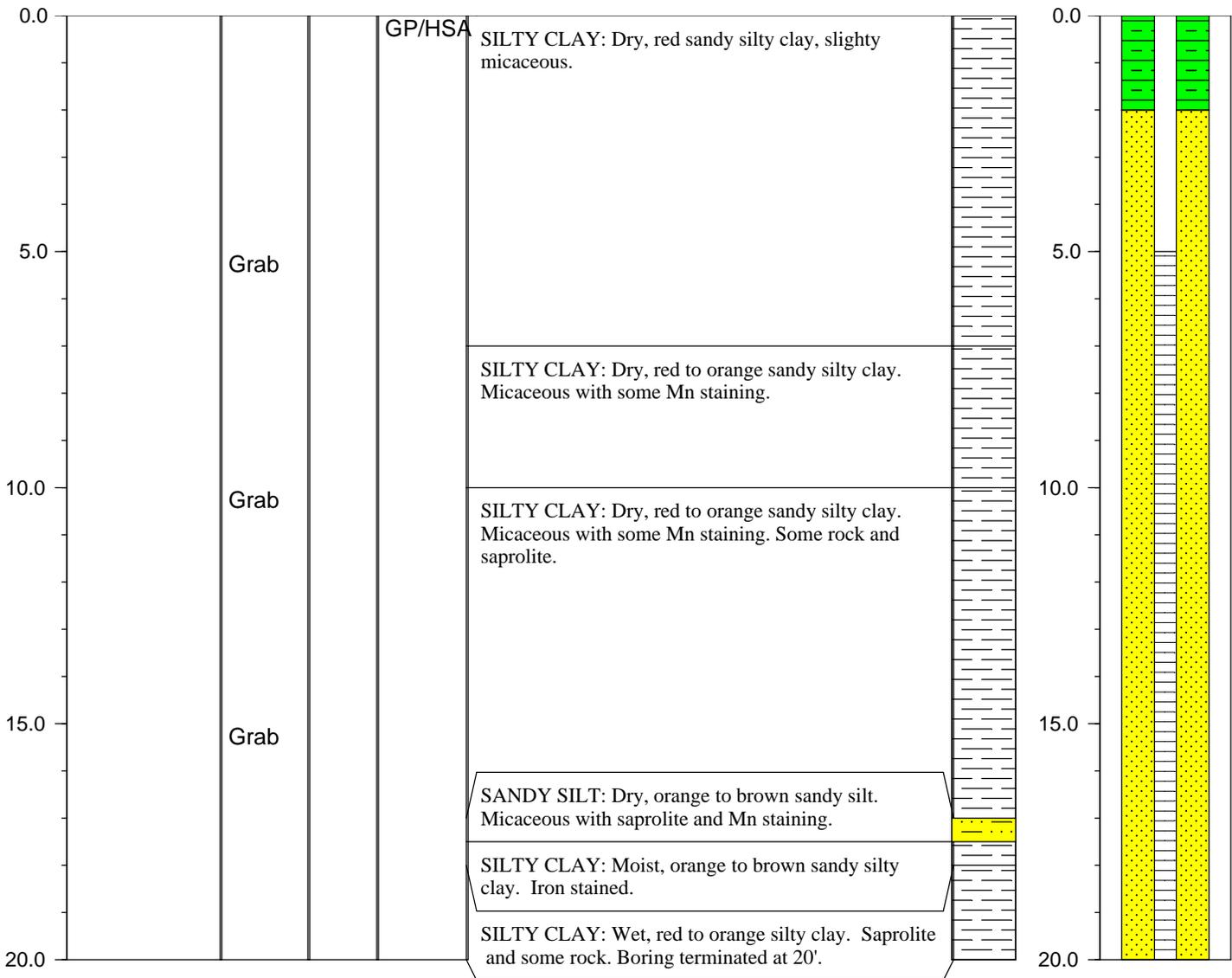
BOREHOLE NUMBER **GP-4** Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**
 LOCATION: **Ingalls, NC**
 DRILLING CO: **Mad Dawg Drilling Inc**
 DRILLING METHOD: **Geoprobe/HSA**
 FIELD PARTY: **Tom Whitehead**
 GEOLOGIST: **Don Misenheimer**
 DATE BEGUN: **10/29/09** COMPLETED: **10/29/09**

TOTAL DEPTH: **20**
 TOP OF CASING ELEV.: **GROUND ELEV.:**
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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Appendix B

Reporting Forms

**Landfill Gas Monitoring Plan
Avery County Solid Waste Facility
Ingalls, North Carolina**

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DENR USE ONLY:

Paper Report Electronic Data - Email CD (data loaded: Yes / No)

Doc/Event #:

NC DENR

Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i)).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: _____ Phone: _____

E-mail: _____

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)

Environmental Status: (Check all that apply)

- Initial/Background Monitoring
 Detection Monitoring
 Assessment Monitoring
 Corrective Action

Type of data submitted: (Check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Groundwater monitoring data from monitoring wells
<input type="checkbox"/> Groundwater monitoring data from private water supply wells
<input type="checkbox"/> Leachate monitoring data
<input type="checkbox"/> Surface water monitoring data | <input type="checkbox"/> Methane gas monitoring data
<input type="checkbox"/> Corrective action data (specify) _____
<input type="checkbox"/> Other(specify) _____ |
|---|--|

Notification attached?

- No. No groundwater or surface water standards were exceeded.
 Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
 Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Facility Representative Name (Print) _____ Title _____ (Area Code) Telephone Number _____
 Affix NC Licensed/ Professional Geologist Seal

Signature _____ Date _____

Facility Representative Address _____

NC PE Firm License Number (if applicable effective May 1, 2009)

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Attachment E

Financial Assurance

**Permit Renewal Application
Avery County Solid Waste Facility
Ingalls, North Carolina**

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14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DATE: March 10, 2016
BY: SAS

**Avery County Solid Waste Facility (NC SW Permit No. 06-03)
Engineer's Financial Assurance Summary**

Item No.	Item Description	Estimate
1.0	Landfill Closure Estimate	\$ 269,375
2.0	Transfer Station Closure Estimate	\$ 127,380
3.0	Landfill Post Closure Estimate	\$ 607,722
4.0	Total Financial Assurance Estimate	\$ 1,004,477

Notes:

1. Costs are presented in current dollars and should be increased at an inflation rate prescribed by the NCDEQ Division of Waste Management per <http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/financial-assurance-for-solid-waste-management-facilities> if additional review is not performed annually.
2. This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor. The ESTIMATE is intended to be accurate to within +/- 10% of the Total Estimated Cost.

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14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DATE:
BY:

**Avery County C&D Landfill
Engineer's Post Closure Estimate**

Item	Quantity or Cost	Unit	Comments
A. Groundwater Monitoring			
Monitoring wells	4	wells	Reference 1
Surface water point	2	points	Reference 1
Sampling frequency	2	events	Reference 1
Field sampling, collection, and shipping.	\$ 800	per event	S+G estimate
Laboratory Analysis	\$ 325	per well	S+G estimate
Data review, statistics, and reporting	\$ 2,000	per event	S+G estimate
Maintenance and repair	\$ 1,000	per well	S+G historical estimate
Subtotal Cost	\$ 11,900	per year	
B. Landfill Gas Management			
Control System Vents	7	vents	Per Ref. 1 (pro-rated @ one (1) per acre)
Sub-Surface Perimeter Monitoring Probes	4	probes	Per Ref. 1
Control system monitoring, maintenance and repair	\$ 50	per vent per year	S+G estimate
Semi-Annual Perimeter Monitoring	\$ 50	per probe per year	S+G estimate
Subtotal Cost	\$ 550	per year	Averaged over post-closure period
C. Final Cover Management			
Area of maintenance	7	acres	Extends to area immediately around landfill.
Mowing	\$ 100	per acre	Site historical estimate
Erosion and sediment control maintenance	\$ 200	per acre	Site historical estimate
Topdressing (seed & fertilizer)	\$ 150	per acre	Site historical estimate
Vector and rodent control	\$ 10	per acre	Site historical estimate
Maintenance Mobilization	\$ 1,000	per year	Site historical estimate
Subtotal Cost	\$ 4,307	per year	
D. Administration, Inspections, and Reporting			
Administration and record keeping	\$ 1,000	per year	Site historical estimate
Inspection	\$ 1,000	per year	Site historical estimate
Miscellaneous engineering	\$ 1,500	per year	Site historical estimate
Subtotal Cost	\$ 3,500	per year	
E. Subtotal Post-Closure Costs			
Number of Years for Post-Closure	30	years (see Note 1)	
Estimated Average Annual Costs	\$ 20,257	per year	
Cost per Acre	\$ 2,817.44	per year	
Subtotal Post Closure Costs	\$ 607,722	(See Note 2)	
Subtotal Post Closure Costs	\$ 607,722	(See Note 2)	

Notes:

- Costs are presented in current dollars and should be increased at the inflation rate prescribed by the NCDEQ Division of Waste Management website at <http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/financial-assurance-for-solid-waste-management-facilities> if additional review is not performed annually.
- This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor. The estimate is intended to be accurate to within +/- 10% of the Total Estimated Cost.

References:

- Avery County Construction and Demolition Landfill Phase III Permit to Construct Application by Richardson Smith Gardner & Associates, Inc. dated February 2009 with revisions through August 2009.

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14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DATE: March 10, 2016
BY: SAS

**Avery County C&D Landfill
Engineer's Closure Construction Cost Estimate**

Item No.	Item Description	Unit	Contractor			Comments
			Quantity	Unit Price	Total Price	
Closure Area (Horizontal Plan) ---->		AC	3.75			
1.0	Pre-Construction		Pre-Construction Subtotal:		\$ 13,875	
1.1	Construction Documents & Bidding	AC	3.75	\$12k + \$500/AC	\$ 13,875	S+G Estimate
2.0	Construction		Construction Subtotal:		\$ 223,875	References 1 & 2
2.1	Surveys and Layout	AC	3.75	\$ 7,500	\$ 7,500	Based on Closure Event No. 2 Bids (2013) & S+G
2.2	Mobilization	AC	3.75	\$ 2,500	\$ 9,375	Based on Closure Event No. 2 Bids (2013) & S+G
2.3	Site Preparation (repairs to intermediate cover layer)	AC	3.75	\$ 5,000	\$ 18,750	Based on Closure Event No. 2 Bids (2013) & S+G
2.4	18" On-site Low Permeability Soil	CY	9,075	\$ 9	\$ 81,675	Based on Closure Event No. 2 Bids (2013) & S+G
2.5	18" Vegetative Support Layer	CY	9,075	\$ 6	\$ 54,450	Based on Closure Event No. 2 Bids (2013) & S+G
2.6	Landfill Gas Venting System	AC	3.75	\$ 2,400	\$ 9,000	Based on Closure Event No. 2 Bids (2013) & S+G
2.7	Cap Drainage Structures (berms, piping, etc.)	AC	3.75	\$ 7,500	\$ 28,125	Based on Closure Event No. 2 Bids (2013) & S+G
2.8	Erosion & Sediment Control (grading, silt fence, maintenance, etc.)	AC	3.75	\$ 2,000	\$ 7,500	Based on Closure Event No. 2 Bids (2013) & S+G
2.9	Revegetation	AC	3.75	\$ 2,000	\$ 7,500	Based on Closure Event No. 2 Bids (2013) & S+G
3.0	Quality Assurance, Certification, & Deed Notation		CQA Subtotal:		\$ 26,938	
3.1	Field Monitoring	AC	3.75	\$ 3,000	\$ 11,250	S+G Estimate
3.2	Laboratory Testing	AC	3.75	\$ 2,500	\$ 9,375	S+G Estimate
3.3	Surveying and Deed Notation	AC	3.75	\$ 100	\$ 375	S+G Estimate
3.4	Engineering Certification	AC	3.75	\$5k + \$250/AC	\$ 5,938	S+G Estimate
4.0	Miscellaneous Costs to Close		Misc. Costs Subtotal:		\$ 4,688	
4.1	Erosion and Stormwater Control (outside landfill footprint)	AC	3.75	\$ 1,000	\$ 3,750	S+G Estimate
4.2	Engineering and Reporting	AC	3.75	\$ 250	\$ 938	S+G Estimate
5.0	Total Closure Costs					
		Construction Estimate ---->			\$ 269,375	
		Cost per Acre ---->			\$ 71,833	
		Total Estimate ---->			\$ 269,375	(2014\$) (See Note 1)

Notes:

- Costs are presented in current dollars and should be increased at an inflation rate prescribed by the NCDEQ Division of Waste Management per <http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/financial-assurance-for-solid-waste-management-facilities> if additional review is not performed annually.
- This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor. The ESTIMATE is intended to be accurate to within +/- 10% of the Total Estimated Cost.

References:

- Avery County Construction and Demolition Landfill Phase III Permit to Construct Application by Richardson Smith Gardner & Associates, Inc. dated February 2009 with revisions through August 2009.
- Correspondence dated March 17, 2010 regarding approval of the site suitability including lateral expansion of Phase 2 following purchase of the Lechler parcel to Mr. Buddy Norris, Avery County from Mr. Zinith Barbee, NCDENR.



14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DATE: 10-Mar-16
BY: SAS

**Financial Assurance
Avery County Transfer Station
Engineer's Remedial Cost Estimate**

Item No.	Item Description	Unit	Contractor			Comments
			Quantity	Unit Price	Total Price	
Facility Area (Horizontal Plan) ---->			AC	5		
1.0	Pre-Remedial Response			Subtotal	\$2,500.00	
1.1	Coordination, Contracts, and Management	AC	5	\$500.00	\$2,500.00	
2.0	Remedial Response Activities				\$110,300.00	Ref. 1
2.1	Surveys and Layout	AC	5	\$500.00	\$2,500.00	S+G Estimate
2.2	Mobilization, Demobilization, and Project Closeout	AC	5	\$500.00	\$2,500.00	S+G Estimate
2.3	Wash Down & Cleanup of the Transfer Station	DY	2	\$1,500.00	\$3,000.00	Assume single work crew per day.
2.4	Fencing & Concrete Barrier Protection	LS	1	\$5,000.00	\$5,000.00	Assume close transfer station and place concrete barriers across access road.
2.5	Excess Waste Disposal (MSW)	TN	100	\$60.00	\$6,000.00	Two (2) days. Hauling and loading included. Disposal locations: Bristol City, VA; or Foothills landfills (~\$40/Ton)
	Excess Hazardous Materials Disposal	DRUM	2	\$1,500.00	\$3,000.00	Assumes cost of waste characterization, sampling, removal, treatment or disposal.
2.6	Excess Recycling & Processing Material	CY	2,450	\$30.00	\$73,500.00	Assume cost of loading, transportation, and disposal.
2.7	Leachate Disposal	GAL	3,000	\$0.10	\$300.00	Assume cost of loading and Transport.
2.8	Erosion & Sediment Control (grading, silt fence, maintenance, etc.)	AC	5	\$500.00	\$2,500.00	S+G Estimate
2.9	Revegetation	AC	8	\$1,500.00	\$12,000.00	S+G Estimate
2.10	Fuel Storage Removal	GAL	2,000.0	\$0.00	\$0.00	Usable product to be sold.
3.0	Quality Assurance, Certification, & Deed Notation				\$3,000.00	
3.1	Engineering and Reporting	LS	1	\$2,500.00	\$2,500.00	S+G Estimate
3.2	Surveying and Deed Notation	LS	1	\$500.00	\$500.00	S+G Estimate
Remedial Response Estimate ---->					\$115,800	
10% Contingency ---->					\$11,580	
Total Estimate ---->					\$127,380	(2014\$) (See Note 1)

Notes:

- Costs are presented in current dollars and should be increased at an inflation rate prescribed by the NCDEQ Division of Waste Management per <http://deq.nc.gov/about/divisions/waste-management/solid-waste-section/financial-assurance-for-solid-waste-management-facilities> if additional review is not performed annually.
- This ESTIMATE has been prepared for financial assurance purposes only and shall not be considered a replacement for an actual bid from a licensed contractor and is considered acceptable within a +/- 10% of the Total Estimate value.

References:

- Avery County Waste Disposal and Recycling Permit Application by Richardson Smith Gardner & Associates, Inc dated January 2011.

Denotes values calculated in spreadsheet.

Attachment F

Drawings

**Permit Renewal Application
Avery County Solid Waste Facility
Ingalls, North Carolina**

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