

E²S

ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY

3008 ANDERSON DRIVE, SUITE 102

RALEIGH, NC 27609

(919) 781-7798

Scanned by	Date	Doc ID #
<i>Zinith Barbee</i>	7/16/10	11163

LETTER OF TRANSMITTAL

Date: June 29, 2010

To: Mr. Zinith Barbee
Hydrogeologist
Solid Waste Section

From: Pat Shillington
E²S

Subject: Renewal Permit Supplement
Hoke County LCID Landfill
LCID Permit No. 47-A



Submitted are five (5) copies of Sheets 4, 5 and 6 which reflect the boundaries of the areas of disposal for the next five years; the specified volume, acreage, tonnage and side slopes of the stockpiled area; and the specified time the material will be stock piled.

Also, submitted are (5) copies of the Operations Plan that reflects the disposal of dead animals.

Barbee, Zinith

From: Barbee, Zinith
Sent: Friday, July 16, 2010 3:45 PM
To: 'e2s@bellsouth.net'
Cc: 'Don Russell'; Hammonds, Andrew
Subject: Electronic Copy of Revised Application

Thank you for the prompt response to the Solid Waste Section (SWS) request (Doc ID 11110) regarding the LCID 47-A.

This afternoon the SWS received hard copies of the information listed in the Letter of Transmittal dated June 29, 2010 (Doc ID 11163). Please submit an electronic record of that information. In its initial letter (Doc ID 9262), the SWS requested "a pdf-formatted copy of the information combined on a disc." The electronic record will be entered into the SWS database and be more accessible.

Thank you for your attention and cooperation. If you have any questions, please contact me.

Zinith Barbee
Hydrogeologist
Solid Waste Section
Division of Waste Management

1646 Mail Service Center
Raleigh, NC 27699-1646
tel: 919.508.8401 fax: 919.733.4810

E-mail correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties.

Page Break

Fac/Perm/Co ID #	Date	Doc ID#
47-A	7/21/10	

Carmen Johnson



ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY

3008 ANDERSON DRIVE, SUITE 102

RALEIGH, NC 27609

(919) 781-7798

Permit Application Renewal

For

Hoke County LCID Landfill

Permit No. 47A-LCID-1996

SR-1302 Raeford, NC

Fac/Permit Co # 47-A	DATE 7/21/10	Doc ID#	DIN
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Carmen Johnson

Owner

Hoke County

Solid Waste Office

P.O. Box 179

Raeford, NC 28376



April 5, 2010

Revised June 29, 2010

Engineering & Environmental Science Company (E²S)

3008 Anderson Drive, Suite 102

Raleigh, NC 27609

Office (919) 781 - 7798

Fax (919) 781 - 7796

Applicant Signature Page

Name of facility: HOKE COUNTY TRANSFER STATION

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.

[Handwritten Signature]

Signature

Don Russell

Print Name

4/15/10
Date

Solid Waste Director
Title

HOKE County
Business or organization name

4/15/10
Date

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LIST OF ATTACHMENTS

- Attachment A: Local Government Approval
- Attachment B: Deed Description
- Attachment C: Erosion Control Approval Letter and Evaluation
- Attachment D: Hydrogeologic Study

Drawings (D-Sheets-24X36)

- Sheet 1: Hoke County NCDOT Map
- Sheet 2: Facility Site Setting
- Sheet 3: Existing Conditions
- Sheet 4: Final Layout
- Sheet 5: Cross-Section A-A'
- Sheet 6: Cross-Section B-B'
- Sheet 7: Cross-Sections C-C' and D-D'

1.0 Introduction

The existing LCID Landfill (Permit No. 47A-LCID-1996) is located on a 20 acre tract of land that is adjacent to the closed Solid Waste Landfill. A transfer station and several office and maintenance builds are on this parcel of land where the closed Solid Waste Landfill is located. Attachment A provides the local government (Hoke County) approval letter and Attachment B contains the deed description.

The LCID Landfill was originally permitted in 1994 and operated by the City of Raeford. Responsibility for the LCID Landfill operations was subsequently transferred to Hoke. Initial permitting of this site was for a Construction Demolition Debris Landfill but was subsequently changed to a LCID Landfill during the permitting process.

Presently, the foot print of the LCID Landfill is about 1.2 Acres. Proposed maximum extent of the landfill is 4.3 Acres.

In addition to the LCID Landfill, a wood and yard/landscape waste grind operation that will occupy about 1.5 acres of the site is proposed. The finished product will be sold as decorative landscaping material and for a renewable energy source. Specific potential sales volume has not been determined at this time. Excess produced material can always be deposited into the LCID Landfill.

2.0 Anticipated Lifetime of Project

The anticipated lifetime of the LCID Landfill is anticipated to last to 2025. The remaining capacity of the landfill is approximately 50,025 cubic yards. The following provides calculations for the life of the LCID landfill:

Total LCID Capacity Remaining:	50,215 yd ³
Projected Average Annual Weight:	700 tons/year
*Projected Average Annual Volume:	$700 \text{ tons/year} \times 2,000 \text{ lbs/ton} \div 600 \text{ lbs/yd}^3$ $= 2,333 \text{ yd}^3 / \text{year}$
**Annual Volume Consumed by Monthly Soil Cover & Final Cover:	892 yd ³
Total Annual Consumed Volume:	$2,333 \text{ yd}^3 + 892 \text{ yd}^3$ $= 3,225 \text{ yd}^3$
Projected Remaining Life of Landfill:	$50,215 \text{ yd}^3 \div 3,225 \text{ yd}^3 / \text{year}$ $= 15.5 \text{ years}$

*600 lbs/yd³ is estimated weight/volume ration for LCID waste

**See earthwork calculations for annual soil volume

3.0 Earthwork Calculations

For one (1) 5 year operation an area of 123 ft by 182 ft will be consumed. An average depth of 10 ft will be excavated. Total soil volume excavated is:

$$123 \text{ ft} \times 182 \text{ ft} \times 10 \text{ ft} \times (1 \text{ yd}^3 / 27 \text{ ft}^3) = 8,291.1 \text{ yd}^3$$

The LCID debris will be covered on a monthly basis with the debris being placed in four individual layers with the plan area of about 31 ft by 45 ft. The last layer will have the 2 ft final cover while the lower 3 layers will have a 1 ft monthly soil cover. The vertical sides of each cell will also have 1 ft monthly soil cover.

Require Final Soil Cover

$$123 \text{ ft} \times 182 \text{ ft} \times 2 \text{ ft} \times (1 \text{ yd}^3 \div 27 \text{ ft}^3) = 1,658.2 \text{ yd}^3$$

Monthly Cover

$$[123 \text{ ft} \times 182 \text{ ft} \times 3 \text{ ft} + 2 \times 123 \text{ ft} \times 4 \text{ ft} \times 1 \text{ ft} + 2 \times 182 \text{ ft} \times 14 \text{ ft} \times 1 \text{ ft}] \times (1 \text{ yd}^3 / 27 \text{ ft}^3) \\ = 2,803.6 \text{ yd}^3$$

Net Excess Soil per 5-year Period

$$8,291.1 \text{ yd}^3 - 1,658.2 \text{ yd}^3 - 2,803.6 \text{ yd}^3 \\ = 3,829.3 \text{ yd}^3$$

Approximate Annual Volume Consumed by Monthly Soil Cover & Final Soil Cover

$$(1,658.2 \text{ yd}^3 + 2,803.6 \text{ yd}^3) \div 5 \text{ years} \\ = 892 \text{ yd}^3 / \text{years}$$

4.0 Erosion Control Evaluation

Erosion control was provided during the original permitting of the landfill (see Land Quality approval letter dated May 31, 1994 in Attachment C).

With the new area of disturbance added for the grinding/stockpile area, the stormwater basin was re-evaluated. Based on this evaluation, the existing basin meets the erosion control requirements of the Land Quality Section. The calculations are provided in Attachment C.

Evaluation was also conducted for stormwater discharge leaving the top of the disposal area. This evaluation indicates suitable low surface water velocities at the 2:1 (H:V) slopes.

5.0 Description of Compliance with Rule 15A NCAC 1313.0564

Attachment D contains the Hydrogeologic Study that was conducted in the 1994 by E²S for the initial permitting of this site.

6.0 Description of Compliance with Rule 15A NCAC 1313.0564

1. The facility is located outside of the 100 year flood plain per the Hoke County Flood Insurance Maps
2. The facility is active with the property vegetated in grass outside of the LCID Landfill area. Facility or practices do not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife.
3. This facility or practices will not cause destruction or adverse modification of critical habitat of endangered species or threatened species as identified in CFR Part 17.
4. The facility is not located in an area that will damage or destroy and archaeological or historical site.
5. The facility is more than 2 miles from a state park, recreation scenic area, or any other lands such as state nature and historic preserves. This facility and practices will not effect the above mentioned.
6. The facility is not located in a wetland or near a wetland as defined in the Clean Water Act, Section 404(b).
7. Sufficient on-site suitable soils are available for the landfill cover. A net volume of soil will be provided which will be used for fill at other Hoke County projects.
8. The LCID Landfill meets the following criteria:
 - a) All stormwater is directed to the stormwater basin. From this basin the water must travel at least 2000ft to the nearest stream. The facility and practices will not violate the requirements of the NPDES, Section 402 of the Clean Water Act.
 - b) The facility will not cause a discharge of dredged or fill material into the waters of the state per the requirements, Clean Water Act, Section 404.
 - c) The facility will not cause non-point source pollution of waters of the state that violate assigned water quality standards.
 - d) The waste base is at least 10ft above the seasonally high water table.
 - e) Not Applicable, the facility is larger than 2 acres.

9. The Facility meets the following buffer requirements:
- a) The waste boundary is more than 1400ft from a surface water of the state. (50ft is required)
 - b) A 100ft buffer is provided from the waste boundary and the property line. The waste boundary is more than 2900ft from any residence and 1050ft from the Hoke County office facilities. No water supply wells are within ½ mile of the site.

10. The facility is approved by Hoke County, the local government having zoning jurisdiction (See Attachment A).

7.0 Operation Plan

7.1 Responsible Individual and Operation Time

Hours of Operation: 7:00AM to 5:00PM Monday- Friday
7:00AM to 12:00PM Saturday

Responsible Individual: Mr. Don Russell
Solid Waste Office
Hoke County
P.O. Box 179
Raeford, NC 28376
Phone: (910) 875 - 3111

7.2 Land Use After Closure

Public access will not be allowed once the LCID Landfill is closed.

7.3 Description of Systematic Usage, Operation, Orderly Development, and Closure

Access Roads: An asphalt paved road that leads from the public roadway system to the weight scales. From the weight scales to the LCID Landfill, the road is exposed ground. The soils at the exposed ground meet the definition of a Class C Soil Base per NCDOT Specifications. This portion of the access road is periodically smoothed to remove the wash board effect caused by vehicle wheel loads. During the drier times of the year, the ground is wetted with a water truck to minimize dusting.

Material Handling: As each load of LCID debris enters the site and is dumped the type of waste is visually examined. Waste primarily consisting of wood and landscape or yard waste will be dumped at the grinding area. This type of waste is further sorted between wood and yard/landscape waste (leaves, small branches). This material is then ground

Page 5
Hoke County LCID Landfill

with a tub grinder and stockpiles. The ground material will be sold for landscaping needs and as renewable fuel.

The grinding operations will be conducted periodically during the year. Hoke County will not own the tub grinder but will contract or outsource this activity. The wood and yard/landscape waste will be stockpiled until it is economical for a contractor to mobilize at the site. The grinding operation will take about one to two weeks.

After the grinding has been complete, the material may not be sold immediately. If necessary, excess ground material can be disposed in the LCID Landfill area.

Debris containing brick and concrete will be deposited at the LCID Landfill area. The LCID Landfill deposition will continue at its present location and proceed towards the stormwater basin. Each cell is excavated about 10ft below ground with the soil stockpiled in front of the excavation. The LCID waste material is deposited to about 5ft above existing surrounding ground levels. Excess soil not used for cover will be stockpiled for later use at other Hoke County projects.

At closure at least 24 inches of soil cover will be placed over the LCID debris and revegetated with grass. The top of the LCID surface will be constructed to shed stormwater as sheet water flow off the deposition area.

Within the grinding area and stockpile area, the ground will be graded to promote positive drainage towards the stormwater basin. The area will be revegetated in grasses. The stormwater basin will remain in-place once the site is closed.

Stormwater Runoff: The runoff from the LCID Landfill area and the Grinding/Stockpile area all drain to the stormwater basin. The basin is checked once monthly for any operational defects, and when deficiencies are noted, they are corrected within a timely manner. Sediment accumulation is removed from the basin and incorporated into the soil used for landfill cover.

Leachate Management: Leachate production should be minimal to non-existing.

Additional Operational Requirements per 15A NCAC 13B.0566:

- (1) Operational plans shall be approved and followed as specified for the facility.
- (2) The facility shall only accept those wastes which it is permitted to receive.
- (3) The waste shall be restricted to the smallest area feasible and compacted as densely as practical into cells.
- (4) Adequate soil cover shall be applied monthly, or when the active area reaches one acre in size, whichever occurs first.

Page 6
Hoke County LCID Landfill

- (5) 120 calendar days after completion of any phase of disposal operations, or upon revocation of a permit, the disposal area shall be covered with a minimum of 2 feet of suitable soil cover sloped to allow surface water runoff in a controlled manner. The Division may require further action in order to correct any condition which is or may become injurious to the public health, or a nuisance to the community.
- (6) Adequate erosion control measures, structures, or devices shall be utilized to prevent silt from leaving the site and to prevent excessive on site erosion.
- (7) Provisions for a ground cover sufficient to restrain erosion must be accomplished within 30 working days or 120 calendar days upon completion of any phase of landfill development.
- (8) The facility shall be adequately secured by means of gates, chains, berms, fences, etc. to prevent unauthorized access except when an operator is on duty. An attendant shall be on duty at all times while the landfill is open for public use to assure compliance with operational requirements and to prevent acceptance of unauthorized wastes.
- (9) Access roads shall be of all-weather construction and properly maintained.
- (10) Surface water shall be diverted from the working face and shall not be impounded over waste.
- (11) Solid waste shall not be disposed of in water.
- (12) Open burning of solid waste is prohibited.
- (13) The concentration of explosive gases generated by the facility shall not exceed:
 - (a) Twenty-five percent of the lower explosive limit for the gases in facility structures.
 - (b) The lower explosive limit for the gases at the property boundary.
- (14) Leachate shall be properly managed on site through the use of current best management practices.
- (15) Should the Division deem it necessary, ground water or surface water monitoring, or both, may be required as provided for under Rules .0601 and .0602 of this Subchapter.
- (16) A sign shall be posted at the facility entrance showing the contact name and number in case of an emergency and the permit number. The permit number requirement is not applicable for facilities not requiring an individual permit.

Disposal of Dead Animal Requirements per 02 NCAC 52C .0102:

1. Dead animals will be disposed of by methods approved by the State Veterinarian and will be buried at least three feet below the surface of the ground.

Burial Standards

1. The bottom of the hole where dead animals are to be buried will be approximately 27 feet above the seasonal high water table. Dead animals will be disposed of by methods approved by the State Veterinarian and will be buried at least three feet below the surface of the ground.
2. Standing water in the hole does not preclude animal burial as the bottom of the hole is approximately 27 feet above the seasonal high water table.
3. There must be at least 3 feet of soil covering any buried animal. This can be interpreted to mean soil mounded over the animals above the adjacent ground zlevel.
4. The burial site must be at least 300 feet from any existing stream or public body of water.
5. The burial site must be at least 300 feet from any existing public water supply well.
6. The burial site must be at least 100 feet from any other type of existing well.
7. The burial site shall be located so as to minimize the effect of stormwater runoff.
8. A record of the location of the approved site (GPS latitude and longitude coordinates if available), the burial history of each burial site to include the date, species, head count and age must be kept by the owner and reported to the Local Health Director who will in turn report this information to the appropriate State agency - DENR Division of Water Quality, Groundwater Section

7.4 Type, Source, and Quantity of Waste to be accepted

Type of Waste: Industrial asphalt, concrete (with incidental Rebar), brick, block, unpainted wood, land clearing debris, inert debris.

Source of Waste: 1. City & County Public Works projects
2. Private developers
3. Commercial developers
4. State Department of Transportation
5. Residential Homeowners

Quantity of Waste: 700 Ton/Year (2,333 yd³)

7.5 Emergency Contingency Plan

Equipment used in the operation of the landfill shall be used to control accidental fires. This equipment shall include a backhoe and dump truck. If necessary, additional equipment will be acquired from other Hoke County Departments.

In the case of fire, the following actions shall be taken:

1. Notify the Hoke County and City of Raeford Fire Department and the North Carolina Division of Waste Management/Fayetteville Regional office.
2. Separate the burning material from the remaining waste as soon as possible.
3. Attempt to smother the fire with soil if possible.
4. At the last resort, water should be used to extinguish the fire. Should it be necessary to use water, downslope collection berms should be constricted to collect the water. All efforts should be made to prevent contaminated water from directly flowing into creeks.

In the case of a hazardous spill, the following action shall be taken:

1. Notify the Fayetteville Regional Office and the Hoke County and Raeford Fire Department.
2. Isolate the spilled material and wait for instruction from Hoke County and Raeford Fire Department.

Emergency Numbers:

911 - The Raeford/Hoke County Emergency Communications Center is the Public Safety Answering Point (PSAP) for all emergency calls in the City of Raeford and Hoke County. The Communications Center is a centralized communications facility that utilizes an enhanced 911 (E-911) system that is wireless Phase II compliant. The Communications Center is staffed 24 hours per day.

Hoke County Emergency Management is located at:
429 East Central Avenue
PO Box 299

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Hoke County LCID Landfill

Raeford, NC 28376
(910) 875-4126
FAX: (910) 875-3726

NCDENR- Fayetteville Regional Office
225 Green Street, Suite 714, Fayetteville, NC 28301-5043
Telephone: (910) 433-3300
FAX: (910) 486-0707

Attachment A: Local Government Approval



Hoke County Planning & Inspection

Post Office Box 1556 – 423 E. Central Avenue
Raeford, North Carolina 28376
(910) 875-8407 – Fax (910) 875-1072

North Carolina Department of Environment and Natural Resources
Division of Waste Management
Zenith Barbee, Hydrogeologist

To Whom It May Concern:

The Hoke County LCID Landfill has been grandfathered in to all Hoke County zoning ordinances. Additionally, the landfill also meets all requirements in the Hoke County Land Use plan. The Planning and Zoning Department has no problems with this request. If you have any questions or concerns please feel free to contact me.

Regards,

Conrad G. Garrison
Planning and Zoning Director
Hoke County Government

423 E. Central Avenue
Raeford, NC 28376
910-875-8407
910-875-1072 (Fax)
cgarrison@hokecounty.org

Attachment B: Deed Description

by

Instrument was prepared by

R. PALMER WILLCOX

Description of the land

NORTH CAROLINA GENERAL WARRANTY DEED

DEED made this 13th day of December, 19 93, by and between

GRANTOR

GRANTEE

ERT H. GATLIN, widower

COUNTY OF HOKE
P. O. Box 217
Raeford, N. C. 28376

In appropriate block for each party: name, address, and, if appropriate, character of entity, e.g. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the City of Raeford Township,

County, North Carolina and more particularly described as follows:
certain tract or parcel of land in Raeford Township, Hoke County, North Carolina situated about two miles north of Raeford, N.C. and about 1400 feet northwest of the west terminus of N.C.S.R. No. 1321, adjoining the lands of Robert H. Gatlin on the southeast, Canal Land and Timber Company on the northeast and northwest and by the County of Hoke on the southwest, being further described as follows:

beginning at a concrete monument, said monument being the westernmost corner of the Robert Gatlin Tract No. 11 as described in Deed Book 208, Page 58 in the Hoke County Registry, the northernmost corner of the County of Hoke "landfill tract" described in Deed Book 161, Page 373 in the Hoke County Registry and a common corner with the tract of land conveyed from Robert H. Gatlin to Cape Fear Wood Corporation (now Canal Land and Timber Company) in Deed Book 94, Page 163, said monument also being a corner of the Federal Paper Board Company tract as shown and recorded in Plat Cabinet 1, Slide 81, Map Book 4, Page 23; thence as a common line of Robert H. Gatlin and said Cape Fear Wood Corp. tract, N29-39-00E 1046.64 feet to an axle with a pine pointer, common corner with said Cape Fear Wood Corp. tract; thence continuing as a common line of Robert Gatlin and said Cape Fear Wood Corp. tract, S71-09-45E 1261.51 feet to an iron rod in said line; thence as a common line of Robert Gatlin and the aforementioned County of Hoke "landfill" tract; thence as a common line with Robert Gatlin and the County of Hoke, N55-00-00W 758.19 feet to the beginning containing 10.00 acres and being a portion of the Robert H. Gatlin Tract No. 11 as described in Deed Book 208, Page 58 in the Hoke County Registry.

Attachment C: Erosion Control Approval Letter and Evaluation

State of North Carolina
Department of Environment,
Health and Natural Resources
Fayetteville Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Andrew McCall, Regional Manager



May 31, 1994

RECEIVED JUN 02 1994

Mr. Michael Wood, County Manager
County of Hoke
PO Box 266
Raeford, NC 28376

Re: Approval of Soil Erosion and Sediment
Control Plan
Landfill Closure Borrow Site
Hoke County, NC

Dear Mr. Wood:

The review of the above referenced erosion control plan has been completed.

The plan has been found to be acceptable subject to the following stipulations:

1. Enclosed is a Certificate of Plan Approval which must be displayed at the job site.
2. This project is subject to the National Pollutant Discharge Elimination System (NPDES) for point source stormwater discharges from construction activities. Enclosed is a copy of the necessary permit application. Please contact Ken Averitte, Environmental Technician, at (910) 486-1541 for further assistance regarding this permit.
3. In order to ensure the early coordination and implementation of the erosion control plan for this project, it is requested that a preconstruction conference be held. As a minimum, representatives of the owner, engineer, contractor, and this office should attend, subject to the availability of staff. Please notify Gerald Lee of this office as to when this conference is scheduled.

Approval of Soil Erosion and Sediment Control Plan
Page 2

4. The developer is responsible for obtaining any and all permits and approvals necessary for the development of this project prior to the commencement of this land-disturbing activity. This could include the Division of Environmental Management under storm water regulations, the US Army Corps of Engineers under Article 404 jurisdiction, local county or town agencies under their local ordinances, or others that may be required. This approval cannot supersede any other permit or approval; however, in the case of a Cease and Desist Order from the Corps of Engineers, that Order would only apply to wetland areas. All other lands must still be in compliance with the Sedimentation Pollution Control Act.
5. If any area on site falls under the jurisdiction of Section 404 of the Clean Water Act, the developer is responsible to the orders of the US Army Corps of Engineers. Any erosion control measures that fall within jurisdictional wetland area must be relocated to the transition point between the wetlands and the highlands to assure that the migration of sediment will not occur. If that relocation presents a problem or contradicts any requirements of the Corps of Engineers, it is the responsibility of the developer to inform the Land Quality Section's Regional Office so that an adequate contingency plan can be made to assure sufficient erosion control on-site. Failure to do so will be considered a violation of this approval.
6. Following the completion of the project, you should notify this office to schedule a final inspection. The purpose of this inspection is to ensure that all erosion control requirements have been met.

This approval is subject to the satisfactory performance of the erosion control measures under field conditions. Should it be determined that the requirements of the Sedimentation Pollution Control Act of 1973 (GS 113A,51-66) are not being met, revisions to the plan and its implementation will be required.

This permit allows for a land disturbance, as called for on the application plan, not to exceed 18 acres and/or the limits of the submitted plans. Exceeding these limits will be a violation of this permit and would require a revised plan and additional application fee. Amendments to the plan should be submitted to this office under the same procedures as followed for the original plan.

Title 15, Section 4B.0017 (A) of the North Carolina Administrative Code requires that a copy of the approved plan be on file at the job site and that inspections of the project be made by this office to ensure compliance with the approved plan.

Approval of Soil Erosion and Sediment Control Plan
Page 3

We look forward to working with you on this project. -

Sincerely,



Gerald Lee
Assistant Regional Engineer
Land Quality Section

GL/bt

Enclosure

cc: Daniel W. Sundberg, ASLA
Billy Cox
Ken Averitte



Erosion Control Evaluation

Based on site observations, the site is predominantly grass covered, Ditches or swales are stable and in reasonable condition. Exposed areas primarily consist of the haul road and the area where the active placement of LC10 is occurring.

Future disturbance and exposed ground will occur where the proposed grading and stockpile area will be conducted.

With new areas to be disturbed, this evaluation is for the existing sediment basin.

Also, this evaluation is conducted for the side slopes of the mound formed by LC10 landfill. Evaluation of the existing ditches is not conducted since they are grass covered and stable.

The Rational Design method is used for the evaluation. $A C = 0.15$ is used for the sandy soils that are grass covered. $A C = 0.40$ is used for exposed ground.

Table 8.03b
Value of Runoff Coefficient
(C) for Rational Formula

Land Use	C	Land Use	C
Business:		Lawns:	
Downtown areas	0.70-0.95	Sandy soil, flat, 2%	0.05-0.10
Neighborhood areas	0.50-0.70	Sandy soil, ave., 2-7%	0.10-0.15 0.15-0.20
Residential:		Sandy soil, steep, 7%	0.13-0.17 0.18-0.22
Single-family areas	0.30-0.50	Heavy soil, flat, 2%	0.25-0.35
Multi units, detached	0.40-0.60	Heavy soil, ave., 2-7%	
Multi units, Attached	0.60-0.75	Heavy soil, steep, 7%	0.30-0.60 0.20-0.50
Suburban	0.25-0.40	Agricultural land:	
Industrial:		Bare packed soil	0.30-0.60
Light areas	0.50-0.80	Smooth	0.20-0.50
Heavy areas	0.60-0.90	Rough	0.20-0.40
Parks, cemeteries	0.10-0.25	Cultivated rows	0.10-0.25
Playgrounds	0.20-0.35	Heavy soil no crop	
Railroad yard areas	0.20-0.40	Heavy soil with crop	0.15-0.45 0.05-0.25
Unimproved areas	0.10-0.30	Sandy soil no crop	0.05-0.25
Streets:		Sandy soil with crop	0.10-0.25
Asphalt	0.70-0.95	Pasture	
Concrete	0.80-0.95	Heavy soil	0.15-0.45
Brick	0.70-0.85	Sandy soil	0.05-0.25
Drives and walks	0.75-0.85	Woodlands	0.05-0.25
Roofs	0.75-0.85		

NOTE: The designer must use judgement to select the appropriate C value within the range for the appropriate land use. Generally, larger areas with permeable soils, flat slopes, and dense vegetation should have lowest C values. Smaller areas with slowly permeable soils, steep slopes, and sparse vegetation should be assigned highest C values.

Source: American Society of Civil Engineers

Raleigh, North Carolina 35.8706N 78.7864W

ARI* (years)	5 min.	10 min.	15 min.	30 min.	60 min.	120 min.	3 hr.	6 hr.	12 hr.	24 hr.
2	5.58	4.46	3.74	2.58	1.62	0.94	0.66	0.40	0.24	0.14
10	7.08	5.66	4.78	3.46	2.25	1.33	0.95	0.58	0.34	0.21
25	7.78	6.19	5.24	3.88	2.58	1.54	1.11	0.68	0.41	0.24
100	8.64	6.86	5.78	4.43	3.05	1.85	1.36	0.84	0.51	0.30

Fayetteville, North Carolina 35.0583N 78.8583W

ARI* (years)	5 min.	10 min.	15 min.	30 min.	60 min.	120 min.	3 hr.	6 hr.	12 hr.	24 hr.
2	6.11	4.88	4.09	2.83	1.77	1.04	0.74	0.44	0.26	0.15
10	7.96	6.36	5.36	3.88	2.53	1.54	1.10	0.66	0.39	0.23
25	8.94	7.13	6.02	4.46	2.97	1.83	1.32	0.80	0.47	0.28
100	10.44	8.29	6.99	5.35	3.69	2.29	1.69	1.03	0.62	0.36

Wilmington, North Carolina 34.2683N 77.9061W

ARI* (years)	5 min.	10 min.	15 min.	30 min.	60 min.	120 min.	3 hr.	6 hr.	12 hr.	24 hr.
2	7.39	5.92	4.96	3.42	2.15	1.28	0.91	0.56	0.33	0.19
10	9.70	7.75	6.54	4.74	3.08	1.94	1.39	0.87	0.51	0.30
25	10.98	8.75	7.40	5.48	3.65	2.38	1.73	1.08	0.64	0.38
100	12.92	10.27	8.65	6.63	4.56	3.18	2.37	1.49	0.89	0.53

Washington, North Carolina 35.5933N 77.0167W

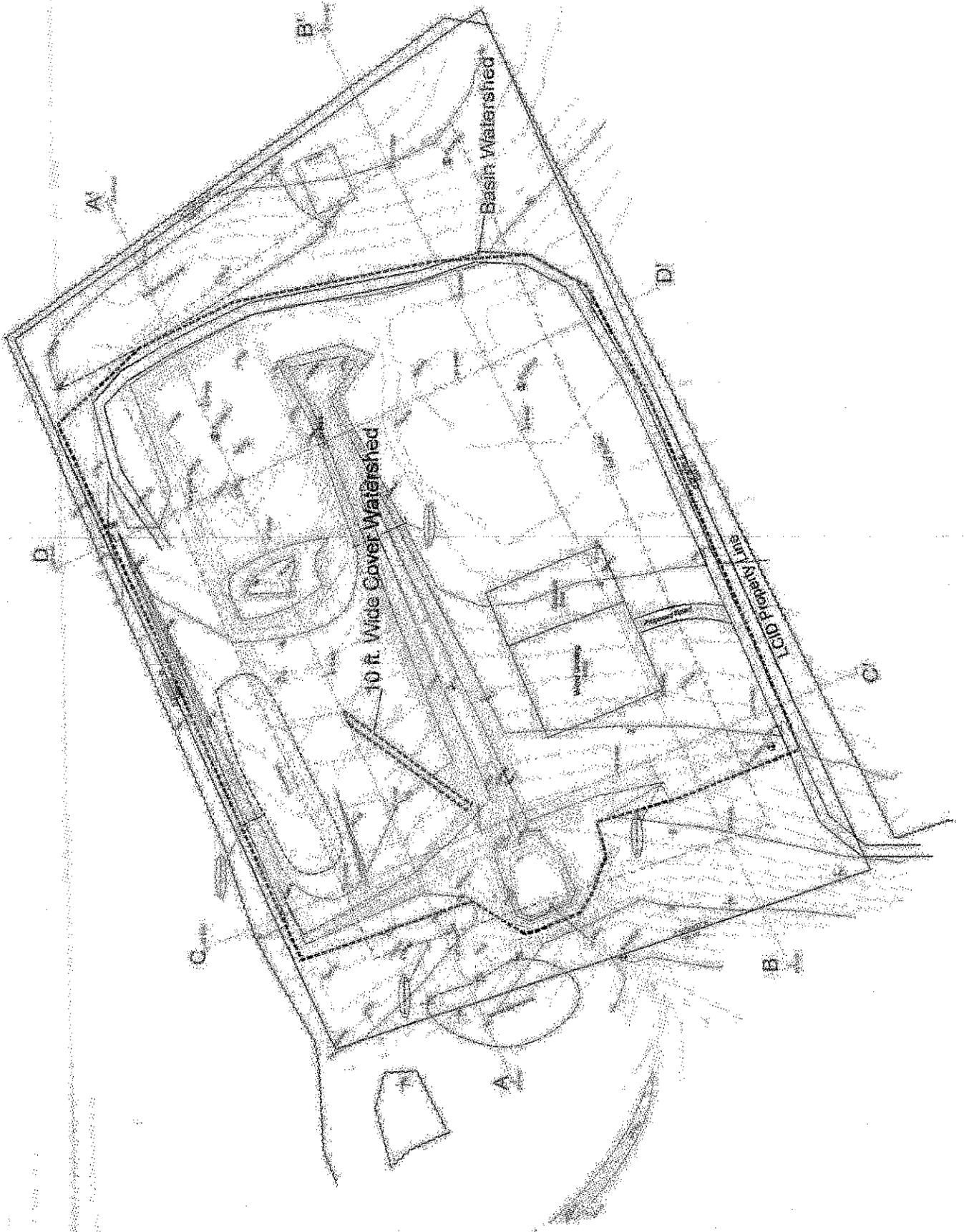
ARI* (years)	5 min.	10 min.	15 min.	30 min.	60 min.	120 min.	3 hr.	6 hr.	12 hr.	24 hr.
2	6.41	5.12	4.29	2.96	1.86	1.10	0.78	0.47	0.27	0.16
10	8.38	6.70	5.65	4.09	2.66	1.64	1.19	0.72	0.42	0.25
25	9.48	7.55	6.38	4.73	3.15	1.99	1.46	0.88	0.52	0.31
100	11.16	8.87	7.47	5.72	3.94	2.58	1.93	1.18	0.70	0.42

Manteo Airport, North Carolina 35.9167N 75.7000W

ARI* (years)	5 min.	10 min.	15 min.	30 min.	60 min.	120 min.	3 hr.	6 hr.	12 hr.	24 hr.
2	6.46	5.16	4.32	2.96	1.87	1.08	0.79	0.48	0.29	0.17
10	8.47	6.77	5.71	4.14	2.69	1.62	1.20	0.74	0.44	0.27
25	9.56	7.62	6.44	4.77	3.17	1.96	1.47	0.91	0.54	0.33
100	11.26	8.95	7.54	5.77	3.98	2.54	1.95	1.21	0.73	0.44

Cape Hatteras, North Carolina 35.2322N 75.6225W

ARI* (years)	5 min.	10 min.	15 min.	30 min.	60 min.	120 min.	3 hr.	6 hr.	12 hr.	24 hr.
2	7.20	5.75	4.82	3.33	2.09	1.29	0.94	0.58	0.34	0.20
10	9.41	7.52	6.35	4.60	2.99	1.93	1.43	0.89	0.53	0.31
25	10.66	8.49	7.18	5.31	3.54	2.33	1.75	1.09	0.65	0.38
100	12.53	9.95	8.39	6.42	4.42	3.03	2.32	1.45	0.88	0.51



10 ft. Wide Cover Watershed

Bash Watershed

IGIP Property Line

A

B

D

D

C

C

B

A

25-year: $12.3 - 6.4 = 5.9 \text{ cfs}$

$$h = \left(\frac{5.9}{2.8(22)} \right)^{2/3} = 0.21 \text{ ft}$$

Check water velocity over secondary spillway
For 10-year rain event, Assume vertical sides.

$$V = \frac{43}{(22)(0.17)} = 1.1 \text{ ft/sec} \therefore \text{Velocity less than } 2 \text{ ft/sec}$$

Outlet Stone Protection for Primary Spillways

Max. Flowrate is 6.4 cfs - From Figure 9.066 of
ESL PDM (see attached), the $D_{50} = 0.25'$ and
 $L_a = 15 \text{ ft}$. Existing stone extends more than 20 ft
from the outlet and consists of Class B erosion
control stone $D_{50} = 0.75'$. Outlet protection O.K.

Required Basin Surface Area:

$$Q_{10} \times 435 = (10.7)(435) = 4654.5 \text{ ft}^2$$

at top of riser - Surface area is 71' by 98' or 6958 ft²

Require Storage Volume

$$\text{Area Disturbed} \times 3600 = 2.58 \times 3600 = 9288 \text{ ft}^3$$

Actual Volume

Elev.	Area	Average Area	Depth	Vol.	Cum. Vol.
246	4356	—	—	—	—
247	5369	4862.5	1	4862.5	4862.5
248	7044	6231.5	1	6231.5	11094 ft ³

i. At El. 248 before discharge through top of pipe - Storage Volume is 11,094 ft³ and is greater than required volume of 8288 ft³.

2-year

T	I	T _{cul}
30	2.83	42.7 ← use
60	1.77	52.6

10-year

30	3.88	40.1 ← use
60	2.53	44.9

25-year

30	4.46	34.9 ← use
60	2.97	41.8

Peak Flow rates

$$2\text{-year } Q = (14.05) (0.196) (2.83) = 7.8 \text{ cfs}$$

$$10\text{-year } Q = (14.05) (0.196) (3.88) = 10.7 \text{ cfs}$$

$$25\text{-year } Q = (14.05) (0.196) (4.46) = 12.3 \text{ cfs}$$

The riser pipe is at EL 248.92 ft. The embankment crest is at 254.0 ft and the secondary spillway is about 253.0 ft for a length of at least 22 ft. The horizontal pipe is 48 ft long and outlet is at 245.54. The riser pipe is 18" Dia and the horizontal pipe is 12" Dia. C.M.P.

Check Flow rate of primary conduit with
water level at 253 ft; level at the secondary
spillway

Weir control

$$Q = CLh^{3/2}$$

$$h = 253 - 248.9 = 4.1 \text{ ft}$$

$$C = 3.1 \text{ sharp crested weir}$$

$$L = \pi \cdot 1.5 = 4.71 \text{ ft}$$

$$Q = (3.1)(4.71)(4.1)^{3/2} = \underline{\underline{121 \text{ cfs}}}$$

Orifice Control

$$Q = CA(2gh)^{0.5}$$

$$C = 0.6$$

$$A = \frac{\pi(1.5)^2}{4} = 1.767 \text{ ft}^2$$

$$Q = (0.6)(1.767) [2(32.2)(4.1)]^{0.5} \quad h = 253 - 248.9 = 4.1 \text{ ft}$$

$$= \underline{\underline{17.2 \text{ cfs}}}$$

Barrel Control

$$Q = A \left(\frac{2gh}{1 + K_m + K_p L} \right)^{0.5}$$

$$A = \frac{\pi(1)^2}{4} = 0.785$$

$$H = 253 - 245.94 = 7.06$$

km³/s

$$L = 48$$

$$K_p = \frac{5037 n^2}{d^{4/3}}$$

$$d = 12''$$

$$n = 0.034 \text{ - CIP}$$

$$Q = 0.785 \left[\frac{(2)(32.2)(7.46)}{-1 + 1 + 0.107(48)} \right]^{0.5}$$

$$= \underline{\underline{6.44 \text{ cfs}}}$$

$$K_p = \frac{5037 (0.024)^2}{12^{4/3}} = 0.107$$

o barrel condition controls

- Since the barrel flow will not significantly increase with additional water height - use this value 6.4 cfs to evaluate discharge at secondary spillway

$$Q = CL h^{3/2}$$

$$C = 2.8 \text{ broad crested weir}$$

$$L = 22 \text{ ft}$$

$$h = \left(\frac{Q}{CL} \right)^{2/3}$$

$$2\text{-year: } 7.8 - 6.4 = 1.4 \text{ cfs}$$

$$h = \left(\frac{1.4}{(2.8)(22)} \right)^{2/3} = 0.08 \text{ ft}$$

$$10\text{-year: } 10.7 - 6.4 = 4.3 \text{ cfs}$$

$$h = \left(\frac{4.3}{2.8(22)} \right)^{2/3} = 0.17 \text{ ft}$$

25-year: $12.3 - 6.4 = 5.9 \text{ cfs}$

$$h = \left(\frac{5.9}{2.8(32)} \right)^{2/3} = 0.21 \text{ ft}$$

Check water velocity over secondary spillway
for 10-year rain event, Assume vertical sides.

$$V = \frac{4.3}{(22)(0.17)} = 1.1 \text{ ft/sec} \therefore \text{Velocity less than } 2 \text{ ft/sec}$$

Outlet Stone Protection for Primary Spillway:

Max. Flowrate is 6.4 cfs - From Figure 8.066 of
ESCPDM (see Attached), the $D_{50} = 0.25'$ and
 $L_a = 148 \text{ ft}$. Existing stone extends more than 20 ft
from the outlet and consists of Class B erosion
control stone $D_{50} = 0.75'$. Outlet Protection O.K.

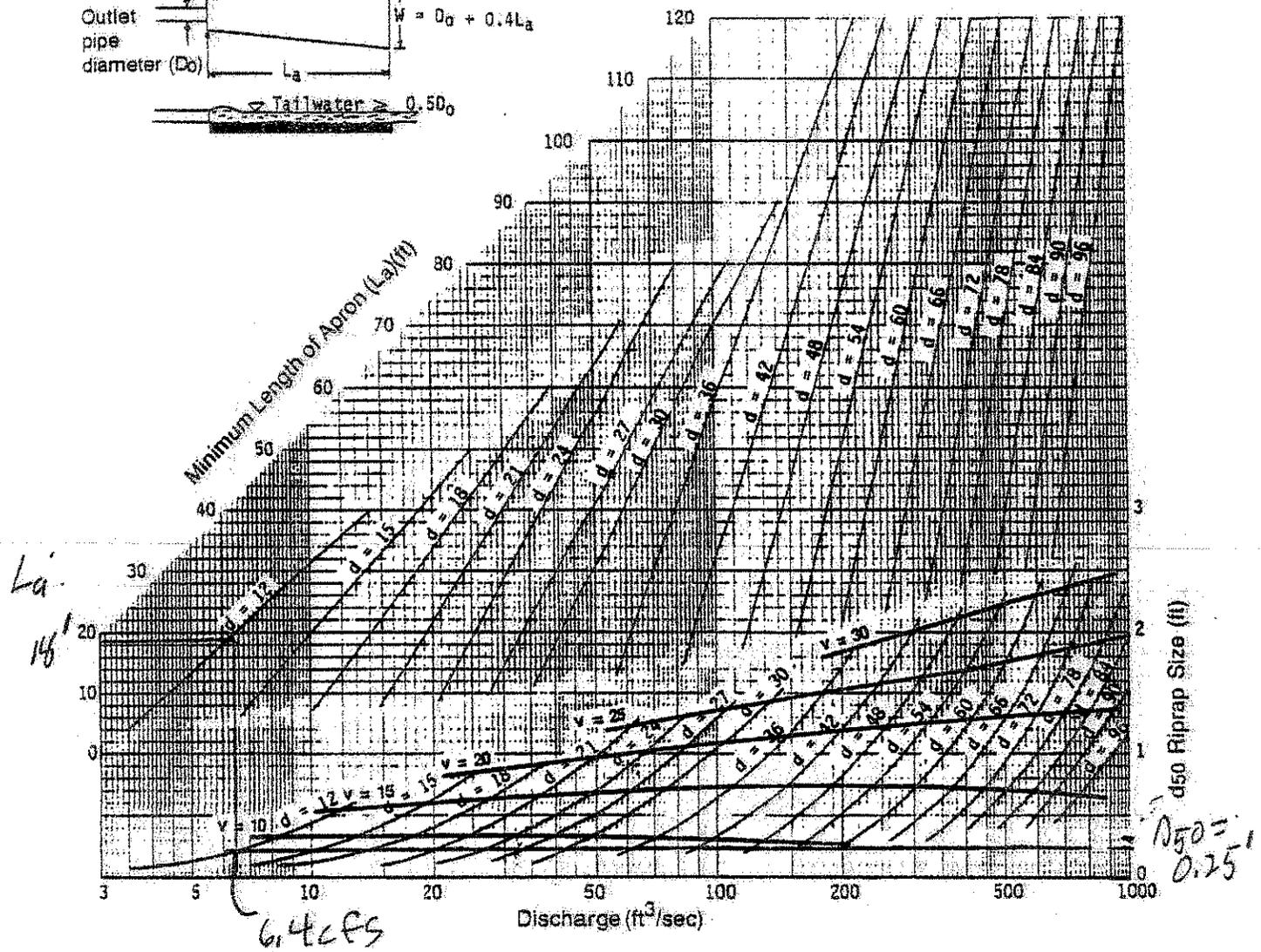
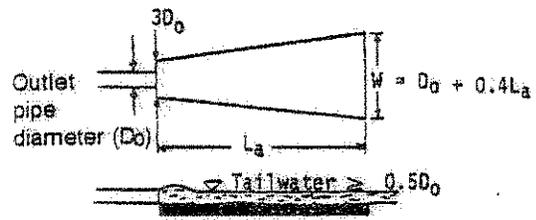
Required Basin Surface Area:

$$Q_{10} \times 435 = (10.7)(435) = 4654.5 \text{ ft}^2$$

at top of riser - surface area is 75' by 95' or 7125 ft²

Require Storage Volume

$$\text{Area Disturbance} \times 3600 = 2.58 \times 3600 = 9288 \text{ ft}^3$$



Curves may not be extrapolated.

Figure 8.06b Design of outlet protection from a round pipe flowing full, maximum tailwater condition ($T_w \geq 0.5$ diameter).

Side Slope Drainage Evaluation

The side slopes are proposed at 2:1 (H:V).
Runoff from the top of the LCID Landfill,
will drain down this slopes.

For evaluation purposes, a 10ft wide strip
is evaluated which would provide the most
area for drainage.

Max area is 2035 ft^2 (0.0467 acres)

Coeff of runoff = 0.15 assume $t = 5 \text{ min}$ although
the time of concentration would be larger, use
the Rain intensity for the 25-year return, $I_{25} = 8.96 \text{ in/hr}$

$$Q = (0.0467)(0.15)(8.96) = 0.0628 \text{ cfs}$$

Check the maximum flow rate allowed to maintain
a water velocity of 2 ft/s or less on the 2:1 (H:V)
slope

$$V = \frac{1.49}{n} r^{2/3} \sqrt{S}$$

$$2 = \frac{1.49}{0.15} d^{2/3} \sqrt{0.5}$$

$$d = 0.152 \text{ ft}$$

$$S = 0.5 \text{ for } 2:1 \text{ (H:V) slope}$$

$$A = 10(d) \quad r = \frac{A}{wp} = \frac{10d}{10} = d$$

$$wp = 10$$

$$n = 0.15 \text{ for short grass}$$

Flow rate for this depth is

$$Q = VA = (2)(1.52) = 3.04 \text{ cfs} \quad A = 10(0.152) \\ = 1.52$$

i. 2:1 (H:V) side slopes OK.

Attachment D: Hydrogeologic Study

ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY

3008 ANDERSON DRIVE, SUITE 102

RALEIGH, NC 27609

(919) 781-7798

December 15, 1994

Mr. Dan Sundberg
 Hobbs, Upchurch & Associates
 P.O. Box 1737
 Southern Pines, NC 28387

RE: Clarification Letter
 Construction and Demolition
 Debris Landfill Clarifications
 Hoke County, North Carolina

Dear Mr. Sundberg:

The following discusses three topics: (1) the removal of the existing piezometers, (2) the proposed location of the monitoring wells, and (3) the effect of the proposed construction on the groundwater table.

REMOVAL OF EXISTING PIEZOMETERS

The existing piezometers will be removed by one of two alternatives:

1. A slurry of neat concrete paste will be injected under pressure through the top of the piezometer pipe as the pipe is slowly removed from the ground.
2. Using hollow stem augers with the drill rig, the piezometer location will be redrilled and cement grout will be injected through the hollow stem as the augers are removed from the ground.

PROPOSED MONITORING WELL LOCATIONS

The locations for the monitoring wells have been altered for 5-year increments of disposal. Also, they will be situated to monitor the water perched above the semi-aquitard. The approximate surface elevation of this semi-aquitard at the various test locations is as follows:

<u>Boring No.</u>	<u>Semi-Aquitard Surface Elevation, ft.</u>	<u>Depth Below Ground Surface</u>
B-1	228	38.0
B-2	238	27.0
B-3	231	31.0
B-4	217	42.0
B-5	225	19.5

Groundwater levels in these piezometers were measured on March 24, 1994, and again on March 24, 1994. On December 7, 1994, the water level depths and elevations were also determined at the three groundwater monitoring wells for the adjacent solid waste landfill. The following table displays the results:

Well No.	Top of Casing Elev., ft.	Depth to Groundwater, ft.		Water level Elevation, ft.	
		3/24/94	12/7/94	3/24/94	12/7/94
1	266.31	dry	dry	—	—
2	261.21	24.89	25.10	236.32	236.11
3	268.89	36.02	33.61	232.87	235.28
4	265.63	dry	(1) N/A	—	—
5	246.16	19.06	(1) N/A	227.06	—
<u>SWL No.</u>					
1	251.19	54.26	53.56	194.20	197.63
2	204.65	—	17.74	—	186.91
3	217.00	—	28.09	—	188.91

(1) Wells disturbed by construction activity.

In general, two groundwater conditions are present. The upper groundwater condition appears to be a result of water perched at or above the more clayey sands. These clayey sands were encountered after depths of 22 feet to 38 feet below ground level.

This semi-aquitard with variable soil texture did not appear to cause water to perch at B-1 and B-4. The semi-aquitard appears to slope downward in a southeasterly direction. The lower groundwater table appears to also move in a southeasterly direction, based on the topography and on the monitoring well measurement at the adjacent solid waste landfill (See attached figure).

The proposed monitoring wells for the 5-year limits of the Construction and Demolition Debris Landfill are shown on sheet 3 of 10 prepared by Hobbs, Upchurch & Associates. An upgradient and downgradient well is proposed to monitor the upper groundwater conditions. A Type III well is proposed downgradient to monitor the lower groundwater conditions. It is estimated that the two shallow wells will have about two to five feet of water.

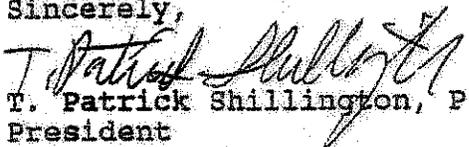
It is recommended that the deep well be installed first so that the upper groundwater table can be verified as present before the installation of the two shallow wells. It is possible that the upper groundwater condition may not be encountered, and if this occurs, it may be advantageous not to install the shallow well. Also, it would be necessary to install a Type III well at the upgradient well location, in lieu of the proposed shallow well.

PROPOSED CONSTRUCTION EFFECTS ON GROUNDWATER

It is anticipated that the groundwater table and perched groundwater conditions will not be substantially affected by the landfill construction. Infiltration of precipitation will be minimized at this site due to promotion of runoff both around and within the landfill. The only area where surface water accumulation will occur will be at the sediment basin. Mounding of the water table beneath the sediment basin is possible, but the basin will only accumulate water during precipitation. Therefore, water recharge would be minimal and infrequent, and water table mounding beneath the sediment basin would be minimal.

We appreciate serving Hobbs, Upchurch & Associates on this project. Please contact us if you need further clarifications.

Sincerely,

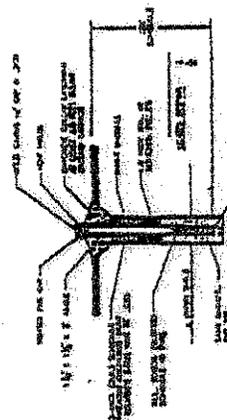

T. Patrick Shillington, P. E.
President

Attachment: Figure



ATTACHMENT:

Figure



MONITORING WELL DETAIL

DATE	TIME	WELL NO.	DEPTH (FEET)	WATER LEVEL (FEET)	TEMPERATURE (°F)	PH	CONDUCTIVITY (µmhos/cm)	TURBIDITY (NTU)

GENERAL NOTES

1. THIS PLAN IS PREPARED FOR THE USE OF THE CLIENT AND IS NOT TO BE USED FOR ANY OTHER PURPOSE.
2. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED.
3. THE CLIENT IS RESPONSIBLE FOR THE PROTECTION OF THE MONITORING WELLS.
4. THE CLIENT IS RESPONSIBLE FOR THE MAINTENANCE OF THE MONITORING WELLS.
5. THE CLIENT IS RESPONSIBLE FOR THE REPAIR OF THE MONITORING WELLS.
6. THE CLIENT IS RESPONSIBLE FOR THE REPLACEMENT OF THE MONITORING WELLS.

PERIMETER

NO.	SECTION	LENGTH (FEET)	AREA (SQ. FEET)
1	SECTION 1	100	1000
2	SECTION 2	150	2250
3	SECTION 3	200	4000
4	SECTION 4	250	6250
5	SECTION 5	300	9000
6	SECTION 6	350	12250
7	SECTION 7	400	16000
8	SECTION 8	450	20250
9	SECTION 9	500	25000
10	SECTION 10	550	30250
11	SECTION 11	600	36000
12	SECTION 12	650	42250
13	SECTION 13	700	49000
14	SECTION 14	750	56250
15	SECTION 15	800	64000
16	SECTION 16	850	72250
17	SECTION 17	900	81000
18	SECTION 18	950	90250
19	SECTION 19	1000	100000
20	SECTION 20	1050	110250
21	SECTION 21	1100	121000
22	SECTION 22	1150	132250
23	SECTION 23	1200	144000
24	SECTION 24	1250	156250
25	SECTION 25	1300	169000
26	SECTION 26	1350	182250
27	SECTION 27	1400	196000
28	SECTION 28	1450	210250
29	SECTION 29	1500	225000
30	SECTION 30	1550	240250
31	SECTION 31	1600	256000
32	SECTION 32	1650	272250
33	SECTION 33	1700	289000
34	SECTION 34	1750	306250
35	SECTION 35	1800	324000
36	SECTION 36	1850	342250
37	SECTION 37	1900	361000
38	SECTION 38	1950	380250
39	SECTION 39	2000	400000
40	SECTION 40	2050	420250
41	SECTION 41	2100	441000
42	SECTION 42	2150	462250
43	SECTION 43	2200	484000
44	SECTION 44	2250	506250
45	SECTION 45	2300	529000
46	SECTION 46	2350	552250
47	SECTION 47	2400	576000
48	SECTION 48	2450	600250
49	SECTION 49	2500	625000
50	SECTION 50	2550	650250
51	SECTION 51	2600	676000
52	SECTION 52	2650	702250
53	SECTION 53	2700	729000
54	SECTION 54	2750	756250
55	SECTION 55	2800	784000
56	SECTION 56	2850	812250
57	SECTION 57	2900	841000
58	SECTION 58	2950	870250
59	SECTION 59	3000	900000
60	SECTION 60	3050	930250
61	SECTION 61	3100	961000
62	SECTION 62	3150	992250
63	SECTION 63	3200	1024000
64	SECTION 64	3250	1056250
65	SECTION 65	3300	1089000
66	SECTION 66	3350	1122250
67	SECTION 67	3400	1156000
68	SECTION 68	3450	1190250
69	SECTION 69	3500	1225000
70	SECTION 70	3550	1260250
71	SECTION 71	3600	1296000
72	SECTION 72	3650	1332250
73	SECTION 73	3700	1369000
74	SECTION 74	3750	1406250
75	SECTION 75	3800	1444000
76	SECTION 76	3850	1482250
77	SECTION 77	3900	1521000
78	SECTION 78	3950	1560250
79	SECTION 79	4000	1600000
80	SECTION 80	4050	1640250
81	SECTION 81	4100	1681000
82	SECTION 82	4150	1722250
83	SECTION 83	4200	1764000
84	SECTION 84	4250	1806250
85	SECTION 85	4300	1849000
86	SECTION 86	4350	1892250
87	SECTION 87	4400	1936000
88	SECTION 88	4450	1980250
89	SECTION 89	4500	2025000
90	SECTION 90	4550	2070250
91	SECTION 91	4600	2116000
92	SECTION 92	4650	2162250
93	SECTION 93	4700	2209000
94	SECTION 94	4750	2256250
95	SECTION 95	4800	2304000
96	SECTION 96	4850	2352250
97	SECTION 97	4900	2401000
98	SECTION 98	4950	2450250
99	SECTION 99	5000	2500000
100	SECTION 100	5050	2550250

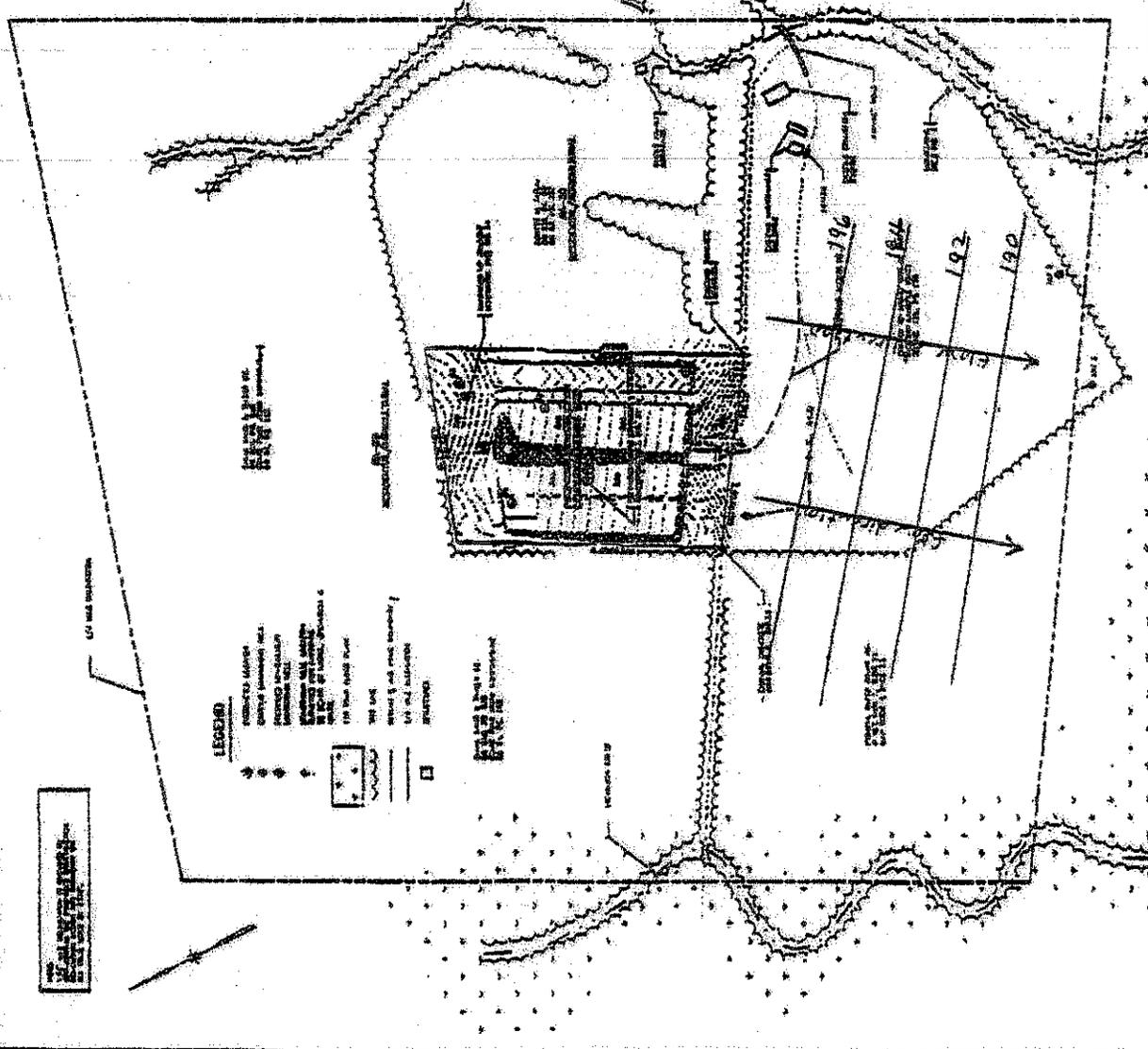
INFORMA, INCORPORATED & ASSOCIATES, P.A.
 10000 W. CENTRAL EXPRESSWAY
 SUITE 1000
 TAMPA, FLORIDA 33607
 TEL: (813) 877-1111
 FAX: (813) 877-1112

CONSULTING ENGINEER
 LICENSED PROFESSIONAL ENGINEER
 STATE OF FLORIDA
 LICENSE NO. 12345

DESIGNED AND DRAWN BY
 INFROMA, INCORPORATED & ASSOCIATES, P.A.

DATE
 10/1/2000

SCALE
 AS SHOWN



LEGEND

- MONITORING WELL
- BUILDING
- PROPERTY BOUNDARY
- PERIMETER
- UTILITY LINE
- ROAD
- RAILROAD
- WATERWAY
- TOPOGRAPHY
- CONTOUR
- SPOT ELEVATION
- GRID
- GRID INTERSECTION
- GRID LINE
- GRID POINT
- GRID CONTROL POINT
- GRID CONTROL POINT WITH ELEVATION
- GRID CONTROL POINT WITH ELEVATION AND DATE
- GRID CONTROL POINT WITH ELEVATION AND DATE AND NAME
- GRID CONTROL POINT WITH ELEVATION AND DATE AND NAME AND ADDRESS
- GRID CONTROL POINT WITH ELEVATION AND DATE AND NAME AND ADDRESS AND PHONE NUMBER
- GRID CONTROL POINT WITH ELEVATION AND DATE AND NAME AND ADDRESS AND PHONE NUMBER AND FAX NUMBER
- GRID CONTROL POINT WITH ELEVATION AND DATE AND NAME AND ADDRESS AND PHONE NUMBER AND FAX NUMBER AND E-MAIL ADDRESS
- GRID CONTROL POINT WITH ELEVATION AND DATE AND NAME AND ADDRESS AND PHONE NUMBER AND FAX NUMBER AND E-MAIL ADDRESS AND WEBSITE ADDRESS

HYDROGEOLOGIC STUDY
CONSTRUCTION AND DEMOLITION
DEBRIS LANDFILL
HOKE COUNTY, NORTH CAROLINA

April 9, 1994

Prepared For:

Hobbs, Upchurch & Associates
P. O. Box 1737
SouthernPines, NC 28388

Prepared By:

Engineering & Environmental
Science Company
3008 Anderson Dr., Ste. 102
Raleigh, NC 27609

E²S

ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY

3008 ANDERSON DRIVE, SUITE 102

RALEIGH, NC 27609

(919) 781-7798

April 9, 1994

Mr. Dan Sundberg
Hobbs, Upchurch & Associates
P.O. Box 1737
Southern Pines, NC 28388

RE: Hydrogeologic Study
Construction & Demolition Debris Landfill
Hoke County, North Carolina

Dear Mr. Sundberg:

Engineering & Environmental Science Company (E²S) has completed the Hydrogeologic Study for the proposed Construction and Demolition Debris Landfill at the above referenced site. This Study was requested and authorized by Mr. Dan Sundberg of Hobbs, Upchurch & Associates, Inc. Following is a brief discussion of the project, subsurface conditions and evaluations and recommendations. More detailed information is contained in this report.

The proposed Construction & Demolition Landfill is located on approximately 20 acres of land that is immediately north of the existing Solid Waste Landfill operated by the City of Raeford and Hoke County. The exact base depth of the Construction and Demolition Debris Landfill has not been established at this time. However, maximum excavation will be approximately 10 ft. to 20 ft.

Subsurface soils predominantly consist of granular soils having varying amounts of silt and clay fines. Two groundwater conditions were noted. The upper groundwater condition appears to be a result of water perched in the more clayey sands that were encountered generally after depths of 22 ft. to 42 ft. below ground level (Elevation 227 ft. to 237 ft.). The limits of excavation for the demolition landfill should be several feet above the perched water level.

The lower groundwater table was found at elevation 194.2 ft. at the adjacent exist well for the Solid Waste Landfill. This water level is approximately 4 to 5 ft. higher than the surface water level at the intersection of Nicholson and Rockfish Creeks. The lower groundwater table appears to move in a southeast direction towards the intersection of Nicholson Creek and Rockfish Creek with a hydraulic gradient of approximately 0.003 ft./ft.

There is insufficient information to accurately determine the direction of the upper groundwater due to the variable permeability and possible lateral extent of the semi-aquitard. Because of the semi-pervious nature of this semi-aquitard, it is anticipated that this perched water will eventually percolate downward to the lower groundwater table.

Since groundwater perched above this layer will eventually reach the lower groundwater table, it is recommended that only the lower groundwater table be monitored. One additional well for up gradient testing is proposed along the west side of the demolition landfill. Depending on the water level measured in the new well relative to the existing well, one additional well may be required near the northeast corner of the demolition landfill.

We appreciate serving Hobbs, Upchurch & Associates on this project. Please contact us, if you have any questions about this Hydrogeologic Study.

Sincerely,

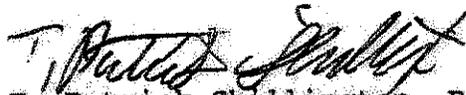

T. Patrick Shillington, P. E.
President



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Attachment A: Figures
Attachment B: Tables
Attachment C: Boring Logs

1.0 INTRODUCTION

The proposed Construction & Demolition Landfill is located on approximately 20 acres of land that is immediately north of the existing Solid Waste Landfill operated by the City of Raeford and Hoke County (see Figure 1, Attachment A). For this evaluation, Hobbs, Upchurch & Associates has provided preliminary drawings of the proposed construction.

Initially the site will provide borrow material for the adjacent Solid Waste Landfill. Approximately 5 ft. to 10 ft. of cut in some areas will be conducted for borrow material. Falling head permeability tests and Standard Proctor moisture density relationship tests were previously conducted on the shallow soils and were provided by Engineering & Environmental Science Company in the report dated November 22, 1993.

The exact base depth of the Construction and Demolition Debris Landfill has not been established at this time. However, excavation to establish the base of the landfill will be approximately 10 ft. to 20 ft. Cut slopes and fill slopes will be approximately 2:1 (H:V).

2.0 FIELD AND LABORATORY TESTING

Five (5) soil borings were drilled in the proposed Construction and Demolition Landfill to depths of 25 ft. to 50 ft. below the existing site grades. The borings were drilled at the approximate locations shown on the enclosed Figure No. 2. The locations and elevations of the borings were determined by Hobbs, Upchurch & Associates.

The borings were advanced using hollow-stem auger drilling techniques. Split-spoon samples were obtained at 5.0 ft. intervals and were obtained in accordance with the Standard Method for Penetration and Split-Barrel Sampling of Soils (ASTM D-1586). At Boring B-5, one shelly tube sample was taken in accordance with ASTM D-1587. The soils were sampled and logged in the field by a Geotechnical Engineer.

Upon completion of each boring, temporary piezometers were installed. The piezometers consisted of 10 ft. to 15 ft. lengths of No. 10 PVC screen (2" dia.) surrounded with sand extending from the bottom of the boring to the top of the screen. Solid PVC Pipe (2" dia.) connected to the screen continued to the ground surface. Water levels at each piezometer were measured to the nearest 0.01 ft. The water level was also measured in the existing groundwater monitoring well, for the Solid Waste Landfill. During the determination of water levels, downhole permeability tests were conducted in three (3) piezometers by hand bailing the well and

then monitoring the rise in water with time. Table 1 shows the test results and Figure No. 3 shows the measured water level elevations at each boring and the existing monitoring well.

Representative samples from each boring were sealed in glass jars and were returned to the E²S laboratory. The soil samples were classified in accordance with the Unified Soil Classification System. To aid in the evaluation and classification of the soils, moisture content, Atterberg Limits and wash No. 200 sieve tests were conducted. Falling head permeability and density tests were conducted on the undisturbed soil sample taken from Boring B-5. Laboratory test results are shown on Table No. 2.

3.0 FIELD AND LABORATORY TEST RESULTS

3.1 SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered in the borings are presented in the Boring Logs in Attachment C. Strata divisions shown on the boring logs were estimated based on visual examination of the recovered boring samples. In the field, strata changes could occur gradually and/or at slightly different levels than indicated. Generalized subsurface conditions, based on the finds of the borings, are described below.

Beneath approximately 6 inches of topsoil, the underlying soils predominantly consisted of granular materials having non-plastic silt or low-plastic clay fines. These soils were classified as SM, SM-SC, SC, and SM-SP soil types. The less fines content soils (SM-SP) commonly were found after depths of 17 ft. below ground surface. At Boring B-5, the SM-SP soils were encountered after 4 ft. below ground level.

Some minor random cohesive (CL & ML) layers and seams were encountered in some of the borings and were commonly layered with the granular SC soil types.

The majority of the granular soils were medium dense with standard penetration resistance values of 11 blow per foot (bpf) to 38 bpf. Loose granular soils (Standard Penetration Resistance values ranging from 8 bpf to 10 bpf) typically were found near the ground surface and dense to very dense granular soils (47 to 77 blows per foot) were found in association with a trace of gravel in the soil matrix.

Groundwater conditions were noted during drilling and also measured several days after drilling. Table No. 1 shows the static groundwater levels measured several days after drilling. At that time, Borings B-1 and B-4 were dry, Borings B-2, B-3 and B-5 had water levels ranging from 19.06 ft. to 36.02 ft. below the top of

the piezometer casing. The existing well outside of the demolition landfill had a water level 54.26 ft. below the top of the casing.

Although groundwater was not found in Borings B-1 and B-4, water was noted on the drilling rods during drilling at depths of 40 ft. and 42 ft. below ground level.

3.2 TEST RESULTS

Based on the laboratory test results, the following soil types, have the indicated range of percent volume water (moisture contents), fines content and Atterberg Limit Test results:

<u>Soil Type</u>	<u>Moisture Content, %</u>	<u>% Fines (<#200)</u>	<u>Atterberg Limits, %</u>		
			<u>LL</u>	<u>PL</u>	<u>PI</u>
SM-SP	4.3-12.0	9.9-12.9	None Plastic		
SM	11.6-21.7	19.8-25.4	25	22	3
SM-SC	12.1-12.9	21.3-28.4	26-30	21	5-9
SC-CL	12.9-29.0	*28.4-29.2	33-48	20-26	22-12

* Only applies to SC soil types.

Figure No. 4 shows the various depths of these material types at the various boring locations.

Laboratory testing also included one permeability test on the SC-CL soil type at Boring B-5. The permeability and dry density were 6.7×10^{-6} cm/s and 117.0 pcf, respectively.

In the field, horizontal coefficient of permeability of the water bearing soils in Borings B-2, B-3 and B-5 were estimated. These water bearing zones were underlain by the SC soil types that typically have a lower vertical coefficient of permeability (6.7×10^{-6} cm/s).

In general, the SM and SM-SP soils had a horizontal coefficient of permeability of 2.6×10^{-4} cm/s to 5.5×10^{-4} cm/s in Borings B-2 and B-5. The SM-SC soils at Boring B-3 had a coefficient of permeability of 1.7×10^{-5} cm/s.

4.0 EVALUATIONS AND RECOMMENDATIONS

4.1 GENERAL HYDROGEOLOGY

Subsurface soils predominantly consist of granular soils having varying amounts of silt and clay fines. The more clayey sands have cohesive clay layers.

Two groundwater conditions were noted. The upper groundwater condition appears to be a result of water perched at or above the more clayey sands that were encountered generally after depths of 22 ft. to 38 ft. below ground level.

This semi-aquitard appeared variable in texture and permeability. In Borings B-2, B-3 and B-5, static groundwater was observed above these less permeable zones at approximately 21 ft. to 38 ft. below ground surface. During drilling at Borings B-1 and B-4, water was noted immediately above these less permeable zones at depths of 38 ft. to 42 ft. below ground level. However, no water was noted in these piezometers several days after drilling.

The laboratory and field observations and testing generally indicate that the semi-aquitard had a higher clay content and higher plasticity index where perched water was noted in the piezometers than at the areas where no perched ground water was noted. Conditions that may also influence the presents of perched water is lateral extent of the semi-aquitard. These layers may not be connected and the lateral extent of each zone could vary.

The following table lists the elevations of the anticipated minimum groundwater depth at each boring. The observed water levels in the three piezometers and the depth of the suspected semi-aquitard at other locations were used for the water level elevations.

<u>Boring No.</u>	<u>Water Elev., ft.</u>
B-1	229
B-2	237
B-3	233
B-4	228
B-5	227

The semi-aquitard was estimated to have a vertical coefficient of permeability of 6.7×10^{-6} cm/s for the undisturbed sample taken at Boring B-5. This sample also had a dry density of 117.0 pound per cubic foot and a volume percent water (moisture content) of 15.5. Volume percent water also varied from 14.0 to 18.5 percent at other borings. The porosity was determined at 0.293.

Based on the down hole permeability tests at Boring B-2, B-3 and B-5, the overlying more pervious soils have a horizontal coefficient of permeability of 2×10^{-4} cm/s to 1×10^{-5} cm/s. Volume percent water varied from 21.6 to 21.9 percent within this layer. Assuming saturated conditions, the porosity is estimated at approximately 0.22.

There is insufficient information to accurately determine the direction of the upper groundwater, due to the variable permeability and possible lateral extent of the semi-aquitard. Because of the semi-pervious nature of this semi-aquitard, it is anticipated that this perched water will eventually percolate downward to the lower groundwater table.

The lower groundwater table was found at elevation 194.2 ft. at the exist well. This water level is approximately 4 to 6 ft. higher than the surface water level at the intersection of Nicholson and Rockfish Creeks (see Figure No. 5). Based on the existing monitoring well and utilization of the USGS Nicholson Creek Quadrangle Map, the lower groundwater table appears to move in a southeast direction towards the intersection of Nicholson Creek and Rockfish Creek with a hydraulic gradient of approximately 0.003 ft./ft.

4.2 PROPOSED MONITORING WELL SYSTEM

At the Construction & Demolish Debris Landfill site, two groundwater systems were encountered. The upper groundwater system is a result of a semi-aquitard. Since groundwater perched above this layer will eventually reach the lower groundwater table, it is recommended that the lower groundwater table be monitored. The well should be cased and sealed at and above the semi-aquitard.

Based on the estimated directional trend of the lower groundwater table, the existing up gradient monitoring well for the existing Solid Waste Landfill can be used for the down gradient monitoring for the Construction & Demolition Debris Landfill. One additional well for up gradient testing is proposed along the west side of the demolition landfill (see Figure No.6).

The proposed new up gradient well will provide better data for determining the exact flow direction of the lower ground water. If the water level in this new well is lower than the existing monitoring well, then groundwater movement is in a more westerly direction, and this new well is more in line and down gradient from the demolition landfill than the existing monitoring well. Should this situation occur, a third up gradient well should be installed near the northeast corner of the demolition landfill.

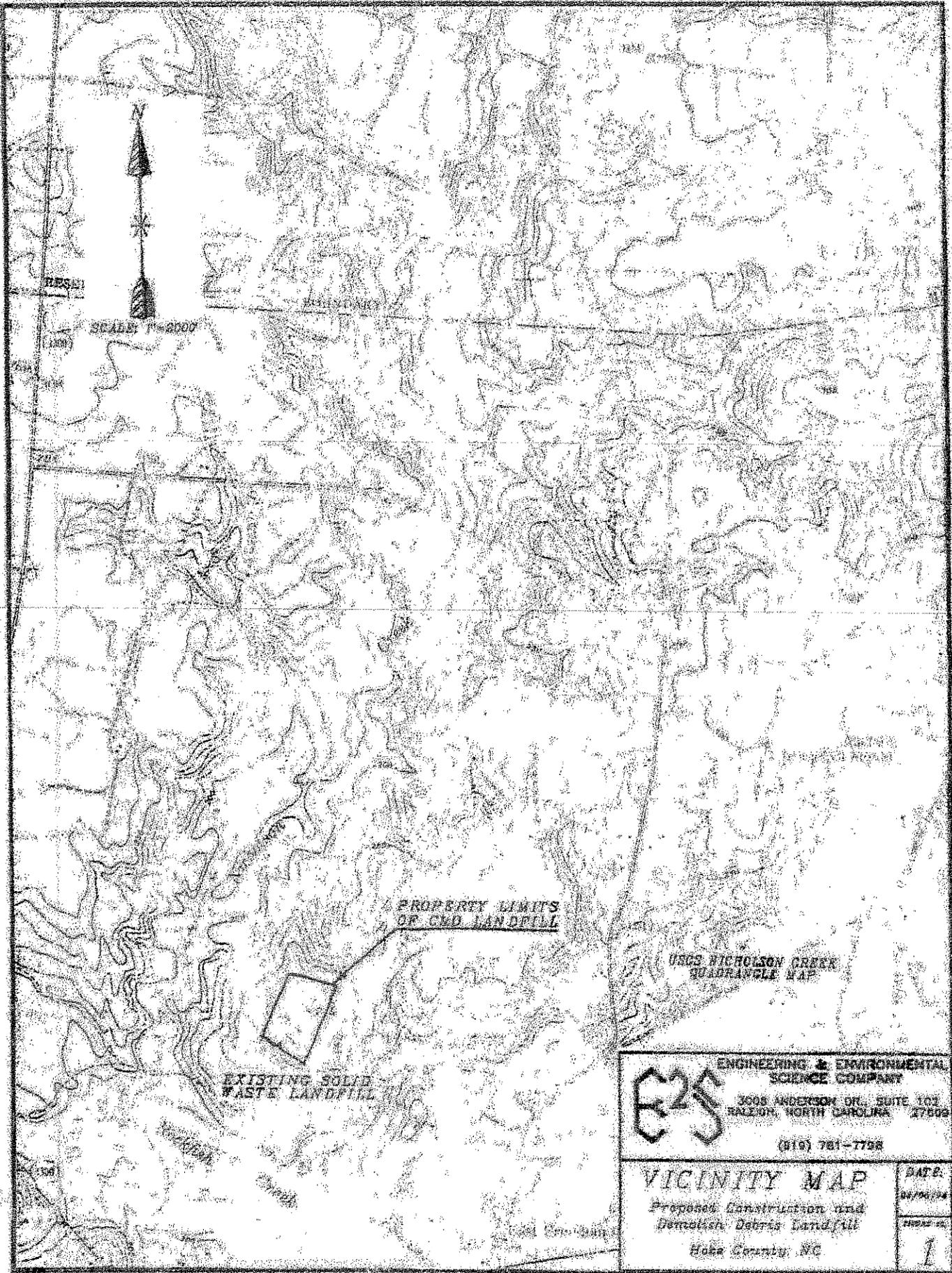
4.3 SOIL COVER MATERIALS

With the existing adjacent Solid Waste Landfill closure, evaluation of the coefficient of permeability of the surficial soils was conducted by E²S and the information was provided in the report dated November 22, 1993. Degree of compaction to achieve a coefficient of permeability of at least 1×10^{-5} cm/sec. is 98 percent of standard Proctor maximum dry density (ASTM-D-698). Testing was conducted on the shallow SM, SM-SC and SC soil types. These soils commonly were found from below the topsoil to depths of at least 17 ft. below ground level.

To achieve 98 percent compaction, in-place density of these soils will need to be compacted to a dry density of 114.8 to 119.1 pounds per cubic foot. This correlates to a porosity of approximately 0.298 to 0.280.

ATTACHMENT A

Figures



PROPERTY LIMITS
OF C&D LANDFILL

EXISTING SOLID
WASTE LANDFILL

USGS NICHOLSON CREEK
QUADRANGLE MAP



ENGINEERING & ENVIRONMENTAL
SCIENCE COMPANY

3005 ANDERSON DR., SUITE 101
RALEIGH, NORTH CAROLINA 27609

(919) 781-7758

VICINITY MAP

Proposed Construction and
Demolish Debris Landfill

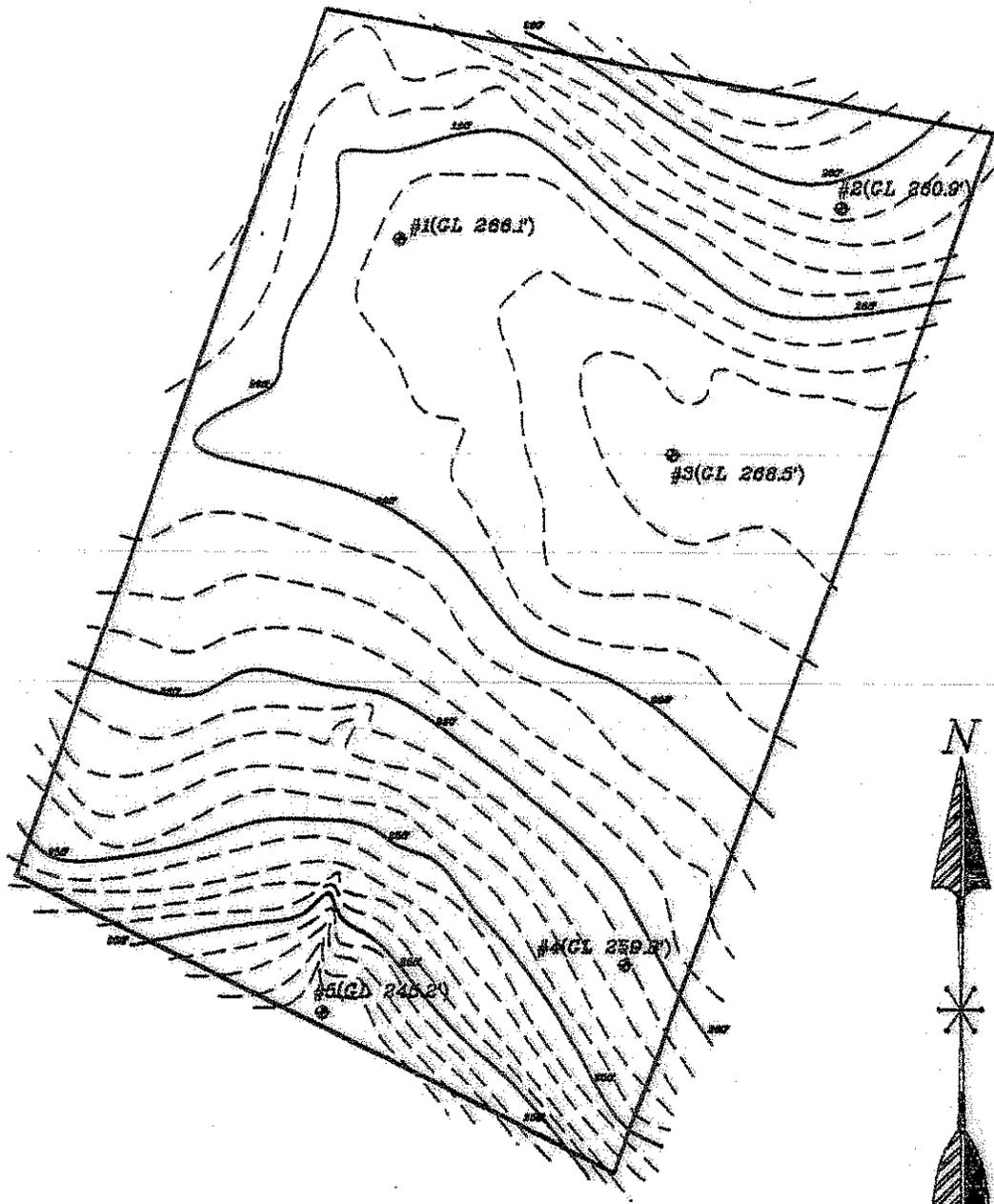
Hoke County, NC

DATE:
08/06/04

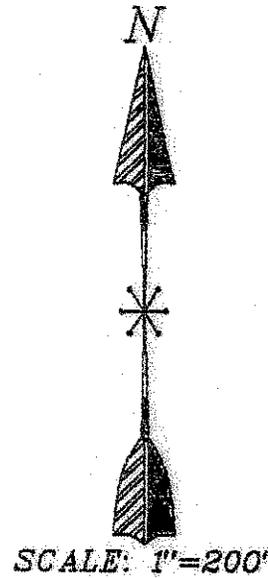
PROJECT NO.

1

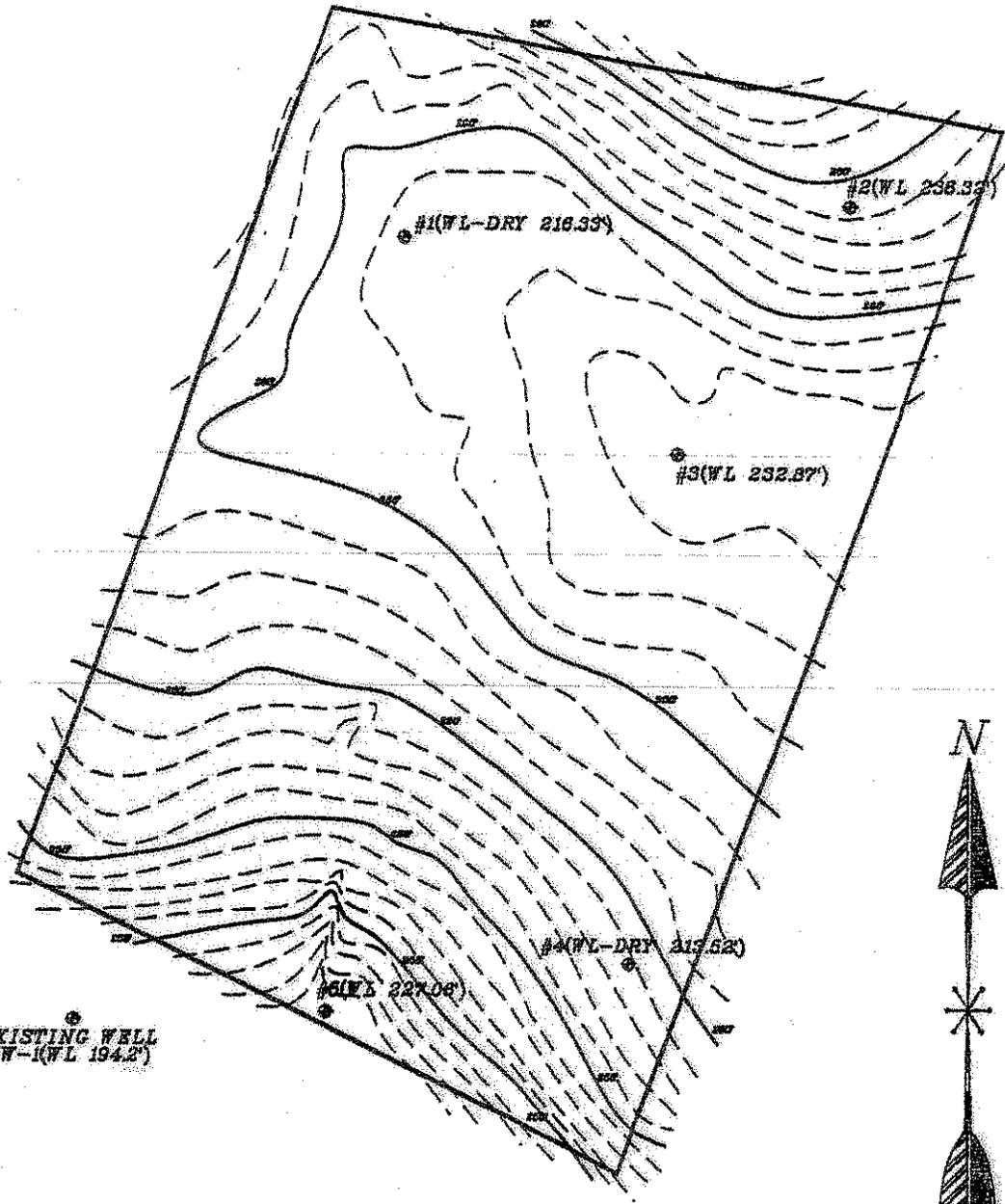
E&S



NOTE: GL 268.5' INDICATES GROUND LEVEL
AT EACH BORING ELEVATION



	ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY	
	3008 ANDERSON DR., SUITE 102 RALEIGH, NORTH CAROLINA 27609 (919) 781-7798	
BORING LOCATION		DATE: 04/01/04
Demolition Landfill Hoke County, NC		PAGE NO. 2



EXISTING WELL
MW-1 (WL 194.2')

NOTE: WL 194.2' INDICATED WATER
ELEVATION

N
SCALE: 1"=200'

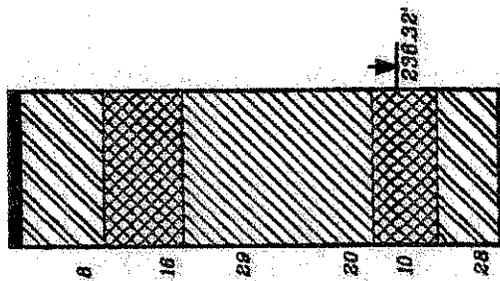
	ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY	
	3008 ANDERSON DR., SUITE 102 RALEIGH, NORTH CAROLINA 27608 (919) 781-7798	
WATER ELEVATIONS	DATE: 04/01/04	FIGURE NO. 3
Demolition Landfill Hoke County, NC		

E2S

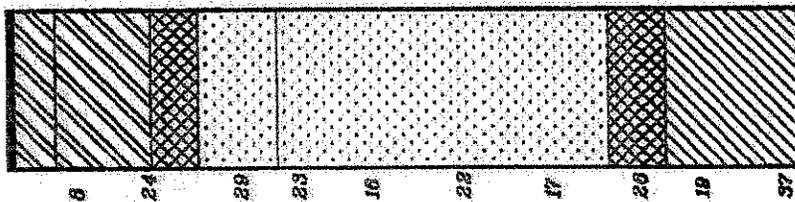
ELEVATION
(ft)



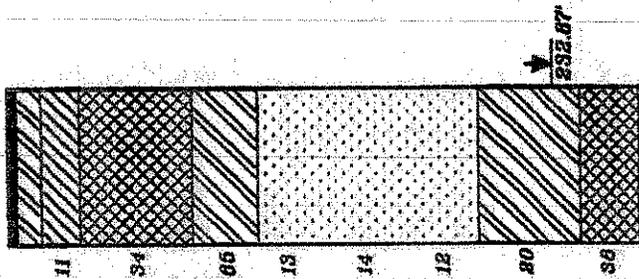
B-2



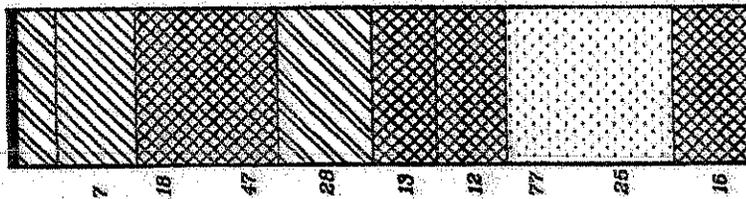
B-1



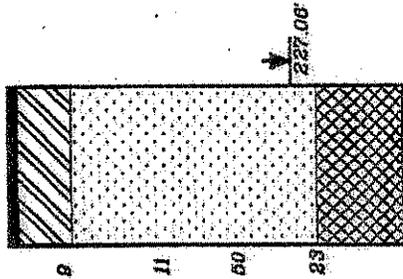
B-3



B-4



B-5



NOTES:

NUMBER ON LEFT OF BORING REPRESENTS STANDARD PENETRATION TEST (BLOWS PER FOOT)

↓ INDICATES MEASURED WATER LEVEL

LEGEND

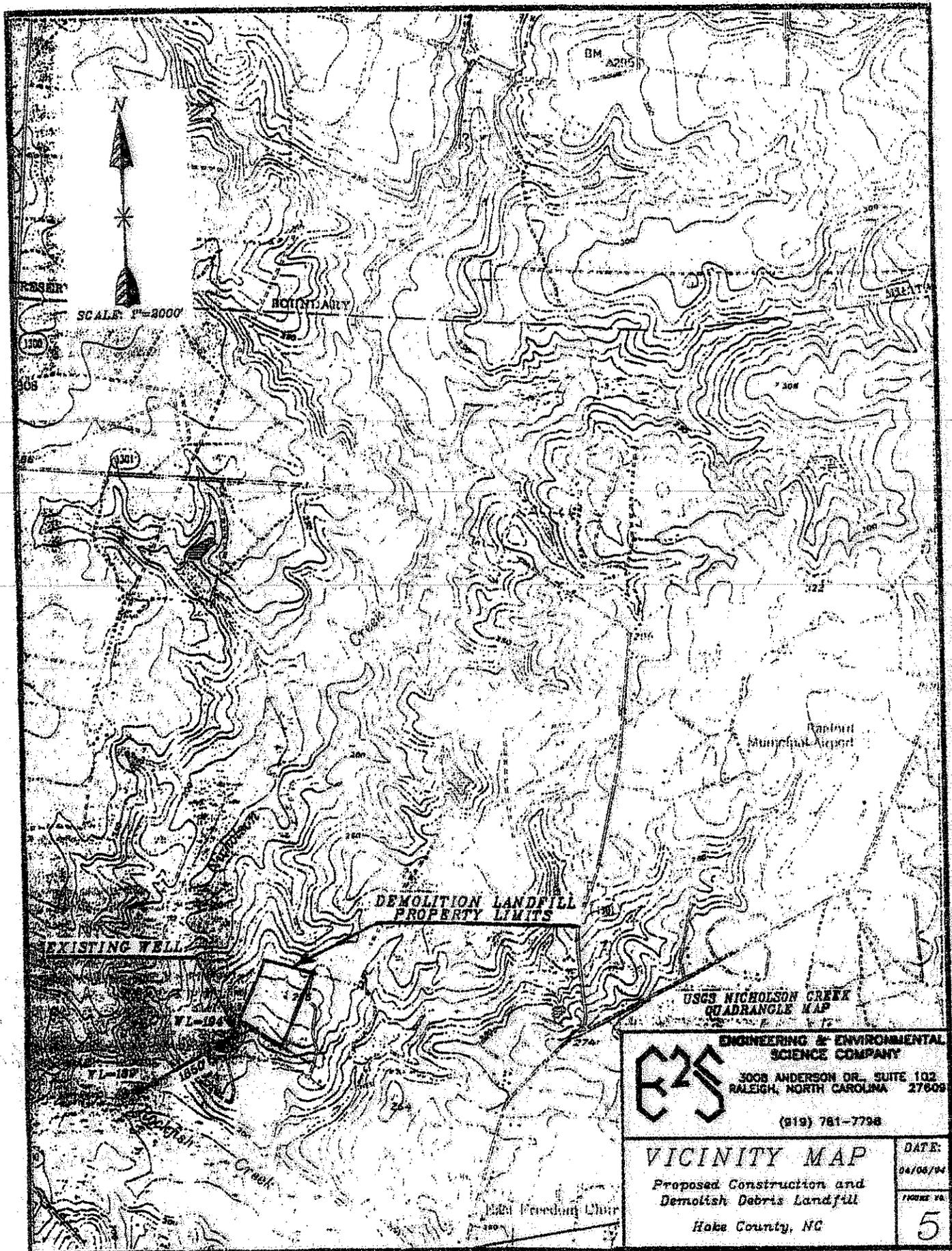
SOIL TYPE	MOISTURE CONTENT, %	PLASTICITY INDEX, PI	ATTERBERG LIMITS, %
TOPSOIL	—	—	—
SM-SF	4.5-18.0	8.0-18.9	NONE PLASTIC
SM	11.9-21.7	18.8-25.4	86 22 6
SM-SC	12.1-19.9	21.9-30.4	24-30 21 6-9
SC & CL	12.5-26.0	25.4-32.2	35-48 20-48 22-12

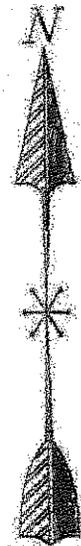
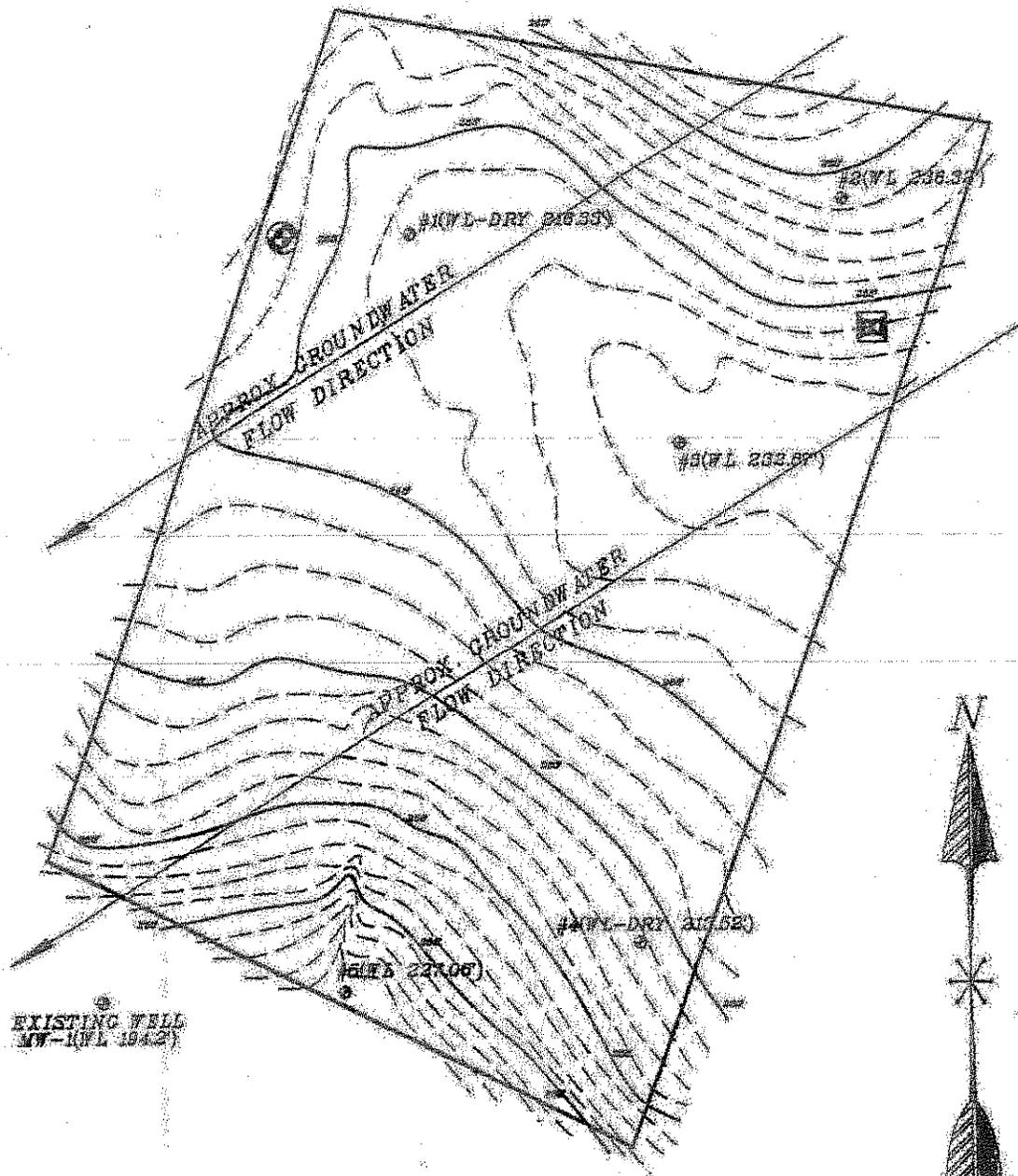
* ONLY APPLIES TO SC SOIL TYPES

ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY
 3008 ANDERSON DR., SUITE 102
 RALEIGH, NORTH CAROLINA 27606
 (919) 761-7798

STRATAGRAPHIC CROSS-SECTION
 Demolition Landfill
 Hoke County, NC

DATE: 04/07/04
 SHEET NO. 4





SCALE: 1"=200'

NOTES:

- ⊙ INDICATES PROPOSED WELL LOCATION
- ⊠ INDICATES POSSIBLE WELL LOCATION

	ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY	
	3008 ANDERSON DR., SUITE 103 RALEIGH, NORTH CAROLINA 27609	
(919) 781-7798		DATE: 06/01/04
PROPOSED MONITORING WELL LOCATION		DRAWING NO. 6
Demolition Landfill Hoke County, NC		

ATTACHMENT B

Tables

Table No. 1: Water Level Elevations & Downhole Permeability Tests Results

Boring No.	Elevation, ft.	Water, ft.	Elevation, ft.	Down Hole Perm., cm/s
B-1	266.31	Dry-49.98	>216.33	
B-2	261.21	24.89	236.32	2.6×10^{-4}
B-3	268.89	36.02	232.87	1.7×10^{-5}
B-4	260.63	Dry-47.11	>213.52	
B-5	246.12	19.06	227.06	5.5×10^{-4}
Existing Well	248.50	54.26	194.2	

TABLE NO. 2: Laboratory Test Results

Boring No.	Sample Depth, ft.	Moisture Content, %	% Passing No. 200 Sieve	Atterberg Limits, %		
				LL	PL	PI
B-1	3.5- 5.0	14.8	19.8	25	22	3
	8.5- 9.5	15.6				
	9.5-10.0	14.9				
	13.5-15.0	4.3	10.6			
	23.5-25	8.4	9.9			
	33.5-35	21.9	10.1			
	38.5-40	17.7	25.2	33	21	12
	48.5-50	12.0	12.9			
B-2	8.5-10.0	12.9	28.4	41	25	16
	13.5-15.0	12.1	21.3	31	24	16
	28.5-30.0	14.0		40	22	18
B-3	23.5-25.0	9.1	11.0			
	33.5-35.0	21.7	25.4	26	21	5
	38.5-40.0	15.1	25.2	39	20	19
B-4	3.5- 5.0	11.6				
	8.5-10.0	13.4	29.2			
	23.5-25.0	5.2	29.0			
	38.5-40	7.0	11.7			
	43.5-45	18.5	21.6			
B-5	13.5-15	8.0	10.9			
	18.5-20	21.6		48	26	22
		Wet Density, pcf	Moisture Content, %	Dry Density pcf	Coef. of Perm. cm/s	
B-5	23' - 25'	135.2	15.5	117.0	6.7×10^{-6}	

ATTACHMENT C

Boring Logs

CLIENT: Hebbs Henschel & Associates

BORING NO: B-1 DATE: 02/18/94

PROJECT NAME: Demolition Landfill

JOB NO: _____

PROJECT LOCATION: Hoke County, NC

STATION: _____

BORING METHOD: 4 1/2" HSA

FOREMAN: Sanford Swearing

ROCK CORE DIA: N/A

INSPECTOR: Pat Shillington

SHELBY TUBE O.D: 3" Dia.

DEPTH (ft)	DESCRIPTION & REMARKS	STRATUM, ft	SAMPLE NUMBER	**SPT		SOIL, PPM	MOISTURE CONTENT, %	CALIBRATED PENETROMETER TSP	PIEZOMETER DIAGRAM EL 288.3T
				BLOWS/6 in	RECOVER %				
SURFACE ELEVATION: <u>288.1 ft.</u>									
----- TOPSOIL -----									
0.5	Loose, gray silty medium SAND(SM), moist	0.5							
6	Medium dense, brown silty fine SAND(SM), moist	3.0	1	3 3-3	90				
10	Very stiff, brown, gray, & maroon silty CLAY(CL), moist with sandy zones (SC)	9.5	2	4 8-18	95				
15	Medium dense, light brown silty medium to coarse SAND(SM-SP), moist, trace of mica	12.0	3	9 14-15	100				
20	Medium dense, brown minor maroon, and light gray silty fine SAND(SM-SP), moist, trace of mica	17.0	4	6 11-12	85				
25			5	7 8-8	90				
30	Sand grades to coarse after 28'		6	8 9-13	85				
35			7	8 8-9	90				

(CONTINUED ON NEXT PAGE)

BORING METHOD

- HSA - HOLLOW STEM AUGER
- CPA - CONTINUOUS FLIGHT AUGER
- DC - DRIVEN CASING
- MD - MUD DRILLING
- RC - ROCK CORING

ORGANIC VAPOR METER,
PARTS PER MILLION

STANDARD PENETRATION TEST

GROUND WATER

- ▽ NOTED ON RODS 40 FT. AFTER _____ HRS. _____ FT.
- ▽ AT COMPLETION DRY FT. AFTER _____ HRS. _____ FT.
- ▽ AFTER 664 HRS. DRY FT. AFTER _____ HRS. _____ FT.

CLIENT: Hobbs Uphurch & Associates

BORING NO: B-1 DATE: 02/18/94

PROJECT NAME: Demolition Landfill

JOB NO:

PROJECT LOCATION: Wake County, NC

STATION:

BORING METHOD: 4 1/2" HSA

FOREMAN: Sanford Sweating

ROCK CORE DIA: N/A

INSPECTOR: Pat Skillington

SHELBY TUBE O.D.: 3" Dia

DEPTH (ft)	DESCRIPTION & REMARKS	STRATUM DEPTH, ft.	SAMPLE NUMBER	**SPT		%M. PPM	MOISTURE CONTENT, %	CALIBRATED PENETROMETER TSP	PIEZOMETER DIAGRAM
				BLOWS/6 IN.	RECOVERY %				
SURFACE ELEVATION: 266.1 ft									
38.0'	Medium dense, brown minor maroon, and light gray silty fine to coarse SAND(SM-SP), moist, trace of mica								
40'	Medium dense, gray clayey medium SAND(SC), very moist, trace of mica		8	9	100				
				11-15					
42.0'									
45'	Medium dense to dense, brown and light gray silty fine to medium SAND(SM-SP), very moist		9	8	85				
				9-10					
50'			10	10	80				
				12-23					

LEGEND

- SOIL BACKFILL
- 2" PVC SOLID PIPE
- SAND PACK
- 2" PVC No.10 SCREEN

BORING METHOD

- HSA - HOLLOW STEM AUGER
- CFA - CONTINUOUS FLIGHT AUGER
- DC - DRIVEN CASING
- MD - MUD DRILLING
- RC - ROCK CORING

- ORGANIC VAPOR METER, PARTS PER MILLION
- STANDARD PENETRATION TEST

GROUND WATER

- NOTED ON RODS 40 FT. AFTER _____ HRS. _____ FT.
- AT COMPLETION DRY FT. AFTER _____ HRS. _____ FT.
- AFTER 246 HRS. DRY FT. AFTER _____ HRS. _____ FT.

CLIENT: Hobbs Hinchurch & Associates BORING NO.: B-2 DATE: 02/16/94
 PROJECT NAME: Demolition Landfill JOB NO.: _____
 PROJECT LOCATION: Hoke County, NC STATION: _____
 BORING METHOD: 4 1/2" HSA FOREMAN: Sanford Smeeting
 ROCK CORE DIA: N/A INSPECTOR: Pat Shillington
 SHELBY TUBE O.D.: 3" Dia

DEPTH (ft)	DESCRIPTION & REMARKS	STRAVIN DEPTH, ft.	SAMPLE NUMBER	**SPT		%W, PPM	MOISTURE CONTENT, %	CALIBRATED PENETROMETER TEST	PIEZOMETER DIAGRAM EL. 281.21'
				BLOKS/6 ft.	RECUV INCH *				
SURFACE ELEVATION: <u>260.9 ft.</u>									
TOPSOIL									
0.5'	Loose, brown silty fine to medium SAND(SM), moist to very moist								
6'			1	3 4-4	80				
6.0'	Medium dense, brown and reddish-brown clayey fine SAND(SC), moist, trace of mica								
10'			2	8 8-8	90				
11.0'									
15'	Medium dense, brown and reddish-brown clayey silty fine to medium SAND(SM-SC), moist to very moist								
15'			3	10 12-17	100				
20'									
20'			4	6 10-10	95				
23.0'									
25'	Medium dense, reddish-brown and light gray silty coarse SAND(SM), wet, trace of mica								
25'			5	4 4-8	95				
27.0'									
30'	Medium dense, reddish-brown and light gray clayey coarse SAND(SC), moist, trace of mica, random CLAY(GL) layers								
30'			6	35 9-19	95				
31.0'									

LEGEND:

- SOIL BACKFILL
- SAND PACK
- 2" PVC SOLID PIPE
- 2" PVC No.10 SCREEN

BORING METHOD

HSA - HOLLOW STEM AUGER
 CFA - CONTINUOUS FLIGHT AUGER
 DC - DRIVEN CASING
 MD - MUD DRILLING
 RC - ROCK CORING

*ORGANIC VAPOR METER, PARTS PER MILLION
 **STANDARD PENETRATION TEST

GROUND WATER

NOTED ON RODS 27.0 FT. AFTER _____ HRS. _____ FT.
 AT COMPLETION _____ FT. AFTER _____ HRS. _____ FT.
 AFTER 302 HRS. 24.6 FT. AFTER _____ HRS. _____ FT.

CLIENT: Hobbs, Upchurch & Associates

BORING NO.: B-3 DATE: 02/17/04

PROJECT NAME: Demolition Landfill

JOB NO.:

PROJECT LOCATION: Wake County, NC

STATION:

BORING METHOD: 4 1/2" HSA

FOREMAN: Sanford Sweating

ROCK CORE DIA: N/A

INSPECTOR: Pat Shillington

SHELBY TUBE O.D.: 3" Dia

DEPTH (ft)	DESCRIPTION & REMARKS	STATION DEPTH ft.	SAMPLE NUMBER	**SPT		%M. PPM	MOISTURE CONTENT %	CALIBRATED PENETROMETER TYP.	PIEZOMETER DIAGRAM EL. 288.89'
				BLOWS/ft.	RECOVERY %				
SURFACE ELEVATION: 288.5 ft.									
	Topsoil	0.8'							
	Loose, brown silty fine to medium SAND(SM), moist	2.5'							
5	Medium dense, reddish-brown clayey silty fine SAND(SM-SC), moist		1	5 5-6	90				
		6.0'							
10	Dense, brown, minor reddish-brown mottling clayey fine SAND(SC), moist		2	9 11-23	80				
		12.0'							
16	Dense, light gray and light brown, minor red silty fine SAND(SM), moist, trace of mica		3	15 25-10	80				
		17.0'							
20	Medium dense, reddish-brown and light gray silty coarse SAND(SM-SP), very moist		4	6 6-7	100				
25			5	5 8-8	100				
30	Minor light gray clayey SAND(SC) seams after 27'		6	4 8-8	95				
		31.0'							
35	Medium dense, maroon and light gray silty clayey micaceous fine SAND(SM-SC), very moist		7	3 4-18	90				

(CONTINUED ON NEXT PAGE)

BORING METHOD

HSA - HOLLOW STEM AUGER
 CFA - CONTINUOUS FLIGHT AUGER
 DC - DRYHOLE CASING
 MD - MUD DRILLING
 RC - ROCK CORING

ORGANIC VAPOR METER,
 PARTS PER MILLION
 STANDARD PENETRATION TEST

GROUND WATER

NOTED ON RODS 33 FT. AFTER HRS. FT.
 AT COMPLETION FT. AFTER HRS. FT.
 AFTER 880 HRS. 35.8 FT. AFTER HRS. FT.

CLIENT: Hobbs, Upchurch & Associates BORING NO.: B-9 DATE: 02/17/04
 PROJECT NAME: Demolition Landfill JOB NO.: _____
 PROJECT LOCATION: Hoke County, NC STATION: _____
 BORING METHOD: 4 1/2" HSA FOREMAN: Sanford Susetingo
 ROCK CORE DIA: N/A INSPECTOR: Pat Shallington
 SHELBY TUBE O.D.: 3" Dia.

DEPTH (ft)	DESCRIPTION & REMARKS	STRATUM DEPTH, ft.	SAMPLE NUMBER	**SPT		NO. OF BLOWN	MOISTURE CONTENT, %	CALIBRATED PENETROMETER	PIEZOMETER DIAGRAM
				BLOCKS/ft.	RECOVERY %				
	SURFACE ELEVATION: <u>268.5 ft.</u>								
36.0	Dense, gray minor brown and dark red mottling clayey medium to coarse SAND(SC), moist, trace of mica	42.0	8	14	80				
40				15-23					
45									
50									
55									
60									
65									
70									

LEGEND

- SOIL BACKFILL
- 2" PVC SOLID PIPE
- SAND PACK
- 2" PVC No.10 SCREEN

BORING METHOD

HSA - HOLLOW STEM AUGER
 CFA - CONTINUOUS FLIGHT AUGER
 DC - DRIVEN CASING
 MD - MUD DRILLING
 RC - ROCK CORING

ORGANIC VAPOR METER
 PARTS PER MILLION
 STANDARD PENETRATION TEST

GROUND WATER

NOTED ON RODS 33 FT. AFTER _____ HRS. _____ FT.
 AT COMPLETION _____ FT. AFTER _____ HRS. _____ FT.
 AFTER 960 HRS. 35.6 FT. AFTER _____ HRS. _____ FT.

CLIENT: Hobbs, Upchurch & Associates BORING NO.: B-4 DATE: 02/17/94
 PROJECT NAME: Demolition Landfill JOB NO.: _____
 PROJECT LOCATION: Hoke County, NC STATION: _____
 BORING METHOD: A 1/2" HSA FOREMAN: Sanford Sweeting
 ROCK CORE DIA: N/A INSPECTOR: Pat Shillington
 SHELBY TUBE O.D.: 3" Dia

DEPTH (ft)	DESCRIPTION & REMARKS	STRATUM DEPTH, ft.	SAMPLE NUMBER	**SPT		% W, PPM	MOISTURE CONTENT, %	CALIBRATED PENETROMETER (PSF)	PIEZOMETER DIAGRAM EL. 280.63'
				BLOWS/ft	RECOVERY %				
SURFACE ELEVATION: <u>259.8 ft</u>									
TOPSOIL									
0.5'	Loose, brown silty fine SAND(SM), moist	0.5'							
2.5'	Loose, reddish-brown silty clayey fine SAND(SM-SC), moist	2.5'	1	3 3-4	95				
6.0'		6.0'							
10.0'	Medium dense to very dense, brown and reddish-brown clayey medium SAND(SC), moist	10.0'	2	8 12-16	75				
16.0'		16.0'							
17.0'		17.0'	3	11 23-26	66				
20.0'	Medium dense to dense, brown and light gray silty medium to coarse SAND(SM), moist	20.0'							
23.0'		23.0'	4	9 13-15	95				
25.0'	Medium dense, gray and maroon clayey coarse SAND(SC), moist	25.0'							
27.0'		27.0'	5	4 6-7	100				
30.0'	Medium dense, alternating layers of reddish brown silty medium SAND(SM), maroon clayey SILT(ML), and light gray clayey fine SAND(SC), moist	30.0'							
31.0'		31.0'	6	11 8-8	100				
35.0'	Very dense, reddish-brown silty fine to medium SAND(SM-SP), moist, trace of gravel Gravel content increases after 34 ft.	35.0'							
35.0'	(CONTINUED ON NEXT PAGE)		7	8 27-50	40				

BORING METHOD

HSA - HOLLOW STEM AUGER
 CPA - CONTINUOUS FLIGHT AUGER
 DC - DRIVEN CASING
 MD - MUD DRILLING
 RC - ROCK CORING

ORGANIC VAPOR METER,
 PARTS PER MILLION
 -STANDARD PENETRATION TEST

GROUND WATER

NOTED ON RODS 42 FT. AFTER _____ HRS. _____ FT.
 AT COMPLETION _____ FT. AFTER _____ HRS. _____ FT.
 AFTER 332 HRS. DRY FT. AFTER _____ HRS. _____ FT.

CLIENT: Hobbs, Hinchurch & Associates BORING NO.: B-4 DATE: 02/17/04
 PROJECT NAME: Demolition Landfill JOB NO.: _____
 PROJECT LOCATION: Hoke County, NC STATION: _____
 BORING METHOD: A 1/2" HSA FOREMAN: Sanford Smaeting
 ROCK CORE DIA: N/A INSPECTOR: Pat Shillington
 SHELBY TUBE O.D.: 3" Dia

DEPTH (ft)	DESCRIPTION & REMARKS	STRAUM DEPTH, ft.	SAMPLE NUMBER	**SPT		COV. PPM	MOISTURE CONTENT, %	CALIBRATED PENETROMETER USE	PIEZOMETER DIAGRAM
				BLOWS/8 in.	RECOVERY %				
SURFACE ELEVATION: <u>259.8 ft.</u>									
40	Medium dense, reddish-brown silty fine to medium SAND(SM-SP), moist, trace of gravel		8	30 15-10	80				
45	Medium dense, gray clayey medium SAND(SC), wet, trace of mica	42.0'	9	7 7-9	100				
50		47.0'							LEGEND
55									
60									
65									
70									

BORING METHOD
 HSA - HOLLOW STEM AUGER
 CPA - CONTINUOUS FLIGHT AUGER
 DC - DRIVEN CASING
 MD - MUD DRILLING
 RC - ROCK CORING

ORGANIC VAPOR METER, PARTS PER MILLION
 STANDARD PENETRATION TEST

GROUND WATER
 NOTED ON RODS 42 FT. AFTER _____ HRS. _____ FT.
 AT COMPLETION _____ FT. AFTER _____ HRS. _____ FT.
 AFTER 992 HRS. DRY FT. AFTER _____ HRS. _____ FT.

CLIENT: Hobbs Upphauch & Associates BORING NO.: B-5 DATE: 02/17/04
 PROJECT NAME: Demolition Landfill JOB NO.: _____
 PROJECT LOCATION: Hoke County, NC STATION: _____
 BORING METHOD: 4 1/2" HSA FOREMAN: Sanford Sweeting
 ROCK CORE DIA: N/A INSPECTOR: Pat Skillington
 SHELBY TUBE O.D.: 3" Dia

DEPTH (ft)	DESCRIPTION & REMARKS	STRAUM METER, ft.	SAMPLE NUMBER	**SPT		ORG. PPM	MOISTURE CONTENT, %	CALIBRATED PENETROMETER TSP	PIEZOMETER DIAGRAM EL. 248.12'
				BLOWS/6 in.	RECOVERY %				
SURFACE ELEVATION: <u>245.2 ft.</u>									
----- TOPSOIL -----									
0.5'	Loose, gray silty medium SAND(SM), moist, trace of fine pebbles								
4.0'			1	3 6-3	100				
5'	Loose to dense, reddish-brown silty fine SAND(SM-SP), moist								
10'	Sand grades to medium after 7'		2	10 5-6	80				
15'	Trace of gravel after 14'		3	16 25-25	65				
19.5'			4	8 8-15	90				
20'	Very stiff to hard, gray silty CLAY(CL), moist, trace of sand								
25'		25.0'	5					+4.0	

NOTES:

Sample 5 is Shelby Tube Sample

LEGEND

-  -SOIL BACKFILL
-  -2" PVC SOLID PIPE
-  -SAND PACK
-  -2" PVC No.10 SCREEN

BORING METHOD

- HSA - HOLLOW STEM AUGER
- CFA - CONTINUOUS FLIGHT AUGER
- DC - DRIVEN CASING
- MB - MUD DRILLING
- RC - ROCK CORING

*ORGANIC VAPOR METER, PARTS PER MILLION

**STANDARD PENETRATION TEST

GROUND WATER

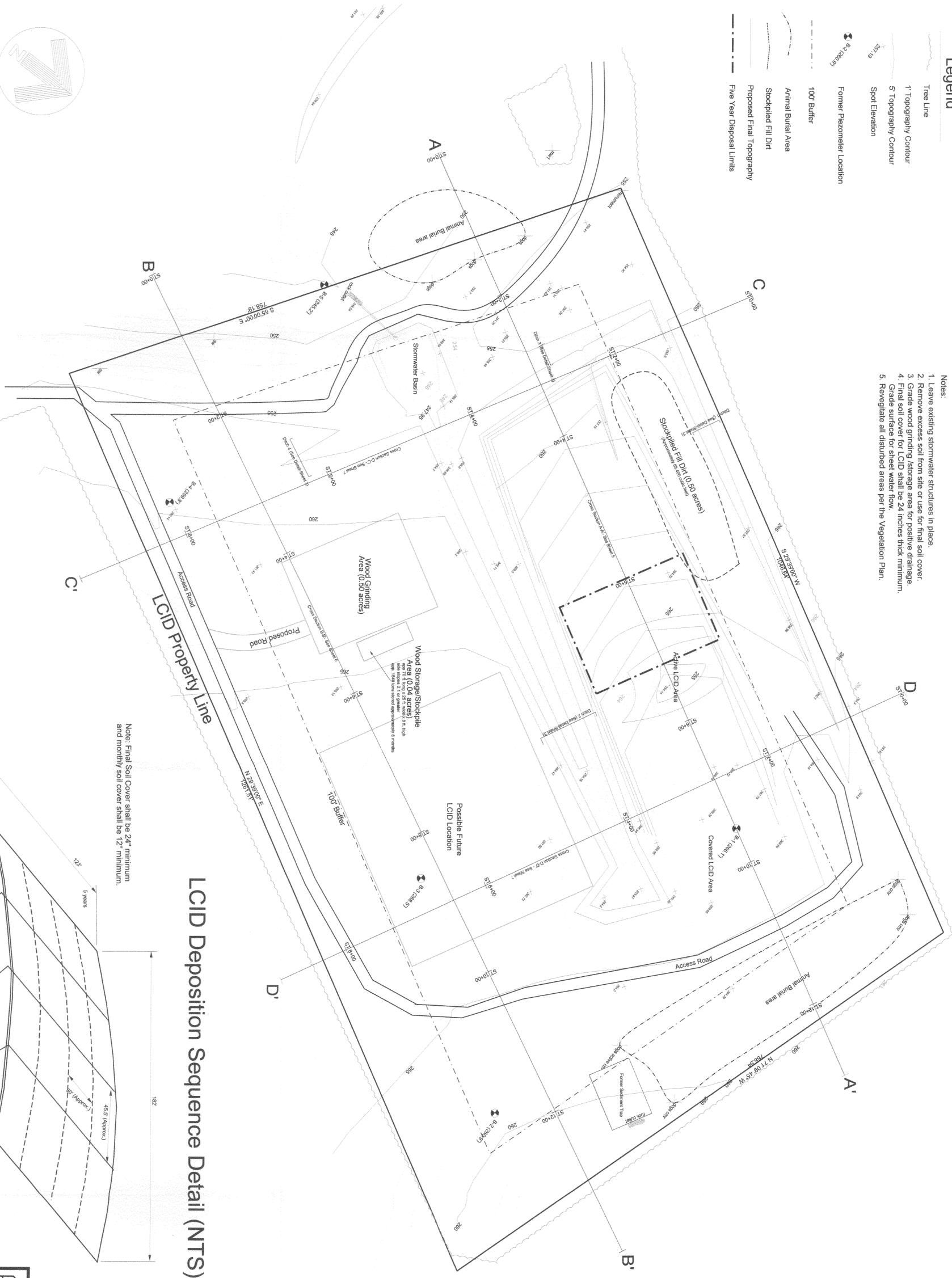
-  NOTED ON RODS 18.0 FT.  AFTER _____ HRS. _____ FT.
-  AT COMPLETION _____ FT.  AFTER _____ HRS. _____ FT.
-  AFTER 925 HRS. 18.14 FT.  AFTER _____ HRS. _____ FT.

Legend

- Tree Line
- 1' Topography Contour
- 5' Topography Contour
- Spot Elevation
- Former Piezometer Location
- 100' Buffer
- Animal Burial Area
- Stockpiled Fill Dirt
- Proposed Final Topography
- Five Year Disposal Limits

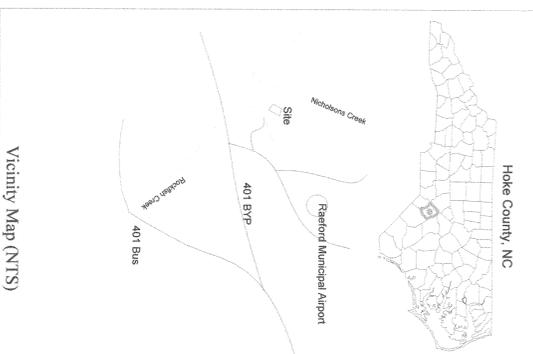
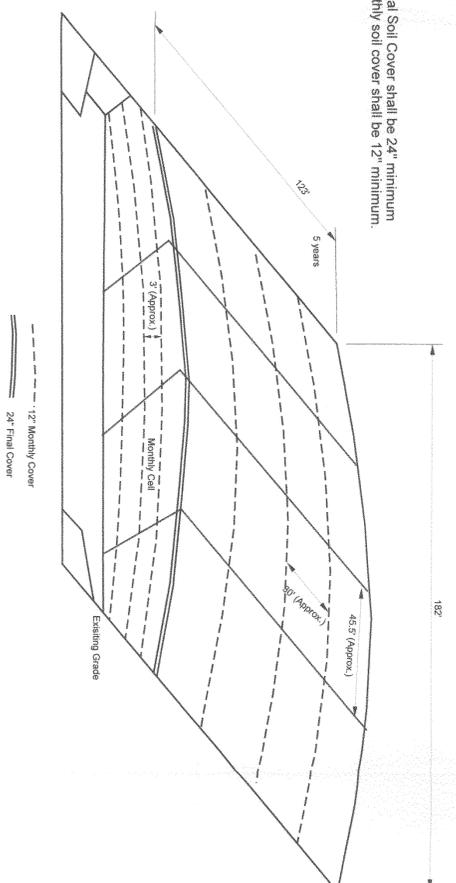
Closure Considerations

- Notes:
1. Leave existing stormwater structures in place.
 2. Remove excess soil from site or use for final soil cover.
 3. Grade wood grinding/storage area for positive drainage.
 4. Final soil cover for LCD shall be 24 inches thick minimum.
 5. Revegetate all disturbed areas per the Vegetation Plan.



Note: Final Soil Cover shall be 24" minimum and monthly soil cover shall be 12" minimum.

LCD Deposition Sequence Detail (NTS)



VEGETATION PLAN

1. Spread topsoil over disturbed areas and leave surface reasonably smooth and uniform.
2. Scarify surface to prepare a seedbed from topsoil, hedges deep, front end loader.
3. Mix lime and fertilizer with the soil during seedbed preparation.
4. Seed on freshly prepared seedbed following the application rates for the appropriate season.
5. Mutch all seeded areas immediately.
6. Track mutch on slopes 3:1 (Horizontal to Vertical) or steeper. Mutch on slopes 3:1 or steeper should be done using a front end loader. Mutch on slopes 3:1 or steeper may also be done on slopes.
7. Inspect seeded areas and make repairs within the planting season. If vegetation is over 60% damaged, repeat steps 2 through 5.
8. Permanent revegetation shall be accomplished at the specified time of the year. Temporary vegetation shall be applied outside of the optimal time for establishment of permanent vegetation.
9. Seeding Schedule:

TEMPORARY SEEDING SCHEDULE

Seeding Date:	August 15 to April 15
Rate:	120 lbs./acre
Rate:	10-10-10 Fertilizer
Rate:	2000 lbs./acre
Rate:	4000 lbs./acre
Seeding Date:	April 15 to August 15
Rate:	40 lbs./acre
Rate:	2000 lbs./acre
Rate:	4000 lbs./acre
Rate:	4000 lbs./acre

PERMANENT SEEDING SCHEDULE

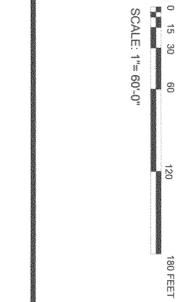
Seeding Date:	February 15 to April 30
Seeding Date:	September 1 to October 31
Rate:	50 lbs./acre
Rate:	1000 lbs./acre
Rate:	1000 lbs./acre
Rate:	3000 lbs./acre
Rate:	4000 lbs./acre

- Notes:
- Note 1: Fertilizer and lime application rates may deviate from above if soils are analyzed for optimum rates.
 - Note 2: Mutch shall be mutch with emulsified asphalt at rate of 14 to 28 gallons/1000 sq. ft. on slopes of 3:1 (H:V) or steeper.
 - Note 3: Use Unseeded Sericea seed from September 1 to March 1 for permanent seeding period.
 - Note 4: Penncost Bahiagrass and Sericea Lespedeza are to be the likes above line and Penncost Bahiagrass planted along the sloped shore line.

E2S ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY
 3008 Anderson Drive
 Raleigh, NC 27609
 (919) 781-7798

Professional Engineer Seal
 NORTH CAROLINA
 ENGINEER
 SEAL
 15472
 E2S ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY

Final Layout
 Hoke County LCD Landfill
 Raeford, NC
 Hoke County Solid Waste
 PO BOX 179
 Raeford, NC 28376

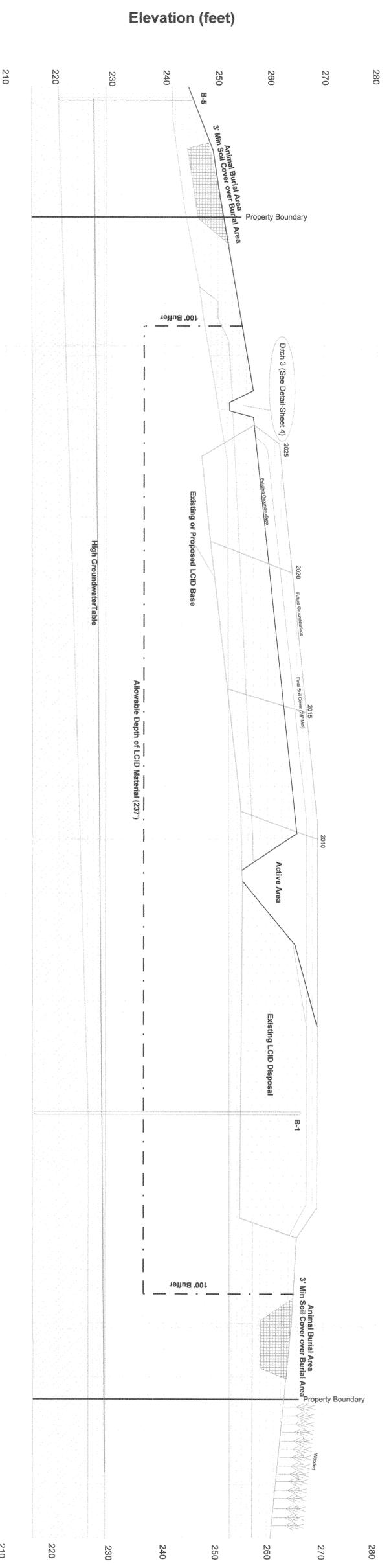


DATE: 03-02-2010
 DRAWN: CPM
 REVISIONS: 06-29-2010
 SCALE: See Drawing
 SHEET NO.: 4
 OF: 7

Hoke County LCID Landfill Cross-Section

A

A'



Profile Scale:
Horizontal: 1"=50'
Vertical: 1"=10'

Soils Legend

	Final Soil Cover		SM-SP		SM-SC
	LCID Material		SC & CL		
	Animal Burial		SM		

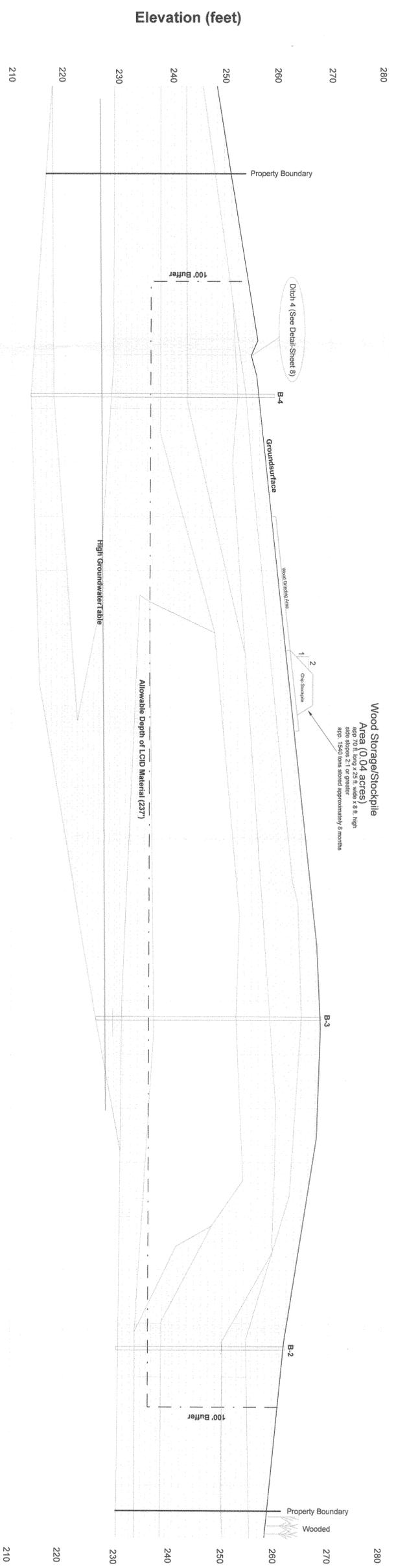
<p>ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY 3008 Anderson Drive Raleigh, NC 27609 (919) 781-7798</p>	<p>DATE: 04-05-2010 DRAWN: CPM REVISIONS: 06-29-2010</p>
	<p>Cross Section A-A' Hoke County LCID Landfill LCID Permit 47-A Raeford, NC</p>
<p>Hoke County Solid Waste PO BOX 179 Raeford, NC 28376</p>	<p>SCALE: See Drawing Sheet No. 5 of 7</p>



B

Hoke County LCID Landfill Cross-Section

B'

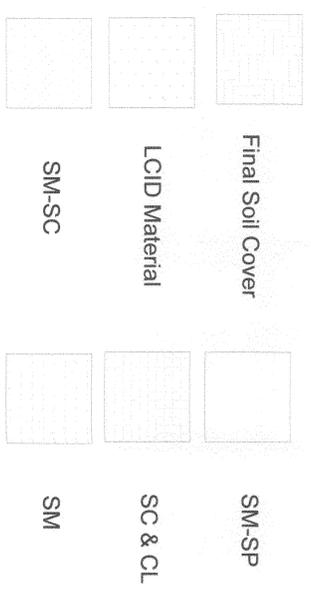


Profile Scale:

Horizontal: 1"=50'

Vertical 1"=10'

Soils Legend



Note: Red indicates proposed or future conditions.

 <p>ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY 1000 S. W. 10th Ave. Raleigh, NC 27609 (919) 781-7798</p>	<p>DATE: 04/05/2010</p> <p>DRAWN: CPM</p>
	<p>REVISION: 6-29-2010</p> <p>SCALE: See Drawing</p>
<p>Cross Section B-B' Hoke County LCID Landfill LCID Permit 47-A Raeferd, NC</p>	<p>SHEET NO. 6</p>
<p>Hoke County Solid Waste PO BOX 179 Raeferd, NC 28376</p>	<p>SHEET NO. 7</p>



End of Book

LCIDN 47-A Permit Hoke County
Landfill

North Carolina
Department of Environment and Natural Resources



Division of Waste Management

Michael F. Easley, Governor
William G. Ross Jr., Secretary
Dexter R. Matthews, Director

July 12, 2002

Mr. Mike Wood, County Manager
County of Hoke
P.O. Box 266
Raeford, North Carolina 28376

Subject: Hoke County Land Clearing and Inert Debris Landfill
located adjacent to and North of the Hoke County Landfill
Raeford, Hoke County, North Carolina
Permit # **47-A: Modification #1**

Dear Mr. Wood:

Enclosed please find a Solid Waste Permit, Conditions of the Solid Waste Permit, and a Certified Copy of the Solid Waste Permit for the above referenced Land Clearing & Inert Debris(LCID)landfill. This is a renewed PERMIT TO OPERATE the five year operating phase of the LCID landfill as shown as Cell 1 on sheet 3 of 10(Conceptual Site Plan) and Figure 1 and Figure 2 in the original application report, consistent with the approved plans.

Please note Condition No. 3. This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and the copy is returned to the Solid Waste Section, within thirty (30) working days, from date received, with the page and book number, date of recordation, and Register's seal. Based on a review of the Section files, it appears that permit 47-A has not been recorded to date and a copy of the recorded permit forwarded to our office

If you have questions about your permit, please contact me at (910) 486-1541 or Ikie Guyton, Waste Management Specialist, for this facility.

Sincerely,


Jim Barber

Eastern Area Engineer
Solid Waste Section

cc: Jim Coffey Mark Fry
Ikie Guton Raleigh Central File: Permit # 47-A

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
Phone: 919-733-0692 \ FAX: 919-733-4810 \ Internet: www.enr.state.nc.us/

PERMIT NUMBER: 47-A
ORIGINAL DATE ISSUED: 12/03/96
MODIFICATION #1 ISSUED: 07/12/02

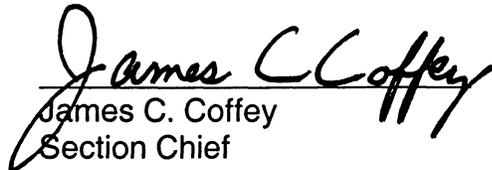
STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
1646 MAIL SERVICE CENTER; RALEIGH, N.C. 27699-1646

SOLID WASTE PERMIT

COUNTY OF HOKE

is hereby issued a PERMIT TO OPERATE CELL 1 for a
LAND CLEARING AND INERT DEBRIS LANDFILL

located adjacent to and North of the existing closed Hoke County landfill, in the Raeford Township, Hoke County, North Carolina 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 facility is located and described by the legal description on page four of this permit.


James C. Coffey
Section Chief
Solid Waste Section
Division of Waste Management

PERMIT NUMBER: 47-A
ORIGINAL PERMIT ISSUED(ptc/pto): December 3, 1996
MODIFICATION #1 ISSUES(pto): July 12, 2002
FACILITY NAME: Hoke County LCID Landfill

CONDITIONS OF PERMIT

1. This permit is issued for a period not to exceed five years from date of issuance, 12 July 2007, and shall be renewed consistent with .0201(e). This permit is for the operation of landfill Cell #1 according to the approved plans. Any revisions of these approved plans must be approved by the North Carolina Solid Waste Section. Ninety days prior to the 12 July 2007, or when Cell #1 is full, Hoke County shall submit to the Section the following information:
 - a. A letter requesting that permit 47-A be reviewed for compliance history;
 - b. Information in said letter shall indicate the necessary space needed for the next five year operating window;
 - c. A site drawing indicating the area(s) filled to date, with the approximate tonnage or yardage used;
 - d. Estimate of future disposal needs and if construction of future cells will be required.
2. Amendments or revisions to the NC Solid Waste Management Rules or any violation of groundwater standards may necessitate modification of the approved plans or closure of the facility.
3. **This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and indexed in the grantor index under the name of the owner of the land in the county or counties in which the land is located.** The certified copy of the permit, affixed with the Register's seal and the date, book, and page number of recording shall be returned to the Division of Solid Waste Management, within **THIRTY (30)** working days, from date received. A copy of the original recorded permit has not been return to the Section to date. Please send the recorded permit copy to:

SOLID WASTE SECTION
225 GREEN STREET; SUITE 601
FAYETTEVILLE, NORTH CAROLINA 28301
ATTN: JIM BARBER
4. When this property is sold, leased, conveyed, or transferred, the deed or other instrument of transfer shall contain in the deed 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 land clearing and inert debris landfill.

PERMIT NUMBER: 47-A
ORIGINAL PERMIT ISSUED(ptc/pto): December 3, 1996
MODIFICATION #1 ISSUES(pto): July 12, 2002
FACILITY NAME: Hoke County LCID Landfill

5. This facility is permitted to receive land clearing waste, yard trash, untreated and unpainted wood, and inert debris such as rock, brick, concrete, concrete block, and uncontaminated soil. Waste acceptance requirements may be affected by future revisions and amendments to the NC General Statutes, or to the NC Solid Waste Management Rules.
6. Waste shall be placed a minimum of four (4) feet above the seasonal high water table.
7. This facility shall conform to the operational requirements of the NC Solid Waste Management Rules, 15A NCAC 13B .0566, and to the operational plan required by 15A NCAC 13B .0565(4).
8. This permit is not transferable.
9. The following requirements shall be met **prior** to receiving solid waste, at the site:
 - a. A site inspection and pre-operative meeting shall be conducted by a representative of the Solid Waste Section.
 - b. A sign shall be posted at the entrance as required by the NC Solid Waste Management Rules Operational Requirements, 15A NCAC 13B .0566 (16).
10. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L.
11. An approved sedimentation and erosion control plan shall be obtained prior to the beginning of earth disturbing activities and all such activities shall be conducted in accordance with the Sedimentation Pollution Control Act of 1973 (15 NCAC 4) along with any other state, federal or local requirements.
12. All earth work shall be in accordance with the approved plan and consistent with the soils report dated 29 August 1995 by Engineering & Environmental Science Company.

Lot No.

ad by _____ County on the _____ day of _____, 19 _____

after recording to _____

Instrument was prepared by R. PALMER WILLCOX

of description for the Index

[Empty rectangular box]

NORTH CAROLINA GENERAL WARRANTY DEED

DEED made this 13th day of December, 1993, by and between

GRANTOR

GRANTEE

ROBERT H. GATLIN, widower

COUNTY OF HOKE
P. O. Box 217
Raeford, N. C. 28376

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity, e.g. corporation or partnership.

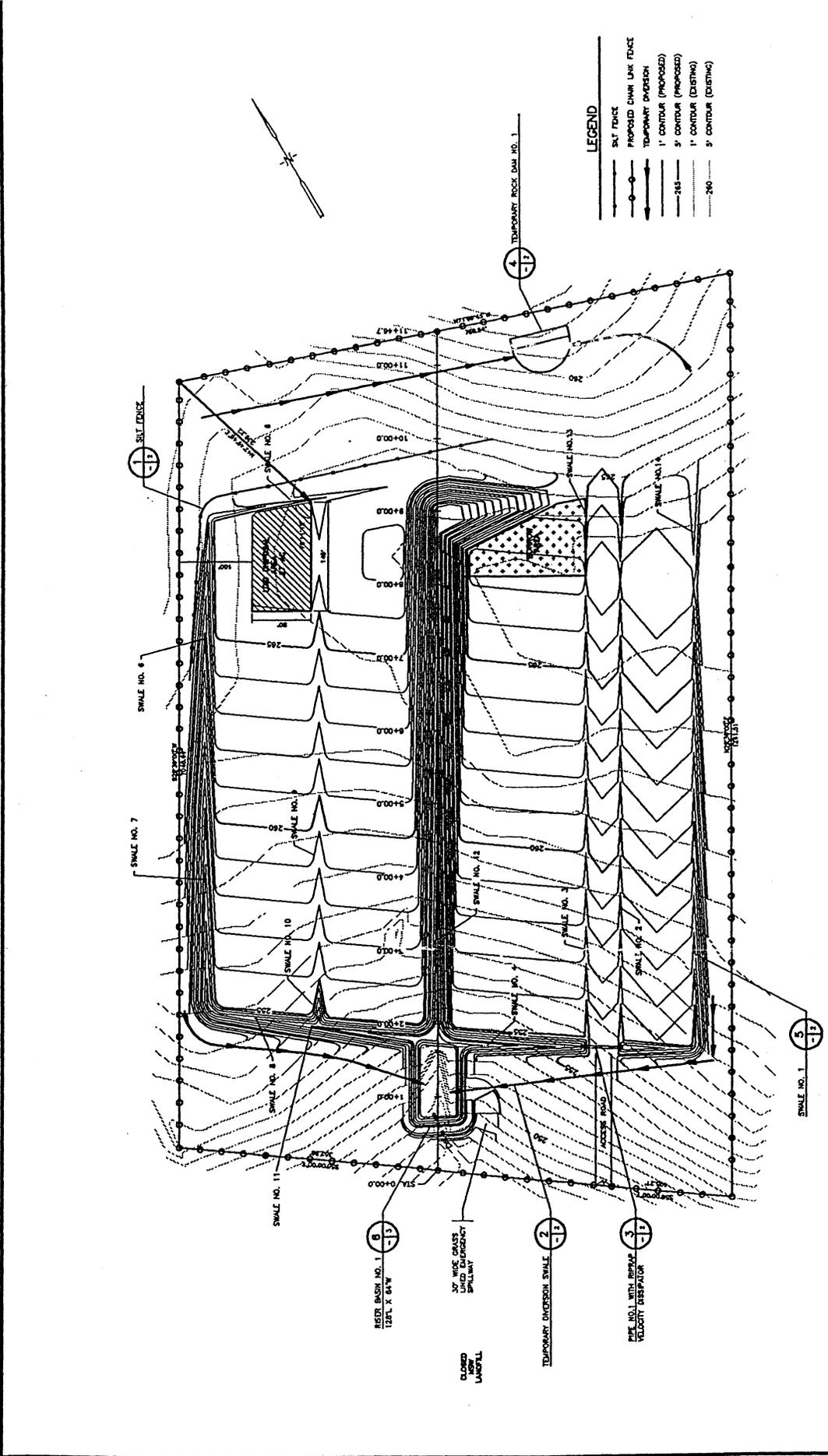
The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the City of _____, Raeford Township,

_____ County, North Carolina and more particularly described as follows:

A certain tract or parcel of land in Raeford Township, Hoke County, North Carolina situated about two miles north of Raeford, N.C. and about 1400 feet northwest of the west terminus of N.C.S.R. No. 1321, adjoining the lands of Robert H. Gatlin on the southeast, Canal Land and Timber Company on the northeast and northwest and by the County of Hoke on the southwest, being further described as follows:

Beginning at a concrete monument, said monument being the westernmost corner of the Robert H. Gatlin Tract No. II as described in Deed Book 208, Page 58 in the Hoke County Registry, the northernmost corner of the County of Hoke "landfill tract" described in Deed Book 161, Page 573 in the Hoke County Registry and a common corner with the tract of land conveyed from Robert H. Gatlin to Cape Fear Wood Corporation (now Canal Land and Timber Company) in Deed Book 94, Page 163, said monument also being a corner of the Federal Paper Board Company tract as shown and recorded in Plat Cabinet 1, Slide 81, Map Book 4, Page 23; thence as a common line of Robert H. Gatlin and said Cape Fear Wood Corp. tract, N29-39-00E 1046.64 feet to an axle with a pine pointer, common corner with said Cape Fear Wood Corp. tract; thence continuing as a common line of Robert Gatlin and said Cape Fear Wood Corp. tract, S71-09-45E 768.77 feet to an iron rod in said line; thence S29-39-00W 1261.51 feet to an iron rod in the common line of Robert Gatlin and the aforementioned County of Hoke "landfill" tract; thence as a common line with Robert Gatlin and the County of Hoke, N55-00-00W 758.19 feet to the beginning containing 20.00 acres and being a portion of the Robert H. Gatlin Tract No. II as described in Deed Book 208, Page 58 in the Hoke County Registry.



LOCATION MAP
SCALE 1" = 200'

	HOBBS, UPCHURCH & ASSOCIATES, P.A. CONSULTING ENGINEERS SOUTHWEST PAVES, NORTH CAROLINA 28347	
	PROJECT NO. DRAWING NO. DATE: 10/11/00	SHEET NO. OF SHEETS 1 OF 1
RAEFORD-HOKE COUNTY LAND CLEARING & INERT DEBRIS LANDFILL RAEFORD, NORTH CAROLINA		LOCATION MAP 1

ATTACHMENTS

1. Site plan prepared by Hobbs, Upchurch & Assoc. dated 14 September 1995 and approved 3 December 1996.
2. Land Clearing and Inert Debris Landfill permit application report and operations plan dated 6 September 1995 and approved 3 December 1996.
3. Piezometer abandonment records received by fax from Hobbs, Upchurch & Assoc. on 17 May 1996.
4. Request letter dated 8 May 2002 from Don Russell concerning reissuing the LCID permit, 47-A, along with a site drawing indicating the area of disposal for the next five years.

Tony Hunt
Chairman

James Leach
Vice Chairman

Robert Wright
Commissioner

Cleo Bratcher, Jr.
Commissioner



Charles Daniels
Commissioner

Neil Yarborough
County Attorney

County Manager

Clerk to the Board

May 8, 2002

Mr. Ikie Guyton
NC DENR, Solid Waste Division
225 Green Street
Fayetteville, N.C. 28301

RECEIVED

MAY 09 2002

**DIVISION OF WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE**

Mr. Guyton,

On behalf of Hoke County, I respectfully request the renewal of permit No. 47-A. This permits the county to operate a land clearing and inert debris landfill on State Road 1321 in The County of Hoke. If repermited, the facility will continue to comply with all applicability, siting and operating criteria, as defined in the (September 1995) Application.

The enclosed print is a segment of sheet three of the original site plan. The 165 ft. X 210 ft. area in the northwest corner of cell one is filled disposal. All remaining air space is available for disposal. At our current rate of usage there should be capacity for many years to come. This was attested to in your (March 12, 2002) Compliance Audit Report.

Thank you for your help. If I can supply further information, please call.

Respectfully Yours

Don Russell
Solid Waste Director

HOKE COUNTY

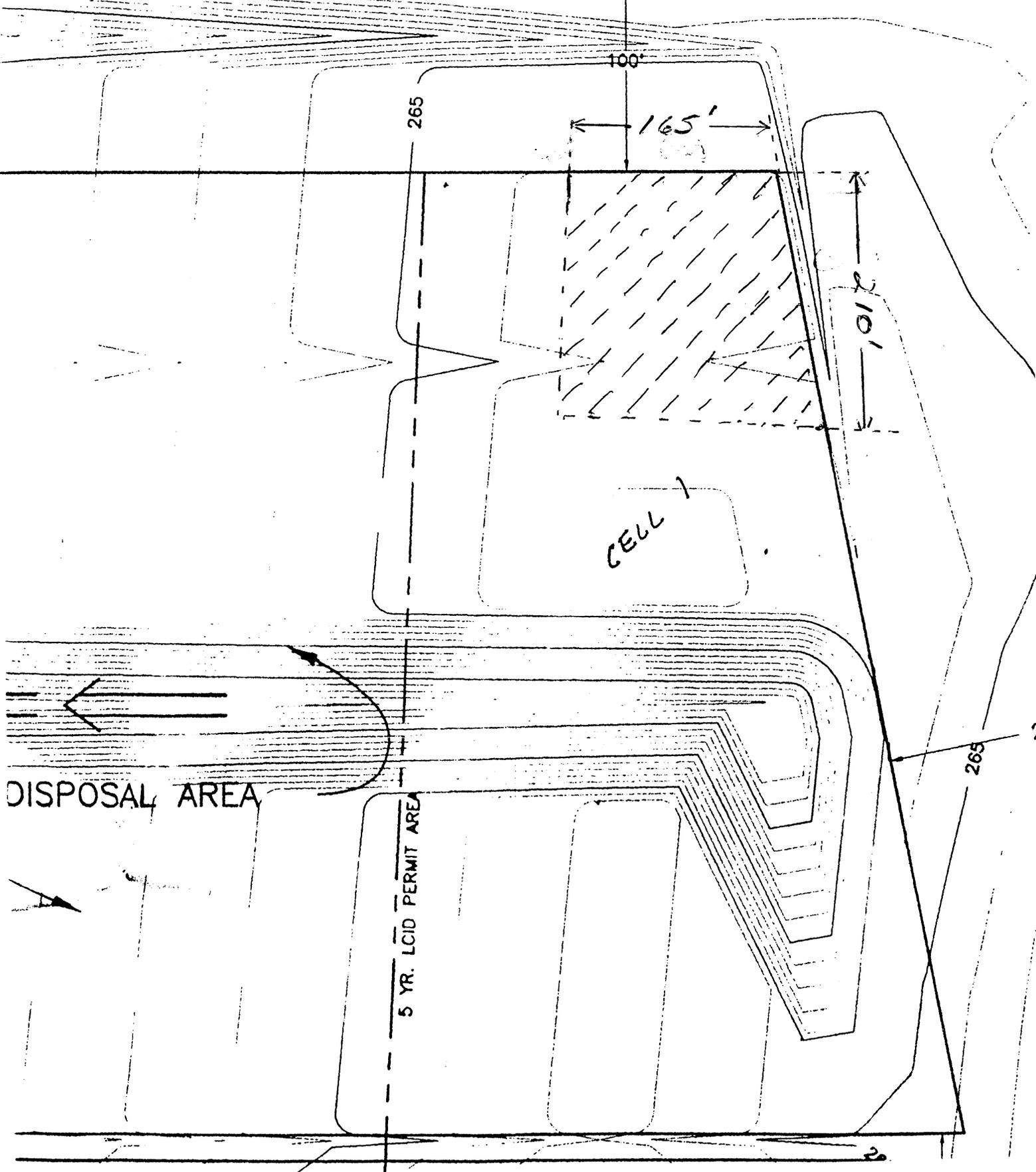
Pratt Building • P.O. Box 210 • 227 N. Main St. • Raeford, NC 28376 • (910) 875-8751 • Fax (910) 875-9222

RECEIVED

MAY 09 2002

S29°39'00"W
1046.64'

DISPOSAL OF WASTE MATERIAL
FROM THE WASTE TREATMENT PLANT



⊖ SOLID WASTE ACTION PERMIT APPLICANT COMPLIANCE REVIEW ⊖

Instructions: Complete upper portion and submit this form to the Field Operations Branch Compliance Officer.

Review Requested by: JIM BARBER Date Requested: 5/24/02

Type of Permit: LCID LF Check One: New Permit Renewal

Applicant Contact and Business Name: HOKE COUNTY

Parent Company/Known Subsidiaries/Other known names business has operated under:

Known Counties of Operation: HOKE

Does the applicant have a past or current solid waste permit? Yes No

If yes, write facility type: LCID LF, and permit #: 47-A

To be completed by Compliance Officer and returned to Permitting or Composting & Land Application Branch staff.

1. The applicant's compliance history for the past three years was reviewed on 5/28/02.

2. The applicant has an outstanding compliance order with administrative penalty.
Yes If yes, describe unresolved issue(s): _____

No

3. The applicant has been issued two or more compliance orders in the past three years.
Yes If yes, describe nature of the violation(s): _____

No

4. Permit denial based on the applicant's compliance history is recommended.
Yes Remarks: _____

No

May 28, 2002
Date

Courtney A. Ashburn
Compliance Officer

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management



James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

December 3, 1996

Mr. Mike Wood, County Manager
County of Hoke
P.O. Box 266
Raeford, North Carolina 28376

Subject: Hoke County Land Clearing and Inert Debris Landfill
located adjacent to and North of the Hoke County Landfill
Raeford, Hoke County, North Carolina
Permit # 47-A

Dear Mr. Wood:

Enclosed please find a Solid Waste Permit, Conditions of the Solid Waste Permit, and a Certified Copy of the Solid Waste Permit for the above referenced Land Clearing & Inert Debris(LCID)landfill. This is a PERMIT TO CONSTRUCT and OPERATE the first five year phase of the LCID landfill as shown as Cell 1 on sheet 3 of 10(Conceptual Site Plan) and Figure 1 and Figure 2 in the application report, consistent with the approved plans.

Please note Condition No. 3. This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and the copy is returned to the Solid Waste Section, within thirty (30) working days, from date received, with the page and book number, date of recordation, and Register's seal.

Also note Condition No. 5, which requires that we hold a pre-operative meeting and that outlines the pre-operative conditions that need to be met prior to the issuance of a PERMIT TO OPERATE. Please contact Ikie Guyton, Waste Management Specialist, when you are ready to schedule a meeting. Mr. Guyton can be reached in our Fayetteville Regional Office at 910-486-1191. If you have questions about your permit, please contact me at (910) 486-1191.

Sincerely,

Jim Barber
Eastern Area Engineer
Solid Waste Section

cc: Jim Coffey Terry Dover
Ikie Guton Dan Sundberg
✓ Raleigh Central File: Permit # 47-A

PERMIT # 47-A

Dated Issued: December 3, 1996

SOLID WASTE PERMIT

COUNTY OF HOKE

is hereby issued a permit to CONSTRUCT & OPERATE CELL 1 for a

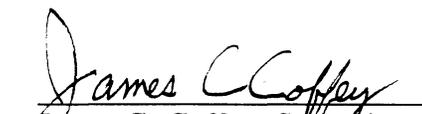
LAND CLEARING AND INERT DEBRIS LANDFILL

located adjacent to and North of the existing closed Hoke County landfill, in the Raeford Township, Hoke County, North Carolina 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 facility is located and described by the legal description on page four of this permit.


James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

CERTIFIED COPY OF SOLID WASTE PERMIT

I do hereby certify that the attached permit is an exact and true copy of Permit Number 47-A.


James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

North Carolina

Johnston County

I, Sue S. Hodge, a Notary Public for said County and State, do hereby certify that James C. Coffey, Supervisor, Permitting Branch, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and seal, this the 3rd day of December, ~~1994~~ ¹⁹⁹⁶.


Public Notary

My commission expires 10-21, ~~19~~ ²⁰⁰⁰.

PERMIT NUMBER: 47-A
PERMIT ISSUED: December 3, 1996
FACILITY NAME: Hoke County LCID Landfill

CONDITIONS OF PERMIT

1. This permit is issued for a period not to exceed five years from date of issuance. This permit is for the construction and operation of the landfill(Cell 1) according to the approved plans. Any revisions of these approved plans must be approved by the North Carolina Solid Waste Section.
2. Amendments or revisions to the NC Solid Waste Management Rules or any violation of groundwater standards may necessitate modification of the approved plans or closure of the facility.
3. **This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and indexed in the grantor index under the name of the owner of the land in the county or counties in which the land is located.** The certified copy of the permit, affixed with the Register's seal and the date, book, and page number of recording shall be returned to the Division of Solid Waste Management, within **THIRTY (30)** working days, from date received. Please send the recorded permit copy to:

SOLID WASTE SECTION
225 GREEN STREET; SUITE 601
FAYETTEVILLE, NORTH CAROLINA 28301
ATTN: JIM BARBER

4. When this property is sold, leased, conveyed, or transferred, the deed or other instrument of transfer shall contain in the deed 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 land clearing and inert debris landfill.
5. This facility is permitted to receive land clearing waste, yard trash, untreated and unpainted wood, and inert debris such as rock, brick, concrete, concrete block, and uncontaminated soil. Waste acceptance requirements may be affected by future revisions and amendments to the NC General Statutes, or to the NC Solid Waste Management Rules.
6. Waste shall be placed a minimum of four (4) feet above the seasonal high water table.
7. This facility shall conform to the operational requirements of the NC Solid Waste Management Rules, 15A NCAC 13B .0566, and to the operational plan required by 15A NCAC 13B .0565(4).

PERMIT NUMBER: 47-A
PERMIT ISSUED: December 3, 1996
FACILITY NAME: Hoke County LCID Landfill

8. This permit is not transferable.
9. The following requirements shall be met **prior** to receiving solid waste, at the site:
 - a. A site inspection and pre-operative meeting shall be conducted by a representative of the Solid Waste Section.
 - b. A sign shall be posted at the entrance as required by the NC Solid Waste Management Rules Operational Requirements, 15A NCAC 13B .0566 (16).
10. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L.
11. An approved sedimentation and erosion control plan shall be obtained prior to the beginning of earth disturbing activities and all such activities shall be conducted in accordance with the Sedimentation Pollution Control Act of 1973 (15 NCAC 4) along with any other state, federal or local requirements.
12. All earth work shall be in accordance with the approved plan and consistent with the soils report dated 29 August 1995 by Engineering & Environmental Science Company.

ATTACHMENTS

1. Site plan prepared by Hobbs, Upchurch & Assoc. dated 14 September 1995 and approved 3 December 1996.
2. Land Clearing and Inert Debris Landfill permit application report and operations plan dated 6 September 1995 and approved 3 December 1996.
3. Piezometer abandonment records received by fax from Hobbs, Upchurch & Assoc. on 17 May 1996.

FILED in Hoke County, NC
on Jul 22 2002 at 11:19:49 AM
by Della Maynor-Lewon
Register of Deeds *omb*
BOOK 511 PAGE 792

4
JUL 2002
Register

CERTIFIED COPY OF SOLID WASTE PERMIT

I do hereby certify that the attached permit is an exact and true copy of Permit Number 47-A.

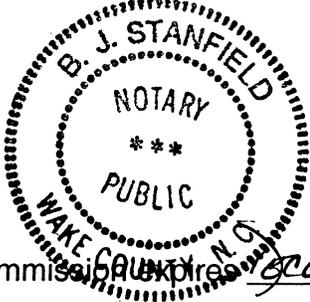
James C Coffey
James C. Coffey
Section Chief
Solid Waste Section
Division of Waste Management

North Carolina

Wake County

I, B. J. Stanfield, a Notary Public for said County and State, do hereby certify that James C. Coffey, Section Chief, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and seal, this the 15 day of July, 2002.



B. J. Stanfield
Notary Public

My commission expires DECEMBER 29, 2004.

Return: County of Hoke

PERMIT NUMBER: **47-A**
ORIGINAL DATE ISSUED: 12/03/96
MODIFICATION #1 ISSUED: 07/12/02

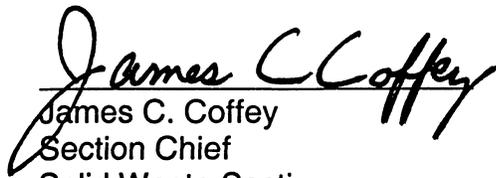
STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
1646 MAIL SERVICE CENTER; RALEIGH, N.C. 27699-1646

SOLID WASTE PERMIT

COUNTY OF HOKE

is hereby issued a PERMIT TO OPERATE CELL 1 for a
LAND CLEARING AND INERT DEBRIS LANDFILL

located adjacent to and North of the existing closed Hoke County landfill, in the Raeford Township, Hoke County, North Carolina 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 facility is located and described by the legal description on page four of this permit.


James C. Coffey
Section Chief
Solid Waste Section
Division of Waste Management

PERMIT NUMBER: 47-A
ORIGINAL PERMIT ISSUED(ptc/pto): December 3, 1996
MODIFICATION #1 ISSUES(pto): July 12, 2002
FACILITY NAME: Hoke County LCID Landfill

CONDITIONS OF PERMIT

1. This permit is issued for a period not to exceed five years from date of issuance, 12 July 2007, and shall be renewed consistent with .0201(e). This permit is for the operation of landfill Cell #1 according to the approved plans. Any revisions of these approved plans must be approved by the North Carolina Solid Waste Section. Ninety days prior to the 12 July 2007, or when Cell #1 is full, Hoke County shall submit to the Section the following information:
 - a. A letter requesting that permit 47-A be reviewed for compliance history;
 - b. Information in said letter shall indicate the necessary space needed for the next five year operating window;
 - c. A site drawing indicating the area(s) filled to date, with the approximate tonnage or yardage used;
 - d. Estimate of future disposal needs and if construction of future cells will be required.
2. Amendments or revisions to the NC Solid Waste Management Rules or any violation of groundwater standards may necessitate modification of the approved plans or closure of the facility.
3. **This permit shall not be effective unless the certified copy is filed in the Register of Deeds office and indexed in the grantor index under the name of the owner of the land in the county or counties in which the land is located.** The certified copy of the permit, affixed with the Register's seal and the date, book, and page number of recording shall be returned to the Division of Solid Waste Management, within **THIRTY (30)** working days, from date received. A copy of the original recorded permit has not been return to the Section to date. Please send the recorded permit copy to:

SOLID WASTE SECTION
225 GREEN STREET; SUITE 601
FAYETTEVILLE, NORTH CAROLINA 28301
ATTN: JIM BARBER

4. When this property is sold, leased, conveyed, or transferred, the deed or other instrument of transfer shall contain in the deed 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 land clearing and inert debris landfill.

PERMIT NUMBER: 47-A
ORIGINAL PERMIT ISSUED(ptc/pto): December 3, 1996
MODIFICATION #1 ISSUES(pto): July 12, 2002
FACILITY NAME: Hoke County LCID Landfill

5. This facility is permitted to receive land clearing waste, yard trash, untreated and unpainted wood, and inert debris such as rock, brick, concrete, concrete block, and uncontaminated soil. Waste acceptance requirements may be affected by future revisions and amendments to the NC General Statutes, or to the NC Solid Waste Management Rules.
6. Waste shall be placed a minimum of four (4) feet above the seasonal high water table.
7. This facility shall conform to the operational requirements of the NC Solid Waste Management Rules, 15A NCAC 13B .0566, and to the operational plan required by 15A NCAC 13B .0565(4).
8. This permit is not transferable.
9. The following requirements shall be met **prior** to receiving solid waste, at the site:
 - a. A site inspection and pre-operative meeting shall be conducted by a representative of the Solid Waste Section.
 - b. A sign shall be posted at the entrance as required by the NC Solid Waste Management Rules Operational Requirements, 15A NCAC 13B .0566 (16).
10. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L.
11. An approved sedimentation and erosion control plan shall be obtained prior to the beginning of earth disturbing activities and all such activities shall be conducted in accordance with the Sedimentation Pollution Control Act of 1973 (15 NCAC 4) along with any other state, federal or local requirements.
12. All earth work shall be in accordance with the approved plan and consistent with the soils report dated 29 August 1995 by Engineering & Environmental Science Company.

Lot No.

Recorded by

County on the

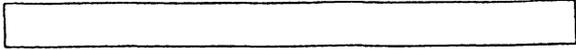
day of

BOOK 511 PAGE 796

after recording to

Instrument was prepared by R. PALMER WILLCOX

of description for the Index



NORTH CAROLINA GENERAL WARRANTY DEED

DEED made this 13th day of December, 1993, by and between

GRANTOR

GRANTEE

BERT H. GATLIN, widower

COUNTY OF HOKE
P. O. Box 217
Raeford, N. C. 28376

appropriate block for each party: name, address, and, if appropriate, character of entity, e.g. corporation or partnership.

designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and all include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the City of Raeford Township,

County, North Carolina and more particularly described as follows:

certain tract or parcel of land in Raeford Township, Hoke County, North Carolina situated about two miles north of Raeford, N.C. and about 1400 feet northwest of the west terminus of N.C.S.R. No. 1321, adjoining the lands of Robert H. Gatlin on the southeast, Canal Land and Timber Company on the northeast and northwest and by the County of Hoke on the southwest, being further described as follows:

beginning at a concrete monument, said monument being the westernmost corner of the Robert H. Gatlin Tract No. II as described in Deed Book 208, Page 58 in the Hoke County Registry, the northernmost corner of the County of Hoke "landfill tract" described in Deed Book 161, Page 573 in the Hoke County Registry and a common corner with the tract of land conveyed from Robert H. Gatlin to Cape Fear Wood Corporation (now Canal Land and Timber Company) in Deed Book 94, Page 163, said monument also being a corner of the Federal Paper Board Company tract as shown and recorded in Plat Cabinet 1, Slide 81, Map Book 4, Page 23; thence as a common line of Robert H. Gatlin and said Cape Fear Wood Corp. tract, N29-39-00E 1046.64 feet to an axle with a pine pointer, common corner with said Cape Fear Wood Corp. tract; thence continuing as a common line of Robert Gatlin and said Cape Fear Wood Corp. tract, S71-09-45E 168.11 feet to an iron rod in said line; thence S20-39-00W 1261.51 feet to an iron rod in the common line of Robert Gatlin and the aforementioned County of Hoke "landfill" tract; thence as a common line with Robert Gatlin and the County of Hoke, N55-00-00W 758.19 feet to the beginning containing 20.00 acres and being a portion of the Robert H. Gatlin Tract No. II as described in Deed Book 208, Page 58 in the Hoke County Registry.

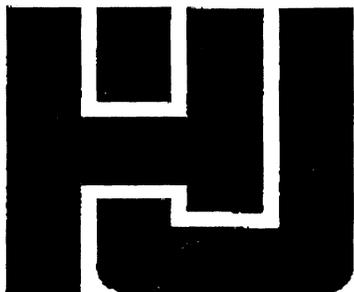
ATTACHMENTS

1. Site plan prepared by Hobbs, Upchurch & Assoc. dated 14 September 1995 and approved 3 December 1996.
2. Land Clearing and Inert Debris Landfill permit application report and operations plan dated 6 September 1995 and approved 3 December 1996.
3. Piezometer abandonment records received by fax from Hobbs, Upchurch & Assoc. on 17 May 1996.
4. Request letter dated 8 May 2002 from Don Russell concerning reissuing the LCID permit, 47-A, along with a site drawing indicating the area of disposal for the next five years.

Hobbs, Upchurch & Associates, P.A.

CONSULTING ENGINEERS

P.O. Box 1737, Southern Pines, NC 28388



Date: 5/17/96

Number of pages including cover sheet: 9

To:

Mr. Jim Barber
NCDEHNR; Solid Waste

Phone:

Fax #: (910) 486-1791

CC:

From:

Dan Sundberg
HC 9601

Phone: 910-692-5616

Fax #: 910-692-4795

REMARKS: Piezometer abandonment records enclosed.

We are awaiting survey to locate buried
piezometer No. 15 as discussed.
Please call w/ any questions.

Sincerely,
Dan Sundberg

E2S

ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY

3008 ANDERSON DRIVE, SUITE 102

RALEIGH, NC 27609

(919) 781-7798

September 29, 1995

Mr. Daniel W. Sundberg
Hobbs, Upchurch & Associates, P. A.
P. O. Box 1737
Southern Pines, NC 28388

RE: Piezometer Abandonment
Raeford/Hoke Landfill
Hoke County, NC

Dear Mr. Sundberg:

Attached are copies of the abandonment of the piezometers that were installed for the Land Clearing and Inert Debris Landfill at the above-referenced facility.

All piezometers except for B-5 were grouted. The piezometer located near the erosion control basin could not be found.

We appreciate serving Hobbs, Upchurch & Associates on this project. Please contact us if you have any questions.

Sincerely,


T. Patrick Shillington, P. E.
President

Attachment: Abandonment Records

ATTACHMENT:

Abandonment Records

North Carolina
 Department of Environment, Health, & Natural Resources
 Division of Environmental Management
 Groundwater Section
 P.O. Box 29535 - Raleigh, N.C. 27626-0535

B-1

WELL ABANDONMENT RECORD

CONTRACTOR Sweeting Drilling INC REG. NO. 866

1. WELL LOCATION: (Show a sketch of the location on back of form.)
 Nearest Town: Raeford County Hoke
SR-1302 Nicholson Clark
 (Road, Community, Subdivision, Lot No.) Quadrangle No.

2. OWNER: Raeford/Hoke County

3. ADDRESS: _____

4. TOPOGRAPHY: draw, slope, hilltop, valley, flat

5. USE OF WELL: water DATE: _____

6. TOTAL DEPTH: 50 DIAMETER: 2"

7. CASING REMOVED:

	feet	diameter
	<u>40</u>	<u>2"</u>
Screen	<u>10</u>	<u>2"</u>

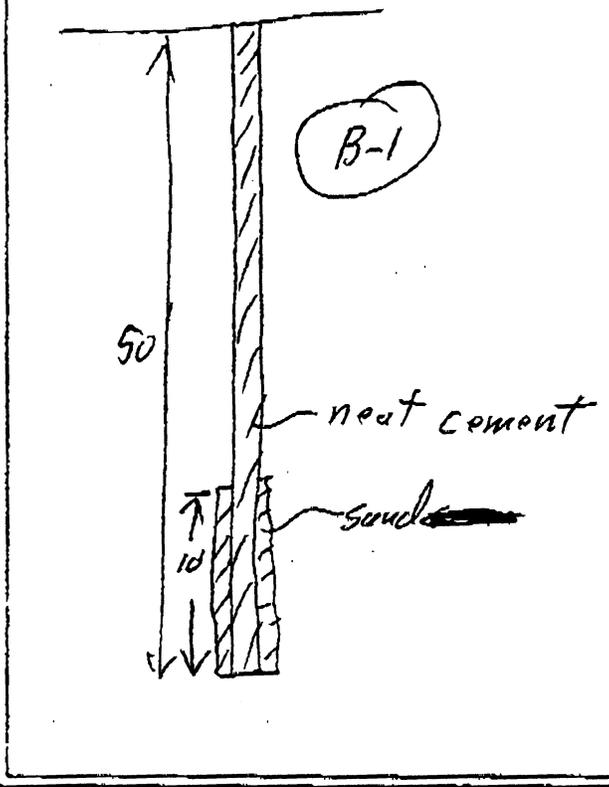
8. SEALING MATERIAL:

Neat cement bags of cement	<u>3</u>	Sand cement bags of cement	_____
gals. of water	<u>21</u>	yds. of sand	_____
		gals. of water	_____

Other Type material _____
 Amount _____

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.
neat cement was injected into well casing
and the casing a screen were lifted as the
cement was injected.

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval intervals of casing perforations, and depths and types of fill materials used.



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Donald Swartz Date 9/13/95

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers:

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

North Carolina
 Department of Environment, Health, & Natural Resources
 Division of Environmental Management
 Groundwater Section
 P.O. Box 29535 - Raleigh, N.C. 27626-0535

B-2

WELL ABANDONMENT RECORD

CONTRACTOR Sweet's Drilling EUC

REG. NO. 866

1. WELL LOCATION: (Show a sketch of the location on back of form.)
 Nearest Town: Rutherford County Hoke
SR-1302 Nicholson Creek
 (Road, Community, Subdivision, Lot No.) Quadrangle No.

2. OWNER: Rutherford/Hoke

3. ADDRESS: _____

4. TOPOGRAPHY: draw, slope, hilltop, valley, flat

5. USE OF WELL: water level measurements DATE: _____

6. TOTAL DEPTH: _____ DIAMETER: 2"

7. CASING REMOVED:

feet	diameter
<u>16'</u>	<u>2"</u>
<u>Screen 15'</u>	<u>2"</u>

8. SEALING MATERIAL:

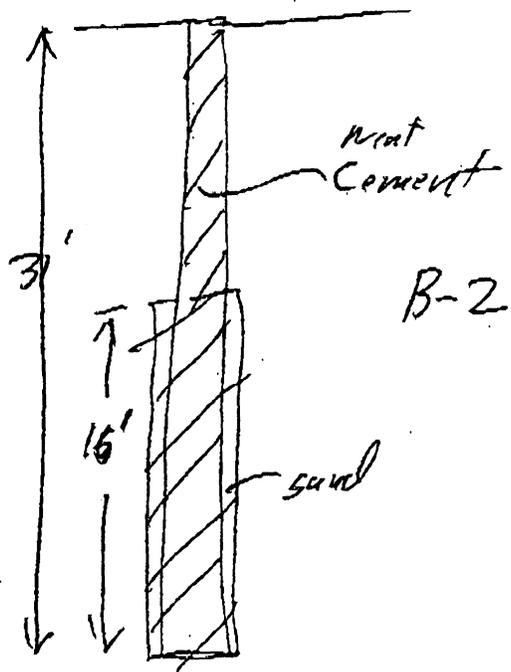
Neat cement bags of cement <u>2 1/2</u>	Sand cement bags of cement _____
gals. of water <u>18</u>	yds. of sand _____
	gals. of water _____

Other Type material _____

Amount _____

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL. see B-1

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent [Signature] Date 9/13/95

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

North Carolina
 Department of Environment, Health, & Natural Resources
 Division of Environmental Management
 Groundwater Section
 P.O. Box 29535 - Raleigh, N.C. 27626-0535

B-3

WELL ABANDONMENT RECORD

CONTRACTOR Sweeting Drilling INC REG. NO. 866

1. WELL LOCATION: (Show a sketch of the location on back of form.)
 Nearest Town: Hoke County Hoke
SR-1002 (Road, Community, Subdivision, Lot No.) Michelson Creek Quadrangle No.

2. OWNER: Rusford/Hoke

3. ADDRESS: _____

4. TOPOGRAPHY: draw, slope, hilltop, valley, flat

5. USE OF WELL: water level measurements DATE: _____

6. TOTAL DEPTH: 42' DIAMETER: 2"

7. CASING REMOVED:

feet	diameter
<u>27</u>	<u>2"</u>
<u>5' from</u>	<u>2"</u>

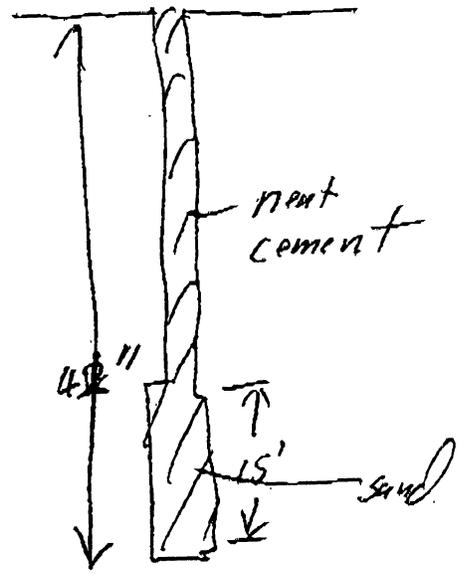
8. SEALING MATERIAL:

Neat cement bags of cement <u>3</u>	Sand cement bags of cement _____
gals. of water <u>20</u>	yds. of sand _____
	gals. of water _____

Other Type material _____
 Amount _____

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL. see B-1

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.



I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent [Signature] Date 09/13/95

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.

North Carolina
 Department of Environment, Health, & Natural Resources
 Division of Environmental Management
 Groundwater Section
 P.O. Box 29535 - Raleigh, N.C. 27626-0535

B-4

WELL ABANDONMENT RECORD

CONTRACTOR Sweeting Drilling INC

REG. NO. 866

1. WELL LOCATION: (Show a sketch of the location on back of form.)

Nearest Town: Roxford

County Wake

SR-1302

(Road, Community, Subdivision, Lot No.)

Nicholson Creek
Quadrangle No.

2. OWNER: Roxford/Wake

3. ADDRESS: _____

4. TOPOGRAPHY: draw, slope, (hilltop) valley, flat

5. USE OF WELL: measure water DATE: _____
Electricity

6. TOTAL DEPTH: 47 DIAMETER: 2"

7. CASING REMOVED:

feet	diameter
<u>32</u>	<u>2"</u>
<u>Screen 15</u>	<u>2"</u>

8. SEALING MATERIAL:

Neat cement bags of cement <u>3/4</u>	Sand cement bags of cement _____
gals. of water <u>23</u>	yds. of sand _____
	gals. of water _____

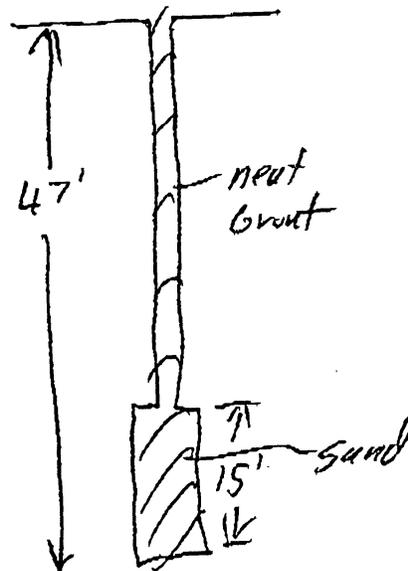
Other Type material _____

Amount _____

9. EXPLAIN METHOD EMPLACEMENT OF MATERIAL.

see B-1

WELL DIAGRAM: Draw a detailed sketch of the well showing total depth, depth and diameter of screens remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

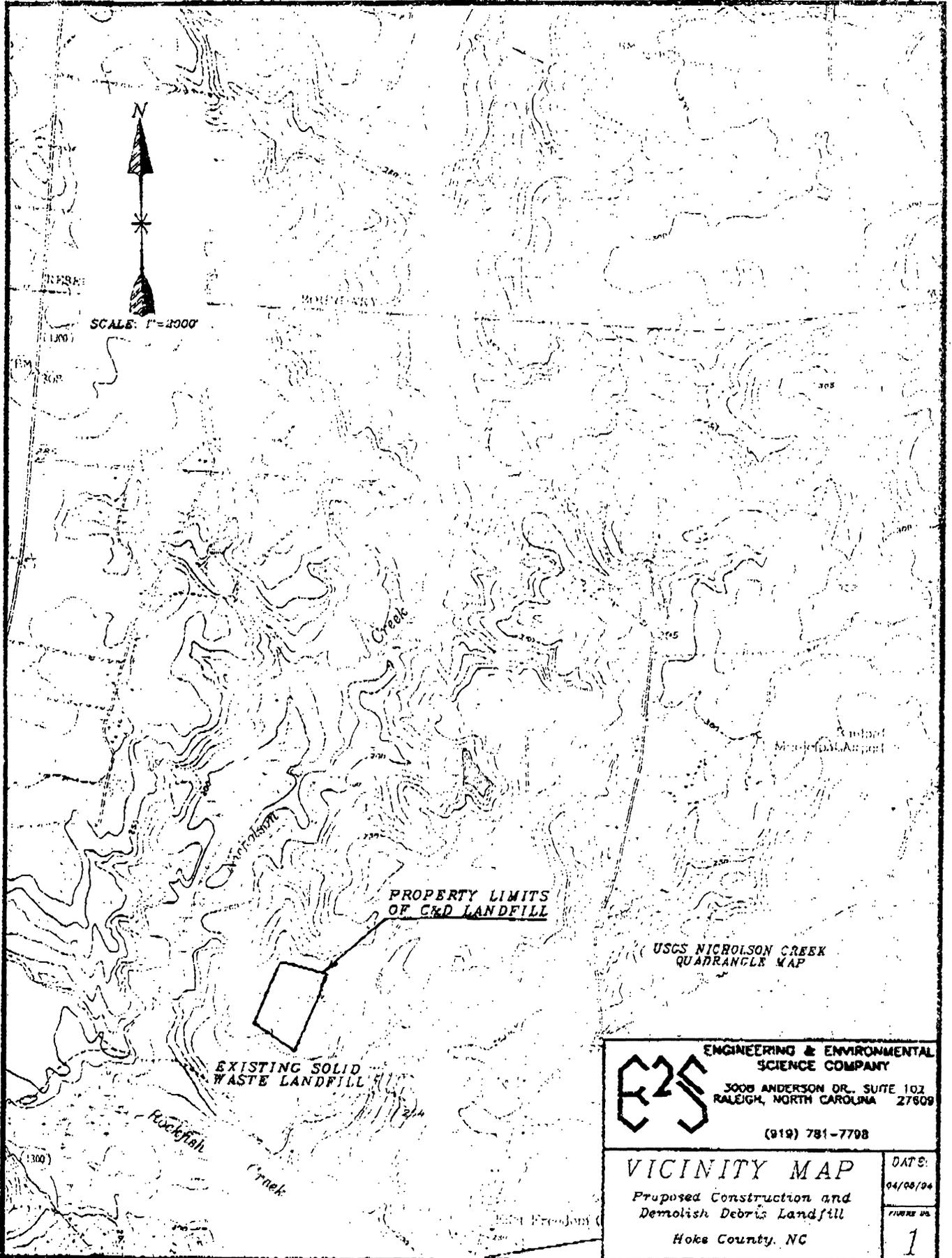


I do hereby certify that this well abandonment record is true and exact.

Signature of Contractor or Agent Donald Swartz Date 04/13/95

WELL LOCATION: Draw a location sketch on the reverse of this sheet, showing the direction and distance of the well to at least two (2) nearby reference points such as roads, intersections and streams. Identify roads with State Highway road identification numbers.

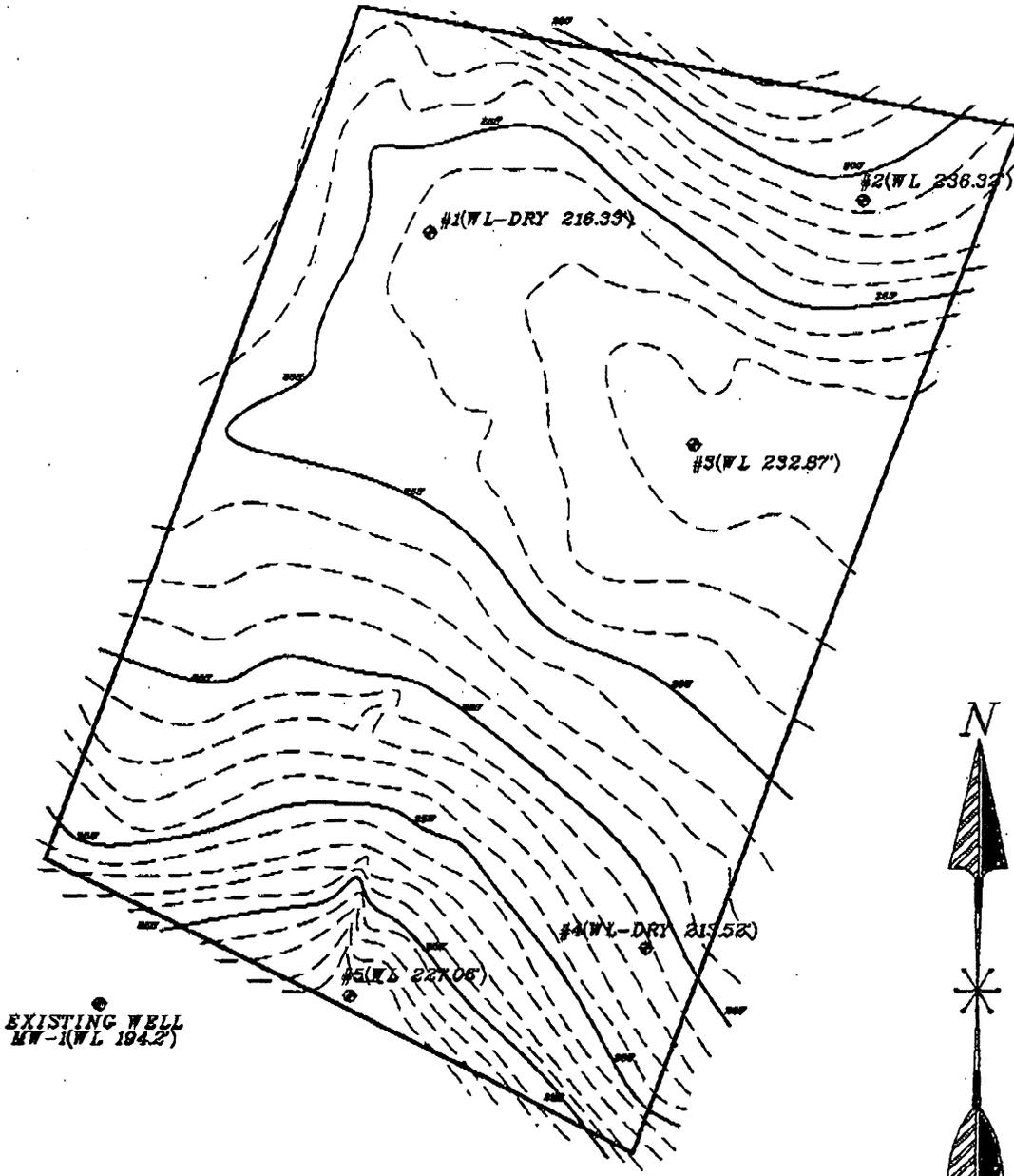
Submit original to the Division of Environmental Management, one copy to the Driller, and one copy to the owner.



E2S ENGINEERING & ENVIRONMENTAL
SCIENCE COMPANY
3008 ANDERSON DR., SUITE 102
RALEIGH, NORTH CAROLINA 27609
(919) 781-7708

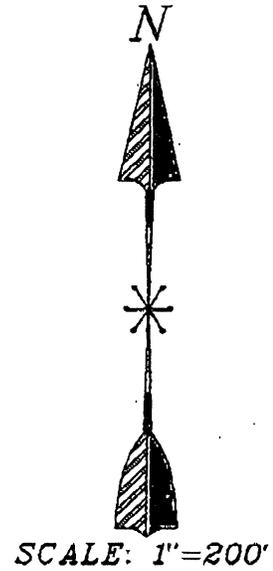
VICINITY MAP
Proposed Construction and
Demolish Debris Landfill
Hoke County, NC

DATE:
04/08/04
FIGURE NO.
1



EXISTING WELL
MW-1 (WL 194.2')

NOTE: WL 194.2' INDICATED WATER
ELEVATION



	ENGINEERING & ENVIRONMENTAL SCIENCE COMPANY	
	3008 ANDERSON DR., SUITE 102 RALEIGH, NORTH CAROLINA 27609 (919) 781-7798	
WATER ELEVATIONS		DATE: 04/01/94
Demolition Landfill Hoke County, NC		FIGURE NO. 3

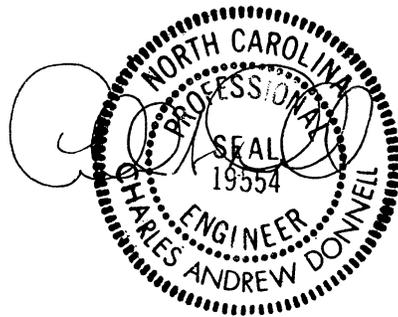
E2S

APPROVED
DIVISION OF SOLID WASTE MANAGEMENT
DATE 12/3/96 BY DOC
ATTACHMENT # 2
CENTRAL FILE COPY
47-A

**LAND CLEARING AND INERT DEBRIS
LANDFILL PERMIT APPLICATION REPORT**

FOR

**CITY OF RAEFORD & HOKE COUNTY
RAEFORD, NORTH CAROLINA**



9-6-95

HOBBS, UPCHURCH & ASSOCIATES, P.A.

SEPTEMBER, 1995

HUA NO. RA9402

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 - potential or existing sources of ground water and surface water pollution
 - water intakes
 - airport and runways
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i. DEED DESCRIPTION

Lot No. _____
Recorded by _____ County on the _____ day of _____, 19____

After recording to _____

This instrument was prepared by R. PALMER WILLCOX

of description for the Index

NORTH CAROLINA GENERAL WARRANTY DEED

DEED made this 13th day of December, 1993, by and between

GRANTOR

GRANTEE

ERT H. GATLIN, widower

COUNTY OF HOKE
P. O. Box 217
Raeford, N. C. 28376

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity, e.g. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in the City of _____, _____ Township,

_____ County, North Carolina and more particularly described as follows:
a certain tract or parcel of land in Raeford Township, Hoke County, North Carolina situated about two miles north of Raeford, N.C. and about 1400 feet northwest of the west terminus of N.C.S.R. No. 1321, adjoining the lands of Robert H. Gatlin on the southeast, Canal Land and Timber Company on the northeast and northwest and by the County of Hoke on the southwest, being further described as follows:

Beginning at a concrete monument, said monument being the westernmost corner of the Robert H. Gatlin Tract No. II as described in Deed Book 208, Page 58 in the Hoke County Registry, the northernmost corner of the County of Hoke "landfill tract" described in Deed Book 161, Page 573 in the Hoke County Registry and a common corner with the tract of land conveyed from Robert H. Gatlin to Cape Fear Wood Corporation (now Canal Land and Timber Company) in Deed Book 94, Page 163, said monument also being a corner of the Federal Paper Board Company tract as shown and recorded in Plat Cabinet 1, Slide 81, Map Book 4, Page 23; thence as a common line of Robert H. Gatlin and said Cape Fear Wood Corp. tract, N29-39-00E 1046.64 feet to an axle with a pine pointer, common corner with said Cape Fear Wood Corp. tract; thence continuing as a common line of Robert Gatlin and said Cape Fear Wood Corp. tract, S71-09-45E 768.00 feet to an iron rod in said line; thence S29-39-00W 1261.51 feet to an iron rod in the common line of Robert Gatlin and the aforementioned County of Hoke "landfill" tract; thence as a common line with Robert Gatlin and the County of Hoke, N55-00-00W 758.19 feet to the beginning containing 20.00 acres and being a portion of the Robert H. Gatlin Tract No. II as described in Deed Book 208, Page 58 in the Hoke County Registry.

ii. **INDIVIDUAL RESPONSIBLE FOR OPERATION AND MAINTENANCE OF SITE:**

Mike McNeill, Raeford Public Works Director
315 Main Street
Raeford, North Carolina 28376
Phone No. (910)875-5031

iii. **PROJECTED LAND USE; POST DEVELOPMENT:**

Closed w/no public access

iv. **ANTICIPATED LIFETIME OF PROJECT: 1995 - 2015
20 YEAR DISPOSAL SITE
LAND CLEARING AND INERT DEBRIS CALCULATION**

- Waste stream: 3400 Tn/Yr
3400 TN = 6,800,000 lbs.
6,800,000 lbs at 600 #/cy = 11,333 cy/yr
11,333 cy/yr x 20 yr. = 226,666 cy Total

- Monthly cell dimensions:
11,333 cy per yr / 12 mo per yr = 944 cy per mo
944 cy/mo x 27 cf/cy = 25,488 cf
25,488 cf / 2.5'DP = 10,195 sf
10,195 sf / 35'W = 291'L
* 700' total length - 20 yrs. = 35'/yr.

- Monthly cover req. =
35'W x 291'L x .5'DP = 5,100 cf/mo

- 1 year monthly cover req. =
5,100 cf/mo x 12 mo = 61,171 cf/yr

- 20 year weekly cover req. =
61,171 cf/yr x 20 yr = 1,223,425 cf
1,223,425 cf / 27 cf per cy = 45,312 cy

- Final cover req. =
700'L avg. x 440' W avg. x 2.0' Thick = 616,000 CF
616,000 cf / 27 cf per cy = 22,814 cy

- Total borrow req. =
22,814 cy final cover + 45,312 cy monthly cover
Total Cover = 68,127 cy

- Total Volume Required:
226,666 cy land clearing and inert debris
+68,127 cy weekly and final cover
= 294,793 cy

v. **DESCRIPTION OF SYSTEMATIC USAGE OF AREA, OPERATION, ORDERLY DEVELOPMENT AND COMPLETION OF LCID LANDFILL.**

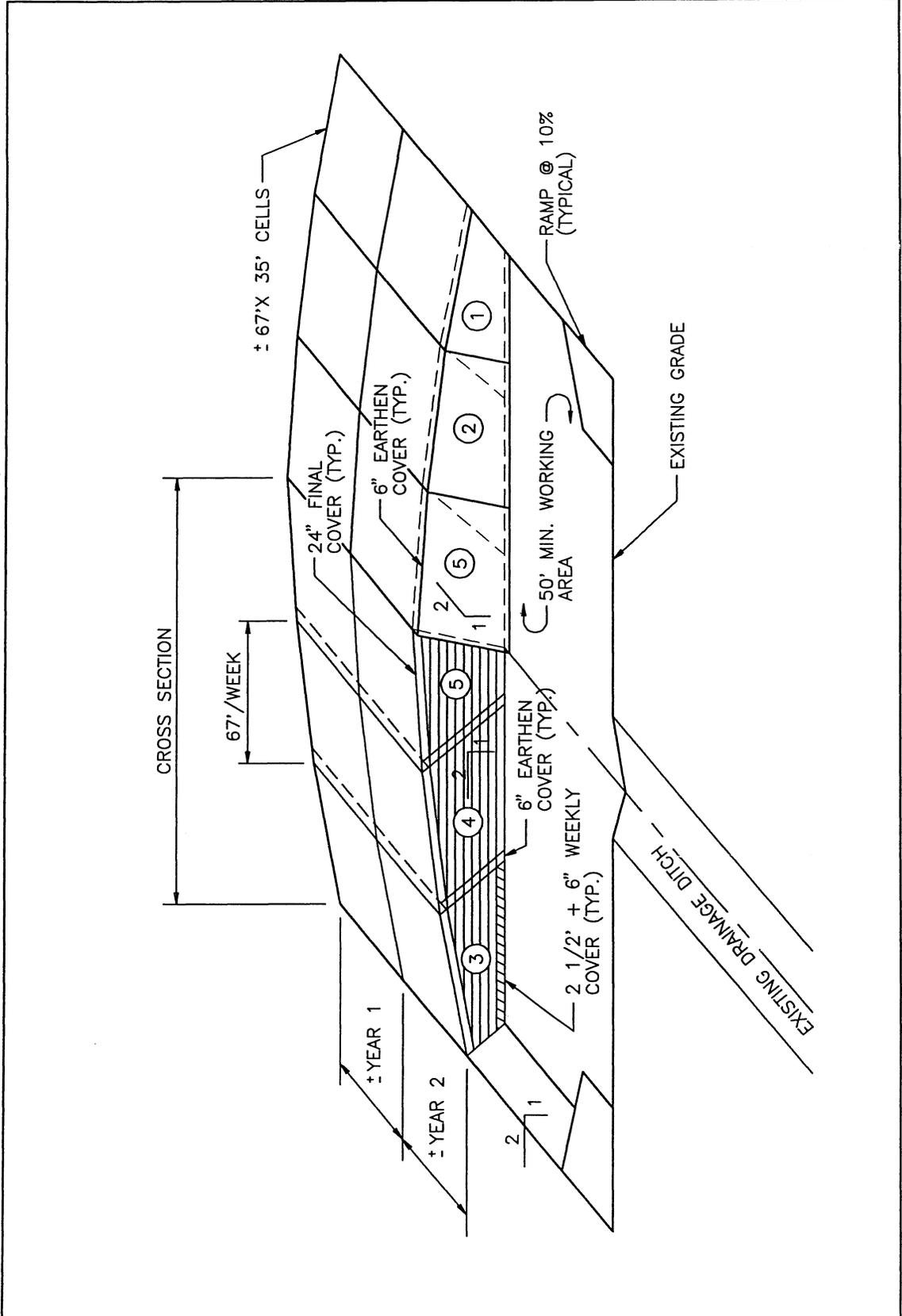
The land clearing and inert debris landfill will be constructed to allow stormwater which is not diverted by the perimeter swales (precipitation falling directly into the active cell) to be channeled to a temporary riser basin.

The progression of fill will begin at the upgradient portion of the disposal area at a point furthest from the central drainage ditch. Filling will proceed toward the center as the final elevation is attained (Figure 1). Dumping of land clearing and inert debris will occur at a location best suited to the existing elevation. Temporary ramps will be constructed for access to the dumping point by grading suitable fill materials into slopes less than 10% (Figure 2). A permanent access ramp will be constructed at the northern end of the site for access across the top of the LCID Landfill toward the dumping area.

Excavation for borrow material will occur as needed for monthly and final cover.

Land clearing and inert debris landfilling will proceed toward the riser basin as the final elevation is attained (Figure 2).

The LCID Landfill will be considered closed upon final grades being reached and erosion control approval by the Department of Environment, Health & Natural Resources, Land Quality Section.

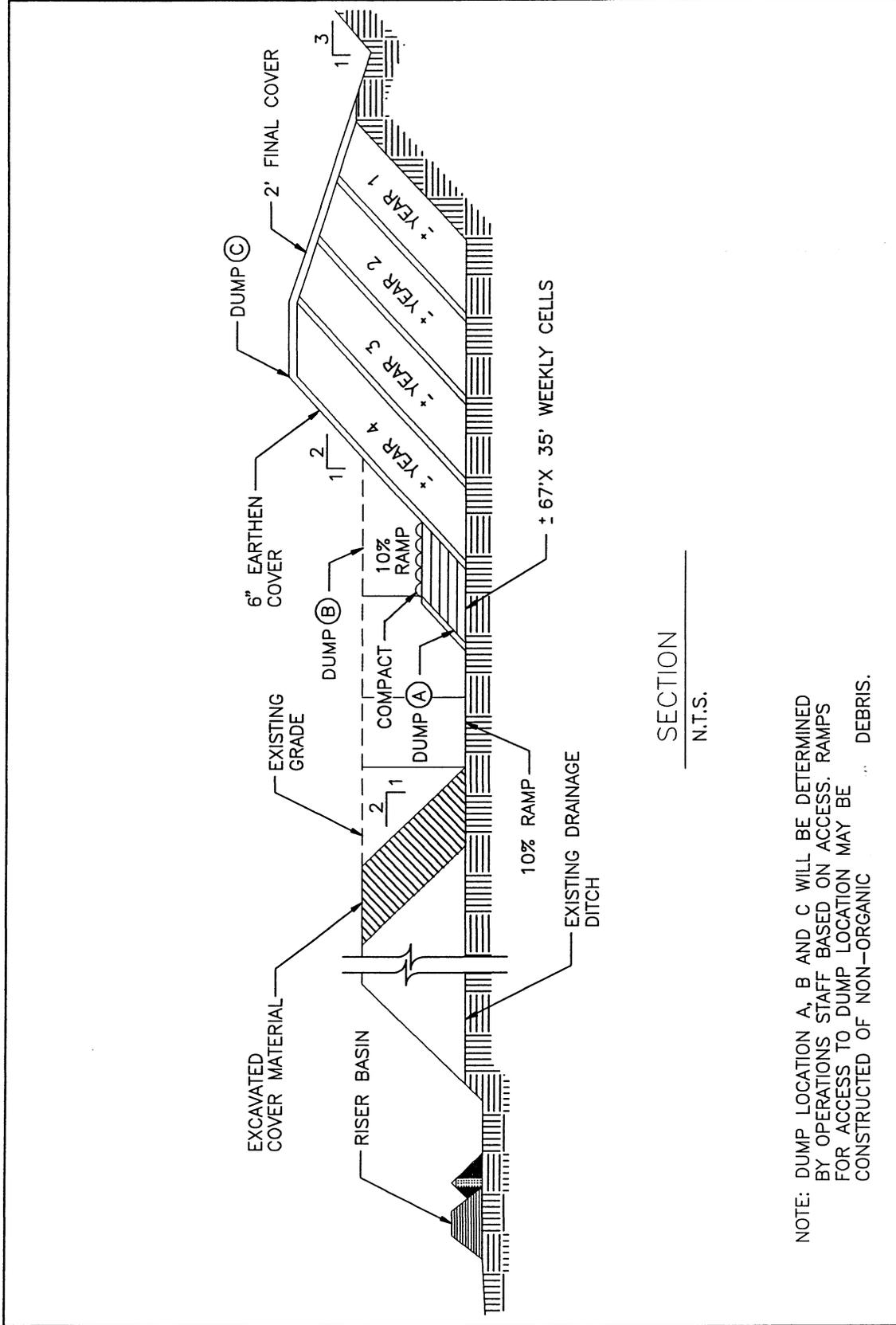


SCALE: N.T.S.

CONSTRUCTION SEQUENCE FOR DEBRIS DISPOSAL

FIGURE: 1

HU
 HOBBS, UPCHURCH & ASSOCIATES, P.A.
 CONSULTING ENGINEERS
 SOUTHERN PINES, NORTH CAROLINA 28387



SECTION
N.T.S.

NOTE: DUMP LOCATION A, B AND C WILL BE DETERMINED BY OPERATIONS STAFF BASED ON ACCESS. RAMPS FOR ACCESS TO DUMP LOCATION MAY BE CONSTRUCTED OF NON-ORGANIC DEBRIS.

SCALE: N.T.S.

CONSTRUCTION SEQUENCE FOR
DEBRIS DISPOSAL



HOBBS, UPCHURCH & ASSOCIATES, P.A.
CONSULTING ENGINEERS
SOUTHERN PINES, NORTH CAROLINA 28387

FIGURE: 2

vi. EARTHWORK CALCULATIONS

I. Cover Material Required:

- a. Weekly cover required (calculated within section iv.) 45,312 c.y.
- b. Final cover required (calculated within section iv.): 22,814 c.y.
- c. Total cover required: 68,126 c.y.

II. Cover Material Available:

- a. Total cover material available: 76,184 c.y.

vii. SEEDING SPECIFICATIONS & SCHEDULE

PERMANENT SEEDING SCHEDULE

PERMANENT SEEDING MIXTURE

<u>SPECIES</u>	<u>RATE (LB./ACRE)</u>	<u>DATE</u>
GERMAN MILLET	10	April 15 - July 1
ANNUAL RYE	40	April 15 - July 1
PENSICOLA BAHIAGRASS	60	January 1 - March 1
HYBRID BERMUDA (HULLED)	25	April 15- July 1
HYBRID BERMUDA (UNHULLED)	30	January 13 - March 1

TEMPORARY SEEDING MIXTURE

<u>SPECIES</u>	<u>RATE (LB./ACRE)</u>	<u>DATE</u>
GERMAN MILLET	120	May 1 - August 25
ANNUAL RYE (GRAIN)	200	August 25 - May 1

NOTE: TEMPORARY SEED MIX SHALL BE USED FOR ALL AREAS EXPOSED GREATER THAN ONE WEEK AND SUBJECT TO FURTHER DISTURBANCE. PERMANENT SEED MIX SHALL BE CHECKED FOR ADEQUACY ON JULY 15. AN ADEQUATE COVER SHALL HAVE 30 SPRIGS OF BERMUDA OR BAHIAGRASS PER ONE SQUARE FOOT.

SOIL AMENDMENTS

APPLY AGRICULTURAL LIMESTONE - 2 TONS/ACRE
APPLY FERTILIZER AT A RATE OF 1,000 LB/ACRE (10-10-10).

MULCH

MULCH - 2 TO 2 1/2 TONS/ACRE - SMALL GRAIN STRAW OR EQUIVALENT COVER.

ANCHOR - ASPHALT EMULSION ON SLOPES @ 430 GAL./ACRE (TYPE R.S.)
MULCH ANCHORING TOOL SHALL BE USED ON ALL OTHER AREAS.

MAINTENANCE

REFERTILIZE IN THE SECOND YEAR UNLESS GROWTH IS FULLY ADEQUATE. MOW TO 3" HT. WHEN AVERAGE HT. OF GRASS BECOMES 5". RESEED, APPLY SOIL AMENDMENTS AND MULCH DAMAGED OR DEAD AREAS IMMEDIATELY.

**RAEFORD LAND CLEARING AND INERT DEBRIS
Sedimentation and Erosion Control
Calculations
HUA No. RA9402B**

Size Swales

Swale No. 1

$$Q_{10}: (.30)(5.6)(.86) = 1.5 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032 (grass)

Yn: .45'

V: 2.5 ft./sec. (requires excelsior mat)

Check Shear Stress:

$$T = (62.4)(.45)(.02) = .56 \text{ lb./SF (checks O.K., Table 8.05g)}$$

Swale No. 2

$$Q_{10}: (.30)(5.6)(1.0) = 1.7 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .5'

V: 2.5 ft./sec. (requires excelsior mat)

Swale No. 3

$$Q_{10}: (.3)(5.6)(.29) = .5 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .3'

V: 1.9 ft./sec. (seed and mulch only)

Swale No. 4

$$\begin{aligned} Q_{10}: (.30)(5.6)(2.4) &= && 4.0 \text{ CFS} \\ &+ && 1.5 \text{ CFS (Swale No. 1)} \\ &+ && 1.7 \text{ CFS (Swale No. 2)} \\ &+ && \underline{.5} \text{ CFS (Swale No. 3)} \end{aligned}$$

7.7 CFS TOTAL

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .85'

V: 3.6 ft./sec. (requires excelsior mat)

Check Shear Stress:

$$T = (62.4)(.85)(.02) = 1.06 \text{ lb./SF (checks O.K., Table 8.05g)}$$

Swale No. 5

$$Q_{10}: (.3)(5.6)(.55) = 1 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .013

n: .032

Yn: .4'

V: 1.8 ft./sec. (seed and mulch only)

Swale No. 6

$$\begin{aligned} Q_{10}: (.3)(5.6)(.64) &= && 1.7 \text{ CFS} \\ &+ && \underline{1.0} \text{ CFS (Swale No. 5)} \\ &&& 2.1 \text{ CFS TOTAL} \end{aligned}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .52'

V: 2.6 ft./sec. (requires excelsior mat)

Swale No. 7

$$Q_{10}: (.3)(5.6)(.5) = \begin{array}{r} .5 \text{ CFS} \\ + \frac{2.1 \text{ CFS (Swales 5 and 6)}}{3.0 \text{ CFS}} \end{array}$$

Z: 3:1

BW: 0'

S: .013

n: .032

Yn: .6'

V: 2.5 ft./sec. (excelsior mat required)

Swale No. 8

$$Q_{10}: (.3)(5.6)(1) = \begin{array}{r} 4.0 \text{ CFS} \\ + \frac{3.0 \text{ CFS (Swales 5, 6 and 7)}}{4.7 \text{ CFS TOTAL}} \end{array}$$

Z: 3:1

BW: 0'

S: .013

n: .032

Yn: .76'

V: 2.7 ft./sec. (requires excelsior mat)

Swale No. 9

$$Q_{10}: (.3)(5.6)(2.2) = 3.7 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .64'

V: 3 ft./sec. (requires excelsior mat)

Swale No. 10

Q_{10} : 3.7 CFS

Z: 3:1

BW: 0'

S: .10

n: .054 (Class B flowing .5-1' deep)

Yn: .58'

V: 3.7 ft./sec.

Check Shear Stress:

$$T = (62.4)(.54)(.1) = 3.4 \text{ lb./SF (checks O.K.)}$$

Swale No. 11

$$Q_{10}: (.3)(5.6)(.9) = 1.5 \text{ CFS} \\ + \frac{8.4 \text{ CFS (Swales 5 thru 9)}}{9.9 \text{ CFS TOTAL}}$$

Z: 3:1

BW: 0'

S: .013

n: .032

Yn: 1.0'

V: 3.3 ft./sec. (excelsior mat required)

Swale No. 12

$$Q_{10}: (.3)(5.6)(1.5) = 2.5 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .005

n: .032

Yn: .66'

V: 1.9 ft./sec. (seed and mulch only)

Swale No. 13

$$Q_{10}: (.3)(5.6)(.1) = .2 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .22'

V: 1.4 ft./sec. (seed and mulch only)

Swale No. 14

Q_{10} : $(.3)(5.6)(.26) = .44$ CFS
Z: 3:1
BW: 0'
S: .02
n: .032
 Y_n : .3'
V: 1.6 ft./sec. (seed and mulch only)

Pipe No. 1

Q_{10} : 1.5 CFS + 1.7 CFS (Swales 1 and 2)
n: .012 (RCP)
S: .02
Diatheo: 10" (upsized to 18")
Rip-rap Velocity Dissipator:
L: 8'
 W_1 : 9.5'
 W_2 : 4.5'
 D_{50} : 3"
Thick: 9"

Size Riser Basin No. 1

Riser Basin No. 1:

Denuded Area: 13.6 Acres
Storage:
13.6 Acres at 1,800 CF/Acre = 24,480 CF
24,480 CF / 3' Deep = 8,160 SF
8,160 SF at 2:1 L x W = 128' L x 64' W
 Q_{25} : $(.3)(7.0)(13.6) = 29$ CFS
Size Principle Spillway:
Outlet el. 246.0
Minimum capacity: 13.6 Acres at .2 CFS/AC = 2.8 CFS
H Avail:
40' at .01 = .4'
3' storage depth
1' additional depth to emer. spillway
Total H = 4.4'

Q Pipe =

Dia: 12"

Q = 4.02 (table 8.07a)

Size Dewatering holes:

$$A_o = \frac{A_s 2H}{(T)(cd)(20,428)}$$

$$A_o = \frac{(8160(2)(2))}{(8)(.6)(20.428)} = \frac{32,640}{98,054} = .33 \text{ S.F.}$$

$$.33 \text{ S.F. at } .00136 \text{ S.F./hole (1/2" holes)} = 243 \text{ holes}$$

243 holes at 2" O.C. (between cmp valleys)

243 holes ÷ 18 valleys = 13.5/valley 56" circumference ÷ 13.5
= 4.5" O.C. w/in cmp valleys

Riser Diameter:

Pipe Conduit = 12"

Riser dia. = 12" x 1.5 = 18"

Size Emergency Spillway:

Q₂₅: 29 CFS - 4.0 CFS (primary spillway) = 25 CFS

Try 5% slope w/30' bottom width

n: .032 (Bermuda grass)

Z: 3:1

Yn: .22'

V: 3.7 ft./sec. (excelsior mat required)

Check shear stress:

$$T = (62.4)(.22)(.05) = .7 \text{ lb./S.F.}$$

Size Riprap Velocity Dissipator:

2.8 CFS through 12" barrel

Class A riprap (D₅₀ 4")

8'L

$$W_1 = 1.5 \times 3 = 4.5'$$

$$W_2 = 9.5'$$

Anti-Flotation Device:

- displacement

$$3' \text{ Ht} \times \pi \cdot .75'^2 = 5.3 \text{ C.F.}$$

$$5.3 \text{ C.F.} \times 62 \text{ lb./CF} = 328 \text{ lbs.}$$

$$328 \text{ lbs.} \div 110 \text{ lb./CF (conc.)} = 3/\text{CF}$$

$$\text{Block Size} = 3' \text{ W} \times 3' \text{ L} \times 1.5' \text{ DP.} = 13.5 \text{ C.F.}$$

Size Rock Dam

Rock Dam No. 1:

Denuded Area: 3.1 Acres (initial grading only)

Storage:

$$13.1 \text{ Acres at } 1,800 \text{ CF/Acre} = 5,620 \text{ CF}$$

$$5,620 \text{ CF} / 3' \text{ Deep} = 1,873 \text{ SF}$$

$$1,873 \text{ SF at } 2:1 \text{ L} \times \text{W} = 62' \text{ L} \times 31' \text{ W}$$

Size Weir:

$$Q_{25}: (.3)(7.0)(3.1) = 6.5 \text{ CFS}$$

$$L = \frac{Q}{(3.0)(H)^{1.5}}$$

$$L = \frac{6.5}{(3.0)(.5)^{1.5}} = 6.5' \text{ L}$$

Size Dissipator:

$$Q_{25}: 6.5$$

n: .068 (Class B flowing .5-1' Deep)

End W: 6.5'

S: .005

Y_n: .71'

V: 1.0 ft./sec. (checks O.K.)

Temporary Slope Drains (3/Total)

$$Q_{10} (.3)(5.6)(.5) = .9 \text{ CFS}$$

Slope: .33

n: .01 (H.D.P.E.)

dia_{theo}: 3.4"

dia: 12"

Riprap Velocity Dissipation (Figure 8.06a)

Riprap: Class A (d₅₀ 4")

L: 8'

W₁: 4.5'

W₂: 9.5'

Temporary Culvert

$$Q_{10}: (.3)(5.6)(.5) = .9 \text{ CFS}$$

n: .022 (CMP)

s: .02

Dia: 12"

Riprap Velocity Dissipation (Figure 8.06a)

Riprap: Class A (d₅₀ 4")

L: 8'

W₁: 4.5'

W₂: 9.5'

RAEFORD LANDFILL BORROW AREA
Sedimentation and Erosion Control
Calculations
HUA No. RA9402B

Size Swales

Swale No. 1

$$Q_{10}: (.30)(5.6)(.86) = 1.5 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032 (grass)

Yn: .45'

V: 2.5 ft./sec. (requires excelsior mat)

Check Shear Stress:

$$T = (62.4)(.45)(.02) = .56 \text{ lb./SF (checks O.K., Table 8.05g)}$$

Swale No. 2

$$Q_{10}: (.30)(5.6)(1.0) = 1.7 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .5'

V: 2.5 ft./sec. (requires excelsior mat)

Swale No. 3

$$Q_{10}: (.3)(5.6)(.29) = .5 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .3'

V: 1.9 ft./sec. (seed and mulch only)

Swale No. 4

$$\begin{array}{r} Q_{10}: (.30)(5.6)(2.4) = 4.0 \text{ CFS} \\ + 1.5 \text{ CFS (Swale No. 1)} \\ + 1.7 \text{ CFS (Swale No. 2)} \\ + \underline{.5 \text{ CFS (Swale No. 3)}} \end{array}$$

7.7 CFS TOTAL

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .85'

V: 3.6 ft./sec. (requires excelsior mat)

Check Shear Stress:

$$T = (62.4)(.85)(.02) = 1.06 \text{ lb./SF (checks O.K., Table 8.05g)}$$

Swale No. 5

$$Q_{10}: (.3)(5.6)(.55) = 1 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .013

n: .032

Yn: .4'

V: 1.8 ft./sec. (seed and mulch only)

Swale No. 6

$$\begin{array}{r} Q_{10}: (.3)(5.6)(.64) = 1.7 \text{ CFS} \\ + \underline{1.0 \text{ CFS (Swale No. 5)}} \\ 2.1 \text{ CFS TOTAL} \end{array}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .52'

V: 2.6 ft./sec. (requires excelsior mat)

Swale No. 7

$$Q_{10}: (.3)(5.6)(.5) = \begin{array}{l} .5 \text{ CFS} \\ + \frac{2.1 \text{ CFS (Swales 5 and 6)}}{3.0 \text{ CFS}} \end{array}$$

Z: 3:1

BW: 0'

S: .013

n: .032

Yn: .6'

V: 2.5 ft./sec. (excelsior mat required)

Swale No. 8

$$Q_{10}: (.3)(5.6)(1) = \begin{array}{l} 4.0 \text{ CFS} \\ + \frac{3.0 \text{ CFS (Swales 5, 6 and 7)}}{4.7 \text{ CFS TOTAL}} \end{array}$$

Z: 3:1

BW: 0'

S: .013

n: .032

Yn: .76'

V: 2.7 ft./sec. (requires excelsior mat)

Swale No. 9

$$Q_{10}: (.3)(5.6)(2.2) = 3.7 \text{ CFS}$$

Z: 3:1

BW: 0'

S: .02

n: .032

Yn: .64'

V: 3 ft./sec. (requires excelsior mat)

Swale No. 10

Q₁₀: 3.7 CFS
Z: 3:1
BW: 0'
S: .10
n: .054 (Class B flowing .5-1' deep)
Yn: .58'
V: 3.7 ft./sec.
Check Shear Stress:
T = (62.4)(.54)(.1) = 3.4 lb./SF (checks O.K.)

Swale No. 11

Q₁₀: (.3)(5.6)(.9) = 1.5 CFS
+ $\frac{8.4 \text{ CFS (Swales 5 thru 9)}}{9.9 \text{ CFS TOTAL}}$
Z: 3:1
BW: 0'
S: .013
n: .032
Yn: 1.0'
V: 3.3 ft./sec. (excelsior mat required)

Swale No. 12

Q₁₀: (.3)(5.6)(1.5) = 2.5 CFS
Z: 3:1
BW: 0'
S: .005
n: .032
Yn: .66'
V: 1.9 ft./sec. (seed and mulch only)

Swale No. 13

Q₁₀: (.3)(5.6)(.1) = .2 CFS
Z: 3:1
BW: 0'
S: .02
n: .032
Yn: .22'
V: 1.4 ft./sec. (seed and mulch only)

Swale No. 14

Q_{10} : $(.3)(5.6)(.26) = .44$ CFS
Z: 3:1
BW: 0'
S: .02
n: .032
 Y_n : .3'
V: 1.6 ft./sec. (seed and mulch only)

Pipe No. 1

Q_{10} : 1.5 CFS + 1.7 CFS (Swales 1 and 2)
n: .012 (RCP)
S: .02
Diatheo: 10" (upsized to 18")
Rip-rap Velocity Dissipator:
L: 8'
 W_1 : 9.5'
 W_2 : 4.5'
 D_{50} : 3"
Thick: 9"

Size Riser Basin No. 1

Riser Basin No. 1:

Denuded Area: 13.6 Acres
Storage:
13.6 Acres at 1,800 CF/Acre = 24,480 CF
24,480 CF / 3' Deep = 8,160 SF
8,160 SF at 2:1 L x W = 128' L x 64' W
 Q_{25} : $(.3)(7.0)(13.6) = 29$ CFS
Size Principle Spillway:
Outlet el. 246.0
Minimum capacity: 13.6 Acres at .2 CFS/AC = 2.8 CFS
H Avail:
40' at .01 = .4'
3' storage depth
1' additional depth to emer. spillway
Total H = 4.3'

Q Pipe =

Dia: 12"

Q = 4.02 (table 8.07a)

Size Dewatering holes:

$$A_o = \frac{A_s 2H}{(T)(cd)(20,428)}$$

$$A_o = \frac{(8160(2)(2))}{(8)(.6)(20.428)} = \frac{32,640}{98,054} = .33 \text{ S.F.}$$

$$.33 \text{ S.F. at } .003 \text{ S.F./hole (1/2" holes)} = 110 \text{ holes}$$

$$110 \text{ holes at } 2" \text{ O.C. (between cmp valleys)}$$

$$= 4.5" \text{ O.C. w/in cmp valleys}$$

Riser Diameter:

Pipe Conduit = 12"

Riser dia. = 12" x 1.5 = 18"

Size Emergency Spillway:

Q₂₅: 29 CFS - 4.0 CFS (primary spillway) = 25 CFS

Try 5% slope w/30' bottom width

n: .032 (Bermuda grass)

Z: 3:1

Yn: .22'

V: 3.7 ft./sec. (excelsior mat required)

Check shear stress:

$$T = (62.4)(.22)(.05) = .7 \text{ lb./S.F.}$$

Size Riprap Velocity Dissipator:

2.8 CFS through 12" barrel

Class A riprap (D₅₀ 4")

8'L

$$W_1 = 1.5 \times 3 = 4.5'$$

$$W_2 = 9.5'$$

Anti-Flotation Device:

- displacement

$$3' \text{ Ht} \times \pi \cdot .75'^2 = 5.3 \text{ C.F.}$$

$$5.3 \text{ C.F.} \times 62 \text{ lb./CF} = 328 \text{ lbs.}$$

$$328 \text{ lbs.} \div 85 \text{ lb./CF (conc.)} = \text{L/CF}$$

$$\text{Block Size} = 3' \text{ W} \times 3' \text{ L} \times 1.5' \text{ DP.} = 13.5 \text{ C.F.}$$

Size Rock Dam

Rock Dam No. 1:

Denuded Area: 3.1 Acres (initial grading only)

Storage:

$$13.1 \text{ Acres at } 1,800 \text{ CF/Acre} = 5,620 \text{ CF}$$

$$5,620 \text{ CF} / 3' \text{ Deep} = 1,873 \text{ SF}$$

$$1,873 \text{ SF at } 2:1 \text{ L} \times \text{W} = 62' \text{ L} \times 31' \text{ W}$$

Size Weir:

$$Q_{25}: (.3)(7.0)(3.1) = 6.5 \text{ CFS}$$

$$L = \frac{Q}{(3.0)(H)^{1.5}}$$

$$L = \frac{6.5}{(3.0)(5)^{1.5}} = 6.5' \text{ L}$$

Size Dissipator:

$$Q_{25}: 6.5$$

n: .068 (Class B flowing .5-1' Deep)

End W: 6.5'

S: .005

Yn: .71'

V: 1.0 ft./sec. (checks O.K.)



Hobbs, Upchurch & Associates, P.A.

Consulting Engineers

290 S.W. Broad Street • Post Office Box 1737 • Southern Pines, NC 28388

February 3, 1995

Mr. Tim Donnelly
Regional Engineer
N.C. Department of Environment, Health
and Natural Resources
Division of Environmental Management
Water Quality Section, NPDES Group
P.O. Box 29535
Raleigh, NC 27626-0535

RE: NPDES, NOI for the Raeford Construction-Demolition Landfill
HUA No. RA9402

Dear Mr. Donnelly:

Please find enclosed the NPDES, NOI Permit Application, \$50.00 permit fee, USGS quad sheet map depicting the site and the letter of acceptance from the NCDEHNR for the above mentioned project.

If you should have any questions or require any additional information, please do not hesitate to contact this office at your earliest convenience.

Sincerely,
HOBBS, UPCHURCH & ASSOCIATES, P.A.

Daniel W. Sundberg, ASLA

Enclosures

cc: Mr. Mike McNeill
Mr. Mike Wood
Mr. Jim Barber

Southern Pines, NC
Winston-Salem, NC

• Telephone 910-692-5616
• Telephone 910-759-3009

• Fax 910-692-7342
• Fax 910-759-7590



FOR AGENCY USE ONLY

DATE RECEIVED		
YEAR	MONTH	DAY
CERTIFICATE OF COVERAGE		
DATE ISSUED		
YEAR	MONTH	DAY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

**NOTICE OF INTENT REQUESTING COVERAGE UNDER THE
CONSTRUCTION ACTIVITIES GENERAL NPDES PERMIT NCG010000
STORMWATER DISCHARGES**

Complete this Notice of Intent (NOI) and mail to the following address

North Carolina Division of Environmental Management
Water Quality Section, NPDES Group
P.O. Box 29535
Raleigh, North Carolina, 27626-0535

The NOI must be accompanied with a general permit filing fee of \$50.00. The check should be made out to the North Carolina Department of Environment, Health, and Natural Resources.

Applicant Information: (please print or type)

Name: City of Raeford
Address: 315 North Main Street
City: Raeford State: North Carolina
Zip: 28376 Phone: (910) 875-8161

Project Information:

Name of project: Raeford Construction-Demolition Debris Landfill
City: Raeford State: North Carolina
County: Hoke
Estimated time table of the project:
July 1995 - July 2015

Physical Location

Description:(Street address, state road number, distance and direction from roadway intersection, and attach a copy of a county map or USGS quad with the facility marked on the map.) SR 1321 ± 2 miles west of SR 1302

[Agency use only: Latitude _____ Longitude _____]

Stormwater discharges to Rockfish Creek

(name of receiving water
or, if to a municipal separate storm sewer system, name of the municipal system)

Number of stormwater discharge points? 1

I hereby request coverage under the referenced General Permit. I understand that coverage under this permit will constitute the permit requirements for the discharge(s) and is enforceable in the same manner as an individual permit.

I agree to abide by the following as a part of coverage under this General Permit:

1. I agree to abide by the approved Sedimentation and Erosion Control Plan for this project and to keep a signed copy of the letter of approval of the plan on-site at all times. (A copy of the letter of approval of the plan must be attached to this request.)
2. I agree to not discharge any sanitary wastewater from this construction activity except under the provisions of another NPDES permit specifically issued therefore.
3. I agree that there will be no chemicals added to the discharge.
4. I agree that wastes composed of building materials will be disposed of in accordance with N.C. statutes and rules governing solid waste disposal.
5. I agree that maintenance activities for vehicles and heavy equipment will be performed so as to not result in contamination of the surface or ground waters.

I agree to abide by the provisions as listed above and recognize that the provisions are to be considered as enforceable requirements of the General Permit.

I certify that I am familiar with the information contained in the application and that to the best of my knowledge and belief such information is true, complete, and accurate.

Michael N. Wood
signature

2-1-95
date

Michael N. Wood
name of person signing above (printed or typed)

Hoke County Manager
title

North Carolina General Statute 143-215.6B (f) provides that: Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, or who falsifies, tampers with or knowingly renders inaccurate any recording or monitoring device or method required to be operated or maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, shall be guilty of a misdemeanor punishable by a fine not to exceed \$10,000, or by imprisonment not to exceed six months, or by both. (18 U.S.C. Section 1001 provides a punishment by a fine of not more than \$10,000 or imprisonment not more than 5 years, or both, for similar offense.)



State of North Carolina
Department of Environment,
Health and Natural Resources
Fayetteville Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Andrew McCall, Regional Manager



RECEIVED AUG 19 1994

August 16, 1994

Mr. Michael Wood, County Manager
County of Hoke
PO Box 266
Raeford, NC 28376

Re: Approval of Soil Erosion and Sediment
Control Plan
Raeford Construction Demolition Landfill
Hoke County, NC

Dear Mr. Wood:

The review of the above referenced erosion control plan has been completed.

The plan has been found to be acceptable subject to the following stipulations:

1. Enclosed is a Certificate of Plan Approval which must be displayed at the job site.
2. This project is subject to the National Pollutant Discharge Elimination System (NPDES) for point source stormwater discharges from construction activities. Enclosed is a copy of the necessary permit application. Please contact Mr. Ken Averitte, Division of Environmental Management, at (910) 486-1541 for further assistance regarding this permit.
3. In order to ensure the early coordination and implementation of the erosion control plan for this project, it is requested that a preconstruction conference be held. As a minimum, representatives of the owner, engineer, contractor, and this office should attend, subject to the availability of staff. Please notify Gerald Lee of this office as to when this conference is scheduled.

Approval of Soil Erosion and Sediment Control Plan
Page 2

4. The developer is responsible for obtaining any and all permits and approvals necessary for the development of this project prior to the commencement of this land-disturbing activity. This could include the Division of Environmental Management under storm water regulations, the US Army Corps of Engineers under Article 404 jurisdiction, local county or town agencies under their local ordinances, or others that may be required. This approval cannot supersede any other permit or approval; however, in the case of a Cease and Desist Order from the Corps of Engineers, that Order would only apply to wetland areas. All other lands must still be in compliance with the Sedimentation Pollution Control Act.
5. If any area on site falls under the jurisdiction of Section 404 of the Clean Water Act, the developer is responsible to the orders of the US Army Corps of Engineers. Any erosion control measures that fall within jurisdictional wetland area must be relocated to the transition point between the wetlands and the highlands to assure that the migration of sediment will not occur. If that relocation presents a problem or contradicts any requirements of the Corps of Engineers, it is the responsibility of the developer to inform the Land Quality Section's Regional Office so that an adequate contingency plan can be made to assure sufficient erosion control on-site. Failure to do so will be considered a violation of this approval.
6. Any borrow material brought onto this site must be from a legally permitted mine site or other approved source. A single use borrow or waste area site is only permissible if it is operated under control of the financially responsible person or firm that is developing this site. An approved erosion and sediment control plan is required for all single use borrow and waste sites.
7. Following the completion of the project, you should notify this office to schedule a final inspection. The purpose of this inspection is to ensure that all erosion control requirements have been met.

This approval is subject to the satisfactory performance of the erosion control measures under field conditions. Should it be determined that the requirements of the Sedimentation Pollution Control Act of 1973 (GS 113A,51-66) are not being met, revisions to the plan and its implementation will be required.

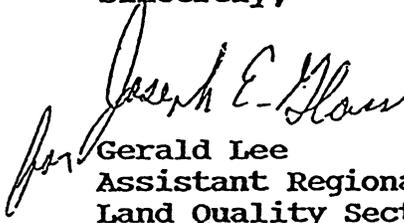
This permit allows for a land disturbance, as called for on the application plan, not to exceed 18 acres and/or the limits of the submitted plans. Exceeding these limits will be a violation of this permit and would require a revised plan and additional application fee. Amendments to the plan should be submitted to this office under the same procedures as followed for the original plan.

Approval of Soil Erosion and Sediment Control Plan
Page 3

Title 15, Section 4B.0017 (A) of the North Carolina Administrative Code requires that a copy of the approved plan be on file at the job site and that inspections of the project be made by this office to ensure compliance with the approved plan.

We look forward to working with you on this project.

Sincerely,



Gerald Lee
Assistant Regional Engineer
Land Quality Section

GL/bt

Enclosure

cc: Daniel W. Sundberg, ASLA
Linda Revels
Ken Averitte

4677

HOBBS, UPCHURCH & ASSOCIATES, P.A.

P. O. BOX-1737, 290 SW. BROAD STREET
SOUTHERN PINES, N.C. 28387

66-112
531

2/3 1995

PAY
TO THE
ORDER OF

North Carolina DEHNR

\$ 50.00

Fifty and no/100

DOLLARS

BB&T

BRANCH BANKING AND TRUST COMPANY
SOUTHERN PINES, NORTH CAROLINA 28387

FOR BA9402

NPDES Permit

David T. Upchurch

⑈00004677⑈ ⑆053101121⑆ 1861000164⑈

State of North Carolina
Department of Environment,
Health and Natural Resources
Fayetteville Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Andrew McCall, Regional Manager



May 31, 1994

RECEIVED JUN 02 1994

Mr. Michael Wood, County Manager
County of Hoke
PO Box 266
Raeford, NC 28376

Re: Approval of Soil Erosion and Sediment
Control Plan
Landfill Closure Borrow Site
Hoke County, NC

Dear Mr. Wood:

The review of the above referenced erosion control plan has been completed.

The plan has been found to be acceptable subject to the following stipulations:

1. Enclosed is a Certificate of Plan Approval which must be displayed at the job site.
2. This project is subject to the National Pollutant Discharge Elimination System (NPDES) for point source stormwater discharges from construction activities. Enclosed is a copy of the necessary permit application. Please contact Ken Averitte, Environmental Technician, at (910) 486-1541 for further assistance regarding this permit.
3. In order to ensure the early coordination and implementation of the erosion control plan for this project, it is requested that a preconstruction conference be held. As a minimum, representatives of the owner, engineer, contractor, and this office should attend, subject to the availability of staff. Please notify Gerald Lee of this office as to when this conference is scheduled.

Approval of Soil Erosion and Sediment Control Plan
Page 2

4. The developer is responsible for obtaining any and all permits and approvals necessary for the development of this project prior to the commencement of this land-disturbing activity. This could include the Division of Environmental Management under storm water regulations, the US Army Corps of Engineers under Article 404 jurisdiction, local county or town agencies under their local ordinances, or others that may be required. This approval cannot supersede any other permit or approval; however, in the case of a Cease and Desist Order from the Corps of Engineers, that Order would only apply to wetland areas. All other lands must still be in compliance with the Sedimentation Pollution Control Act.
5. If any area on site falls under the jurisdiction of Section 404 of the Clean Water Act, the developer is responsible to the orders of the US Army Corps of Engineers. Any erosion control measures that fall within jurisdictional wetland area must be relocated to the transition point between the wetlands and the highlands to assure that the migration of sediment will not occur. If that relocation presents a problem or contradicts any requirements of the Corps of Engineers, it is the responsibility of the developer to inform the Land Quality Section's Regional Office so that an adequate contingency plan can be made to assure sufficient erosion control on-site. Failure to do so will be considered a violation of this approval.
6. Following the completion of the project, you should notify this office to schedule a final inspection. The purpose of this inspection is to ensure that all erosion control requirements have been met.

This approval is subject to the satisfactory performance of the erosion control measures under field conditions. Should it be determined that the requirements of the Sedimentation Pollution Control Act of 1973 (GS 113A,51-66) are not being met, revisions to the plan and its implementation will be required.

This permit allows for a land disturbance, as called for on the application plan, not to exceed 18 acres and/or the limits of the submitted plans. Exceeding these limits will be a violation of this permit and would require a revised plan and additional application fee. Amendments to the plan should be submitted to this office under the same procedures as followed for the original plan.

Title 15, Section 4B.0017 (A) of the North Carolina Administrative Code requires that a copy of the approved plan be on file at the job site and that inspections of the project be made by this office to ensure compliance with the approved plan.

Approval of Soil Erosion and Sediment Control Plan
Page 3

We look forward to working with you on this project. .

Sincerely,



Gerald Lee
Assistant Regional Engineer
Land Quality Section

GL/bt

Enclosure

cc: Daniel W. Sundberg, ASLA
Billy Cox
Ken Averitte



BM 308

308

285

BM 279

R A V E N H O L M

SITE

322

295

200

280

275

274

287

258

East Freedom Church

Robbin Field

McLaughlin

Water Tank

PROSPECT

BM 252

BM 277

BM 244

BM 250

Industrial Waste Ponds

TOWN

4400

HOBBS, UPCHURCH & ASSOCIATES, P.A.
P. O. BOX 1737, 290 SW. BROAD STREET
SOUTHERN PINES, N.C. 28387

66-112
531

6/17 19 94

OF North Carolina DEHNR

\$ 50.00

forty and no/100

DOLLARS

BB&T

BRANCH BANKING AND TRUST COMPANY
SOUTHERN PINES, NORTH CAROLINA 28387

RA9402 NPDES Permit

[Signature]

MP

⑈00004400⑈+⑈053101121⑈1861000164⑈



Hobbs, Upchurch & Associates, P.A.
Consulting Engineers

290 S.W. Broad Street • Post Office Box 1737 • Southern Pines, NC 28388

June 24, 1994

Mr. Tim Donnelly
Regional Engineer
NC Department of Environment,
Health and Natural Resources
Division of Environmental Management
Water Quality Section, NPDES Group
PO Box 29535
Raleigh, North Carolina 27626-0535

RE: NPDES, NOI For the Raeford Municipal Solid Waste
Landfill Closure Borrow Site
HUA No. RA9403

Dear Mr. Donnelly:

Please find enclosed the NPDES, NOI Permit Application, \$50.00 permit fee, USGS quad sheet map depicting the site, and the letter of acceptance from the NCDEHNR for the above mentioned project.

If you should have any questions or require any additional information, please do not hesitate to contact this office at your earliest convenience.

Sincerely,
HOBBS, UPCHURCH & ASSOCIATES, P.A.

Daniel W. Sundberg, A.S.L.A.

cc: Mr. Mike McNeill
Mr. Mike Wood



FOR AGENCY USE ONLY

DATE RECEIVED		
YEAR	MONTH	DAY
CERTIFICATE OF COVERAGE		
DATE ISSUED		
YEAR	MONTH	DAY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

**NOTICE OF INTENT REQUESTING COVERAGE UNDER THE
CONSTRUCTION ACTIVITIES GENERAL NPDES PERMIT NCG010000
STORMWATER DISCHARGES**

Complete this Notice of Intent (NOI) and mail to the following address

North Carolina Division of Environmental Management
Water Quality Section, NPDES Group
P.O. Box 29535
Raleigh, North Carolina, 27626-0535

The NOI must be accompanied with a general permit filing fee of \$50.00. The check should be made out to the North Carolina Department of Environment, Health, and Natural Resources.

Applicant Information: (please print or type)

Name: City of Raeford
Address: 315 North Main Street
City: Raeford State: North Carolina
Zip: 28376 Phone: (910) 875-8161

Project Information:

Name of project: Municipal Solid Waste Landfill Closure Borrow Site
City: Raeford State: North Carolina
County: Hoke

Estimated time table of the project:
July 1994 - July 2014

Physical Location

Description:(Street address, state road number, distance and direction from roadway intersection, and attach a copy of a county map or USGS quad with the facility marked on the map.) SR 1321 ± 2 miles west of SR 1302

[Agency use only: Latitude _____ Longitude _____]

Stormwater discharges to Rockfish Creek

(name of receiving water or, if to a municipal separate storm sewer system, name of the municipal system)

Number of stormwater discharge points? 1

I hereby request coverage under the referenced General Permit. I understand that coverage under this permit will constitute the permit requirements for the discharge(s) and is enforceable in the same manner as an individual permit.

I agree to abide by the following as a part of coverage under this General Permit:

1. I agree to abide by the approved Sedimentation and Erosion Control Plan for this project and to keep a signed copy of the letter of approval of the plan on-site at all times. (A copy of the letter of approval of the plan must be attached to this request.)
2. I agree to not discharge any sanitary wastewater from this construction activity except under the provisions of another NPDES permit specifically issued therefore.
3. I agree that there will be no chemicals added to the discharge.
4. I agree that wastes composed of building materials will be disposed of in accordance with N.C. statutes and rules governing solid waste disposal.
5. I agree that maintenance activities for vehicles and heavy equipment will be performed so as to not result in contamination of the surface or ground waters.

I agree to abide by the provisions as listed above and recognize that the provisions are to be considered as enforceable requirements of the General Permit.

I certify that I am familiar with the information contained in the application and that to the best of my knowledge and belief such information is true, complete, and accurate.

Michael N. Wood
signature

June 9, 1994
date

Michael N. Wood
name of person signing above (printed or typed)

Hoke County Manager
title

North Carolina General Statute 143-215.6B (i) provides that: Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, or who falsifies, tampers with or knowingly renders inaccurate any recording or monitoring device or method required to be operated or maintained under Article 21 or regulations of the Environmental Management Commission implementing that Article, shall be guilty of a misdemeanor punishable by a fine not to exceed \$10,000, or by imprisonment not to exceed six months, or by both. (18 U.S.C. Section 1001 provides a punishment by a fine of not more than \$10,000 or imprisonment not more than 5 years, or both, for similar offense.)

ix. EROSION CONTROL NARRATIVE

1. OBTAIN AN APPROVED SOIL AND EROSION CONTROL PLAN.
2. INSTALL SILT FENCE, TEMP. DIVERSIONS, ROCK DAM, RISER BASIN, CULVERTS, DISSIPATORS AND/OR OTHER MEASURES AS SHOWN ON THE APPROVED PLAN.
3. CALL FOR ON-SITE INSPECTION BY THE N.C.D.E.H.N.R., LAND QUALITY SECTION.
4. BEGIN CLEARING, GRUBBING, AND GRADING. MAINTAIN MEASURES AS REQUIRED.
5. ALL DISTURBED AREAS ARE TO BE PLANTED SUFFICIENTLY TO RESTRAIN EROSION AFTER THE COMPLETION OF ANY PHASE OF GRADING. WHEN AVERAGE HEIGHT OF TURF BECOMES 5 INCHES, MOW TO A 3" HEIGHT.
6. INSTALL SLOPE DRAIN AND TEMPORARY DIVERSION SWALES AS FINAL ELEVATION IS ATTAINED.
7. WHEN CONSTRUCTION IS COMPLETE, ALL AREAS ARE STABILIZED, AND WHEN VEGETATION IS ESTABLISHED, CALL FOR ON-SITE INSPECTION BY THE SEDIMENTATION AND EROSION CONTROL OFFICE.
8. MAINTAIN EROSION CONTROL DEVICES PERIODICALLY AFTER ALL RUNOFF PRODUCING RAINS.
9. WHEN SITE IS CLOSED, CALL FOR PRELIMINARY FINAL INSPECTION.
10. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES, SEED AND MULCH ALL DISTURBED AREAS AND CALL FOR FINAL INSPECTION.

**DESCRIPTION OF COMPLIANCE WITH SITING CRITERIA
IN SECTION .0564**

Siting Criteria for Land Clearing and Inert Debris (LCID) Landfills

The following siting criteria shall apply for the Raeford/Hoke County Land Clearing and Inert Debris (LCID) landfill:

1. The facilities will not be located in the 100-year floodplain.
2. The facilities will not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife.
3. The facilities will not result in the destruction or adverse modification of the critical habitat of endangered or threatened species as identified in 50 CFR Part 17.
4. The facilities will not damage or destroy an archaeological or historical site.
5. The facilities will not cause an adverse impact on a state park, recreation or scenic area, or any other lands included in the state nature and historic preserve.
6. The facilities will not be located in any wetland as defined in the Clean Water Act, Section 404(b).
7. Adequate suitable soils are available for cover from on/off site.
8. The land clearing and inert debris landfill will meet the following surface and groundwater requirements:
 - a. The facilities will not cause a discharge of pollutants into waters of the state that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES), under Section 402 of the Clean Water Act, as amended.
 - b. The facilities will not cause a discharge of dredged materials or fill material into waters of the state that is in violation of the requirements under Section 404 of the Clean Water Act, as amended.
 - c. The facilities will not cause non-point source pollution of waters of the state that violates assigned water quality standards.
 - d. The waste will be placed a minimum of four feet above the seasonal high water table.
9. The facility will meet the following minimum buffer requirements:
 - a. 50 feet from the waste boundary to all surface waters of the state as defined in G.S. 143-212.
 - b. 100 feet from the disposal area to property lines, residential dwellings, commercial or public buildings and wells.
10. The facility shall meet all requirements of any applicable zoning ordinance.

xi. ADDITIONAL PERTINENT INFORMATION

A. Land Use Zoning

A. Land Use Zoning

3st-it™ brand

Fax Transmittal Memo 7672

To *Dan Lumbard*
Company *Hobbs, Upchurch & Assoc.*
Location

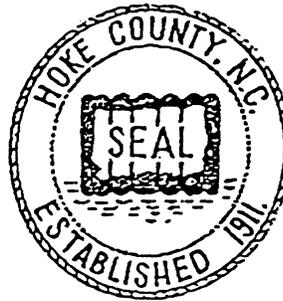
Fax # *(910) 692-7342*
Comments

Telephone # *692-5616*

No. of Pages *1* Today's Date *21/4/94* Time
From *Mike McNeill*
Company *City of Raeford*
Location Dept. Charge
Fax # *(910) 875-8165* Telephone # *875-5031*
Original Disposition: Destroy Return Call for pickup

BOARD OF COUNTY COMMISSIONERS

L. E. McLaughlin, Jr. Chairman
Dr. Riley M. Jordan, Vice Chairman
James A. Leach
Thomas P. Howell
Cleo Bratcher, Jr.



COUNTY MANAGER

Michael Wood

ATTORNEY

Neil Yarborough

COUNTY OF HOKE

April 19, 1994

City of Raeford
P. O. Box 606
Raeford, NC 28376

Dear Sir(s):

On Monday, April 18, 1994 the Hoke County Board of Commissioners approved your request for an additional 20 acre tract of land to Industrial with a conditional use for construction debris. This tract of land adjoins an 85 acre tract of land that is presently zoned Industrial, which is the landfill.

If you have any questions concerning this matter, please let me know.

Sincerely,

Linda Revels
Zoning Administrator

B. 1" = 1,000' Map

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Solid Waste Management



James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
William L. Meyer, Director

October 18, 1996

Mr. John Randall Pandure
Pandure's Bulldozer Service
1069 N. Horace Walters Road
Raeford, North Carolina 28326

Subject: Land Clearing and Inert Debris (LCID) landfill
notification.

Dear Mr. Pandure:

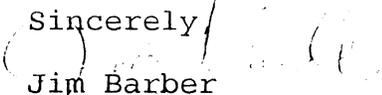
Enclosed is your original LCID landfill application that was forwarded to me by the Solid Waste Section Raleigh Central Office on 15 October 1996 and received in the Fayetteville Regional Office on 18 October 1996. It is required that this document be recorded at the Register of Deeds Office in the Hoke County courthouse and that the Register of Deeds index this document in the Grantor Index. The Register's seal and the date, book, and page number of recording must be included on this document before the Solid Waste Section can process it. Upon recording this document forward a copy to:

Solid Waste Section
225 Green Street
Suite 601
Fayetteville, N.C. 28301
Attn: Jim Barber

Once this document is received, the Solid Waste Section will process and return a confirmation letter back to you with authorization to use the LCID landfill.

If you have any questions or need any additional information, please contact me at (910) 486-1191 or Robert Hearn at (919) 571-4700.

Sincerely,


Jim Barber
Eastern Regional Engineer
Solid Waste Section
cc: Terry Dover
Ikie Guyton