

5101Permit1993 - Batch No. ___

Johnston Co. St. 01

1993

5101.1993

-Booklet-



CLOSURE PLAN
FOR
JOHNSTON COUNTY LANDFILL SITE

State Contact

Mr. Jim Coffey
Division of Solid Waste Management
NCDEHNR
P. O. Box 27687
Raleigh, North Carolina 27611-7687
Phone: (919) 733-0692

Prepared by

McKIM & CREED ENGINEERS, P.A.
5625 Dillard Road, Bldg. 1, Suite 117
Cary, North Carolina 27511

M&C Project No. 358-0023.OR

October 7, 1993
Revised: October 26, 1993



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A. Layout of Landfill Site

The Johnston County Landfill is located in the western part of the County, approximately five (5) miles west of Smithfield. The municipal solid waste cell (Phase IV) in the northwest portion of the landfill to be closed out is shown on the attached plan.

B. Closure Conditions

The cell to be closed out is classified as a Category 2 unit as outlined in the "Closure Conditions for Municipal Solid Waste Landfills" memo dated May 1, 1993. Minimum two (2) foot deep cap will be used for cover and will be placed prior to April 9, 1994. The soil to be used for cover shall have a permeability no greater than 1×10^{-5} cm. per second.

The two foot cap shall consist of a low-permeability barrier that consists of 18 inches of earthen material with a 6 inch layer of earthen material on top that is capable of sustaining active plant growth and will protect the 18 inch layer from root penetration.

Existing and proposed drainage ditches will be checked to assure that adequate capacity is provided so that surface water does not intrude on to the top of waste areas. New ditches will be constructed in areas where erosion currently exist. Permanent erosion control measures including rip rap and jute netting will be provided, as required, in all drainage ditches.

All closure areas within the landfill will be stabilized with seeding that will be included as part of the closure plan. Leachate testing will be performed to determine if there is improper leachate discharge. A remediation plan will be developed if improper discharge is encountered.

A landfill gas survey will be performed to determine if the concentration of explosive gases generated at the landfill site exceed the limits established in Section .0503 of the Solid Waste Management Rules (15A NCAC 13B). In particular, the survey will be performed along the landfill boundary and at the site structures.

The closure site will be in compliance with the buffer requirements in Section .0503 of the Solid Waste Management Rules (15A NCAC 13B).

C. Post Closure Conditions

A water quality monitoring plan will be developed for the post-closure care period in accordance with the N. C. Water Quality Monitoring Guidance Document for Solid Waste Facilities. The plan to monitor groundwater will remain in effect for five (5) years and then be re-evaluated.



MCKIM & CREED

LETTER OF TRANSMITTAL

TO JIM BARBER
 SOLID WASTE SECTION - DIVISION OF SOLID WASTE
 225 GREEN STREET MANAGEMENT
 SUITE 601
 FAYETTEVILLE, NC 28301

DATE	10/27/93	PROJ. NO.	358-0023.0R
ATTENTION			
RE:	JOHNSTON COUNTY LANDFILL		
	CLOSURE PLAN/REPORT (REVISED)		

GENTLEMEN:

- WE ARE SENDING YOU Attached Under separate cover via _____ the following items:
- Shop drawings Prints Originals Samples Specifications
- Other _____

Quan.	Dwg. No.	Description	Status
1		REVISED CLOSURE PLAN REPORT	F

RECEIVED
 10/27/93
 SOLID WASTE SECTION
 FAYETTEVILLE, NC

- Status Code: A. Approved C. Rejected—Re-submit E. For your information
 B. Approved as noted D. Revise and Re-submit F. Refer to remarks

REMARKS SECTION B (CLOSURE CONDITIONS) HAS BEEN REVISED PER
 OUR TELEPHONE CONVERSATION ON 10/25/93.

SUITE 117, BUILDING I 5625 DILLARD ROAD CARY, NC 27511 919/233-8091

cc: C.T. CLAYTON, P.E.
 HAYWOOD PTHISIC (JOHNSTON CO.)

MCKIM & CREED ENGINEERS, PA

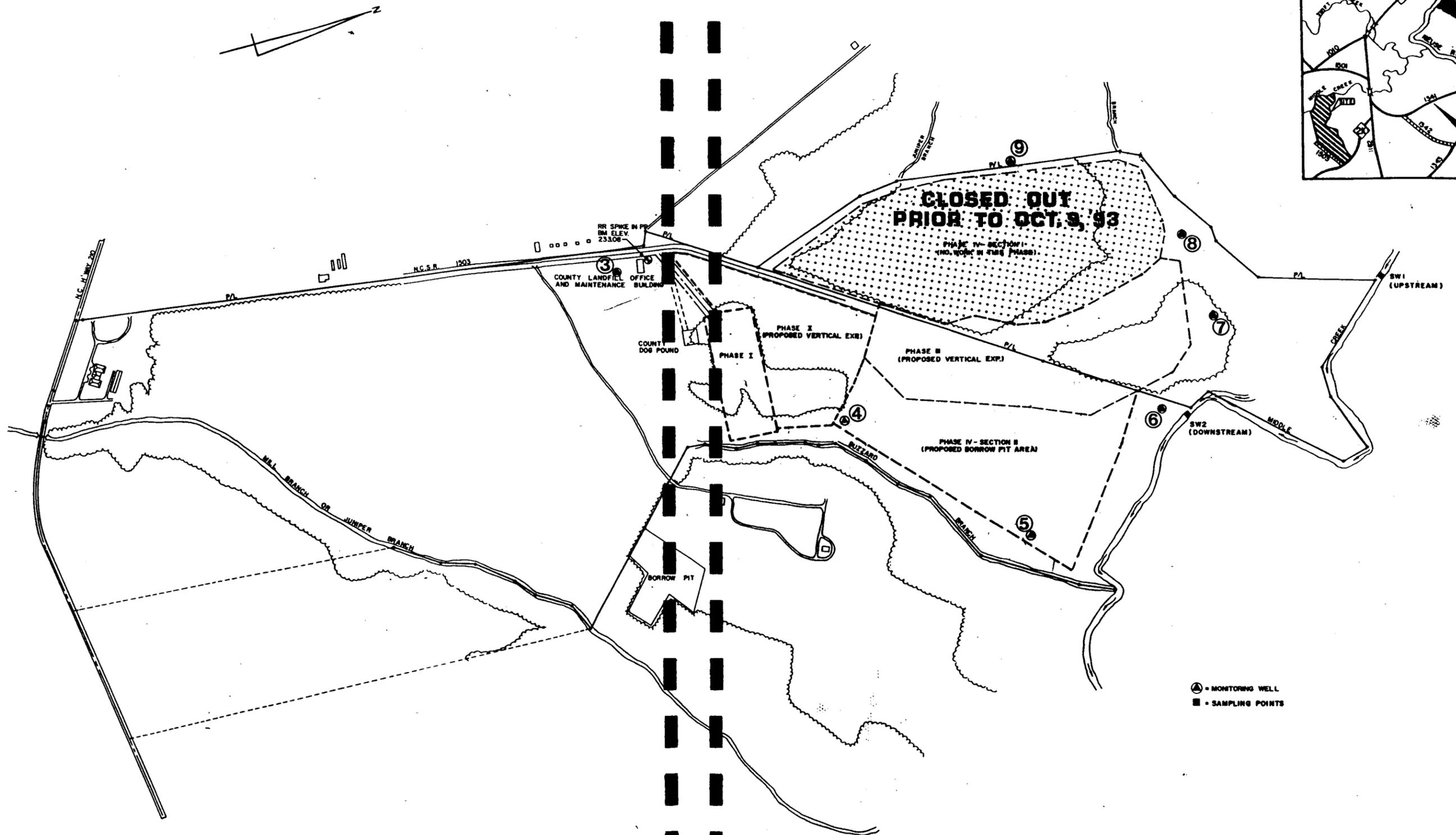
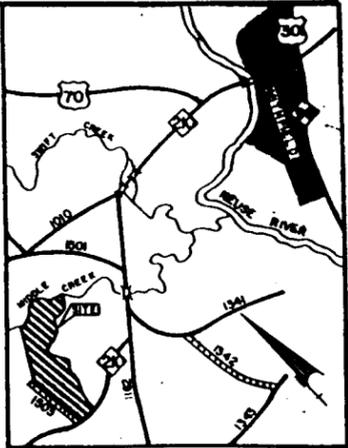
SIGNED Thomas J. Ellis
 THOMAS J. ELLIS, P.E.
 PROJECT ENGINEER

A drainage and erosion control scheme will be developed to assure that surface water will not come into contact with the waste material. Testing will continue after closure to assure that the concentration of explosive gases generated by the site does not exceed the limits established in Rule .0503 of the Solid Waste Management Rules.

D. Closure Plan Schedule

Closure of the existing municipal solid waste cells will be completed by April 9, 1994. The permit application for this closure is being submitted during October 1993 in order to comply with the latest closure requirements of the DEHNR.

By satisfying the buffer requirements and providing adequate roads in the landfill, operation of the remaining cells should not interfere with the closure requirements.



JOHNSTON CO. LANDFILL
MASTER PLAN

⊙ - MONITORING WELL
■ - SAMPLING POINTS

NO.	DESCRIPTION	DATE

DESIGNED	TJE
DRAWN	WHD
CHECKED	TJE
SCALE	AS SHOWN

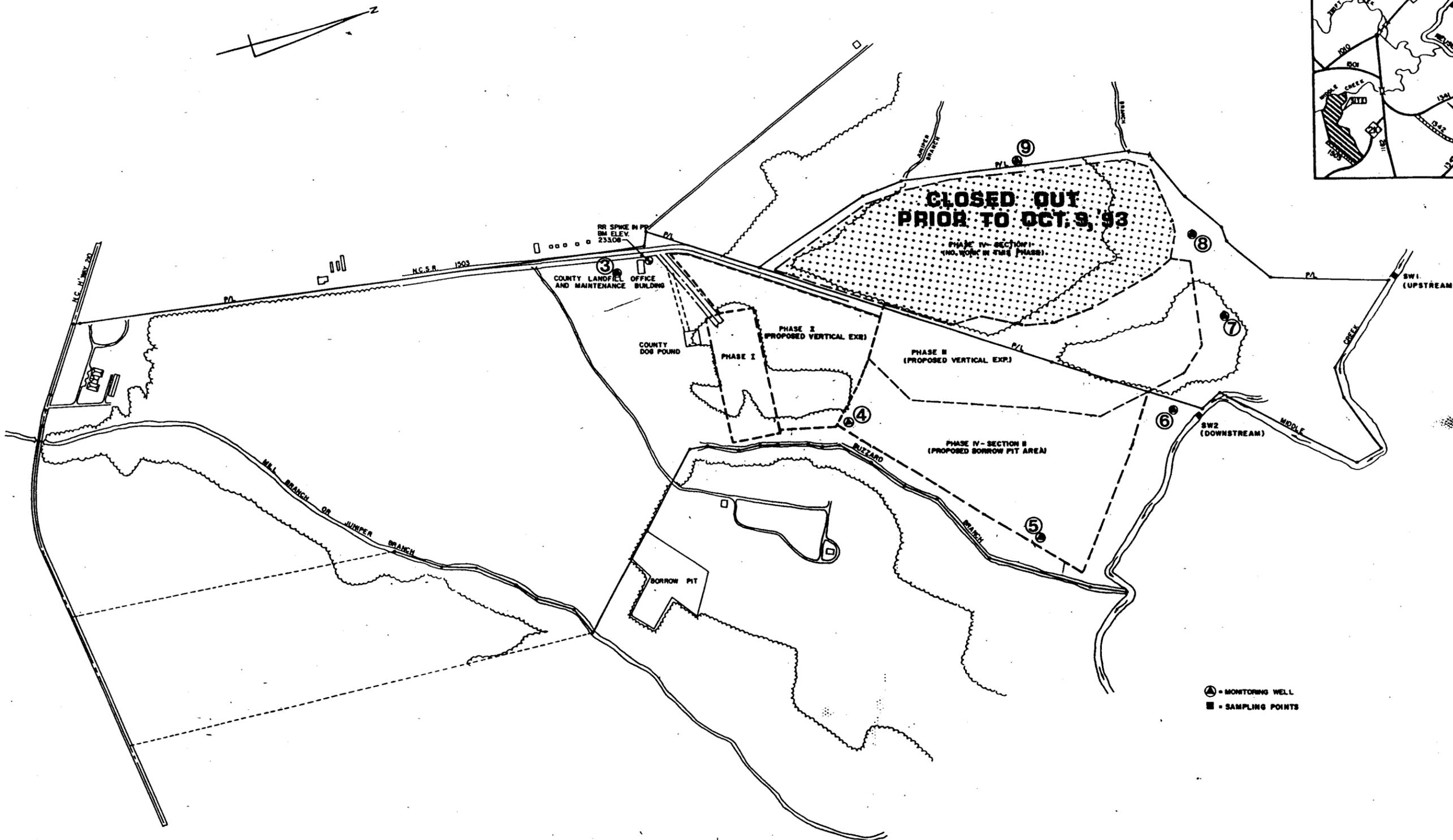
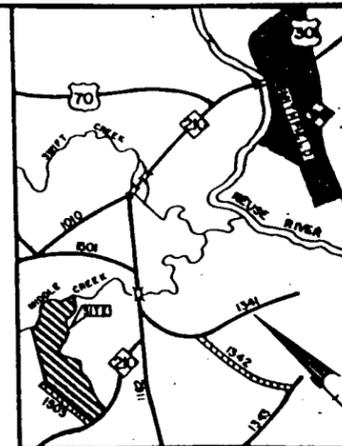
MCKIM & CREED
ENGINEERS • PLANNERS • SURVEYORS
WILMINGTON, NORTH CAROLINA RALEIGH, NORTH CAROLINA
SMITHFIELD, NORTH CAROLINA

JOHNSTON COUNTY
LANDFILL

CLOSURE
PLAN

DATE	OCTOBER 1993
MCKE PROJ. #	
DWG. FILE #	

SCALE	HORIZONTAL	SHEET NO.
	VERTICAL	



JOHNSTON CO. LANDFILL
MASTER PLAN

④ = MONITORING WELL
■ = SAMPLING POINTS

NO.	DESCRIPTION	DATE

DESIGNED	TJE
DRAWN	WHD
CHECKED	TJE
TITLE DES.	CTC

MCKIM & CREED
ENGINEERS • PLANNERS • SURVEYORS
WILMINGTON, NORTH CAROLINA RALEIGH, NORTH CAROLINA
SMITHFIELD, NORTH CAROLINA

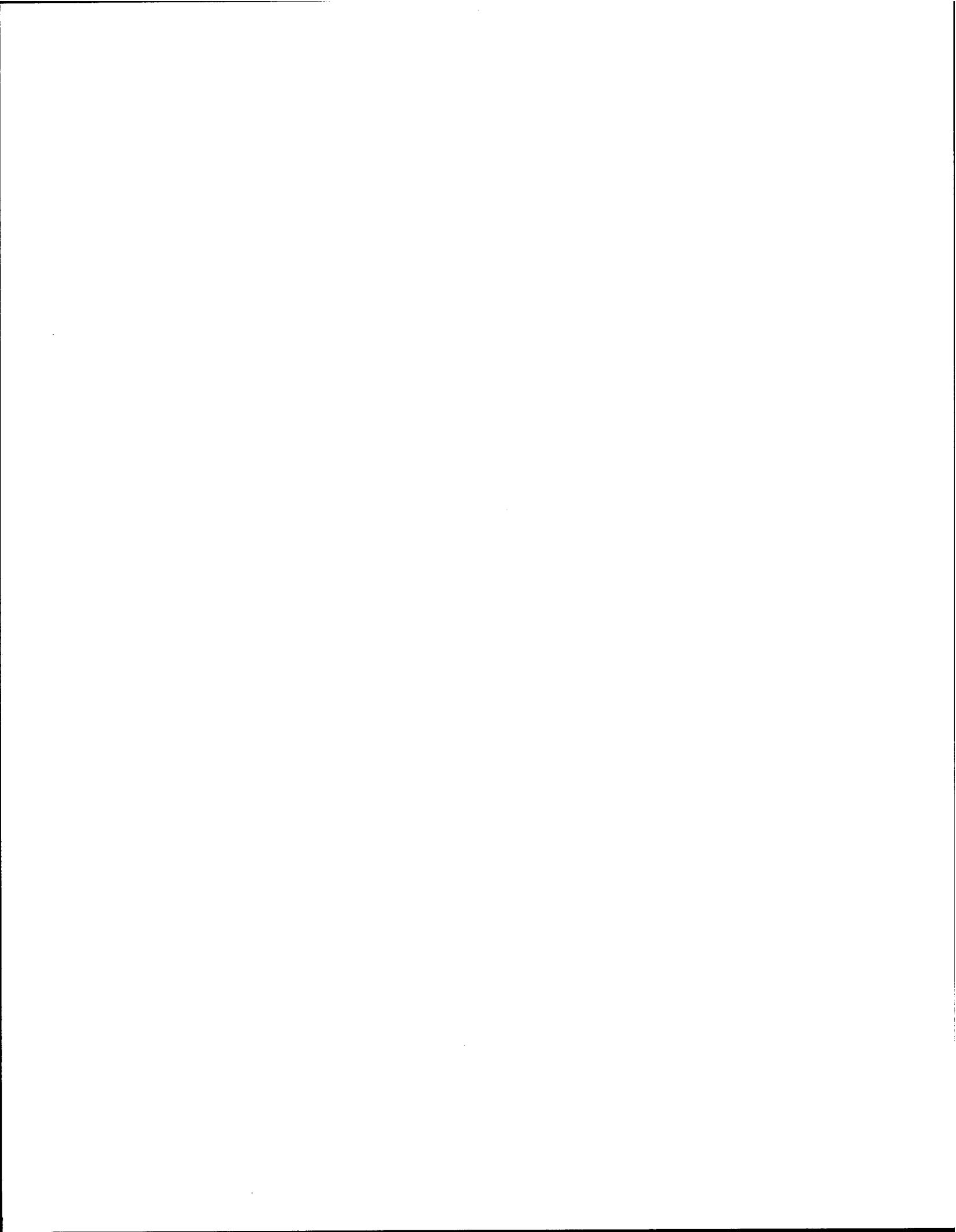
JOHNSTON COUNTY
LANDFILL

CLOSURE
PLAN

DATE:	OCTOBER 1993
MCF PROJ. #	
DWG FILE #	

SCALE	
HORIZONTAL	
VERTICAL	

SHEET NO.	
OF	





State of North Carolina
Department of Environment, Health, and Natural Resources

512 North Salisbury Street • Raleigh, North Carolina 27604

DIVISION OF SOLID WASTE MANAGEMENT

TELEPHONE: (919) 733-0692

James B. Hunt, Jr., Governor

Jonathan B. Howes, Secretary

July 13, 1993

Mr. Richard B. Self
County Manager, Johnston County
Courthouse, Box 1049
Smithfield, N.C. 27577

Re: Implementation Of Subtitle 'D' Ground-water Monitoring Program

Dear Mr. Self,

The purpose of this correspondence is to provide information and clarification on the changes in ground-water monitoring requirements for MSWLF facilities that remain in operation after October 9, 1993. The proposed North Carolina Solid Waste Management Rules reflect significant changes for ground-water monitoring based on requirements of the E.P.A. Subtitle D Rules.

Attachment A to this letter provides a summary of important dates and significant activities that must be accomplished in order to be in compliance with the new rules. Attachment B contrasts existing and proposed ground-water monitoring and assessment requirements based on changes in the rules. Because of significant increases in costs that will be incurred in order to operate a MSWLF under the new Subtitle D Rules, including financial assurance and increased costs for ground-water monitoring and assessment, you may wish to seriously consider closing your sanitary landfill prior to October 9, 1993, when the new rules become effective.

Based on past ground-water monitoring data for the Johnston County landfill, there are already documented violations of North Carolina Groundwater Quality Standards at some of the detection monitoring wells. A copy of recent sampling analytical data is attached on which highlighting has been done for the Appendix I constituents that exceed the Groundwater Quality Standards. The indicator parameters have also been elevated for the past several sampling episodes. Therefore, when the new rules take effect, Johnston County will quickly be required to implement assessment monitoring for all Appendix II constituents. Since the Groundwater Quality Standards are also used in establishing the ground-water

protection standards, you may also rapidly move into assessment of corrective action alternatives based on a full-scale ground-water investigation to determine the nature and extent of contamination at the site.

If Johnston County chooses to continue to operate their MSWLF facility after October 9, 1993, then you need to begin planning and budgeting immediately for the activities outlined in Attachment A. A revised Water Quality Monitoring Plan must be submitted as part of the Transition Plan on or before April 9, 1994. All background sampling and related activities for the upgraded monitoring system must be completed and reported to the Division in order to demonstrate compliance with the new water quality monitoring requirements on or before October 9, 1994.

Please note that the goals and objectives for ground-water assessment monitoring and ground-water contamination investigations are the same under both the current and the proposed rules and shall be accomplished in a way that is protective of human health and the environment. However, current rules allow for greater flexibility in the assessment and investigation activities and the sample analytical costs could be substantially less using the constituent list required under current rules and policy as compared to analytical costs required by the new rules based on Subtitle D, which require sampling for the Appendix II list of constituents.

I hope this letter has been helpful in providing you more insight into the actions that will be required by Johnston County to maintain compliance with the water quality monitoring requirements of the Solid Waste Management Rules as we make the transition to the new rules growing out of the E.P.A. Subtitle D Regulations. If you have any questions or comments regarding this letter, please contact the Solid Waste Section at (919) 733-0692.

Sincerely,

Bobby Lutfy

Bobby Lutfy, Hydrogeologist

Solid Waste Section

cc: Robert Harding

Attachments

ATTACHMENT A

Important dates and significant activities that must be accomplished in order to be in compliance with the new rules on ground-water monitoring at MSWLF facilities:

April 9, 1994: A Water Quality Monitoring Plan that fulfills the requirements of the new Solid Waste Management Rules must be submitted to the Division as part of the Transition Plan on or before April 9, 1994.

October 9, 1994: Compliance with the new ground-water monitoring requirements must be demonstrated to the Division on or before October 9, 1994. In order to demonstrate compliance, the MSWLF owner or operator must perform the following activities and provide documentation to the Division.

1. Upgrade the ground-water monitoring system so that it meets the criteria of the new rules for monitoring systems.
Rule .1631
 - (a) Monitoring wells shall be installed at the relevant point of compliance based upon the waste boundaries established on October 9, 1993. - Rule .1631(a)(2)
 - (b) Monitoring wells shall be designed and constructed in accordance with the applicable North Carolina Well Construction Standards as codified in 15A NCAC 2C. - Rule .1631(b)
2. In order to accurately determine ground-water elevations for each monitoring well, the wells shall have been accurately surveyed by a North Carolina Registered Land Surveyor.
- Rule .1632(d)(1)
3. In order to determine the rate of ground-water flow, the owner or operator shall provide data for hydraulic conductivity and porosity for the formation materials at each of the well locations. - Rule .1632(d)(2)
4. A minimum of four independent samples from each well (background and downgradient) shall be collected and analyzed for the Appendix I constituents during the first semiannual sampling event. - Rule .1633(b)
5. The owner or operator shall determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular ground-water monitoring program that applies to the MSWLF unit. - .1632(i)

ATTACHMENT B

Contrasts between the existing and proposed ground-water monitoring and assessment requirements based on changes in the Solid Waste Management Rules. All MSWLF units that are in operation on or after October 9, 1993, will be subject to the new rules.

EXISTING RULES

NEW RULES

Detection monitoring:

Monitoring frequency:
Semiannual monitoring

Monitoring frequency:
Semiannual monitoring

Monitoring parameters:
23 landfill constituents

Monitoring parameters:
Appendix I constituents

Data evaluation based on:
N.C. Groundwater Quality
Standards

Data evaluation based on:
N.C. Groundwater Quality
Standards and statistical
increase over background
levels

Post Closure Monitoring:

Length of time:
5 years and reevaluate need
for further monitoring

Length of time:
30 years and reevaluate need
for further monitoring

Monitoring parameters:
23 landfill constituents &
occasional VOCs

Monitoring parameters:
Appendix I constituents

Data evaluation based on:
N.C. Groundwater Quality
Standards

Data evaluation based on:
N.C. Groundwater Quality
Standards and statistical
increase over background
levels

Assessment monitoring and ground-water investigations:

Monitoring parameters:
23 landfill constituents,
VOCs, semi-VOCs

Monitoring parameters:
Appendix II constituents
(213 constituents)

Data evaluation based on:
N.C. Groundwater Quality
Standards

Data evaluation based on:
N.C. Groundwater Quality
Standards and statistical
increase over background
levels

Greater flexibility

Flexibility more limited

STATE LABORATORY OF PUBLIC HEALTH
 DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
 P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

2-19-92

51-01

Johnston Co. LF

Well- 3

ORGANIC CHEMICAL ANALYSIS

WELL

4

5

6

7

8

PURGEABLE COMPOUNDS	LAB NO	920484	920485	920486	920487	920488	920489
	FIELD #	5003	5004	5005	5006	5007	5008
	TYPE	(1)	(1)	(1)	(1)	(1)	(1)
COMPOUND	UNITS	($\mu\text{g/l}$) $\mu\text{g/kg}$					
chloromethane	10 ppb	u	u	u	u	u	u
bromomethane	↓		↓				
dichlorodifluoromethane	5 ppb		↓				
vinyl chloride	.		1 J				
chloroethane			u				
methylene chloride							↓
trichlorofluoromethane							5 K
ethene, 1,1-dichloro				↓		↓	u
ethane, 1,1-dichloro-				3 J		6	
1,2-trans-dichloroethene				u		u	
chloroform							
ethane, 1,2-dichloro-							
ethane, 1,1,1-trichloro-							
carbontetrachloride							
bromodichloromethane							
propane, 1,2-dichloro-							
1,3-trans-dichloropropane							
trichloroethylene							
chlorodibromomethane			↓			↓	
benzene			8			7	
ethane, 1,1,2-trichloro-	↓		u			u	
1,3-cis-dichloropropene	10 ppb						
2-chloroethyl vinyl ether	↓						
bromoform	5 ppb						
ethane, 1,1,2,2-tetrachloro-					↓		
ethene, tetrachloro-			↓		trace		
toluene			trace		u	↓	
chlorobenzene			10			12	
ethylbenzene	↓	↓	trace	↓	↓	13	↓
acetone	10 ppb	u	u	u	u	u	u
2-butanone	10						
carbendisulfide	5						
2-hexanone	10						
4-methyl-2-pentanone	10						
styrene	5						
vinyl acetate	10		↓			↓	
xylene (total)	5 ↓	↓	trace	↓	↓	24	↓
Tetrahydrofuran	20	u	16	u	u	u	u
Ethyl ether	5 ↓	↓	21			63	
Methyl-t-butyl ether	5 ↓	↓	u	↓	↓	u	↓
	TMDL ↑						

- J - Estimated value.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- Material was analyzed for but not detected. The number is the Minimum Detection Limit.
- Not analyzed.

1/ - Tentative identification.
 2/ - On NRDC List of Priority Pollutants.
 C - SUSPECT LAB CONTAMINATION.
 N.C. Division of Health Services

STATE LABORATORY OF PUBLIC HEALTH
 DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
 P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

WELL
 ORGANIC CHEMICAL ANALYSIS

9.

PURGEABLE COMPOUNDS	LAB NO	920490						
	FIELD #	5009						
COMPOUND	TYPE	(1)	()	()	()	()	()	()
	UNITS	µg/l µa/kg	µa/l µa/kg					
chloromethane	10 ppb	u						
bromomethane	↓	↓						
dichlorodifluoromethane	5 ppb	↓						
vinyl chloride	↓	1 J ↓						
chloroethane		trace ↓						
methylene chloride		u						
trichlorofluoromethane		↓						
ethene, 1,1-dichloro		↓						
ethane, 1,1-dichloro-		2 J						
1,2-trans-dichloroethene		u						
chloroform								
ethane, 1,2-dichloro-								
ethane, 1,1,1-trichloro-								
carbontetrachloride								
bromodichloromethane								
propane, 1,2-dichloro-								
1,3-trans-dichloropropane								
trichloroethylene								
chlorodibromomethane		↓						
benzene		13						
ethane, 1,1,2-trichloro-	↓	u						
1,3-cis-dichloropropane	10 ppb							
2-chloroethyl vinyl ether	↓							
bromoform	5 ppb							
ethane, 1,1,2,2-tetrachloro-								
ethene, tetrachloro-		↓						
toluene		41						
chlorobenzene		7						
ethylbenzene	↓	9						
acetone	10 ppb	u						
2-butanone	10							
carbendisulfide	5							
2-hexanone	10							
4-methyl-2-pentanone	10							
styrene	5							
vinyl acetate	10	↓						
xylenes (total)	5 ↓	15						
Tetrahydrofuran	20	243						
Ethyl ether	5	74						
Methyl-t-butyl ether	5 ↓	8						
	↑MDL↑							

J - Estimated value.
 K - Actual value is known to be less than value given.
 L - Actual value is known to be greater than value given.
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