



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 6, 1993

Mr. Charles Mashburn
County Manager, Alexander County
Administrative Bldg. 255 Liledoun Rd.
Taylorsville, N.C. 28681

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

Dear Mr. Mashburn,

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 Alexander County landfill, there are already documented violations of North Carolina Groundwater Quality Standards at some of the detection monitoring wells. A copy of your most recent sampling analytical data is attached on which highlighting has been done for the Appendix I constituents that exceed the Groundwater Quality Standards. Therefore, when the new rules take effect, Alexander 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 Alexander 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. As requested in the letter dated May 18, 1992, all private and public water supply wells within a half mile's radius of the landfill site should be identified and a map locating these wells should be submitted immediately. The nearest downstream surface water intake should also be identified and reported.

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 Alexander 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, Hydrogeologist

Solid Waste Section

cc: Anthony Foster

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

Organic
SAMPLE ANALYSES REQUEST

SOLID WASTE SECTION
State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611
MAY 12 1993

Number 02-01 Field Sample Number 17137
 Name of Site Alexander Co LF Site Location 52 1620
 Collected By Rose ID# 062 Date Collected 4-13-93 Time 11:20

Type of Sample:

<input type="checkbox"/> Environmental	<input type="checkbox"/> Concentrate	<input type="checkbox"/> Comments
<input type="checkbox"/> Groundwater (1)	<input type="checkbox"/> Solid (5)	<u>MW-1 - Background</u>
<input type="checkbox"/> Surface Water (2)	<input type="checkbox"/> Liquid (6)	
<input type="checkbox"/> Soil (3)	<input type="checkbox"/> Sludge (7)	
<input type="checkbox"/> Other (4)	<input type="checkbox"/> Other (8)	<u>split sample</u>

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
Arsonic	_____	Arsonic	_____	Silver	_____
Barium	_____	Barium	_____	Sulfates	_____
Cadmium	_____	Cadmium	_____	Zinc	_____
Chromium	_____	Chloride	_____	Ph	_____
Lead	_____	Chromium	_____	Conductivity	_____
Mercury	_____	Copper	_____	TDS	_____
Selenium	_____	Fluoride	_____	TOC	_____
Silver	_____	Iron	_____		_____
	_____	Lead	_____		_____
	_____	Manganese	_____		_____
	_____	Mercury	_____		_____
	_____	Nitrate	_____		_____
	_____	Selenium	_____		_____

ORGANIC CHEMISTRY

Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
P&T:GC/MS	_____	EDB	_____	Methoxychlor	_____
Acid:B/N Ext.	_____	PCB's	_____	Toxaphene	_____
TOX	_____	Petroleum	_____	2,4-D	_____
	_____	Endrin	_____	2,4,5-TP (silvex)	_____
	_____	Lindane	_____		_____

MICROBIOLOGY

RADIOCHEMISTRY

Parameter	Parameter	Results PCI/l
(MF) Coliform Colonies/100mls	Gross Alpha	_____
(MPN) Coliform Colonies/100mls	Gross Beta	_____

Received 4-14-93 SA Date Reported 5-10-93
 Extracted 4-19-93 SA WG AA Date Analyzed 4-19-93 BWA PT 5-6-93 RW
 Collected By John J. Neal Lab Number 930937

#930937- 930941

Organic
SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Number 02-01 Field Sample Number 17139
 Name of Site Alexander Co LF Site Location SR 1620
 Collected By Rosa IDH 062 Date Collected 4-13-93 Time 2:45

Type of Sample:

Environmental	Concentrate	Comments
<input checked="" type="checkbox"/> Groundwater (1)	<input type="checkbox"/> Solid (5)	<u>MW-3</u>
<input type="checkbox"/> Surface Water (2)	<input type="checkbox"/> Liquid (6)	
<input type="checkbox"/> Soil (3)	<input type="checkbox"/> Sludge (7)	
<input type="checkbox"/> Other (4)	<input type="checkbox"/> Other (8)	<u>Split Sample</u>

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
Arsenic	_____	Arsenic	_____	Silver	_____
Barium	_____	Barium	_____	Sulfates	_____
Cadmium	_____	Cadmium	_____	Zinc	_____
Chromium	_____	Chloride	_____	Ph	_____
Lead	_____	Chromium	_____	Conductivity	_____
Mercury	_____	Copper	_____	TDS	_____
Selenium	_____	Fluoride	_____	TOC	_____
Silver	_____	Iron	_____		_____
	_____	Lead	_____		_____
	_____	Manganese	_____		_____
	_____	Mercury	_____		_____
	_____	Nitrate	_____		_____
	_____	Selenium	_____		_____

ORGANIC CHEMISTRY

Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
P&T:GC/MS	_____	EDB	_____	Methoxychlor	_____
Acid:B/N Ext.	_____	PCB's	_____	Toxaphene	_____
TOX	_____	Petroleum	_____	2,4-D	_____
	_____	Endrin	_____	2,4,5-TP (silvex)	_____
	_____	Lindane	_____		_____

MICROBIOLOGY

RADIOCHEMISTRY

Parameter	Parameter	Results PCI/l
(MF) Coliform Colonies/100mls	Gross Alpha	_____
(MPN) Coliform Colonies/100mls	Gross Beta	_____
_____	_____	_____
_____	_____	_____

Received 4-14-93 SA Date Reported _____
 Extracted 4-19-93 SA, WG, AA Date Analyzed BNA 4-19-93 BQ PT 5-6-93 rw
 Collected By _____ Lab Number 930938

Organic
SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Number 02-01 Field Sample Number 17140
 Name of Site Alexander Co LF Site Location SR 1620
 Collected By Ross ID# 062 Date Collected 4-13-93 Time 11255

Type of Sample:
 Environmental Concentrate Comments
 Groundwater (1) Solid (5) MW-4
 Surface Water (2) Liquid (6) _____
 Soil (3) Sludge (7) _____
 Other (4) Other (8) Split Sample

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
Arsenic	_____	Arsenic	_____	Silver	_____
Barium	_____	Barium	_____	Sulfates	_____
Cadmium	_____	Cadmium	_____	Zinc	_____
Chromium	_____	Chloride	_____	Ph	_____
Lead	_____	Chromium	_____	Conductivity	_____
Mercury	_____	Copper	_____	TDS	_____
Selenium	_____	Fluoride	_____	TOC	_____
Silver	_____	Iron	_____		_____
	_____	Lead	_____		_____
	_____	Manganese	_____		_____
	_____	Mercury	_____		_____
	_____	Nitrate	_____		_____
	_____	Selenium	_____		_____

ORGANIC CHEMISTRY

Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
P&T:GC/MS	_____	EDB	_____	Methoxychlor	_____
Acid:B/N Ext.	_____	PCB's	_____	Toxaphene	_____
TOX	_____	Petroleum	_____	2,4-D	_____
	_____	Endrin	_____	2,4,5-TP (silvex)	_____
	_____	Lindane	_____		_____

MICROBIOLOGY

RADIOCHEMISTRY

Parameter	Parameter	Results PCI/1
MF) Coliform Colonies/100mls	Gross Alpha	_____
MPN) Coliform Colonies/100mls	Gross Beta	_____

Received 4-14-93 SA Date Reported _____
 Contracted 4-19-93 SA, WG, AA Date Analyzed BNA 4-19-93 BD PT 5-6-93 TW
 Collected By _____ Lab Number 930939

Organic
SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Number 02-01 Field Sample Number 17141
 Name of Site Alexander Co LF Site Location SR 1620
 Collected By Rosa ID# 062 Date Collected 4-13-93 Time 1:00

Type of Sample:
 Environmental Concentrate Comments
 Groundwater (1) Solid (5) Upstream - BUS-1
 Surface Water (2) Liquid (6) _____
 Soil (3) Sludge (7) _____
 Other (4) Other (8) Split Sample

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
Arsenic	_____	Arsenic	_____	Silver	_____
Barium	_____	Barium	_____	Sulfates	_____
Cadmium	_____	Cadmium	_____	Zinc	_____
Chromium	_____	Chloride	_____	Ph	_____
Lead	_____	Chromium	_____	Conductivity	_____
Mercury	_____	Copper	_____	TDS	_____
Selenium	_____	Fluoride	_____	TOC	_____
Silver	_____	Iron	_____		
		Lead	_____		
		Manganese	_____		
		Mercury	_____		
		Nitrate	_____		
		Selenium	_____		

ORGANIC CHEMISTRY

Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
P&T:GC/MS	_____	EDB	_____	Methoxychlor	_____
Acid:B/N Ext.	_____	PCB's	_____	Toxaphene	_____
TOX	_____	Petroleum	_____	2,4-D	_____
		Endrin	_____	2,4,5-TP (silvex)	_____
		Lindane	_____		

MICROBIOLOGY

RADIOCHEMISTRY

Parameter	Parameter	Results PCI/l
MF) Coliform Colonies/100mls	Gross Alpha	_____
MPN) Coliform Colonies/100mls	Gross Beta	_____

Received 4-14-93 SA Date Reported _____
 Extracted 4-19-93 SA, WG, AA Date Analyzed 4-19-93 BO PT 5-6-93 TW
 Analyzed By _____ Lab Number 930940

Organic
SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Number 02-01 Field Sample Number 17142
 Name of Site Alexander Co LF Site Location SP 1620
 Collected By Ros ID# 062 Date Collected 4-13-93 Time 12:45

Type of Sample:
 Environmental Concentrate Comments
 Groundwater (1) Solid (5) Downstream - WGS-2
 Surface Water (2) Liquid (6) Spring coming from LF
 Soil (3) Sludge (7) _____
 Other (4) Other (8) Split Sample

INORGANIC CHEMISTRY

Extractables		Total			
Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
Arsenic	_____	Arsenic	_____	Silver	_____
Barium	_____	Barium	_____	Sulfates	_____
Cadmium	_____	Cadmium	_____	Zinc	_____
Chromium	_____	Chloride	_____	Ph	_____
Lead	_____	Chromium	_____	Conductivity	_____
Mercury	_____	Copper	_____	TDS	_____
Selenium	_____	Fluoride	_____	TOC	_____
Silver	_____	Iron	_____		_____
	_____	Lead	_____		_____
	_____	Manganese	_____		_____
	_____	Mercury	_____		_____
	_____	Nitrate	_____		_____
	_____	Selenium	_____		_____

ORGANIC CHEMISTRY

Parameter	Results mg/l	Parameter	Results mg/l	Parameter	Results mg/l
P&T:GC/MS	_____	EDB	_____	Methoxychlor	_____
Acid:B/N Ext.	_____	PCB's	_____	Toxaphene	_____
TOX	_____	Petroleum	_____	2,4-D	_____
	_____	Endrin	_____	2,4,5-TP (silvex)	_____
	_____	Lindane	_____		_____

MICROBIOLOGY

RADIOCHEMISTRY

Parameter	Parameter	Results PCI/1
MF) Coliform Colonies/100mls	Gross Alpha	_____
MPN) Coliform Colonies/100mls	Gross Beta	_____

Received 4-14-93 SA Date Reported _____
 Extracted 4-19-93 SA, WG, AA Date Analyzed BNA 4-20-93 BD PT 5-6-93 nw
 Collected By _____ Lab Number 930941

1 (Revised 7/85)
 Hazardous Waste (Review 7/87)

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

ISE/NEUTRAL AND ACID EXTRACTABLES	LAB NO	MW-1		MW-3		MW-4		US		Spring						
		FIELD #	TYPE	UNITS												
COMPUND		17137	(1)	µg/l µg/kg	17139	(1)	µg/l µg/kg	17140	(1)	µg/l µg/kg	17141	(2)	µg/l µg/kg	17142	(2)	µg/l µg/kg
trisodimethylamine	10/330	u	u	u	u	u	u	u	u	u	u	u	u	u	u	u
2-chloroethyl)ether																
lorophenol																
ol																
dichlorobenzene																
dichlorobenzene 1.4					10K		10K						10K			
dichlorobenzene					u		u						u			
2-chloroisopropyl)ether																
chloroethane																
triso-di-n-propylamine																
obenzene																
horone																
trophenol																
-dimethylphenol																
2-chloroethoxy)methane																
-dichlorophenol																
4-trichlorobenzene																
thalene 10					10K											
chlorobutadiene					u											
loro-m-cresol																
chlorocyclopentadiene																
6-trichlorophenol																
loronaphthalene																
naphthylene																
ethyl phthalate																
-dinitrotoluene																
naphthene																
-dinitrophenol	50/1650															
-dinitrotoluene	10/330															
itrophenol	50/1650															
prene	10/330															
lorophenylphenylether																
thyl phthalate 5000 (2L Draft)																
-dinitro-o-cresol	50/1650															
henylamine	10/330															
benzene																
romophenylphenylether																
achlorobenzene																
tachlorophenol	50/1650															
nanthrene	10/330															
hracene																
utyl phthalate 700 (2L Draft)																
oranthene																

MDL
 H₂O/501L

- Estimated value.
- Actual value is known to be less than value given.
- Actual value is known to be greater than value given.
- Material was analyzed for but not detected. The number is the Minimum Detection Limit. MDL
- Not analyzed.
- Tentative identification.
- On NRDC List of Priority Pollutants.

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

MN-1 ORGANIC CHEMICAL ANALYSIS W-4 u5 Spring

BASE/NEUTRAL AND ACID EXTRACTABLES	LAB NO	930937	930938	930939	930940	930941
COMPOUND	FIELD #	17137	17139	17140	17141	17142
	TYPE	(1)	(1)	(1)	(2)	(2)
	UNITS	μg/l μg/kg				
pyrene	10/330	u	u	u	u	u
benzidine	50/1650					
butyl benzyl phthalate	10/330					
benz(a)anthracene	↓					
chrysene	↓					
3,3-dichlorobenzidine	50/1650					↓
bis(2-ethylhexyl)phthalate	10/330	10 (HP9)				10K
di-n-octyl phthalate	10/330					u
benzo(b)fluoranthene	50/1650					↓
benzo(k)fluoranthene	↓					↓
benzo(a)pyrene	↓					↓
indeno(1,2,3-cd)pyrene	↓					↓
dibenzo(a,h)anthracene	↓	↓	↓	↓	↓	↓
benzo(g,h,i)perylene	↓	↓	↓	↓	↓	↓
aniline	50/1650	u	u	u	u	u
benzoic acid	↓					
benzyl alcohol	↓					
4-chloroaniline	↓					
dibenzofuran	10/330					
2-methylnaphthalene	↓					
2-methylphenol	↓					
4-methylphenol	↓					
2-nitroaniline	50/1650					
3-nitroaniline	↓					
4-nitroaniline	↓	↓	↓	↓	↓	↓
2,4,5-trichlorophenol	↓	↓	↓	↓	↓	↓
CAPROLACTAM		u	85	u	u	u

MDL H₂O/SOIL

- 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.
- U - Material was analyzed for but not detected. The number is the Minimum Detection Limit. MDL
- NA - Not analyzed.
- 1/ - Tentative identification.
- 2/ - On NRDC List of Priority Pollutants.

