



May 31, 2000

Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Dear Sir:

Re: BASF Enka Site, Sanitary Landfill Permit No. 11-02

Listed below are the sampling data for the May 2000 well monitoring. All samples were collected on May 1, 2000 and analyzed to determine the Appendix I Organic and Inorganic constituents. The sampling and the laboratory analyses were performed by Pace Analytical of Asheville, North Carolina. Results are attached.

DATA ON WELLS

	Well Identification			
	MW-2	MW-3	MW-4	MW-5
Well Depth	50'	50'	35'	20'
Well Diameter	2"	2"	2"	2"
Depth to water	20.2'	9.5'	27.1'	8.6'
Sample depth	50'	50'	35'	20'
Gallons purged Before sampling	15.0	20.2	2.8	3.0

↑
sulfate contamination

R. L. Ackerman
Environmental Manager

- No VOCs
- No metals > stds.



Pace Analytical Services, Inc.

54 Ravenscroft Drive
Asheville, NC 28801

Phone: 828.254.7176

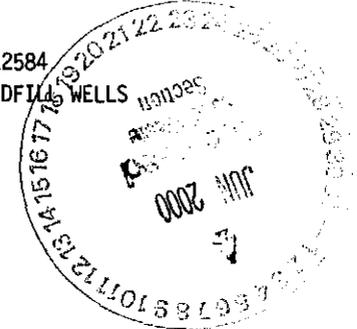
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ASF Corporation
and Hill Road
Asheville, NC 28728

Pace Project Number: 9312584

Client Project ID: LANDFILL WELLS



Attention: Mr. Ray Ackerman
Phone: (704)667-7277

Solid results are reported on a wet weight basis

Sample No: 93543163 Date Collected: 05/01/00 Matrix: Water
Client Sample ID: MW-2 BACKGROUND Date Received: 05/01/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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Field Services

Monitoring Well Data	Method:	Prep Method:
Field pH	5.2 Std. Units	05/01/00 MPS
Field Specific Conductance	51 umhos/cm	05/01/00 MPS
Field Temperature	15 deg C	05/01/00 MPS
Depth of Water	20.18 feet 0	05/01/00 MPS
Well Volume Purged	15.00 Gal No units 0	05/01/00 MPS

Metals

Metals, ICP, trace-level	Method: EPA 6010	Prep Method: EPA 3010
Antimony	ND mg/l 0.01	05/15/00 TRW 7440-36-0
Arsenic	ND mg/l 0.01	05/15/00 TRW 7440-38-2
Barium	0.44 mg/l 0.005	05/15/00 TRW 7440-39-3
Beryllium	ND mg/l 0.002	05/15/00 TRW 7440-41-7
Cadmium	0.002 mg/l 0.001	05/15/00 TRW 7440-43-9
Chromium	0.016 mg/l 0.005	05/15/00 TRW 7440-47-3
Cobalt	0.018 mg/l 0.005	05/15/00 TRW 7440-48-4
Copper	ND mg/l 0.005	05/15/00 TRW 7440-50-8
Lead	ND mg/l 0.01	05/15/00 TRW 7439-92-1
Nickel	0.0077 mg/l 0.005	05/15/00 TRW 7440-02-0
Selenium	ND mg/l 0.02	05/15/00 TRW 7782-49-2
Silver	ND mg/l 0.002	05/15/00 TRW 7440-22-4
Vanadium	0.042 mg/l 0.005	05/15/00 TRW 7440-62-2
Zinc	0.05 mg/l 0.01	05/15/00 TRW 7440-66-6
Date Digested		05/04/00

Thallium, AAS Furnace Method: EPA 7841 Prep Method: EPA 3020

Laboratory Certification IDs

NC Wastewater 40
NC Drinking Water 37712

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs

TN Drinking Water 02980
SC Environmental 99030



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Pace Project Number: 9312584
Client Project ID: LANDFILL WELLS

Sample No: 93543163 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-2 BACKGROUND Date Received: 05/01/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Thallium	ND	mg/l	0.002	05/15/00	TRW	7440-28-0	
Date Digested				05/11/00			

Met Chemistry

Total Dissolved Solids		Method: EPA 160.1		Prep Method: EPA 160.1
Total Dissolved Solids	43	mg/l	1	05/04/00 JMS
Sulfate, Total		Method: EPA 375.4		Prep Method: EPA 375.4
Sulfate	ND	mg/l	1	05/05/00 JDA

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 Fax: 704.875.9091

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 PAGE: 1

BASF Corporation
 Wind Hill Road
 Catawba, NC 28728

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Attention: Mr. Ray Ackerman

Final results are reported on a dry weight basis

Sample No: 93543163 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-2 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
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GC/MS Volatiles

GC/MS VOCs by 8260	Method: EPA 8260	Prep Method: EPA 8260
Chloromethane	ND ug/l	10 1.00 05/03/00 JSS 74-87-3
Vinyl Chloride	ND ug/l	10 1.00 05/03/00 JSS 75-01-4
Bromomethane	ND ug/l	10 1.00 05/03/00 JSS 74-83-9
Chloroethane	ND ug/l	10 1.00 05/03/00 JSS 75-00-3
Trichlorofluoromethane	ND ug/l	10 1.00 05/03/00 JSS 75-69-4
Acetone	ND ug/l	100 1.00 05/03/00 JSS 67-64-1
1,1-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 75-35-4
Iodomethane	ND ug/l	5 1.00 05/03/00 JSS 74-88-4
Acrylonitrile	ND ug/l	100 1.00 05/03/00 JSS 107-13-1
Methylene Chloride	ND ug/l	5 1.00 05/03/00 JSS 75-09-2
Carbon Disulfide	ND ug/l	5 1.00 05/03/00 JSS 75-15-0
trans-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-60-5
1,1-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 75-34-3
Vinyl Acetate	ND ug/l	50 1.00 05/03/00 JSS 108-05-4
2-Butanone	ND ug/l	100 1.00 05/03/00 JSS 78-93-3
cis-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-59-2
Chloroform	ND ug/l	5 1.00 05/03/00 JSS 67-66-3
Bromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 74-97-5
1,1,1-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 71-55-6
1,2-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 107-06-2
Carbon Tetrachloride	ND ug/l	5 1.00 05/03/00 JSS 56-23-5
Benzene	ND ug/l	5 1.00 05/03/00 JSS 71-43-2
Trichloroethene	ND ug/l	5 1.00 05/03/00 JSS 79-01-6
1,2-Dichloropropane	ND ug/l	5 1.00 05/03/00 JSS 78-87-5
Dibromomethane	ND ug/l	5 1.00 05/03/00 JSS 74-95-3
Bromodichloromethane	ND ug/l	5 1.00 05/03/00 JSS 75-27-4

Laboratory Certification IDs
 NC Wastewater 12
 NC Drinking Water 37706
 SC 99006

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 TN UST List
 VA Drinking Water 213



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 Fax: 704.875.9091

DATE: 05/10/00
 PAGE: 2

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

ce Sample No: 93543163 Date Collected: 05/01/00 Matrix: Water
 ient Sample ID: MW-2 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Methyl-2-Pentanone	ND	ug/l	50	1.00	05/03/00	JSS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	5	1.00	05/03/00	JSS	10061-01-5	
Toluene	ND	ug/l	5	1.00	05/03/00	JSS	108-88-3	
trans-1,3-Dichloropropene	ND	ug/l	5	1.00	05/03/00	JSS	10061-02-6	
1,1,2-Trichloroethane	ND	ug/l	5	1.00	05/03/00	JSS	79-00-5	
2-Hexanone	ND	ug/l	50	1.00	05/03/00	JSS	591-78-6	
Dibromochloromethane	ND	ug/l	5	1.00	05/03/00	JSS	124-48-1	
Tetrachloroethene	ND	ug/l	5	1.00	05/03/00	JSS	127-18-4	
1,2-Dibromoethane	ND	ug/l	5	1.00	05/03/00	JSS	106-93-4	
Chlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	630-20-6	
Ethylbenzene	ND	ug/l	5	1.00	05/03/00	JSS	100-41-4	
m&p-Xylene	ND	ug/l	10	1.00	05/03/00	JSS	7816-60-0	
Styrene	ND	ug/l	5	1.00	05/03/00	JSS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	5	1.00	05/03/00	JSS	95-47-6	
Bromoform	ND	ug/l	5	1.00	05/03/00	JSS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	5	1.00	05/03/00	JSS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-12-8	
Dibromofluoromethane (S)	91	%		1.00	05/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	84	%		1.00	05/03/00	JSS	17060-07-0	
Toluene-d8 (S)	99	%		1.00	05/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	99	%		1.00	05/03/00	JSS	460-00-4	

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54 Ravenscroft Drive
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Phone: 828.254.7176

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PAGE: 3

Pace Project Number: 9312584

Client Project ID: LANDFILL WELLS

Sample No: 93543171 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-3 BASIN Date Received: 05/01/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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Field Services

Monitoring Well Data	Method:	Prep Method:
Field pH	6.9 Std. Units	05/01/00 MPS
Field Temperature	15 umhos/cm	05/01/00 MPS
Field Temperature	15 deg C	05/01/00 MPS
Depth of Water	9.45 feet 0	05/01/00 MPS
Well Volume Purged	20.25 Gal No units 0	05/01/00 MPS

Metals

Metals, ICP, trace-level	Method: EPA 6010	Prep Method: EPA 3010
Antimony	ND mg/l 0.01	05/15/00 TRW 7440-36-0
Arsenic	ND mg/l 0.01	05/15/00 TRW 7440-38-2
Barium	0.11 mg/l 0.005	05/15/00 TRW 7440-39-3
Beryllium	ND mg/l 0.002	05/15/00 TRW 7440-41-7
Cadmium	ND mg/l 0.001	05/15/00 TRW 7440-43-9
Chromium	ND mg/l 0.005	05/15/00 TRW 7440-47-3
Cobalt	0.066 mg/l 0.005	05/15/00 TRW 7440-48-4
Copper	ND mg/l 0.005	05/15/00 TRW 7440-50-8
Lead	ND mg/l 0.01	05/15/00 TRW 7439-92-1
Nickel	0.026 mg/l 0.005	05/15/00 TRW 7440-02-0
Selenium	ND mg/l 0.02	05/15/00 TRW 7782-49-2
Silver	ND mg/l 0.002	05/15/00 TRW 7440-22-4
Vanadium	0.0053 mg/l 0.005	05/15/00 TRW 7440-62-2
Zinc	ND mg/l 0.01	05/15/00 TRW 7440-66-6
Date Digested		05/04/00

Thallium, AAS Furnace	Method: EPA 7841	Prep Method: EPA 3020
Thallium	ND mg/l 0.002	05/15/00 TRW 7440-28-0
Date Digested		05/11/00

Water Chemistry

Total Dissolved Solids	Method: EPA 160.1	Prep Method: EPA 160.1
121	1 mg/l 1	05/04/00 JMS
Sulfate, Total	Method: EPA 375.4	Prep Method: EPA 375.4
Sulfate	121 mg/l 1	05/05/00 JDA

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 Huntersville, NC 28078
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DATE: 05/10/00
 PAGE: 3

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543171 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-3 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
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GC/MS Volatiles

GC/MS VOCs by 8260	Method: EPA 8260	Prep Method: EPA 8260
Chloromethane	ND ug/l 10 1.00	05/03/00 JSS 74-87-3
Vinyl Chloride	ND ug/l 10 1.00	05/03/00 JSS 75-01-4
Bromomethane	ND ug/l 10 1.00	05/03/00 JSS 74-83-9
Chloroethane	ND ug/l 10 1.00	05/03/00 JSS 75-00-3
Trichlorofluoromethane	ND ug/l 10 1.00	05/03/00 JSS 75-69-4
Acetone	ND ug/l 100 1.00	05/03/00 JSS 67-64-1
1,1-Dichloroethene	ND ug/l 5 1.00	05/03/00 JSS 75-35-4
Iodomethane	ND ug/l 5 1.00	05/03/00 JSS 74-88-4
Acrylonitrile	ND ug/l 100 1.00	05/03/00 JSS 107-13-1
Methylene Chloride	ND ug/l 5 1.00	05/03/00 JSS 75-09-2
Carbon Disulfide	ND ug/l 5 1.00	05/03/00 JSS 75-15-0
trans-1,2-Dichloroethene	ND ug/l 5 1.00	05/03/00 JSS 156-60-5
1,1-Dichloroethane	ND ug/l 5 1.00	05/03/00 JSS 75-34-3
Vinyl Acetate	ND ug/l 50 1.00	05/03/00 JSS 108-05-4
2-Butanone	ND ug/l 100 1.00	05/03/00 JSS 78-93-3
cis-1,2-Dichloroethene	ND ug/l 5 1.00	05/03/00 JSS 156-59-2
Chloroform	ND ug/l 5 1.00	05/03/00 JSS 67-66-3
Bromochloromethane	ND ug/l 5 1.00	05/03/00 JSS 74-97-5
1,1,1-Trichloroethane	ND ug/l 5 1.00	05/03/00 JSS 71-55-6
1,2-Dichloroethane	ND ug/l 5 1.00	05/03/00 JSS 107-06-2
Carbon Tetrachloride	ND ug/l 5 1.00	05/03/00 JSS 56-23-5
Benzene	ND ug/l 5 1.00	05/03/00 JSS 71-43-2
Trichloroethene	ND ug/l 5 1.00	05/03/00 JSS 79-01-6
1,2-Dichloropropane	ND ug/l 5 1.00	05/03/00 JSS 78-87-5
Dibromomethane	ND ug/l 5 1.00	05/03/00 JSS 74-95-3
Bromodichloromethane	ND ug/l 5 1.00	05/03/00 JSS 75-27-4
4-Methyl-2-Pentanone	ND ug/l 50 1.00	05/03/00 JSS 108-10-1
cis-1,3-Dichloropropene	ND ug/l 5 1.00	05/03/00 JSS 10061-01-5
Toluene	ND ug/l 5 1.00	05/03/00 JSS 108-88-3
trans-1,3-Dichloropropene	ND ug/l 5 1.00	05/03/00 JSS 10061-02-6
1,1,2-Trichloroethane	ND ug/l 5 1.00	05/03/00 JSS 79-00-5
2-Hexanone	ND ug/l 50 1.00	05/03/00 JSS 591-78-6
Dibromochloromethane	ND ug/l 5 1.00	05/03/00 JSS 124-48-1
Tetrachloroethene	ND ug/l 5 1.00	05/03/00 JSS 127-18-4
1,2-Dibromoethane	ND ug/l 5 1.00	05/03/00 JSS 106-93-4
Chlorobenzene	ND ug/l 5 1.00	05/03/00 JSS 108-90-7

Laboratory Certification IDs
 NC Wastewater 12
 NC Drinking Water 37706
 SC 99006

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 PAGE: 4

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543171 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-3 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
1,1,1,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	630-20-6	
Ethylbenzene	ND	ug/l	5	1.00	05/03/00	JSS	100-41-4	
m&p-Xylene	ND	ug/l	10	1.00	05/03/00	JSS	7816-60-0	
Styrene	ND	ug/l	5	1.00	05/03/00	JSS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	5	1.00	05/03/00	JSS	95-47-6	
Bromoform	ND	ug/l	5	1.00	05/03/00	JSS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	5	1.00	05/03/00	JSS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-12-8	
Dibromofluoromethane (S)	96	%		1.00	05/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	88	%		1.00	05/03/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		1.00	05/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	102	%		1.00	05/03/00	JSS	460-00-4	

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Asheville, NC 28801

Phone: 828.254.7176

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Pace Project Number: 9312584

Client Project ID: LANDFILL WELLS

Sample No: 93543189 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-4 INCINERATOR Date Received: 05/01/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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Field Services

Monitoring Well Data	Method:	Prep Method:
Field pH	6.0 Std. Units	05/01/00 MPS
Field Specific Conductance	110 umhos/cm	05/01/00 MPS
Field Temperature	15 deg C	05/01/00 MPS
Depth of Water	27.10 feet 0	05/01/00 MPS
Well Volume Purged	2.75 No units 0	05/01/00 MPS

Metals

Metals, ICP, trace-level	Method: EPA 6010	Prep Method: EPA 3010
Antimony	ND mg/l 0.01	05/17/00 TRW 7440-36-0
Arsenic	ND mg/l 0.01	05/17/00 TRW 7440-38-2
Barium	0.087 mg/l 0.005	05/17/00 TRW 7440-39-3
Beryllium	ND mg/l 0.002	05/17/00 TRW 7440-41-7
Cadmium	ND mg/l 0.001	05/17/00 TRW 7440-43-9
Chromium	ND mg/l 0.005	05/17/00 TRW 7440-47-3
Cobalt	ND mg/l 0.005	05/17/00 TRW 7440-48-4
Copper	0.0073 mg/l 0.005	05/17/00 TRW 7440-50-8
Lead	ND mg/l 0.01	05/17/00 TRW 7439-92-1
Nickel	0.012 mg/l 0.005	05/17/00 TRW 7440-02-0
Selenium	ND mg/l 0.02	05/17/00 TRW 7782-49-2
Silver	ND mg/l 0.002	05/17/00 TRW 7440-22-4
Vanadium	ND mg/l 0.005	05/17/00 TRW 7440-62-2
Zinc	0.034 mg/l 0.01	05/17/00 TRW 7440-66-6
Date Digested		05/11/00

Thallium, AAS Furnace	Method: EPA 7841	Prep Method: EPA 3020
Thallium	0.002 mg/l 0.002	05/15/00 TRW 7440-28-0
Date Digested		05/11/00

Wet Chemistry

Total Dissolved Solids	Method: EPA 160.1	Prep Method: EPA 160.1
Total Dissolved Solids	100 mg/l 1	05/04/00 JMS
Sulfate, Total	Method: EPA 375.4	Prep Method: EPA 375.4
Sulfate	15 mg/l 1	05/05/00 JDA

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DATE: 05/10/00
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Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543189 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-4 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
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GC/MS Volatiles

GC/MS VOCs by 8260	Method: EPA 8260	Prep Method: EPA 8260
Chloromethane	ND ug/l	10 1.00 05/03/00 JSS 74-87-3
Vinyl Chloride	ND ug/l	10 1.00 05/03/00 JSS 75-01-4
Bromomethane	ND ug/l	10 1.00 05/03/00 JSS 74-83-9
Chloroethane	ND ug/l	10 1.00 05/03/00 JSS 75-00-3
Trichlorofluoromethane	ND ug/l	10 1.00 05/03/00 JSS 75-69-4
Acetone	ND ug/l	100 1.00 05/03/00 JSS 67-64-1
1,1-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 75-35-4
Iodomethane	ND ug/l	5 1.00 05/03/00 JSS 74-88-4
Acrylonitrile	ND ug/l	100 1.00 05/03/00 JSS 107-13-1
Methylene Chloride	ND ug/l	5 1.00 05/03/00 JSS 75-09-2
Carbon Disulfide	9.5 ug/l	5 1.00 05/03/00 JSS 75-15-0
trans-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-60-5
1,1-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 75-34-3
Vinyl Acetate	ND ug/l	50 1.00 05/03/00 JSS 108-05-4
2-Butanone	ND ug/l	100 1.00 05/03/00 JSS 78-93-3
cis-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-59-2
Chloroform	ND ug/l	5 1.00 05/03/00 JSS 67-66-3
Bromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 74-97-5
1,1,1-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 71-55-6
1,2-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 107-06-2
Carbon Tetrachloride	ND ug/l	5 1.00 05/03/00 JSS 56-23-5
Benzene	ND ug/l	5 1.00 05/03/00 JSS 71-43-2
Trichloroethene	ND ug/l	5 1.00 05/03/00 JSS 79-01-6
1,2-Dichloropropane	ND ug/l	5 1.00 05/03/00 JSS 78-87-5
Dibromomethane	ND ug/l	5 1.00 05/03/00 JSS 74-95-3
Bromodichloromethane	ND ug/l	5 1.00 05/03/00 JSS 75-27-4
4-Methyl-2-Pentanone	ND ug/l	50 1.00 05/03/00 JSS 108-10-1
cis-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-01-5
Toluene	ND ug/l	5 1.00 05/03/00 JSS 108-88-3
trans-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-02-6
1,1,2-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 79-00-5
2-Hexanone	ND ug/l	50 1.00 05/03/00 JSS 591-78-6
Dibromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 124-48-1
Tetrachloroethene	ND ug/l	5 1.00 05/03/00 JSS 127-18-4
1,2-Dibromoethane	ND ug/l	5 1.00 05/03/00 JSS 106-93-4
Chlorobenzene	ND ug/l	5 1.00 05/03/00 JSS 108-90-7

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DATE: 05/10/00
 PAGE: 6

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543189 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-4 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
1,1,1,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	630-20-6	
Ethylbenzene	ND	ug/l	5	1.00	05/03/00	JSS	100-41-4	
m&p-Xylene	ND	ug/l	10	1.00	05/03/00	JSS	7816-60-0	
Styrene	ND	ug/l	5	1.00	05/03/00	JSS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	5	1.00	05/03/00	JSS	95-47-6	
Bromoform	ND	ug/l	5	1.00	05/03/00	JSS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	5	1.00	05/03/00	JSS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-12-8	
Dibromofluoromethane (S)	93	%		1.00	05/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	88	%		1.00	05/03/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		1.00	05/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	100	%		1.00	05/03/00	JSS	460-00-4	

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PAGE: 5

Pace Project Number: 9312584
Client Project ID: LANDFILL WELLS

Sample No: 93543197 Date Collected: 05/01/00 Matrix: Water
Client Sample ID: MW-5 CS-2 Date Received: 05/01/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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Field Services

Monitoring Well Data	Method:	Prep Method:
Field pH	6.1 Std. Units	05/01/00 MPS
Field Specific Conductance	550 umhos/cm	05/01/00 MPS
Field Temperature	13 deg C	05/01/00 MPS
Depth of Water	8.60 feet 0	05/01/00 MPS
Well Volume Purged	3.00 Gal No units 0	05/01/00 MPS

Metals

Metals, ICP, trace-level	Method: EPA 6010	Prep Method: EPA 3010
Antimony	ND mg/l 0.01	05/17/00 TRW 7440-36-0
Arsenic	ND mg/l 0.01	05/17/00 TRW 7440-38-2
Barium	0.15 mg/l 0.005	05/17/00 TRW 7440-39-3
Beryllium	ND mg/l 0.002	05/17/00 TRW 7440-41-7
Cadmium	0.0016 mg/l 0.001	05/17/00 TRW 7440-43-9
Chromium	0.008 mg/l 0.005	05/17/00 TRW 7440-47-3
Cobalt	0.0068 mg/l 0.005	05/17/00 TRW 7440-48-4
Copper	ND mg/l 0.005	05/17/00 TRW 7440-50-8
Lead	ND mg/l 0.01	05/17/00 TRW 7439-92-1
Nickel	ND mg/l 0.005	05/17/00 TRW 7440-02-0
Selenium	ND mg/l 0.02	05/17/00 TRW 7782-49-2
Silver	ND mg/l 0.002	05/17/00 TRW 7440-22-4
Vanadium	0.015 mg/l 0.005	05/17/00 TRW 7440-62-2
Zinc	0.031 mg/l 0.01	05/17/00 TRW 7440-66-6
Date Digested		05/11/00

Thallium, AAS Furnace	Method: EPA 7841	Prep Method: EPA 3020
Thallium	0.002 mg/l 0.002	05/15/00 TRW 7440-28-0
Date Digested		05/11/00

Wet Chemistry

Total Dissolved Solids	Method: EPA 160.1	Prep Method: EPA 160.1
Total Dissolved Solids	300 mg/l 1	05/04/00 JMS
Sulfate, Total	Method: EPA 375.4	Prep Method: EPA 375.4
Sulfate	82 mg/l 1	05/05/00 JDA

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DATE: 05/10/00
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Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543197 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-5 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
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GC/MS Volatiles

GC/MS VOCs by 8260	Method: EPA 8260	Prep Method: EPA 8260
Chloromethane	ND ug/l	10 1.00 05/03/00 JSS 74-87-3
Vinyl Chloride	ND ug/l	10 1.00 05/03/00 JSS 75-01-4
Bromomethane	ND ug/l	10 1.00 05/03/00 JSS 74-83-9
Chloroethane	ND ug/l	10 1.00 05/03/00 JSS 75-00-3
Trichlorofluoromethane	ND ug/l	10 1.00 05/03/00 JSS 75-69-4
Acetone	ND ug/l	100 1.00 05/03/00 JSS 67-64-1
1,1-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 75-35-4
Iodomethane	ND ug/l	5 1.00 05/03/00 JSS 74-88-4
Acrylonitrile	ND ug/l	100 1.00 05/03/00 JSS 107-13-1
Methylene Chloride	ND ug/l	5 1.00 05/03/00 JSS 75-09-2
Carbon Disulfide	ND ug/l	5 1.00 05/03/00 JSS 75-15-0
trans-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-60-5
1,1-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 75-34-3
Vinyl Acetate	ND ug/l	50 1.00 05/03/00 JSS 108-05-4
2-Butanone	ND ug/l	100 1.00 05/03/00 JSS 78-93-3
cis-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-59-2
Chloroform	ND ug/l	5 1.00 05/03/00 JSS 67-66-3
Bromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 74-97-5
1,1,1-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 71-55-6
1,2-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 107-06-2
Carbon Tetrachloride	ND ug/l	5 1.00 05/03/00 JSS 56-23-5
Benzene	ND ug/l	5 1.00 05/03/00 JSS 71-43-2
Trichloroethene	ND ug/l	5 1.00 05/03/00 JSS 79-01-6
1,2-Dichloropropane	ND ug/l	5 1.00 05/03/00 JSS 78-87-5
Dibromomethane	ND ug/l	5 1.00 05/03/00 JSS 74-95-3
Bromodichloromethane	ND ug/l	5 1.00 05/03/00 JSS 75-27-4
4-Methyl-2-Pentanone	ND ug/l	50 1.00 05/03/00 JSS 108-10-1
cis-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-01-5
Toluene	ND ug/l	5 1.00 05/03/00 JSS 108-88-3
trans-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-02-6
1,1,2-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 79-00-5
2-Hexanone	ND ug/l	50 1.00 05/03/00 JSS 591-78-6
Dibromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 124-48-1
Tetrachloroethene	ND ug/l	5 1.00 05/03/00 JSS 127-18-4
1,2-Dibromoethane	ND ug/l	5 1.00 05/03/00 JSS 106-93-4
Chlorobenzene	ND ug/l	5 1.00 05/03/00 JSS 108-90-7

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DATE: 05/10/00
 PAGE: 8

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543197 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: MW-5 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
1,1,1,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	630-20-6	
Ethylbenzene	ND	ug/l	5	1.00	05/03/00	JSS	100-41-4	
m&p-Xylene	ND	ug/l	10	1.00	05/03/00	JSS	7816-60-0	
Styrene	ND	ug/l	5	1.00	05/03/00	JSS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	5	1.00	05/03/00	JSS	95-47-6	
Bromoform	ND	ug/l	5	1.00	05/03/00	JSS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	5	1.00	05/03/00	JSS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-12-8	
Dibromofluoromethane (S)	94	%		1.00	05/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	86	%		1.00	05/03/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		1.00	05/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	99	%		1.00	05/03/00	JSS	460-00-4	

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PAGE: 6

Pace Project Number: 9312584

Client Project ID: LANDFILL WELLS

Pace Sample No: 93543205 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: SW-1 UPSTREAM Date Received: 05/01/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
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Field Services

Monitoring Well Data	Method:	Prep Method:
Field pH	6.6 Std. Units	05/01/00 MPS
Field Specific Conductance	95 umhos/cm	05/01/00 MPS
Field Temperature	11 deg C	05/01/00 MPS

Metals

Metals, ICP, trace-level	Method: EPA 6010	Prep Method: EPA 3010
Antimony	ND mg/l 0.01	05/17/00 TRW 7440-36-0
Arsenic	ND mg/l 0.01	05/17/00 TRW 7440-38-2
Barium	0.022 mg/l 0.005	05/17/00 TRW 7440-39-3
Beryllium	ND mg/l 0.002	05/17/00 TRW 7440-41-7
Cadmium	ND mg/l 0.001	05/17/00 TRW 7440-43-9
Chromium	ND mg/l 0.005	05/17/00 TRW 7440-47-3
Cobalt	ND mg/l 0.005	05/17/00 TRW 7440-48-4
Copper	ND mg/l 0.005	05/17/00 TRW 7440-50-8
Lead	ND mg/l 0.01	05/17/00 TRW 7439-92-1
Nickel	ND mg/l 0.005	05/17/00 TRW 7440-02-0
Selenium	ND mg/l 0.02	05/17/00 TRW 7782-49-2
Silver	ND mg/l 0.002	05/17/00 TRW 7440-22-4
Vanadium	ND mg/l 0.005	05/17/00 TRW 7440-62-2
Zinc	ND mg/l 0.01	05/17/00 TRW 7440-66-6
Date Digested		05/11/00

Thallium, AAS Furnace	Method: EPA 7841	Prep Method: EPA 3020
Thallium	ND mg/l 0.002	05/15/00 TRW 7440-28-0
Date Digested		05/11/00

Wet Chemistry

Total Dissolved Solids	Method: EPA 160.1	Prep Method: EPA 160.1
Total Dissolved Solids	49 mg/l 1	05/04/00 JMS
Sulfate, Total	Method: EPA 375.4	Prep Method: EPA 375.4
Sulfate	7.4 mg/l 1	05/05/00 JDA

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 PAGE: 9

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543205 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: SW-1 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
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GC/MS Volatiles

GC/MS VOCs by 8260	Method: EPA 8260	Prep Method: EPA 8260
Chloromethane	ND ug/l	10 1.00 05/03/00 JSS 74-87-3
Vinyl Chloride	ND ug/l	10 1.00 05/03/00 JSS 75-01-4
Bromomethane	ND ug/l	10 1.00 05/03/00 JSS 74-83-9
Chloroethane	ND ug/l	10 1.00 05/03/00 JSS 75-00-3
Trichlorofluoromethane	ND ug/l	10 1.00 05/03/00 JSS 75-69-4
Acetone	ND ug/l	100 1.00 05/03/00 JSS 67-64-1
1,1-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 75-35-4
Iodomethane	ND ug/l	5 1.00 05/03/00 JSS 74-88-4
Acrylonitrile	ND ug/l	100 1.00 05/03/00 JSS 107-13-1
Methylene Chloride	ND ug/l	5 1.00 05/03/00 JSS 75-09-2
Carbon Disulfide	6.1 ug/l	5 1.00 05/03/00 JSS 75-15-0
trans-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-60-5
1,1-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 75-34-3
Vinyl Acetate	ND ug/l	50 1.00 05/03/00 JSS 108-05-4
2-Butanone	ND ug/l	100 1.00 05/03/00 JSS 78-93-3
cis-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-59-2
Chloroform	ND ug/l	5 1.00 05/03/00 JSS 67-66-3
Bromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 74-97-5
1,1,1-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 71-55-6
1,2-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 107-06-2
Carbon Tetrachloride	ND ug/l	5 1.00 05/03/00 JSS 56-23-5
Benzene	ND ug/l	5 1.00 05/03/00 JSS 71-43-2
Trichloroethene	ND ug/l	5 1.00 05/03/00 JSS 79-01-6
1,2-Dichloropropane	ND ug/l	5 1.00 05/03/00 JSS 78-87-5
Dibromomethane	ND ug/l	5 1.00 05/03/00 JSS 74-95-3
Bromodichloromethane	ND ug/l	5 1.00 05/03/00 JSS 75-27-4
4-Methyl-2-Pentanone	ND ug/l	50 1.00 05/03/00 JSS 108-10-1
cis-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-01-5
Toluene	ND ug/l	5 1.00 05/03/00 JSS 108-88-3
trans-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-02-6
1,1,2-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 79-00-5
2-Hexanone	ND ug/l	50 1.00 05/03/00 JSS 591-78-6
Dibromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 124-48-1
Tetrachloroethene	ND ug/l	5 1.00 05/03/00 JSS 127-18-4
1,2-Dibromoethane	ND ug/l	5 1.00 05/03/00 JSS 106-93-4
Chlorobenzene	ND ug/l	5 1.00 05/03/00 JSS 108-90-7

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DATE: 05/10/00
 PAGE: 10

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543205 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: SW-1 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
1,1,1,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	630-20-6	
Ethylbenzene	ND	ug/l	5	1.00	05/03/00	JSS	100-41-4	
m&p-Xylene	ND	ug/l	10	1.00	05/03/00	JSS	7816-60-0	
Styrene	ND	ug/l	5	1.00	05/03/00	JSS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	5	1.00	05/03/00	JSS	95-47-6	
Bromoform	ND	ug/l	5	1.00	05/03/00	JSS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	5	1.00	05/03/00	JSS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-12-8	
Dibromofluoromethane (S)	96	%		1.00	05/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	90	%		1.00	05/03/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		1.00	05/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	99	%		1.00	05/03/00	JSS	460-00-4	

Laboratory Certification IDs
 NC Wastewater 12
 NC Drinking Water 37706
 SC 99006

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs
 KY Drinking Water 90090
 TN UST List
 VA Drinking Water 213



Pace Analytical Services, Inc.

54 Ravenscroft Drive

Asheville, NC 28801

Phone: 828.254.7176

DATE: 05/18/00 Fax: 828.252.4618

PAGE: 7

Pace Project Number: 9312584

Client Project ID: LANDFILL WELLS

Sample No: 93543213 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: SW-2 DOWNSTREAM Date Received: 05/01/00

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	----------	---------	------	-----------

Field Services

Monitoring Well Data	Method:	Prep Method:
Field pH	6.6 Std. Units	05/01/00 MPS
Field Specific Conductance	110 umhos/cm	05/01/00 MPS
Field Temperature	12 deg C	05/01/00 MPS

Metals

Metals, ICP, trace-level	Method: EPA 6010	Prep Method: EPA 3010
Antimony	ND mg/l 0.01	05/17/00 TRW 7440-36-0
Arsenic	ND mg/l 0.01	05/17/00 TRW 7440-38-2
Barium	0.022 mg/l 0.005	05/17/00 TRW 7440-39-3
Beryllium	ND mg/l 0.002	05/17/00 TRW 7440-41-7
Cadmium	ND mg/l 0.001	05/17/00 TRW 7440-43-9
Chromium	ND mg/l 0.005	05/17/00 TRW 7440-47-3
Cobalt	ND mg/l 0.005	05/17/00 TRW 7440-48-4
Copper	ND mg/l 0.005	05/17/00 TRW 7440-50-8
Lead	ND mg/l 0.01	05/17/00 TRW 7439-92-1
Nickel	ND mg/l 0.005	05/17/00 TRW 7440-02-0
Selenium	ND mg/l 0.02	05/17/00 TRW 7782-49-2
Silver	ND mg/l 0.002	05/17/00 TRW 7440-22-4
Vanadium	ND mg/l 0.005	05/17/00 TRW 7440-62-2
Zinc	ND mg/l 0.01	05/17/00 TRW 7440-66-6
Date Digested		05/11/00

Thallium, AAS Furnace	Method: EPA 7841	Prep Method: EPA 3020
Thallium	0.002 mg/l 0.002	05/15/00 TRW 7440-28-0
Date Digested		05/11/00

Wet Chemistry

Total Dissolved Solids	Method: EPA 160.1	Prep Method: EPA 160.1
Total Dissolved Solids	52 mg/l 1	05/04/00 JMS
Sulfate, Total	Method: EPA 375.4	Prep Method: EPA 375.4
Sulfate	9.3 mg/l 1	05/05/00 JDA

Laboratory Certification IDs
 NC Wastewater 40
 NC Drinking Water 37712

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Laboratory Certification IDs
 TN Drinking Water 02980
 SC Environmental 99030



Pace Analytical Services, Inc.
 9800 Kinsey Avenue, Suite 100
 Huntersville, NC 28078
 Phone: 704.875.9092
 Fax: 704.875.9091

DATE: 05/10/00
 PAGE: 11

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543213 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: SW-2 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
------------	---------	-------	-----	---------	----------	---------	------	-----------

/MS Volatiles

GC/MS VOCs by 8260	Method: EPA 8260	Prep Method: EPA 8260
Chloromethane	ND ug/l	10 1.00 05/03/00 JSS 74-87-3
Vinyl Chloride	ND ug/l	10 1.00 05/03/00 JSS 75-01-4
Bromomethane	ND ug/l	10 1.00 05/03/00 JSS 74-83-9
Chloroethane	ND ug/l	10 1.00 05/03/00 JSS 75-00-3
Trichlorofluoromethane	ND ug/l	10 1.00 05/03/00 JSS 75-69-4
Acetone	ND ug/l	100 1.00 05/03/00 JSS 67-64-1
1,1-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 75-35-4
Iodomethane	ND ug/l	5 1.00 05/03/00 JSS 74-88-4
Acrylonitrile	ND ug/l	100 1.00 05/03/00 JSS 107-13-1
Methylene Chloride	ND ug/l	5 1.00 05/03/00 JSS 75-09-2
Carbon Disulfide	ND ug/l	5 1.00 05/03/00 JSS 75-15-0
trans-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-60-5
1,1-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 75-34-3
Vinyl Acetate	ND ug/l	50 1.00 05/03/00 JSS 108-05-4
2-Butanone	ND ug/l	100 1.00 05/03/00 JSS 78-93-3
cis-1,2-Dichloroethene	ND ug/l	5 1.00 05/03/00 JSS 156-59-2
Chloroform	ND ug/l	5 1.00 05/03/00 JSS 67-66-3
Bromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 74-97-5
1,1,1-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 71-55-6
1,2-Dichloroethane	ND ug/l	5 1.00 05/03/00 JSS 107-06-2
Carbon Tetrachloride	ND ug/l	5 1.00 05/03/00 JSS 56-23-5
Benzene	ND ug/l	5 1.00 05/03/00 JSS 71-43-2
Trichloroethene	ND ug/l	5 1.00 05/03/00 JSS 79-01-6
1,2-Dichloropropane	ND ug/l	5 1.00 05/03/00 JSS 78-87-5
Dibromomethane	ND ug/l	5 1.00 05/03/00 JSS 74-95-3
Bromodichloromethane	ND ug/l	5 1.00 05/03/00 JSS 75-27-4
4-Methyl-2-Pentanone	ND ug/l	50 1.00 05/03/00 JSS 108-10-1
cis-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-01-5
Toluene	ND ug/l	5 1.00 05/03/00 JSS 108-88-3
trans-1,3-Dichloropropene	ND ug/l	5 1.00 05/03/00 JSS 10061-02-6
1,1,2-Trichloroethane	ND ug/l	5 1.00 05/03/00 JSS 79-00-5
2-Hexanone	ND ug/l	50 1.00 05/03/00 JSS 591-78-6
Dibromochloromethane	ND ug/l	5 1.00 05/03/00 JSS 124-48-1
Tetrachloroethene	ND ug/l	5 1.00 05/03/00 JSS 127-18-4
1,2-Dibromoethane	ND ug/l	5 1.00 05/03/00 JSS 106-93-4
Chlorobenzene	ND ug/l	5 1.00 05/03/00 JSS 108-90-7

Laboratory Certification IDs
 NC Wastewater 12
 NC Drinking Water 37706
 SC 99006

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 KY Drinking Water 90090
 TN UST List
 VA Drinking Water 213



Pace Analytical Services, Inc.
 9800 Kinsey Avenue, Suite 100
 Huntersville, NC 28078
 Phone: 704.875.9092
 Fax: 704.875.9091

DATE: 05/10/00
 PAGE: 12

Pace Project Number: 9213755
 Client Project ID: BASF-9312584

Sample No: 93543213 Date Collected: 05/01/00 Matrix: Water
 Client Sample ID: SW-2 Date Received: 05/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
1,1,1,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	630-20-6	
Ethylbenzene	ND	ug/l	5	1.00	05/03/00	JSS	100-41-4	
m&p-Xylene	ND	ug/l	10	1.00	05/03/00	JSS	7816-60-0	
Styrene	ND	ug/l	5	1.00	05/03/00	JSS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	5	1.00	05/03/00	JSS	95-47-6	
Bromoform	ND	ug/l	5	1.00	05/03/00	JSS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	5	1.00	05/03/00	JSS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	5	1.00	05/03/00	JSS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	5	1.00	05/03/00	JSS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	5	1.00	05/03/00	JSS	96-12-8	
Dibromofluoromethane (S)	94	%		1.00	05/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	88	%		1.00	05/03/00	JSS	17060-07-0	
Toluene-d8 (S)	100	%		1.00	05/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	100	%		1.00	05/03/00	JSS	460-00-4	

Laboratory Certification IDs
 NC Wastewater 12
 NC Drinking Water 37706
 SC 99006

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Laboratory Certification IDs
 KY Drinking Water 90090
 TN UST List
 VA Drinking Water 213

Alamance Co. Swepsonville CF.

Subject: Well setback to landfill

Date: Tue, 22 Jan 2002 10:48:04 -0500

From: Terri Craver <Terri.Craver@alamance-nc.com>

To: "larry.rose@ncmail.net" <larry.rose@ncmail.net>

I just wanted to let you know that Alvin Cagle, Gary Justice, Connie Pixley and myself measured from the well off of Crystal Springs Ct. to the landfill. From the creek to the well was 250 feet and from the creek to the toe of the trash was 400 feet. We feel safe saying that the 500' setback is observed.

If you have any questions, please call 336-570-6367 ext. 20 or email.

Subject: private well near old landfill *Swapsville LF*
Date: Thu, 17 Jan 2002 14:31:30 -0500
From: Alvin Cagle <Alvin.Cagle@alamance-nc.com>
To: "larry.rose@ncmail.net" <larry.rose@ncmail.net>

Larry, we assisted the Alamance County Environmental Health in measuring from the new private well and the toe of the landfill waste. It is greater than 500 feet. It should be between 700-800 feet separation. Terri Craver with the Health Dept. will be emailing you in the near future to confirm measurements. Thanks, Alvin Cagle.

- New housing development near MW-4 - Across the creek,

Subject: RE:

Date: Tue, 28 Nov 2000 15:52:00 -0500

From: "Ballsieper, Jeffrey" <JBallsie@kennesaw.Lawco.com>

To: 'Mark Poindexter' <Mark.Poindexter@ncmail.net>

Hey mark, it turns out the hits on Toluene were not statistically significant. Anything we need to do from our end?

-----Original Message-----

From: Mark Poindexter [mailto:Mark.Poindexter@ncmail.net]

Sent: Wednesday, November 22, 2000 7:43 AM

To: Ballsieper, Jeffrey

Subject: Re:

Jeffrey,

Thanks for the update. If the detections turn out to be statistically significant, the County has the option found in .1633 (c) (3). Call or email sometime if you have questions or want to discuss. Have a good Thanksgiving.

"Ballsieper, Jeffrey" wrote:

Mark- our stats person did not run stats on the Toluene. She has gotten the data and will return it as soon as she can digest it. I will keep you posted...

Jeffrey A. Ballsieper, L.G.

Project Geologist

LAW Engineering and Environmental Services, Inc.

7347-E West Friendly Avenue

Greensboro, North Carolina 27410

Phone: (336) 834-2104

Fax: (336) 294-4227

e-mail: jballsie@lawco.com

LR,
This is referring to the latest
data report from Alvarado Co.'s Austin
Quarles landfill. I told Jeff to
keep an eye on it. We would want to see
what the next report revealed.
JAW

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

DIVISION OF WASTE MANAGEMENT

July 7, 1998



JAMES B. HUNT JR.
GOVERNOR

WAYNE McDEVITT
SECRETARY

WILLIAM L. MEYER
DIRECTOR

Mr. Alvin Cagle
Director, Solid Waste Management
Alamance County
124 West Elm Street
Graham, N.C. 27253

Re: Exceedances of Ground Water Standards At The Sweptonville County
Landfill (Permit #01-01).

Dear Mr. Cagle,

Water quality data from past sampling of the ground water detection monitoring wells at the closed Sweptonville County Landfill indicates levels of chemical constituents exceeding water quality standards. Two of the monitoring wells have exceedances of N.C. State groundwater standards and are located at or near the facility property boundaries. Pursuant to N.C. Administrative Code 13B assessment/remediative measures are required.

The County should acquire the services of a N.C. licensed professional geologist with experience in assessment and remediation of ground water contamination and submit a plan that addresses the objectives the County believes will address the ground water exceedances. The professional geologist shall consult with the Solid Waste Section (Section) about the landfill site prior to developing the plan. The Section will review the submitted plan, approve it, or request more information or amendments before implementation. The plan shall then be implemented as approved.

If I can be of assistance or if you have any questions regarding this issue please contact me at (919) 733-0692, extension 261.

Sincerely,

Mark Poindexter, Hydrogeologist
Groundwater Compliance Unit, Solid Waste Section

c: Phil Prete
Hugh Jernigan
Central file

Filename: C:\WPDOCS\COUNTIES\ALAMANCE\01-01.AST

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT

December 18, 1997

Mr. Robert C. Smith, County Manager
2701 West Elm Street
Graham, North Carolina 27253

RE: Preliminary Hydrogeologic Technical Review of the Design
Hydrogeologic Report -- Alamance County: Proposed Cell 2B for
Municipal Solid Waste, and Phase 2 of the Construction and Demolition
Debris Landfill.

Dear Mr. Smith,

A preliminary hydrogeologic review has been completed for the proposed Austin Quarter Road Facility for the proposed expansion submitted by Hazen and Sawyer. Please have Hazen and Sawyer respond to the following comments and questions:

Cell 2B

Page 10: Slug test data completed in the bedrock was analyzed utilizing confined condition methods. Piezometer construction records do not indicate well screens are located in a single water bearing fracture and no methods are given for isolating any water bearing fracture. The estimated effective porosity of three percent for the bedrock also seems to indicate interconnection of fractures. Slug test data calculated for hydraulic conductivities need to be re-evaluated for unconfined conditions.

Page 12: Seasonal high groundwater has not been determined. Include the water level measurements that have been recorded for the expansion area. Hydrographs of wells in the area, meteorological and climatological data also need to be included in the explanation for the seasonal high groundwater determination.

Page 13: An effective porosity ranging from 35 to 40 percent was estimated using laboratory results and soil characteristics. Porosities of 35 to 40 percent are generally clean sands or primary porosities. Provide information used for determining the effective porosity in calculating flow rates.

Page 14: Nest B-34/B-34A is reported to have an upward gradient on April 8, 1997 with subsequent vertical gradients with a downward vertical component. The location of the nested piezometers appear to be in a recharge area. It is unclear why this reading is indicating an upward component. Explain this apparent anomalous event.

Borrow areas located in future cells may impact characterization for design studies. Design hydrogeologic studies are to be conducted on generally undisturbed ground. Determination of the long term seasonal high groundwater and depths to top of rock is most accurate prior to any alteration of the topography. Removal of soil and stockpiling of soil cover can affect the accuracy of hydrologic studies. How will the estimated four foot separation and the groundwater regime be addressed prior to soil removal from the future cells?

C & D Expansion

A Construction and Demolition Debris Landfill is a sanitary landfill that has a defined waste stream and is subject to the .0500 rules. The hydrogeologic report does not include any discussion concerning the one and three-quarter acre lateral expansion for the construction and demolition debris landfill.

Water Quality Management Plan

Page 1: The purpose of monitoring well S51 is unclear. Is monitoring well S51 intended for use as background or release detection?

Page 2: The Design Hydrogeologic Report states the potentiometric surface recharge is beneath Cell 2B, wells S10 and S11 cannot be replaced with equivalent up-gradient wells. Upgradient or background wells are to represent the quality of the background groundwater that has not been affected by leakage from the waste unit. Background water is normally collected from a well or wells that are hydraulically upgradient of the waste management area. It may be preferable to install the background well in a location that is not as subject to abandonment for new cell construction. This type of well can be used as a facility background monitoring well for the life of the site.

Figure 1: Nested monitoring wells MW-8 do not appear to be in a position to detect a potential release from the sump area based on text and the potentiometric surface provided. The temporary sump in the northwest portion of the cell will also need to be monitored.

Sampling and Analysis Plan

Page 8: Line item 5 states a dedicated Teflon or stainless steel bailer may be used to remove water from the well. While a bailer can be dedicated to a given well, bailers are considered a part of a portable monitoring system. Bailers must be laboratory cleaned prior to field use. Field cleaning of bailers is not allowed.

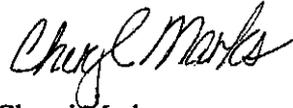
"A minimum of three casing volumes will be removed from wells..."
Purging may actually need to continue past three casing volumes if the pH and specific conductivity have not stabilized.

Page 9: Line item 7 states each groundwater monitoring well will have dedicated bailers. Since bailers are required to be laboratory cleaned, cross contamination between sampling wells is minimized and unlikely.

Page 16: "No equipment blanks are being proposed because each well will have dedicated sampling devices."
Pumps may be used in dedicated systems, however, when bailers are used in a portable system at least one equipment blank is required.

If Hazen and Sawyer have any questions regarding this memo, they may contact me at (919) 733-0692, extension 346.

Sincerely,



Cheryl Marks
Hydrogeologist
Solid Waste Section

cc: Ed Mussler, Solid Waste Section
Bobby Lutfy, Solid Waste Section
Mark Fry, SWS--Fayetteville
John Bove, Hazen and Sawyer

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

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



November 12, 1996

Mr. John Bove
Hazen and Sawyer, P.C.
4011 WestChase Blvd.
Raleigh, N.C. 27607

RE: Review Of Subsurface Exploration Plan For The Alamance County
Landfill Cell 2B Expansion (Permit # 01-04)

Dear Mr. Bove,

After reviewing the proposed Work Plan for the design hydrogeologic investigation for the Alamance County Cell 2B Landfill expansion, the Solid Waste Section offers the following comments:

- The "area of investigation", as specified in Rule .1623(b)(1) includes not only the cell footprint but also the potential monitoring zone at least out to 150 feet around the footprint. This will essentially double the proposed study area and therefore double the number of borings probably needed in order to provide all of the information required in .1623(b).
- Since the surface topography has been altered, it will be important to identify the conditions at the time of the subsurface investigation. Soil stockpiles, etc. can influence surface water flow and subsurface groundwater flow conditions, so it will be important to evaluate these issues.
- In some locations the screen lengths (and sand packs) may need to be less than 10 feet in length in order to isolate a distinct hydrogeologic unit for hydraulic conductivity testing or other testing.
- Note that .1623(a)(4)(E) requires information for porosity and effective porosity for each lithologic unit in addition to information on saturated hydraulic conductivity.

P.O. Box 27687,
Raleigh, North Carolina 27611-7687
Voice 919-733-4996



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Mr. John Bove
Alamance Co. Cell 2B Boring Plan
Page 2

- Unless there is a very limited saprolite aquifer, a minimum of five piezometer nests will be needed in order to provide a couple of hydrogeologic cross-sections representing the vertical dimension of ground-water flow. Nested piezometers also assist in the identification of ground-water recharge areas and discharge areas. Refer to Rule .1623(b)(2)(G) and (H). If there is a very limited saprolite aquifer, fewer than five nested piezometers may be sufficient.
- You may consider potential ground-water quality monitoring locations for the location of some of the piezometers.
- Since the lowest portion of the cell (the sump) could be a critical location for establishing the vertical separation and this could affect grades for the entire cell, at least one piezometer should be placed in this location.
- Borings (including rock cores) should be located in uplands, slopes, and drainage swales. Also keep in mind that cross-sections need to be prepared in selecting the boring locations.
- Remember that the rules require a tabulation of water table readings at time of boring, 24 hours, and under stabilized conditions. Additional stabilized readings are also necessary in order to estimate the seasonal high water table elevations.

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: Hugh Jernigan, SWS Winston-Salem
Alvin Cagle, Alamance County

November 4, 1996

Bobby Lutfy
Solid Waste Section
State of North Carolina Department of Environment,
Health and Natural Resources
P.O. Box 27687
Raleigh, NC 27611-7687

Re: Alamance County Landfill
Cell 2B Expansion
H&S No. 3795

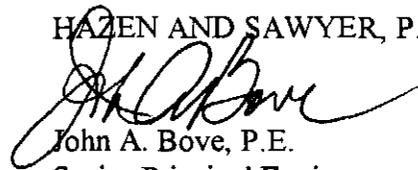
Dear Mr. Lutfy,

On behalf of Alamance County, we wish to inform you that the County is beginning the design of an expansion of its Austin Quarter Road Solid Waste Management Landfill. The expansion, designated as Cell 2B, consists of an approximately eight acre cell to be constructed adjacent to the east side of Cell 1, which is currently operating. A site plan showing the location of the existing cell and the planned expansion is attached for your convenience.

We have attached a work plan for the subsurface investigation for Cell 2B for your review. The Plan outlines the number, location, and the anticipated depth for the wells as well as aquifer testing and reporting. Civil and Environmental Consultants (CEC) will be conducting drilling, inspection, and aquifer testing as a subconsultant to Hazen and Sawyer. The subsurface investigation is scheduled to begin in early December, 1996. We welcome your comments to this plan, and would like to meet with you to discuss it some time in November. We will contact you in a week or so to schedule such a meeting. In the interim, if you have any questions or require additional information, please feel free to contact us.

Very truly yours,

HAZEN AND SAWYER, P.C.



John A. Bove, P.E.
Senior Principal Engineer

Attachments: Site Plan
Hydrogeological Investigation Work Plan
cc: Alvin Cagle, Alamance County
Rick Kenter, CEC

**Alamance County
Austin Quarter Road Solid Waste Management Facility
Cell 2B Expansion**

Hydrogeologic Investigation Work Plan

**Hazen & Sawyer, P.C.
Civil & Environmental Consultants, Inc.**

November, 1996

1. Location

Proposed Cell 2B expansion is located to the east of the currently active Cell 1. The western berm of Cell 2B is the existing Cell 1 Intermediate Berm. The Cell is approximately 8 acres in area and is designed for a five year design life. The Cell 2B area is cleared of trees and brushes except for about one acre in the southeast corner of the expansion area. As shown on the attached "Cell 2B Proposed Well Layout", a topsoil stockpile and portions of the daily cover soil stockpile are located within the proposed footprint. The main Cell 1 access road as well as operations staging area are also located in the area of proposed Cell 2B.

The daily cover stockpile will be depleted prior to Cell 2B construction, and has little impact on investigation or design. The topsoil stockpile will be relocated prior to Cell 2B construction. It is anticipated that this material will be used as part of Cell 1 final cover construction. Access to Cell 1 will be moved to the north end of the Cell just before construction of Cell 2B.

Preliminary lines and grades for Cell 2B are taken from "Overall Base of Compacted Soil Liner", Drawing G5 of the April, 1993 approved Permit Drawings. A subsurface hydrogeological investigation will be conducted to establish feasibility of base grades and to assure adequate separation from groundwater and bedrock. The scope of investigation is described below.

2. Hydrogeological Investigation

The goal of the hydrogeological investigation is to collect information required to provide a Design Hydrogeologic Report in accordance with 15A NCAC 13B 1623 (b). A total of eight borings is required, depending on geologic conditions encountered. There are two existing wells within the Cell 2B footprint; S11 is a temporary monitoring well included in the Water Quality Management Plan and Well 1, which was installed as part of the Site Hydrogeologic Report. In addition, S10, another temporary monitoring well, is located just to the north of the proposed expansion area. Several monitoring wells and test pits installed for the Site Hydrogeologic Report were located in the Cell 2B area, but were abandoned during Cell 1 construction. The attached drawings shows the location of existing and abandoned monitoring wells.

A total of six new borings are proposed at the locations shown on the attached drawing. These locations have been selected for maximum coverage and also to minimize risk of damage during Cell 1 operations. The wells will be marked and protected from damage by earth moving equipment.

All six new wells will be converted to piezometers. The new piezometers, in conjunction with existing wells in the area, will be used to collect water level information so that groundwater flow directions can be determined and the characteristics of the uppermost aquifer can be identified and described.

Borings will be advanced utilizing hollow-stem auger drilling methods to depths ranging from 20 to 40 feet, depending on subsurface conditions. The projected boring depths are shown on Table 1. In each boring, split-spoon samples will be collected at 2.5 foot intervals for the upper ten feet and five foot intervals below that to boring completion. In addition, split-spoon samples will also be collected at major changes in lithology. In some borings, Shelby

tube samples will be collected for analysis in a soils laboratory. In three of the borings, the upper ten feet of bedrock will be cored utilizing NX rock coring methods.

Piezometers will be constructed with 10 to 15 foot length 2-inch schedule 40 PVC screens, with the remainder of the piezometer constructed of 2-inch schedule 40 PVC riser pipe. All piezometers will be installed in accordance with the applicable North Carolina Well Construction Standards codified in 15A NCAC 2C. Upon completion of installation of the piezometers, each will be properly developed to ensure good hydraulic communication with the surrounding aquifer material.

Once all piezometers have been installed and properly developed, aquifer testing, (slug tests) will be performed on selected piezometers. The results of these tests will be used to determine recharge/discharge from the aquifer as well as provide an indication of the horizontal hydraulic conductivity of the formation. Data from the slug tests will be analyzed using Hvorslev's, Bouwer-Rice, or the Cooper-Bredehoeft-Papadopulos methods.

The results of the geotechnical testing will be used to determine if the soils found on the site are suitable for construction of the various components of the landfill (i.e., berms, liners, and final cover) and to define the physical characteristics of the lithologic units of the uppermost aquifer system. In addition to borings several test pits will be excavated and soils samples tested.

During the drilling activities, soil samples will be collected for geotechnical classification and analysis in the laboratory. Bulk soil samples as well as relatively undisturbed Shelby tube samples will be collected. The tests which will be conducted on boring or test pit samples may include:

- Particle Size Analysis of Soils ASTM D422-63)
- Liquid and Plastic Limits (ASTM D4318-83)
- Classification of Soils for Engineering Purposes (ASTM D2487-69)
- Standard Proctor (ASTM D698-78)
- Hydraulic Conductivity Testing (ASTM 5084)
- Natural Moisture Content (ASTM D2216)
- Unit Weight
- Specific Gravity (ASTM D854)

The data analysis will occur after completion of the field work. The goal or the end result of the data analysis and interpretation is to establish an understanding of the Hydrogeologic conditions underlying the proposed Cell 2B area.

A report (Design Hydrogeologic Report) will be prepared in accordance with 15A NCAC 13B.1623 upon completion of all field activities and data analysis. This report will include data collected during the project as well as any interpretation of the data. Descriptions of all field procedures which include site reconnaissance, drilling, piezometer installation, piezometer development and sample collection will be included. The report will contain all boring logs, piezometer completion diagrams, laboratory testing data, water level information, and calculations. In addition, items such as groundwater and bedrock surface contour maps and stratigraphic cross sections will be included in the report.

Groundwater flow regimes including horizontal and vertical components of groundwater flow, horizontal and vertical gradients, and flow rates will be discussed.

3. Schedule

Drilling will commence in early December, 1996. Aquifer testing will be completed in December and water level monitoring will be conducted on a monthly basis throughout the design and permit review period. It is anticipated that an Application for Permit-to-Construct, including the Design Hydrogeologic Report, will be submitted in mid-1997. Cell 2A is scheduled to be on line by early 1999.

Attachment: "Cell 2B - Proposed Well Layout"

HAZEN AND SAWYER

Environmental Engineers & Scientists

Hazen and Sawyer, P.C.
4011 WestChase Blvd.
Raleigh, NC 27607
919 833-7152
Fax: 919 833-1828

B. Lutfy

August 5, 1996

Bobby Lutfy
Solid Waste Section
State of North Carolina Department of Environment,
Health and Natural Resources
P.O. Box 27687
Raleigh, NC 27611-7687



Re: Alamance County Landfill
Surface Water Monitoring
H&S No. 3788

#01-04

Dear Mr. Lutfy,

On behalf of Alamance County, we wish to update you on the status of the underdrain outlet for Cell 1 at the County's new landfill. As you may recall, the Solid Waste Section required installation of the underdrain below portions of Cell 1. This underdrain drains by gravity to a concrete manhole south west of the landfill perimeter. Liquid in the manhole may only be removed by pumping. This manhole has been designated as surface water monitoring point SW-7, and has been sampled along with the rest of the monitoring locations since the landfill opened in March, 1994. On the basis of the sampling completed to date, no evidence of leachate in the manhole has been indicated.

As part of its Operating Permit, the County is required to develop a plan to manage outflow from the underdrain. The County has been monitoring the volume of liquid in the manhole since the facility opened. The depth of water was measured and the volume contained in the 4-ft diameter manhole computed. A summary of water level data as well as a plot of volume versus time are attached for your information. The volume of liquid has gradually increased with time, but much of the liquid is believed to be left over from construction. The contractor did not backfill or place the lid on the manhole until the end of cell construction. At that time (March, 1994) our records indicate that there was about 3-ft of water in the manhole. A Hazen and Sawyer representative entered the manhole in March, 1994 and visually checked in inlet pipe for presence of liquid. The 4-inch diameter corrugated HDPE inlet pipe showed no evidence of liquid or sediment, indicating that no flow had entered the manhole from the pipe. The water in the manhole was from rainfall directly into the manhole or infiltrated through the joints before backfilling.

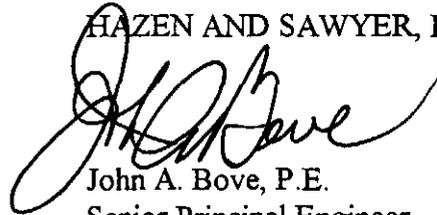
Mr. Bobby Lutfy
August 5, 1996

It is our opinion that there is little or no flow exiting the underdrain at this time. The County plans to pump all of the remaining water from the manhole this summer and place it in the leachate storage tank for treatment. County staff will then monitor the water level in the manhole on a monthly basis for one year. If there is less than 2-ft of liquid in the manhole (180 gallons) no sampling will be completed. Any liquid removed from the manhole within the next year will be pumped to the leachate storage tank. The County will notify the Solid Waste Section when the manhole is first pumped dry and again at the end of the first year's monitoring. Water level data will be provided for review. Assuming no significant inflow occurs at the end of the one year monitoring period, the County will request that no additional analytical sampling of the underdrain be required. The County will continue to visually monitor the manhole quarterly.

We welcome your comments to this plan. Please contact Hazen and Sawyer or Alvin Cagle, the Landfill Manager at (910) 376-8902 with questions or comments.

Very truly yours,

HAZEN AND SAWYER, P.C.



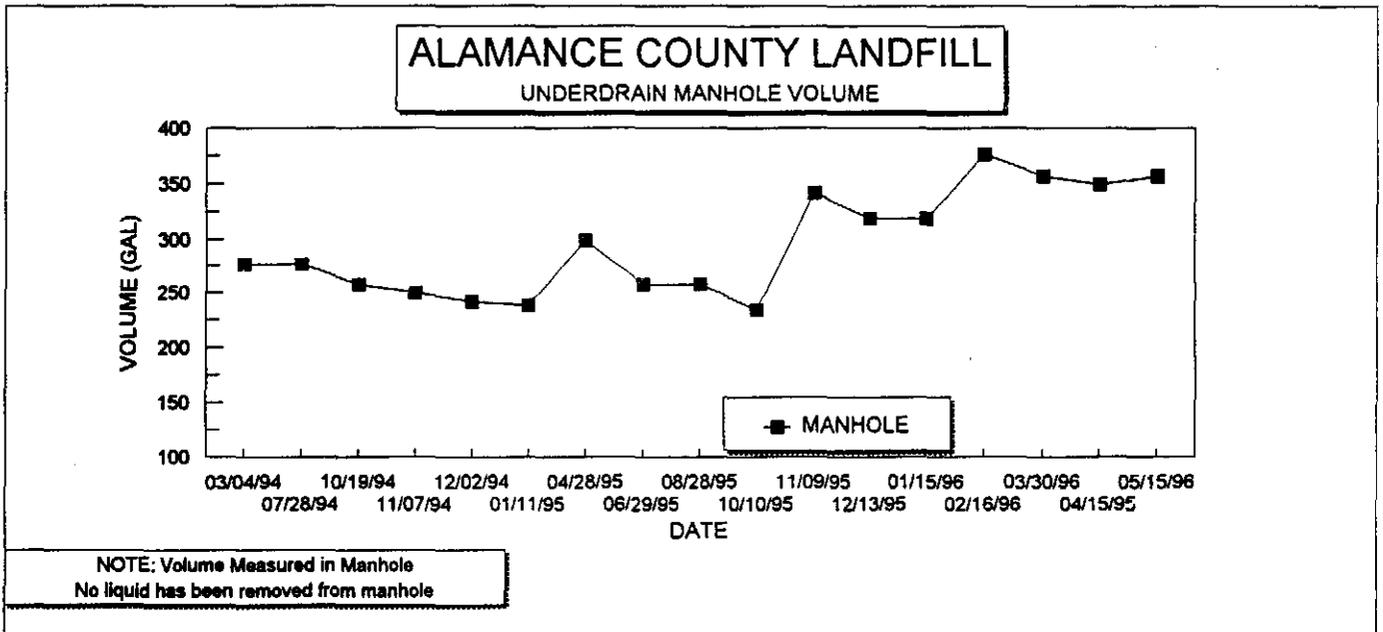
John A. Bove, P.E.
Senior Principal Engineer

cc: Alvin Cagle, Alamance County

**ALAMANCE COUNTY LANDFILL
MSWLF UNDERDRAIN (SW-7)
VOLUME CALCULATIONS**

DATE	WATER DEPTH(IN)	VOLUME (GALLONS)
03/04/94	36.0	276
07/28/94	36.0	276
10/19/94	33.5	257
11/07/94	32.5	250
12/02/94	31.5	242
01/11/95	31.0	238
04/28/95	39.0	299
06/29/95	33.5	257
08/28/95	33.5	257
10/10/95	30.5	234
11/09/95	44.5	342
12/13/95	41.5	319
01/15/96	41.5	319
02/16/96	49.0	376
03/30/96	46.5	357
04/15/96	45.5	349
05/15/96	46.5	357

Note: Inlet pipe is 5-ft above bottom of manhole



Dept. of Environment, Health and Natural Resources
Division of Solid Waste Management
Solid Waste Section
Larry Rose / Mark Poindexter
P.O. Box 27687
Raleigh, NC 27611-7687

Approval given
3/21/96 -
provide written
response ASAP

Dear Mr. Rose

This is notification that chromium, lead and nickel exceeded 15A NCAC 2L standards for groundwater during the September 1995 sampling event at the Austin Quarter Solid Waste Management Facility located in Saxapahaw, N.C. (Alamance County).

We have been in contact with our consultant, Mr. E.W. Scarlett, Jr. P.G., of BPA Environmental and Engineering Inc. to discuss this situation. Mr. Scarlett and county staff feel that the landfill is functioning properly and that the landfill is not adversely impacting groundwater at this site.

Attached is a copy of a proposal from BPA with recommendations to demonstrate that the landfill is not adversely impacting groundwater and thus preclude assessment monitoring. The plan of action as outlined below will take place the week of March 25, 1996 during the next sampling event.

The following work is proposed:

1. Collect both filtered and unfiltered groundwater samples and analyze for metals.
2. Measure turbidity of groundwater samples from each monitoring well.
3. Compare and statistically evaluate analytical results to demonstrate that elevated metal concentrations in the groundwater samples are not attributable to the landfill.

In order to begin work the week of March 25, 1996 time is of essence. Your prompt response is greatly appreciated.

Sincerely,

Alvin H. Cagle
Alvin H. Cagle
Landfill Manager

wp/ja



BPA Environmental & Engineering, Inc.

John E. Palmer, P.G.
E.W. Scarlett, Jr., P.G.
R. Edward Hedgecock, P.E., P.G.

2641-G Randleman Road
Greensboro, NC 27406
(910) 272-9713

March 19, 1996

Mr. Alvin Cagle, R.S.
Landfill Manager
209 N. Graham-Hopedale Road
Burlington, North Carolina 27217-2971

Post-it® Fax Note	7671	Date	3-19-96	# of Pages	2
To	Alvin Cagle	From	Wes Scarlett		
Co./Dept.	Alamance Co.	Co.	BPA		
Phone #	910 376 8902	Phone #	910-272-9713		
Fax #	910 376 8937	Fax #			

RE: Austin Quarter Landfill
Additional Sampling and Analytical
BPA No. 0170.009

Dear Mr. Cagle:

I have spoken with Mr. Bobby Lufy and Mr. Mark Poindexter, of the North Carolina Division of Solid Waste Management concerning the elevated metal concentrations detected in the groundwater at the Austin Quarter Landfill during the September 1995 sampling event. Since chromium, lead, and nickel concentrations exceeded the 15A NCAC 2L Standards for groundwater at the time of sampling, action is required on the County's part.

Solid Waste Management Rule 15A NCAC 13B.1634(a) states that "Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in Appendix I or whenever a violation of the North Carolina groundwater quality standards (15A NCAC 2L.0202) has occurred". It is our opinion that the lined disposal area at the landfill is functioning properly and that the landfill is not adversely impacting groundwater at this site.

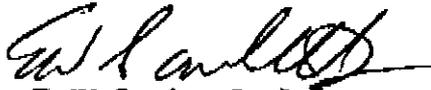
In order to demonstrate that the landfill is not adversely impacting groundwater and thus preclude assessment monitoring, we recommend the following additional work during the next sampling event.

- Collect both filtered and unfiltered groundwater samples and analyze for metals.
- Measure turbidity of groundwater samples from each monitoring well.
- Compare and statistically evaluate analytical results to demonstrate that elevated metal concentrations in the groundwater samples are not attributable to the landfill.

The estimated cost for the additional services is \$1,700.00.

Sincerely,

BPA ENVIRONMENTAL & ENGINEERING, INC.



E. W. Scarlett, Jr., P.G.

Principal

EWS/bs

AUTOMATIC COVER SHEET

DATE: MAR-19-96 TUE 17:23

TO:

FAX #: 919197334810

FROM: ALAMANCE COUNTY C COMM

FAX #: 910 570 6775

05 PAGES WERE SENT
(INCLUDING THIS COVER PAGE)

ALAMANCE COUNTY LANDFILL

209 N. GRAHAM-HOPEDALE ROAD
BURLINGTON, NORTH CAROLINA 27217-2971

PHONE NUMBER: 910-376-8902

FAX NUMBER: 910-376-8937

FAX COVER SHEET

COMPANY NAME: NC DEHNR

CONTACT NAME: Mark Poindexter

FAX NUMBER: 919-733-4810

SENDER: Alvin Cagle

DESCRIPTION: Letter on groundwater sampling
at Austin Quarter Landfill

NUMBER OF PAGES: 4 (INCLUDING COVER)

DATE SENT: March 19, 1996

* If there are any problems with this transmission, please call: 910-376-8902
Fax Number: 910-376-8937

Post-It™ brand fax transmittal memo 7671 # of pages ▶ 1

To James Bealle	From Larry Rose
Co. Alamance Co	Co. Solid Waste Section
Dept.	Phone # 919-730-4600 - Ext 257
Fax # 919-730-3739	Fax #

MEMO

DATE: 2-12-96

TO: James Bealle

SUBJECT: Monitoring Well Data - Alamance Co.

Mr. Bealle,

The Solid Waste Section has received the following water quality monitoring reports:

- 01-04 - Austin Quarter Landfill: 9-26-95
- 01-01 - Swepsonville Landfill: 10-10-95

Both reports appear to be complete & correct,

From: Larry Rose
Solid Waste Section



North Carolina Department of Environment, Health, and Natural Resources



Printed on Recycled Paper

July 5, 1995

Mr. Robert Smith, County Manager
Alamance County
124 West Elm Street
Graham, NC 27253

SUBJECT: Closure of the Alamance County Landfill
Permit #01-01

Dear Mr. Smith:

The Solid Waste Section (the Section) has received and reviewed documentation submitted by your consultant, Hazen and Sawyer, on your behalf regarding the subject facility. Based on this documentation, the Section has determined that the subject facility has been closed in accordance with the applicable requirements. This determination may be rescinded should any of the documentation prove to be inaccurate.

The subject facility is considered closed subject to the attached post closure conditions. The owner of the facility, Alamance County, is responsible for compliance with these conditions.

This closure shall become effective upon written notification by Alamance County that the facility shall be maintained in compliance with the post closure conditions specified in this letter. Also, Rule .0510 states that when a disposal unit is closed, the permit for that unit is terminated and any future disposal operations will require approval by the Section.

POST CLOSURE CONDITIONS

1. **MANAGEMENT OF LANDFILL GAS:** The owner and/or operator shall take the measures necessary to ensure that the closed site shall continue to meet the design standards for landfill gas found in Rule .0503(2)(a).
2. **MANAGEMENT OF SURFACE WATER:** The owner and/or operator shall take the measures necessary to ensure that the closed site shall meet the requirements of Rule .0503(2)(c). In addition, the landfill unit shall be maintained such that surface water runoff occurs in a controlled manner, and surface water shall not be impounded over waste.
3. **AIR QUALITY:** The owner/operator shall ensure that landfill units do not violate any applicable requirements developed under a State Implementation Plan approved or promulgated by the U.S. EPA Administrator pursuant to Section 110 of the Clean Air Act, as amended.
4. **FINAL COVER SYSTEM:** The integrity and effectiveness of the final cover system and any permanent erosion control devices must be maintained. This could include making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events.
5. **PROPOSED USES:** The owner/operator shall submit a proposal for the Section's review and approval addressing post closure uses of the facility. Proposed post closure uses shall not violate any post closure conditions found in this letter. In particular, plans for post closure uses shall avoid possibilities for the entrapment of methane gas. Routine landfill gas monitoring within structures and at the facility boundary may not be sufficient to detect potentially dangerous situations.
6. **ONGOING SOLID WASTE MANAGEMENT ACTIVITIES:** Continuing solid waste management activities (e.g. yard waste composting, scrap tire collection, solid waste transfer) shall not violate any post closure conditions found in this letter, and must meet any other applicable requirements.
7. **RECORDATION:** The owner/operator shall ensure that the recordation requirements for land disposal sites found in Rule .0204 are met.

8. WATER QUALITY MONITORING AND REPORTING REQUIREMENTS:

- a. Groundwater quality at this facility is subject to the "Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina", 15A NCAC 2L. This includes, but is not limited to, the provisions for detection monitoring, assessment, and corrective action.
- b. The permittee shall sample the detection monitoring wells and surface water sampling locations at a minimum on a semi-annual basis.
- c. Water quality detection monitoring shall continue for a minimum of five years from the date of the Section's receipt of Alamance County's notification that the facility will be maintained in compliance with the post-closure conditions specified in this letter. After five years the Section will determine if further monitoring is to be required.
- d. Sampling equipment and methods shall conform to specifications in Attachment 1, "North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities". The sampling parameters and methods shall be those found in Attachment 2, "Sampling and Analysis Requirements".
- e. The permittee shall maintain a record of all monitoring events and analytical data. Reports of the sampling events and analytical data shall be submitted to the Section in a timely manner.
- f. Past groundwater quality data for this facility indicates that Groundwater Quality Standards have been exceeded for some chemical constituents. Additional water quality assessment will be necessary.

**Page Four
Alamance County
Closure Letter**

If there are questions regarding this closure letter, please call the Solid Waste Section at (919) 733-0692.

Sincerely,

**James C. Coffey
Permitting Branch
Solid Waste Section**

**cc: Julian Foscue
Jan McHargue
Bobby Lutfy
Hugh Jernigan
Mr. John Bove, Hazen and Sawyer**

F A C S I M I L E

To: BOBBY LUTZ Date: 4-7-95
Company: HC DEAN Fax #: 919-733-4810

From: ERIC LINTZ Ext #: _____

Location: GREENSBORO Sending From Fax #: (910) 299-0655

Project #: _____

Subject: ACAM. Co. Austin QTS.

Comments: ORIGINAL FEDEX TODAY
W/ ALL TRANSCRIPTS.
THANKS,
ERIC LINTZ

F
A
X

If you do not receive 10 pages (including cover page),
please call us as soon as possible @ (910) 299-9998.

311-J South Westgate Drive, Greensboro, North Carolina 27407

April 07, 1995

Mr. Bobby Lutfy, Hydrogeologist
Solid Waste Section
North Carolina Dept. of Environment,
Health, & Natural Resources
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

**Subject: Alamance County
Austin Quarters Landfill
Monitoring Well, Surface Water, and Underdrain Sampling
Analytical Report**

Telephone

910.299.9998

Emergency

910.288.5979

Facsimile

910.299.0655

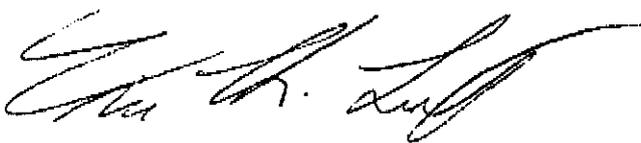
Dear Mr. Lutfy:

Earth Tech Remediation Services (formerly Environmental Technology of North America, Inc. (ETI)) has completed Series 2 water sampling at the above referenced site. Attached is the laboratory summary report and associated transcripts for the Appendix I metals and organics as required. A quality assurance check of the data indicates that all practical quantitation limits (PQLs) are at or better than those specified in Solid Waste Section guidelines.

Please call 910-299-9998 if you have any questions.

Very truly yours,

EARTH TECH



Eric K. Lintz, PG
Project Manager

EKL/ekl

attachments

cc: Alvin Cagle (Landfill Manager, Alamance County)



REMEDIATION SERVICES

CLIENT: EARTH TECH REMEDIATION SERVICE
 WORK ID: ALAM CO - AUSTIN QTS.
 PROJECT NO: 1452
 DATE SAMPLED: 03/16/95 - 03/17/95

SAMPLE DESCRIPTION: SW - 5 S - 1 S - 1 MW - 7 MW - 5 SW - 2
 WORK ORDER NO: B503428-01 B503428-02 B503428-03 B503428-04 B503428-05 B503428-06

Parameter:	CAS Number:	EPA Method:	Units:	Det. Limit:	Date Analyzed:	Analysts' Initials:	Results:	SW - 5 B503428-01	S - 1 B503428-02	S - 1 B503428-03	MW - 7 B503428-04	MW - 5 B503428-05	SW - 2 B503428-06
Appendix I: Metals:													
Antimony	Total	7041	mg/L	0.005	4/3/95	SW	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	Total	7061	mg/L	0.005	3/31/95	SW	BDL	BDL	BDL	BDL	BDL	0.013	BDL
Barium	Total	6010	mg/L	0.03	3/22/95	MM	0.032	1.17	BDL	0.11	0.389	BDL	BDL
Beryllium	Total	7091	mg/L	0.0001	4/4/95	SW	0.0001	0.0101	0.0001	0.0015	0.0088	BDL	BDL
Cadmium	Total	7131	mg/L	0.0001	4/3/95	SW	BDL	0.0034	BDL	0.0003	0.002	BDL	BDL
Chromium	Total	7191	mg/L	0.005	3/31/95	SW	BDL	0.046	BDL	0.007	0.02	BDL	BDL
Cobalt	Total	7201	mg/L	0.001	4/3/95	SW	BDL	0.087	BDL	0.006	0.019	0.004	BDL
Copper	Total	6010	mg/L	0.01	3/29/95	KS	BDL	0.63	BDL	0.026	0.931	0.015	BDL
Lead	Total	7421	mg/L	0.003	4/1/95	SW	BDL	0.049	BDL	0.005	0.108	BDL	BDL
Nickel	Total	6010	mg/L	0.03	3/29/95	KS	BDL	0.043	BDL	BDL	BDL	BDL	BDL
Selenium	Total	7741	mg/L	0.005	4/1/95	SW	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Silver	Total	7761	mg/L	0.00007	3/31/95	SW	0.00012	0.00007	BDL	BDL	0.00017	0.00014	BDL
Thallium	Total	7841	mg/L	0.002	4/3/95	SW	BDL	0.003	BDL	BDL	BDL	BDL	BDL
Titanium	Total	7911	mg/L	0.005	3/31/95	SW	BDL	0.21	BDL	0.035	0.116	BDL	BDL
Zinc	Total	6010	mg/L	0.03	3/29/95	KS	BDL	1.15	BDL	0.069	0.385	BDL	BDL
Appendix I: Volat+ Alkiles:													
Acetone	67-64-1	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	12.2	BDL
Acrylonitrile	107-13-1	8260	µg/L	100	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	71-43-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromochloromethane	74-97-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane	75-27-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromoform	75-25-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon disulfide	75-15-0	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	56-23-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	108-90-7	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroethane	75-00-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	67-66-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibromochloromethane	124-48-1	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropane	96-12-8	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	103-96-4	8260	µg/L	1	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	95-50-1	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL

CLIENT: EARTH TECH REMEDIATION SERVICE
 WORK ID: ALAM CO - AUSTIN QTS.
 PROJECT NO: 1452
 DATE SAMPLED: 03/16/95 - 03/17/95

SAMPLE DESCRIPTION: SW - 5 S - 11 S - 1 MW - 7 MW - 5 SW - 2
 WORK ORDER NO: B503428-01 B503428-02 B503428-03 B503428-04 B503428-05 B503428-06

Parameter:	CAS Number:	EPA Method:	Units:	Det. Limit:	Date Analyzed:	Analysts' Initials:	Results:	SW - 5	S - 11	S - 1	MW - 7	MW - 5	SW - 2
								B503428-01	B503428-02	B503428-03	B503428-04	B503428-05	B503428-06
m-Dichlorobenzene	106-46-7	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,4-Dichloro-2-butene	110-57-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
,1-Dichloroethane	75-34-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
,2-Dichloroethane	107-06-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
,1-Dichloroethene	75-35-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
is-1,2-Dichloroethene	156-59-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	156-60-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
,2-Dichloropropane	78-87-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
is-1,3-Dichloropropene	10061-01-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	10061-02-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	100-41-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Hexanone	591-78-6	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl bromide	74-83-9	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl chloride	74-87-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene bromide	74-95-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene chloride	75-09-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butanone (MEK)	78-93-3	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Octamethane	74-88-4	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Methyl-2-Pentanone (MIBK)	108-10-1	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Styrene	100-42-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	630-20-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	79-34-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	127-18-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	108-88-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
,1,1-Trichloroethane	71-55-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2 Trichloroethane	79-00-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethene	79-01-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorofluoromethane	75-69-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	96-18-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl acetate	108-05-4	8260	µg/L	50	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl Chloride	75-01-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
m-Xylene	95-47-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
o & p-Xylene	108-38-3	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL

CLIENT: EARTH TECH REMEDIATION SERVICE
 WORK ID: ALAM CO - AUSTIN QTS.
 PROJECT NO: 1452
 DATE SAMPLED: 03/16/95 -03/17/95

SAMPLE DESCRIPTION:

WORK ORDER NO:

MW - 2 MW - 2A SW - 3 MANWAY MW - 3 SW - 4
 B503428-07 B503428-08 B503428-09 B503428-10 B503428-11 B503428-12

Parameter:	CAS Number:	EPA Method:	Units:	Det. Limit:	Date Analyzed:	Analysts' Initials:	Results:					
Appendix I: Metals:												
Antimony	Total	7041	mg/L	0.005	4/3/95	SW	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	Total	7061	mg/L	0.005	3/31/95	SW	0.008	0.009	BDL	BDL	BDL	BDL
Barium	Total	6010	mg/L	0.03	3/22/95	MM	1.63	1.79	0.031	BDL	0.05	0.041
Beryllium	Total	7091	mg/L	0.0001	4/4/95	SW	0.0106	0.0108	0.0002	BDL	0.0004	0.0001
Cadmium	Total	7131	mg/L	0.0001	4/3/95	SW	0.0015	0.0013	0.0009	0.0001	0.001	0.0002
Chromium	Total	7191	mg/L	0.005	3/31/95	SW	0.034	0.093	BDL	0.008	BDL	BDL
Cobalt	Total	7201	mg/L	0.001	4/3/95	SW	0.144	0.147	0.002	0.001	0.004	0.002
Copper	Total	6010	mg/L	0.01	3/29/95	KS	0.336	0.472	BDL	BDL	BDL	BDL
Lead	Total	7421	mg/L	0.003	4/1/95	SW	0.045	0.059	BDL	BDL	BDL	0.003
Nickel	Total	6010	mg/L	0.03	3/29/95	KS	0.056	0.056	BDL	BDL	BDL	BDL
Selenium	Total	7741	mg/L	0.005	4/1/95	SW	BDL	BDL	BDL	BDL	BDL	BDL
Silver	Total	7761	mg/L	0.00007	3/31/95	SW	0.00017	0.00026	0.00019	0.00007	0.00012	0.00014
Thallium	Total	7841	mg/L	0.002	4/3/95	SW	BDL	BDL	BDL	BDL	BDL	BDL
Vanadium	Total	7911	mg/L	0.005	3/31/95	SW	0.397	0.405	0.013	0.045	0.007	BDL
Zinc	Total	6010	mg/L	0.03	3/29/95	KS	0.686	0.609	BDL	BDL	BDL	BDL
Appendix I: Volatiles												
Acetone	67-64-1	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Acrylonitrile	107-13-1	8260	µg/L	100	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	71-43-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Bromochloromethane	74-97-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane	75-27-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Bromoform	75-25-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Carbon disulfide	75-15-0	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	56-23-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	108-90-7	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Chloroethane	75-00-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	67-66-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
Dibromochloromethane	124-48-1	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropane	96-12-8	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	103-96-4	8260	µg/L	1	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL
o-Dichlorobenzene	95-50-1	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL

CLIENT: EARTH TECH REMEDIATION SERVICE
 WORK ID: ALAM CO - AUSTIN QTS.
 PROJECT NO: 1452
 DATE SAMPLED: 03/16/95 -03/17/95

SAMPLE DESCRIPTION:
 WORK ORDER NO:

MW - 2 MW - 2A SW - 3 MANWAY MW - 3 SW - 4
 B503428-07 B503428-08 B503428-09 B503428-10 B503428-11 B503428-12

Parameter:	CAS Number:	EPA Method:	Units:	Det. Limit:	Date Analyzed:	Analysts' Initials:	Results:						
p-Dichlorobenzene	106-46-7	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,4-Dichloro-2-butene	110-57-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	75-34-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	107-06-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethene	75-35-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethene	156-59-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	156-60-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloropropane	78-87-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	10061-01-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	10061-02-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	100-41-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Hexanone	591-78-6	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl bromide	74-83-9	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl chloride	74-87-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene bromide	74-95-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene chloride	75-09-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Butanone (MEK)	78-93-3	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Iodomethane	74-88-4	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4-Methyl-2-Pentanone (MIBK)	108-10-1	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Styrene	100-42-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	630-20-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	79-34-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	127-18-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	108-88-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	71-55-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2 Trichloroethane	79-00-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethene	79-01-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorofluoromethane	75-69-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	96-18-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl acetate	108-05-4	8260	µg/L	50	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl Chloride	75-01-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O - Xylene	95-47-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
M & P - Xylene	108-38-3	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL

CLIENT: EARTH TECH REMEDIATION SERVICE
 WORK ID: ALAM CO - AUSTIN QTS.
 PROJECT NO: 1452
 DATE SAMPLED: 03/16/95 - 03/17/95

SAMPLE DESCRIPTION: MW - 4A SW - 6 S - 10 MW - 1 MW - 6 TRIP
 WORK ORDER NO: B503428-13 B503428-14 B503428-15 B503428-16 B503428-17 B503428-18 BLANK

Parameter:	CAS Number:	EPA Method:	Units:	Det. Limit:	Date Analyzed:	Analysts' Initials:	Results						
Appendix I: Metals:													
Antimony	Total	7041	mg/L	0.005	4/3/95	SW	BDL	BDL	BDL	BDL	BDL	BDL	NA
Arsenic	Total	7061	mg/L	0.005	3/31/95	SW	0.054	BDL	BDL	0.012	0.01	0.01	NA
Barium	Total	6010	mg/L	0.03	3/22/95	MM	16.6	0.056	0.154	0.581	0.513	0.513	NA
Beryllium	Total	7091	mg/L	0.0001	4/4/95	SW	0.028	0.0003	0.0008	0.0033	0.0044	0.0044	NA
Cadmium	Total	7131	mg/L	0.0001	4/3/95	SW	0.006	0.0002	0.0005	0.0008	0.0035	0.0035	NA
Chromium	Total	7191	mg/L	0.005	3/31/95	SW	0.58	BDL	BDL	0.056	0.025	0.025	NA
Cobalt	Total	7201	mg/L	0.001	4/3/95	SW	0.774	0.011	0.008	0.041	0.058	0.058	NA
Copper	Total	6010	mg/L	0.01	3/29/95	KS	7.36	BDL	BDL	0.224	0.431	0.431	NA
Lead	Total	7421	mg/L	0.003	4/1/95	SW	0.427	BDL	0.007	0.022	0.04	0.04	NA
Nickel	Total	6010	mg/L	0.03	3/29/95	KS	3.31	BDL	BDL	BDL	BDL	BDL	NA
Selenium	Total	7741	mg/L	0.005	4/1/95	SW	0.015	BDL	BDL	BDL	BDL	BDL	NA
Silver	Total	7761	mg/L	0.00007	3/31/95	SW	0.00016	0.00011	0.00009	0.00009	0.00008	0.00008	NA
Thallium	Total	7841	mg/L	0.002	4/3/95	SW	0.01	BDL	BDL	BDL	BDL	BDL	NA
Vanadium	Total	7911	mg/L	0.005	3/31/95	SW	0.467	0.015	0.022	0.214	0.152	0.152	NA
Zinc	Total	6010	mg/L	0.03	3/29/95	KS	3.16	BDL	0.076	0.211	0.362	0.362	NA
Appendix I: Volatiles:													
Acetone	67-64-1	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	51.7
Acrylonitrile	107-13-1	8260	µg/L	100	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	71-43-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromochloromethane	74-97-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane	75-27-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromoform	75-25-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon disulfide	75-15-0	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	56-23-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	108-90-7	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroethane	75-00-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	67-66-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibromochloromethane	124-48-1	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromo-3-chloropropane	96-12-8	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromoethane (EDB)	103-96-4	8260	µg/L	1	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
o-Dichlorobenzene	95-50-1	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL

04-07-1995 12:50PM FROM P.117

CLIENT: EARTH TECH REMEDIATION SERVICE
 WORK ID: ALAM CO - AUSTIN QTS.
 PROJECT NO: 1452
 DATE SAMPLED: 03/16/95 - 03/17/95

SAMPLE DESCRIPTION: MW - 4A SW - 6 S - 10 MW - 1 MW - 6 TRIP
 WORK ORDER NO: B503428-13 B503428-14 B503428-15 B503428-16 B503428-17 B503428-18 BLANK

Parameter:	CAS Number:	EPA Method:	Units:	Det. Limit:	Date Analyzed:	Analysts' Initials:	Results						
Dichlorobenzene	106-46-7	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,4-Dichloro-2-butene	110-57-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	75-34-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	107-06-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethene	75-35-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethane	156-59-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,2-Dichloroethene	156-60-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloropropane	78-87-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,3-Dichloropropene	10061-01-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,3-Dichloropropene	10061-02-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Styrene	100-41-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Hexanone	591-78-6	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl bromide	74-83-9	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl chloride	74-87-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylene bromide	74-95-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylene chloride	75-09-2	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Butanone (MEK)	78-93-3	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	74-88-4	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl-2-Pentanone (MIBK)	108-10-1	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	100-42-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	630-20-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	79-34-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethylene	127-18-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	108-88-3	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	71-55-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	79-00-5	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	79-01-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	75-69-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	96-18-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl acetate	108-05-4	8260	µg/L	50	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl Chloride	75-01-4	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
m-Xylene	95-47-6	8260	µg/L	5	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL
o & p-Xylene	108-38-3	8260	µg/L	10	3/27/95	JS	BDL	BDL	BDL	BDL	BDL	BDL	BDL

04-07-1995 12:50PM FROM P.03 10197334810 P.03

Alamance County, North Carolina
Austin Quarters Landfill

Collected By: Earth Tech Remediation Services
Last Revised: 04/07/95

FIELD PARAMETERS

LOCATION	TEMP (DEG. F)	pH	Conductivity (U/CM)	REMARKS
MW-1	65.5	8.00	99.0	
MW-2	64.2	7.81	71.8	
MW-2A	67.8	7.80	100.0	
MW-3	63.5	7.99	89.5	
MW-4A	74.0	8.00	89.5	
MW-5	69.6	7.20	65.0	
MW-6	64.3	7.37	89.0	
MW-7	67.1	7.80	59.0	
S-10	68.0	7.80	32.0	
S-11	67.4	8.50	62.0	
SW-1	66.0	9.50	29.0	
SW-2	60.6	7.10	58.0	
SW-3	67.4	7.95	78.0	
SW-4	70.8	8.70	114.0	
SW-5	72.4	8.00	50.0	
SW-6	71.4	8.70	40.0	
Underdrain	64.0	7.25	52.0	

Alamance County, North Carolina
Austin Quarters Landfill

Collected By: Earth Tech Remediation Services
Last Revised: 04/07/95

WELL NO.	DATE	WELL HEAD ELEVATION	DEPTH TO WATER	GROUND WATER ELEVATION	REMARKS
MW-1	03/17/95		11.03		
MW-2	03/17/95		15.29		
MW-2A	03/17/95		17.28		
MW-3	03/17/95		20.72		
MW-4A	03/17/95		17.16		
MW-5	03/16/95		18.44		
MW-6	03/17/95		20.80		
MW-7	03/16/95		28.21		
S-10	03/17/95		40.90		
S-11	03/16/95		24.91		
Underdrain	03/17/95		15.39		

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



January 11, 1995

Mr. Eric Lintz
Environmental Technology of North America, Inc.
311-J South Westgate Drive
Greensboro, N.C. 27407

RE: Appendix I List - Inorganic (Metals) Methodologies

Dear Mr. Lintz,

Thank you for your letter of January 10 regarding sampling analytical methodologies for Appendix I metals. Based on the current Solid Waste Management rules and policies, the methods proposed in your letter are approved methods.

If you have any further questions regarding water quality monitoring at solid waste management facilities, please contact the Solid Waste Section at (919) 733-0692.

Sincerely,

Bobby Lutfy

Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Alvin Cagle, Alamance County

Attachment



**Environmental Technology
of North America, Inc.**

A HazWaste Company

January 10, 1995

Mr. Bobby Lutfy, Hydrogeologist
Solid Waste Section
North Carolina Dept. of Environment,
Health, & Natural Resources
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

RE: Alamance County
Austin Quarters Landfill / Old Swepsonville Landfill
Monitoring Well and Surface Water Sampling
Appendix I List - Inorganic (metals) Methodologies

Dear Mr. Lutfy:

Due to recent interpretations of the Solid Waste Section's June 24, 1994 memorandum, Environmental Technology of North America, Inc. (ETI) respectfully requests clarification on the inorganic (metals) methodologies. Page 2 of the memorandum illustrates the PQL's for metals and refers to "an appropriately certified method for sample analysis." Subsequent conversations with the Solid Waste Section by our contracted laboratory have concluded that the following are the desired methodologies:

Metal	Method	Metal	Method
Antimony	7041	Lead	7421
Arsenic	7061	Nickel	6010
Barium	6010	Selenium	7741
Beryllium	7091	Silver	7761
Cadmium	7131	Thallium	7841
Chromium	7191	Vanadium	7911
Cobalt	7201	Zinc	6010
Copper	6010		

311-J SOUTH WESTGATE DRIVE • GREENSBORO, NORTH CAROLINA 27407
TELEPHONE 910-299-9998 • EMERGENCY 800-228-SPIL
FAX 910-299-0655

ATLANTA • BOWLING GREEN • CHARLESTON • GREENSBORO • RICHMOND • ROANOKE • WOODBRIDGE



**Environmental Technology
of North America, Inc.**

A HazWaste Company

January 10, 1995

Mr. Bobby Lutfy, Hydrogeologist
Solid Waste Section
North Carolina Dept. of Environment,
Health, & Natural Resources
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

RE: Alamance County
Austin Quarters Landfill / Old Swepsonville Landfill
Monitoring Well and Surface Water Sampling
Appendix I List - Inorganic (metals) Methodologies

Dear Mr. Lutfy:

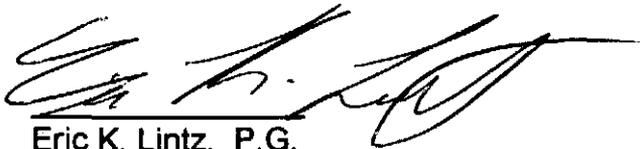
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Beryllium	7091	Silver	7761
Cadmium	7131	Thallium	7841
Chromium	7191	Vanadium	7911
Cobalt	7201	Zinc	6010
Copper	6010		

Please review and advise so that our laboratory will provide the Solid Waste Section with the appropriate desired methodologies for all subsequent sampling events.

Please call 910-299-9998 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eric K. Lintz', written over a horizontal line.

Eric K. Lintz, P.G.
Project Manager

cc: Alvin Cagle (Landfill Manager, Alamance County)

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



September 7, 1994

MEMORANDUM

TO: Owners And Operators Of Existing Lined MSWLF Facilities

FROM: Solid Waste Section

RE: Baseline Water Quality Sampling

Because of the limited time available, the Solid Waste Section has not been able to complete a technical review of the Water Quality Monitoring Plan submitted as part of the Transition Plan. Since the ground-water monitoring systems at existing lined MSWLF facilities were recently approved as part of the permitting process, the Section is assuming that no significant upgrading of the monitoring systems are necessary. Therefore, if you have not already done so, you should proceed with the initial baseline sampling event immediately, in order to meet the October 9, 1994, deadline.

None of the existing monitoring wells are to be abandoned or dropped from the detection monitoring system without written authorization from the Solid Waste Section. The water quality sampling and analysis must be done according to the directives in the June 24, 1994, memorandum from the Solid Waste Section to MSWLF owners and operators.

In addition to the water quality analytical data, the initial baseline sampling report must include the following information for each monitoring well: hydraulic conductivity, porosity, estimated effective porosity, and the direction and rate of ground-water flow. **The initial baseline sampling report must be received by the Solid Waste Section on or before October 9, 1994.** The technical review of the Transition Plan Water Quality Monitoring Plan will not be completed until after the initial baseline sampling report has been received and reviewed by the Solid Waste Section.

If you have any questions regarding the Transition Plan or the baseline water quality sampling, please contact the Solid Waste Section at (919) 733-0692.

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

June 1, 1994

Mr. Alvin Cagle
Director, Solid Waste Management
Alamance County
124 West Elm Street
Graham, North Carolina 27253

Re: Minimum Detection Limits for Cadmium and Lead in Groundwater
Monitoring Data (Alamance County Landfill, Permit # 01-01)

Dear Mr. Cagle:

Analytical data submitted to the Solid Waste Section from the April 15, 1994 sampling episode at the Alamance County Landfill (Permit # 01-01) apparently has minimum detection limits for cadmium (0.01 mg/l) and lead (0.05 mg/l) that are higher than existing NCAC 2L groundwater standards. Consequently, a complete assessment cannot be made of the water quality with respect to concentrations of each metal. Please have the laboratory that conducts the analyses on all future monitoring well samples from both Alamance County Landfills adjust the minimum detection limits for cadmium and lead to be equal to or less than current Class GA Groundwater Standards (cadmium 0.005 mg/l, and lead 0.015 mg/l).

I have enclosed a copy of Subchapter 2L, "Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina" for your information. If you have any questions or comments, please call this office at (919) 733-0692.

Sincerely,

Larry Rose
Hydrogeological Technician
Solid Waste Section

cc: Ms. Lora F. Blanchard
Customer Service Representative
Burlington Research

Enclosure

3-17-94
A.M.

Alamance Co.

- per conversation with John Bove
of Hazen + Sawyer

1-4' gray clay - wet
low bearing capacity
undercut + backfill area 150' x 65' (0.22 acres)

water seepage ("perched") from ME slope -

water in bottom of excavated area - G.W., vs small amount, localized
from rock + gravelly area (PWR)

6-8' below FML

* possible potential static pressure
from fractured bedrock similar
to conditions in underdrain area.

backfill: 2' "bridge" lift - same soil of thick lifts + bridge
compacted "embankment" above - + thin lifts of ^{dry} marginal

bridge lift installed ... became wet

wet area (bridge + residual) undercut + removed

replaced w/ 2' bridge lift ~ 2'

then compacted fill over bridge material

area stabilized (no pumping)

soil liner
material
10-6 ±

for comp. emb.

Drawing G-4

Note 8 - Undercut Area

1 to 6 ft in depth

replaced w/ "compacted embankment" -

• Pump Station down gradient
+ deeper had no G.W.

Did the "perched" w.t. area dry up after removing the wet surface materials? yes
(wet surface materials on ME slope)

Did the undercut area (gray clay) dry up after 2nd bridge lift
was placed? yes

Geotechnical Concerns - OK

Hydrogeological Concerns ±

- vertical separation from sh. w.t. is close. = Bobby Luffy

Source:
Ponded
surface water

Mid November

liner material?

Water in
the Slope

Water in
bottom of
excavation

Report No. 51

Hazen and Sawyer, P.C.
4011 WestChase Boulevard
Suite 500

John Bove
833

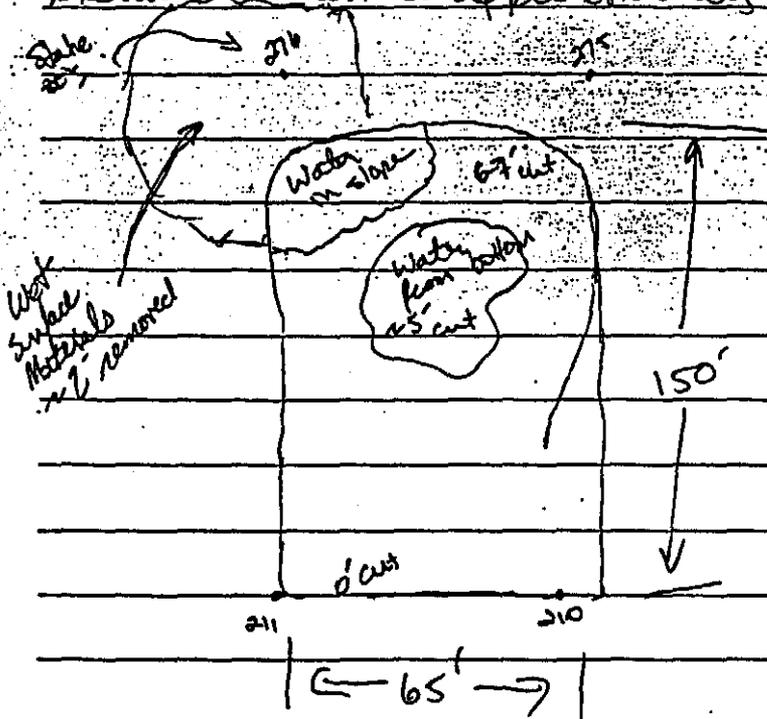
3-17-94

7152

DATE	11/11/93	PROJECT NO.	305
PROJECT	Austin Quarter Road Solid Waste Management Facility		
LOCATION	Austin, Texas		
CONTRACTOR	SUBCONTRACTORS		
WEATHER			
PRESENT AT SITE			
	[Signature]		

THE FOLLOWING WAS NOTED:

However, water appeared in the bottom of the excavation as well as in the ^{North} eastern slope of the excavation. The excavation looked approximately like shown:



The water in the bottom seemed to be coming from rock gravelly areas at the limit of excavation and is probably groundwater. However it is 6'0" below the bottom of the liner (FML). The water in the slope appears to be perched water. Discussions with John Bove we decided to backfill the entire area with a 12" bridge lift w/ compacted Embankment above that. As of quitting time

RESIDENT ENGINEER

FIELD REPORT

SIGNED

[Signature]

COPIES TO

Option 1

Note 1

The Division noted its concerns regarding the area of ^{the} Cell 1 undercut in a memo to the Alamance County Arstia quarter Solid Waste Management Facility file.

Option 2

Just forget the additional language; live with the verbal explanation; remove need to explain, justify ourselves in the future

Option 3

The Division notes that areas of the subgrade were removed and replaced in construction. In these areas, the Division notes that water was evident in the open cut during the removal and replacement process.

The Division request that the project engineer submit to the Division ^{a more detailed} ~~an~~ explanation for the removal and replacement which specifically addresses the source of water in the undercut and the predicted occurrence of future water ~~is~~ ~~is~~ encroaching the vertical buffer between waste and the seasonal high water table as defined in the site suitability letter and the approved permit to construct.

Note 1: If we do this, our concerns will become part of the public record and we may end up defending ourselves.
- The Nancy reply -

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



March 17, 1994

Mr. Robert C. Smith, County Manager
Alamance County
124 W. Elm Street
Graham, North Carolina 27253

RE: Permit To Operate for Cell 1 Austin Quarter
Solid Waste Management Facility - Permit No. 01-04

Dear Mr. Smith:

The Division of Solid Waste Management (the Division) has reviewed the submittals documenting construction of the above referenced landfill. The Division has determined that Alamance County and the project engineer have substantively met the pre-operative conditions of the Permit to Construct. In accordance with North Carolina General Statute 130A-294, Cell 1 of Alamance County's Austin Quarter Solid Waste Management Facility (the Facility) is hereby approved to receive waste.

However, the Division notes that Alamance County needs to implement several operational features contained in the approved plan which are detailed below. Alamance County must submit a schedule to the Division on or before April 9, 1994 for implementing the following portions of the operations plan:

1. **Communications Equipment.** Alamance County needs to provide a two-way radio as per Section 1.3, Appendix D (the Operations Manual), Document 3 of the approved plan for communications between the scale house and the landfill's operations area.
2. **Violent Storms.** Alamance County needs to provide a radio capable of tuning to NOAA Weather Radio per Section 3.5.5 of the Operations Manual.
3. **Video Camera.** Alamance County needs to mount a video camera at the scalehouse as part of the Hazardous and Special Wastes Management program per Appendix A of the Operations Manual.
4. **Geiger Counter.** Alamance County needs to install a Geiger Counter at the scale location to detect the radioactive wastes loads per Appendix A of the Operations Manual.

Mr. Robert Smith
March 17, 1994
Page 2

5. Organic Vapor Analyzer (OVA). Alamance County needs to obtain a handheld OVA for detecting prohibited wastes per Appendix A of the Operations Manual.

Enclosed please find a Solid Waste Permit and Conditions of the Solid Waste Permit for the above referenced landfill. The permit approves the operations as per the approved plans. Please note General Condition No. 2 in this permit which concerns recordation of the permit. Attachment 1 describes the approved documents that are hereby made a part of this permit.

This permit is for a five (5) year period from the date of issuance and approves the operation of the referenced landfill on the property defined in the approved application.

On October 9, 1993, North Carolina Solid Waste Management Rules 15A NCAC 13B Section .1600 became effective. Section .1600 establishes the complete requirements for operating all new and existing facilities.

Since Cell 1 of the Facility is defined as a new unit under Rule .1602 and did not receive waste on or before October 9, 1993, the Section .1600 Rules exempt Alamance County from the transition plan requirements of Rule .1603 (a)(4)(A). However, as an existing facility (the Division approved the Facility in the permit to construct issued 15 July 1993) with a new unit, the Facility is subject to the Permit Renewal requirements of Rules .1604 (b)(2)(P) and .1603 (a)(4)(B). Following Permit Renewal, development of subsequent five year phases (i.e., Cells 3-5) will require an Amendment to the Permit To Construct as described under Rule .1603(a)(2).

If you have any questions or require any other assistance, please feel free to contact the Regional Waste Management Specialist, Mr. Hugh Jernigan at (910) 896-7007, the Western Area Engineer, Ms. Jan McHargue at (910) 896-7007, or this office at (919) 733-0692.

Sincerely,



Ellis Cayton, PE

attachments

copy: Hugh Jernigan - DEHNR
Julian Foscue - DEHNR
Bobby Lutfy - DEHNR
Jan McHargue, PE - DEHNR
John Bove, PE - Hazen and Sawyer

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



PERMIT NO. 01-04
PART 2: PERMIT TO OPERATE
DATE ISSUED 03-17-94

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
DIVISION OF SOLID WASTE MANAGEMENT
P.O. BOX 27687 RALEIGH, NC 27611

SOLID WASTE PERMIT

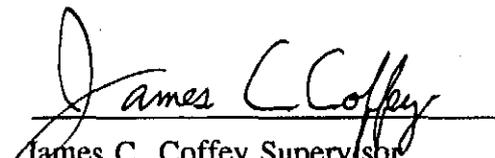
Alamance County

is hereby issued a Permit to Operate Cell 1 at the
Austin Quarter Solid Waste Management Facility

located

off Secondary Road 2148 (Austin Quarter Road)
southeast of Saxapahaw, in Alamance 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 **Part 1: Permit to
Construct # 01-04**, originally issued 07-15-93.


James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section
Division of Solid Waste Management

PERMIT NO. 01-04
DATE ISSUED 03-17-94

SOLID WASTE PERMIT

Part 2: Permit to Operate

Cell 1, a Municipal Solid Waste Landfill Unit, at the
Austin Quarter Solid Waste Management Facility

CONDITIONS OF PERMIT:

GENERAL

1. a. This permit to operate (Part 2: Permit to Operate) and conditions contained herein are in addition to the permit to construct (Part 1: Permit to Construct) issued 15 July 1993 except that several conditions initially contained in the permit to construct have been reiterated here for the purpose of emphasizing important operational considerations. The permittee is not absolved from meeting the conditions of the permit to construct if not reiterated in the permit to operate.

The approved plan is described by Attachment 1 (Revised 03-16-94), "List of Documents for Approved Plan". Where discrepancies may exist between documents of the approved plan, the most recent submittal and the Conditions of Permit shall govern. In the event of conflicts between the permit to construct and this permit to operate, the conditions of this permit to operate supersede previously issued conditions. Some components of the approved plan are reiterated in the Conditions of Permit.

- b. This permit approves municipal solid waste disposal in Cell 1. The Division previously approved construction and demolition waste disposal in the facility's Construction and Demolition Landfill in correspondence to Alamance County dated October 28, 1993.
- c. The owner/operator shall schedule Permit Renewal as set forth in 15A NCAC 13B Section .1604 (b)(2)(P) upon acceptance of this permit to operate and place the scheduled date for Permit Renewal in the facility's operating record and shall also notify the Division in writing of the scheduled date for Permit Renewal. Receipt of waste in Cell 1 shall be considered acceptance of this permit by Alamance County.
- d. This permit will be subject to review every five years as per 15A NCAC 13B .0201 (e) and .1600, according to the issuance date of the Permit to Operate.

2. Recordation Procedures.
 - a. This permit shall not be effective unless the certified copy is filed in the Register of Deeds Office, in the grantor index under the name of the owner of the land in the county or counties in which the land is located. After recordation, the certified copy shall be returned to the Solid Waste Section and shall have indicated on it the page and book number, date of recordation, and Register's seal.
 - b. When this property is sold, leased, conveyed or transferred, the deed or other instrument of transfer shall contain in the description section in no smaller type than that used in the body of the deed or instrument a statement that the property has been used as a sanitary landfill.
3. This permit is not transferable.
4. Within two (2) years from the issuance date of the Permit To Operate, the permittee shall submit a Contingency Plan for managing the volume of ground water discharged from the underdrain system described in Document 3, assuming it was contaminated by leachate. Data from the monitoring requirements specified in this permit shall be incorporated in this plan.

OPERATION

1.
 - a. Waste Disposal. Cell 1 is permitted to receive solid waste according to the approved plan, and as defined in 15A NCAC 13B, .0101(36), except as prohibited in Article 9 of Chapter 130A NCGS and rules adopted by the Commission for Health Services (e.g., 15A NCAC 13B Sections .0103, .1104, and 1626 (1)). Wastes prohibited from disposal in Cell 1 include, but are not limited to, yard waste; white goods; whole tires; hazardous wastes as defined in 15A NCAC 13A, to also include hazardous wastes from conditionally exempt small quantity generators; polychlorinated biphenyls (PCB) wastes as defined in 40 CFR 761; and liquid wastes.
 - b. Acceptance of specific wastes subject to the Division's "Procedure and Criteria for Waste Determination" shall be in accordance with 15A NCAC 13B .0103 (d).
2. The landfill unit shall conform to all operating procedures described in the approved plan, Rule .1626 of 15A NCAC 13B and as specified herein.
 - a. All pertinent landfill operating personnel, including non-county contractual personnel, shall receive training in accordance with Document 14 of the approved

plan in order to properly operate this landfill. Specifically, training must be provided in operational procedures that will prevent damage to the liner and leachate collection and removal systems.

- b. Waste placement shall follow Appendix D, Document 3 of the approved plan.
- c. Stormwater shall be segregated from leachate according to Section 2, Appendix D, Document 3 of the approved plan.
- d. Leachate management, including the monitoring, sampling, storage, transportation, treatment, and ultimate disposal will be conducted in accordance with the approved plan, the conditions specified herein, and all pertinent Federal and State rules and regulations, including, but not limited to, 15A NCAC 13B .1626 (12) and .1680.

Alamance County shall pump and haul leachate from the facility to the City of Burlington's East Side Waste Treatment Plant according to the schedule set forth in Section 5.3.1, Document 3 of the Approved Plan.

- e. The use of synthetic or other alternative daily cover which has been previously approved for use in North Carolina is approved for a 90 trial period but will require prior notification of the Division's Solid Waste Section Regional Waste Management Specialist. At the conclusion of this 90 day trial period, Alamance County shall submit a demonstration to the Division which indicates the alternative daily cover meets the requirements of 15A NCAC 13B .1626 (2)(b).
- f. Alamance County shall maintain a ten foot buffer between the interior toe of the Intermediate Berm as discussed in Section 2, Appendix D, Document 3 of the approved plan in order to facilitate Cell 2 construction.
- g. Alamance County shall maintain a waste screening program in accordance with Appendix A of Appendix D, Document 3 of the approved plan and in accordance with 15A NCAC 13B .1626.
- h. Alamance County shall conduct sedimentation and erosion control activities in accordance with the Sedimentation Control Act codified at 15 NCAC 4, 15A NCAC 13B .1626 (7), and Section 4, Appendix D, Document 3 of the approved plan.
- i. Alamance County shall monitor the height of waste in Cell 1 according to Section 3.6, Appendix D, Document 3 of the approved plan.

3.
 - a. Alamance County shall provide 15 days notice to the Division prior removing subcell divider berms or any portion thereof so that a representative of the Division shall have an opportunity to inspect isolation of the next cell from the stormwater system in accordance with Section 2.3, Appendix D, Document 3 of the approved plan.
 - b. Alamance County shall provide 60 days written notice to the Division prior to closing the temporary 30-inch stormwater pipe in Subcell 6 so that a representative of the Division shall have an opportunity to inspect plans and actual grouting of the pipe in accordance with Section 2.3, Appendix D, Document 3 of the approved plan.
4. Ground water quality at this facility is subject to the classification and remedial action provisions referenced in Rules .1630 (e) and .1634 through .1637 of 15A NCAC 13B.

MONITORING AND REPORTING REQUIREMENTS

1. Ground water monitoring wells and monitoring requirements:
 - a. Sampling equipment and procedures shall conform to specifications outlined in the "North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities" (Attachment 2), or the current guidelines established by DSWM at the time of sampling.
 - b. The permittee shall sample the monitoring wells at least semi-annually or as directed by the Division's Solid Waste Section.
 - c. A readily accessible unobstructed path shall be cleared and maintained so that four-wheel drive vehicles may access the monitoring wells at all times.
2. Surface water sampling locations SW-1, SW-2, SW-3, SW-4, SW-5, and SW-6 shall be sampled and analyzed at least semi-annually according to the protocol and parameters required by the Division at the time of sampling.
3. The permittee shall maintain a record of all monitoring events and analytical data. Reports of the analytical data for each water quality monitoring sampling event (1.g. and 2.) are to be submitted to DSWM in a timely manner.
4. The permittee shall sample the underdrain system outfall (surface water sampling location SW-7) as follows:

- a. Water quality sampling shall be performed every four months (tri-annually) when sufficient flow exists to obtain a representative sample. Flow rate and visual observations shall be recorded at the time of sampling. The samples shall be obtained and analyzed according to the prescribed protocol for ground water monitoring stations.
 - b. The flow rate shall be measured and recorded on a monthly basis and after significant rainfall events.
5. Alamance County shall monitor for explosive gases in accordance with Section 4.3, Appendix D, Document 3 of the approved plan and with 15A NCAC 13B .1626 (4).
6. The permittee shall maintain a record of the amount of solid waste received at the facility, compiled on a monthly basis. Scales shall be used to weigh the amount of waste received.
7. On or before 01 Dec 94, and each year thereafter, the permittee shall report the amount of waste received (in tons) at this facility and disposed of in the landfill to the Division's Solid Waste Section, on forms prescribed by the Section. This report shall include the following information:
 - a. The reporting period shall be for the previous year, beginning 01 July and ending on 30 June. A new reporting period for this facility begins 01 July 1994;
 - b. The amount of waste received and landfilled in tons, compiled on a monthly basis, according to Condition 6 described above; and
 - c. The report shall be signed by the Alamance County Manager.
8. All records shall be maintained on-site and made available to the Division's Solid Waste Section upon request.

ATTACHMENT 1
List of Documents for the Approved Plan

The following documents are incorporated as the approved plan for Permit No. 01-04.

1. Alamance County Site Suitability Study submitted to the Division of Solid Waste Management (DSWM) by Hazen and Sawyer, P.C. on behalf of Alamance County.
2. General Conditions and Site Specific Municipal Solid Waste Landfill (MSWLF) Design Requirements Letter issued by the DSWM, 21 May 1992, to Alamance County.
3. Alamance County, North Carolina Solid Waste Management Facility: Application For Permit To Construct, Volumes I and II, and 46 drawings submitted to DSWM by Hazen and Sawyer, P.C. on behalf of Alamance County.
4. Response Letter dated 16 April 1993 from Hazen and Sawyer, P.C., to Mr. Dexter Matthews, DSWM, Solid Waste Section Chief.
5. Memorandum of Action granting Alamance County's legal control of property described under Permit No. 01-04. The Memorandum of Action describes property containing the Austin Quarter Solid Waste Management Facility.
6. Response Letter dated 25 June 1993 from Hazen and Sawyer, P.C. to Mr. Bobby Lutfy, DSWM, Solid Waste Section Hydrogeologist. (Includes calculations for underdrain system)
7. Response Letter dated 25 June 1993 from Hazen and Sawyer, P.C. to Mr. Ellis Cayton, Environmental Engineer, DSWM, Solid Waste Section.
8. NPDES General Permit sent from N.C. DEHNR, Division of Environmental Management to Alamance County dated 28 May 1993.
9. Letter of Approval With Modifications for sedimentation and erosion control plan for Alamance County Landfill, issued from N.C. DEHNR, Division of Land Resources, Land Quality Section to Alamance County dated 2 June 1993.
10. United States Army Corps of Engineers Nationwide Permit No. 14 issued to Alamance County dated 29 March 1993.
11. United States Army Corps of Engineers Nationwide Permit No. 26 issued to Alamance County dated 29 March 1993.
12. Copy of General Water Quality Certification Nos. 2671 & 2732 issued by N.C. DEHNR, Division of Environmental Management to Alamance County dated 30 June 1993.

ATTACHMENT 1

List of Documents for the Approved Plan

13. Austin Quarter Road Solid Waste Management Facility: Cell 1 - Municipal Solid Waste Landfill Construction Record Documentation Report, February 1994, Volumes I and II and 37 drawings submitted to DSWM by Hazen and Sawyer, P.C. on behalf of Alamance County on 03-15-94. Includes engineer's certification.
14. Correspondence (facsimile) from Mr. Robert Smith, Alamance County Manager, to Mr. Ellis Cayton, Solid Waste Section dated March 14, 1994 concerning training of landfill employees.

Edgerton ENVIRONMENTAL SERVICES, INC.

FACSIMILE TRANSMITTAL SHEET

DATE: 11-29-93

12-1-93
1:00 PM

TO: Bobby Luffy

FROM: Bill Schmithorst

RE: Alamance County Landfill

PROJECT NUMBER: _____

Number of Pages (including cover page): 5

MESSAGE: _____

If any problems, please call (919)469-9795 and ask for: _____

CONFIDENTIALITY NOTE

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Edgerton ENVIRONMENTAL SERVICES, INC.

November 29, 1993

Mr. Bobby Lutfy
N.C. Department of Environment, Health,
and Natural Resources
Solid Waste Section

Re: Austin Quarter Road Solid Waste
Management Facility
Alamance County
EESI Project No. 0011-93-041

Dear Mr. Lutfy:

Edgerton Environmental Services, Inc. (EESI) installed six (6) monitor wells at the above referenced location (Figure 1) on November 26, 1993, in general accordance with the approved monitoring plan approved by the DEHNR. Site conditions were different than originally anticipated requiring a slight modification to the original monitoring plan. EESI encountered bedrock at much shallower depths requiring the monitor wells to be installed with an air rotary drill rig. EESI is requesting your approval of the modified monitoring plan based on the site hydrogeologic conditions as described below.

*Projected
A.R.?*

As shown in the attached table, bedrock was encountered at shallow depths. Therefore, five (5) of the wells had to be advanced using an air rotary drill rig. Monitor well S10 was the only well that could be installed using hollow stem augers. The boreholes advanced using the air rotary rig were advanced in 10 ft. increments to determine the presence of water bearing zones. After waiting for a period of time, additional 10 ft. increments were then advanced until a water bearing zone was encountered. Water bearing zones were not encountered in monitor wells MW1, MW2A, MW3, and S11 until fracture zones were intersected at depths of approximately 40 feet below land surface. Previous attempts were made to advance hollow stem augers to install monitor wells MW1, MW2, MW3, and S11; however, auger refusal was encountered at the bedrock and no groundwater was detected in the boreholes. Due to the depth that a water bearing zone was encountered at MW3, a shallow nested well was not installed since groundwater was not detected at or above the bedrock surface.

how long?

*to A.R.?
how long?*

*MW-2
MW-1
MW-3
S-11
3 days*

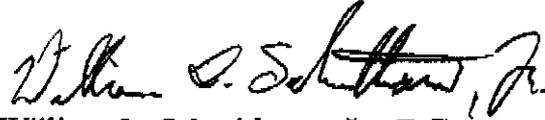
Based on the hydrogeology encountered at the site, EESI concludes that a dual aquifer system is not present at the well locations, therefore an additional nested well next to MW3 is not necessary. The potentiometric surface occurs above the fracture zone due to hydrostatic pressures forcing the water through the bedrock fractures. Since the major zones of groundwater flow occurs in fractures at approximately 40 feet below land surface, light non-aqueous phase liquids, if present, would be detected by the monitor wells installed at the site.

*- Projected
W.T.?*

In summary, due to the shallow bedrock conditions and absence of a shallow water producing zone, EESI did not install a shallow well at the MW3 location. In addition, due to the absence of a shallow water producing zone at monitor well MW1, EESI had to advance the well boring and install the well screen at a depth where water producing fractures were encountered. Your prompt approval of this modification would be greatly appreciated. Please review the attached information and contact me at 469-9795 if you have any questions or comments.

Sincerely,

EDGERTON ENVIRONMENTAL SERVICES, INC.



William L. Schmithorst, Jr., P.G.
Project Manager/Hydrogeologist

TABLE 1
MONITOR WELL CONSTRUCTION DATA*
AUSTIN QUARTER ROAD SOLID WASTE MANAGEMENT FACILITY
ALAMANCE COUNTY
EESI Project No. 0011-93-041

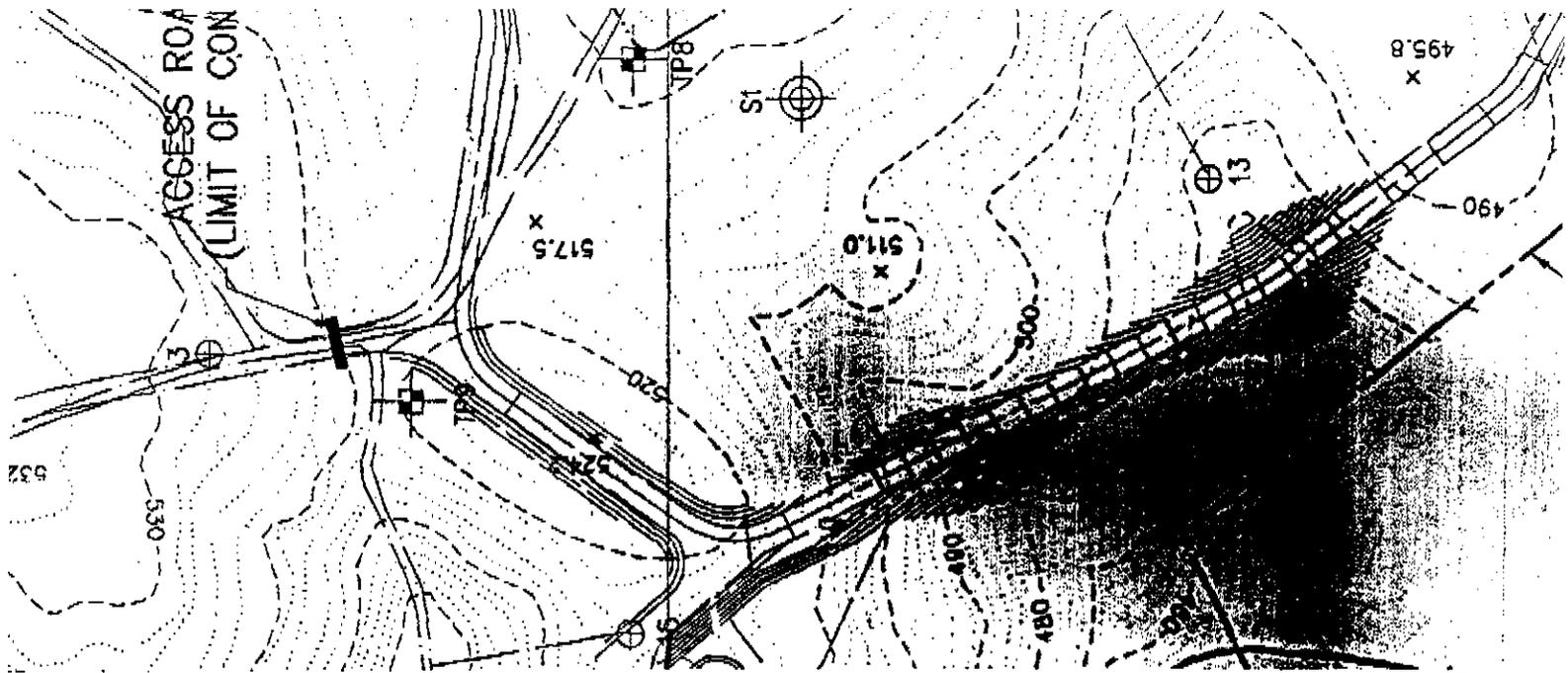
from G.S. ?

Well No.	Total Depth	Screened Interval	Sand Interval	Bentonite Interval	Grout	Static Water Level	Depth to Bedrock
MW1	42	42-27	42-25	25-23	23-0	12.7	5
MW2	25	25-10	25-8	8-6	8-0	16.5	21
MW2A	42	42-27	42-25	25-23	23-0	22.0	21
MW3	42	<u>42-30</u>	42-30	30-28	28-0	24.0	5
S10	43	43-28	43-26	26-24	24-0	<u>38.8</u> <i>4' H₂O</i>	**
S11	42	42-27	42-23	23-21	21-0	20.0	22

* All measurements in feet below land surface.
 ** Bedrock not encountered.

*Well Completion Records
 Boring Logs*

Additional W.T. measurements



TOTAL P. 05

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

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary



October 28, 1993

Mr. Robert C. Smith, County Manager
Alamance County
124 W. Elm Street
Graham, North Carolina 27253

RE: Approval To Operate Construction Demolition Landfill
Austin Quarter Solid Waste Management Facility
Permit No. 01-04

Dear Mr. Smith:

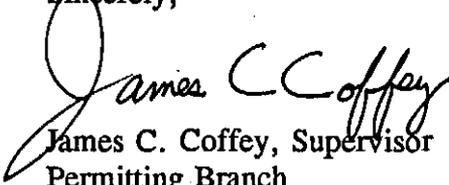
The Solid Waste Section recently reviewed Alamance County's request, submitted by Hazen and Sawyer on behalf of the county, to begin operation of the Austin Quarter Solid Waste Management Facility's Construction Demolition Landfill unit. The Solid Waste Section concluded that the county has satisfied this unit's pre-operative conditions as set forth in the Section's letter to the county dated July 23, 1993.

In accordance with N.C.G.S. 130-294 and the N.C. Solid Waste Management Rules, 15A NCAC 13B, the Solid Waste Section hereby authorizes Alamance County to begin receiving construction demolition waste in the referenced construction demolition landfill unit. Alamance County shall operate this construction demolition landfill unit in accordance with 15A NCAC 13B Section 0.505. The Section will issue Alamance County a formal Permit to Operate for the referenced facility when the county meets all pre-operative conditions for the facility's Municipal Solid Waste Landfill unit (Cell 1).

Mr. Robert Smith
Page 2
October 28, 1993

Should you have questions concerning this approval, please contact me at (919) 733-0692.

Sincerely,

A handwritten signature in black ink that reads "James C. Coffey". The signature is written in a cursive style with a large, looping initial "J".

James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

cc: Mr. John Bove, P.E.
Mr. Ellis Cayton, P.E.
Mr. Julian Foscue
Mr. Hugh Jernigan
Ms. Jan McHargue
Mr. Bobby Lutfy

HAZEN AND SAWYER

Environmental Engineers & Scientists

Hazen and Sawyer, P.C.
4011 WestChase Blvd.
Raleigh, NC 27607
919 833-7152
Fax: 919 833-1828

~~September 13, 1993~~

Mr. Jim Coffee
N.C. Department of Environment, Health
and Natural Resources
512 North Salisbury Street
Raleigh, NC 27604

Re: ~~Alamance County, NC~~
~~Cell 1 Underdrain~~
H&S No. 3705

Dear Mr. Coffee:

This letter is to inform you that the Cell 1 underdrain for the Austin Quarter Road landfill will be ready for inspection as soon as ~~Monday, September 27, 1993~~. As you know, a representative from the Solid Waste Section must inspect the underdrain subgrade before construction can continue.

We will continue to update you on the schedule for underdrain construction to provide you with as much advance notice as possible. This is a critical milestone in the Cell 1 construction schedule so your cooperation in expediting the inspection is greatly appreciated.

If you have any questions or require additional information, please contact us.

Very truly yours,

HAZEN AND SAWYER, P.C.


John A. Bove, P.E.
Senior Principal Engineer

JAB/wp

cc: Robert Smith, Alamance County
~~Bobby Lutz, DEHNR~~
Ellis Cayton, DEHNR
Jan McHargue, DEHNR Western Region
John Barnard, H&S

Alamance County

OFFICE OF THE COUNTY ATTORNEY

124 West Elm Street
Graham, North Carolina 27253
Tel. (919) 228-1312
FAX (919) 570-6788

S. C. KITCHEN
County Attorney
Clerk To The Board

ELIZABETH A. HANSEN
Human Resources Attorney

FAX TRANSMITTAL LETTER

Pages: 5
(Including Cover)

TO: Jim Coffey

FROM: Chuck Kitchen

MEMO: Please call after you
have reviewed. Thanks.

CONFIDENTIALITY NOTE

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A PROPOSAL FOR THE USE OF THE AUSTIN QUARTER LANDFILL BUFFER ZONE

HAW RIVER ASSEMBLY

October, 1993

INTRODUCTION

Part of the Haw River Assembly's mission is to produce and conduct educational programs for the public in conservation, water quality, river ecosystems, and the wise use of our natural resources. We currently sponsor one major educational project, the Haw River Festival, which serves all the counties in the Haw River basin by bringing 3 000 fourth graders to the river each spring to teach them about the unique river resource we all share. We have also conducted streamwatch workshops for many interested individuals and community and civic groups in our eleven years of river advocacy.

In furtherance of our educational mission, we propose to the Alamance County Board of Commissioners that the County grant the Haw River Assembly a license to use that part of the Austin Quarter landfill buffer zone that lies adjacent to the Haw River as an "environmental park."

PROPOSED USE AND ACCESS

We envision a low-impact, minimalist use: we plan to build and maintain a loop trail along the river for hiking and nature study (see accompanying map). A deer trail currently exists, and we see no difficulties in using, and in places improving, the existing trail for this purpose. We will not build any structures or leave any equipment on the site, although eventually we will want to erect signs and markers on the trail identifying interesting natural phenomena, such as beech groves, flood plain vegetation, etc. In addition, there are two creeks that pass through the landfill and the buffer. We propose setting up streamwatch monitoring stations where these creeks intersect the trail. Because of the many ways that landfilling operations can impact streams, such stations can provide valuable long-term monitoring studies, as well as being excellent sites for streamwatch education programs.

Austin Quarter Proposal

For the park to serve the purpose we envision, physical access must be limited. We have obtained permission from an adjacent property owner, Nancy Crutchfield, to use a farm road that runs on the west side of the landfill property to the river to gain access to the buffer near the river. There will be no motor traffic to the site itself; all visitors will park their vehicles near Austin Quarter road on the Crutchfield property and walk the farm road to the trail near the river. The property owner and the Assembly do not foresee any problems in limiting physical access within reasonable expectations, but any suggestions the County has in this regard would be welcome.

ADMINISTRATION

The Haw River Assembly Board of Directors will appoint an individual, or group of individuals, to be responsible for the administration of the site. Use of the site for Assembly programs will be scheduled with the responsible individual(s). In this way, "unofficial" use of the site will be kept to a minimum, and we can avoid the adverse impacts of indiscriminate use. As much as possible, we will try to keep the number of people using the site at any one time small, although we may use the site during the Haw River Festival and take fourth graders there for streamwatch instruction and nature walks, if that proves feasible.

It goes without saying that we plan to stay near the marked trail on the map, for the most part, during our programs, and we will not interfere with the operation of the landfill while on site. We do request, however, that we receive copies of any water quality monitoring reports from the landfill monitoring wells, and that we be allowed to periodically split samples from those monitoring wells for independent analysis, per our discussion with Jim Coffey of the North Carolina Division of Solid Waste.

10/12/93



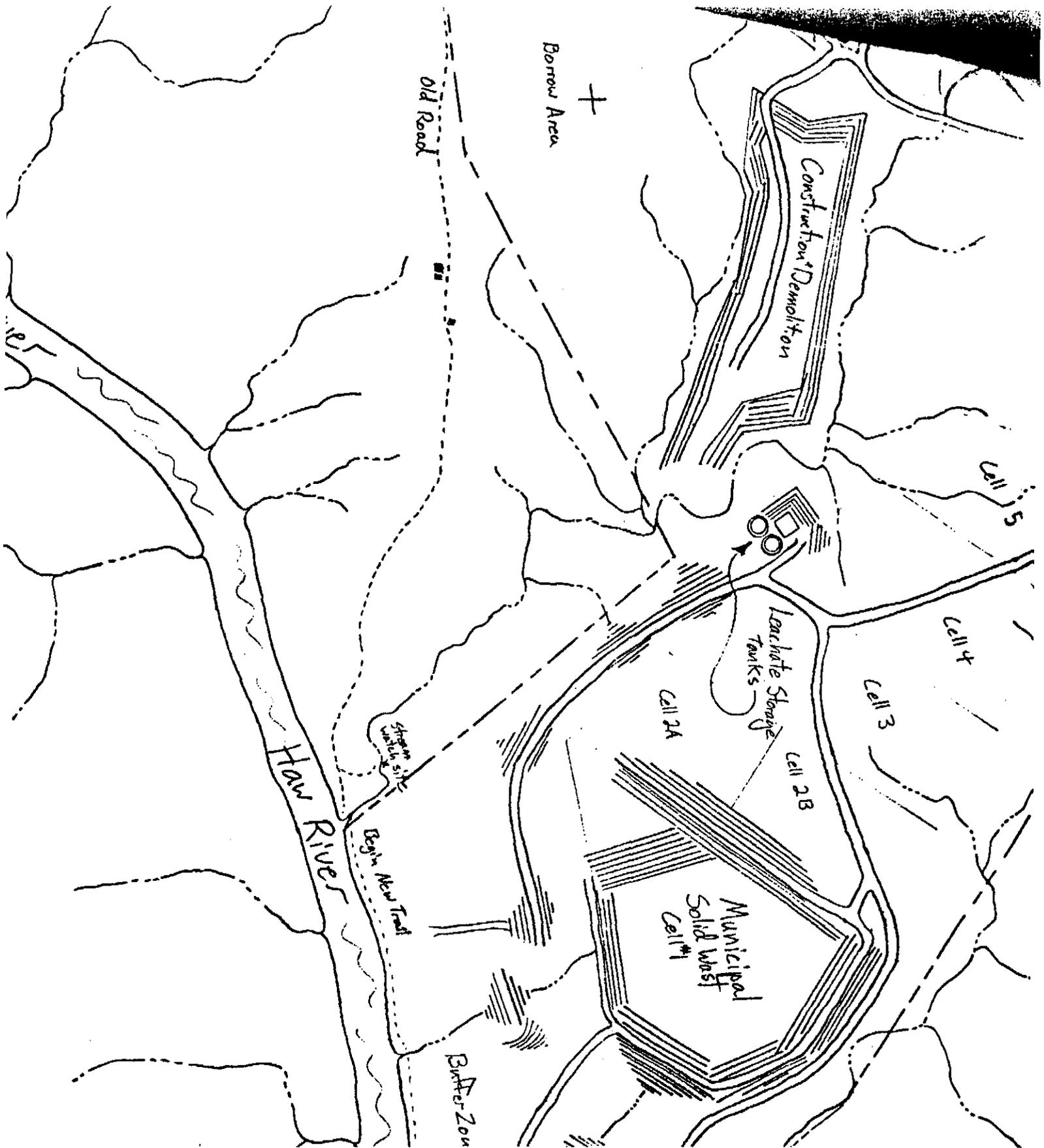
Junior Teague

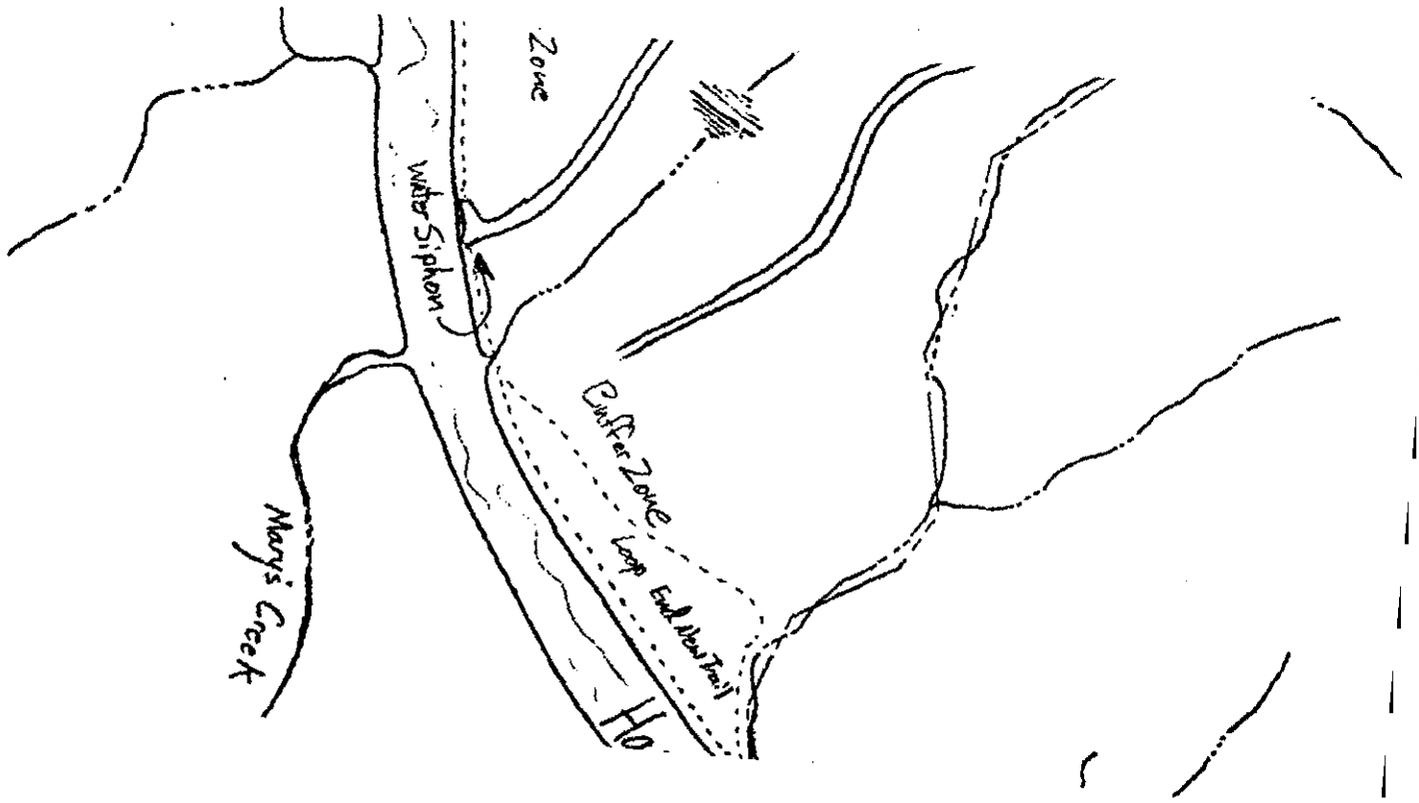
You will find enclosed a copy of the Haw River Assembly's proposal for the use of the Austin Quarter Landfill Buffer Zone written by Steve Grathwohl in collaboration with myself and Chris Carter. I hope that we can get our working agreement with Alamance County finalized soon. I look foreword to speaking with you soon.

yours

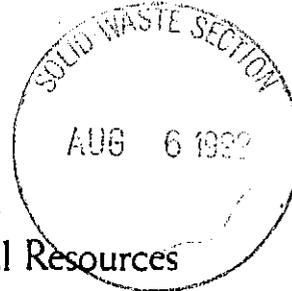
A handwritten signature in black ink, appearing to read 'Michael Chandler', written over a horizontal line.

Michael Chandler
President
for the Haw River Assembly
Home Phone 919-376-6783
Truck 919-880-5622





File



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

James C. Martin, Governor
William W. Cobey, Jr., Secretary

July 6, 1992

Richard K. Rowe
Division Director

Mr. Bobby Lutfy, Hydrologist
Solid Waste Section
P. O. Box 27687
Raleigh, NC 27611-7687

RE: Alamance County Landfill
Alamance County

Dear Mr. Lutfy:

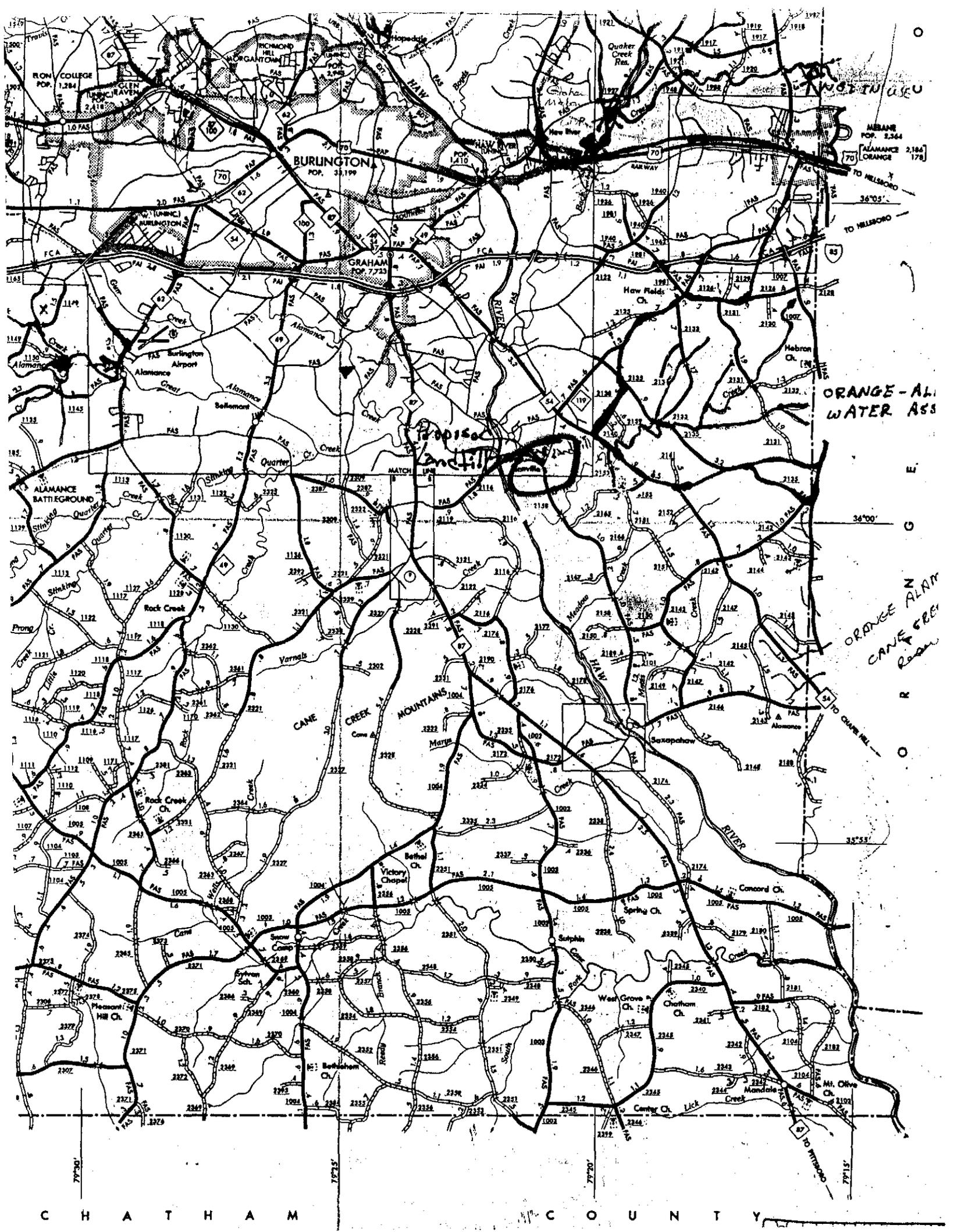
The nearest surface water intake downstream of the Alamance County landfill located on Alfred Road (near intersection of SR 2158 and SR 2164) is for the Town of Pittsboro at Bynum in Chatham County.

Sincerely,

Ernest P. Cain
DEH/Public Water Supply Section

PEC/sbf

cc: Public Water Supply Section
Alvin Cagle, Landfill Manager



NOT IN USE

MERANE POP. 2,364
ALAMANCE 2,184
ORANGE 178

ORANGE - ALI
WATER ASS

ORANGE ALAM
CANE CREEK
Reservoir

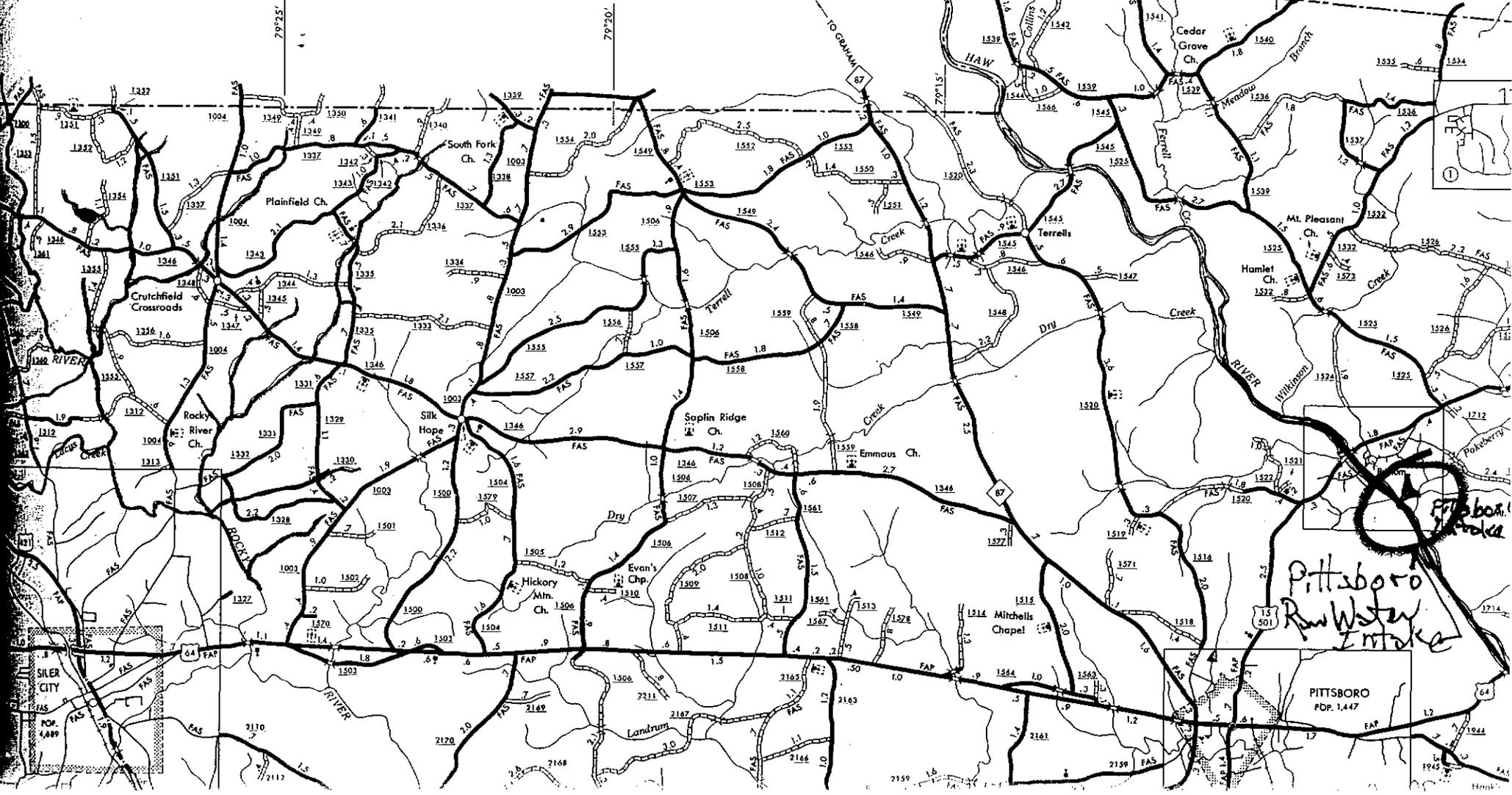
CHATHAM

COUNTY

79°25'
79°25'
79°25'

M A N C E C O U N T Y

O R A N G E C O U N T Y



Pittsboro
Raw Water
Intake

PITTSBORO
POP. 1,447





APR. 17 1991

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Environmental Health
P.O. Box 27687 • Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Richard K. Rowe
Director

April 12, 1991

MEMORANDUM

TO: Gary W. Ahlberg
Task Force Coordinator
Solid Waste Section
Division of Solid Waste Management

FROM: W. E. Venrick, Chief *W.E. Venrick*
Public Water Supply Section

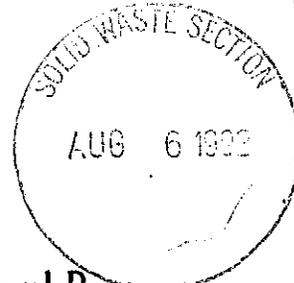
RE: Proposed Landfill
East of Saxapahaw
Alamance County

We have participated in the Inter-Agency Solid Waste Task Force site review of the referenced proposed landfill.

I have no objection to the proposed site as a location for a non-discharging landfill.

WEV:cf

cc: Mr. Richard K. Rowe
Mr. E. P. Cain



file
EPC

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

James C. Martin, Governor
William W. Cobey, Jr., Secretary

March 22, 1991

Richard K. Rowe
Division Director

MEMORANDUM

TO: W.E. Venrick, Chief
Public Water Supply Section, Raleigh

FROM: Wade B. MacDonald, *W.B.M.*
Public Water Supply Section, Winston-Salem

SUBJECT: Proposed Alamance County Landfill
East of Saxapahaw

I have discussed this proposed landfill with J.D. Monroe.

The closest existing downstream raw water intake is located just south of 15-501 Highway. This serves the Town of Pittsboro. Pittsboro will have a new raw water intake in about one year just upstream of 15-501. The proposed intake is approximately fifteen (15) miles downstream of the landfill site. The existing intake is about fifteen and one-half (15-1/2) miles downstream.

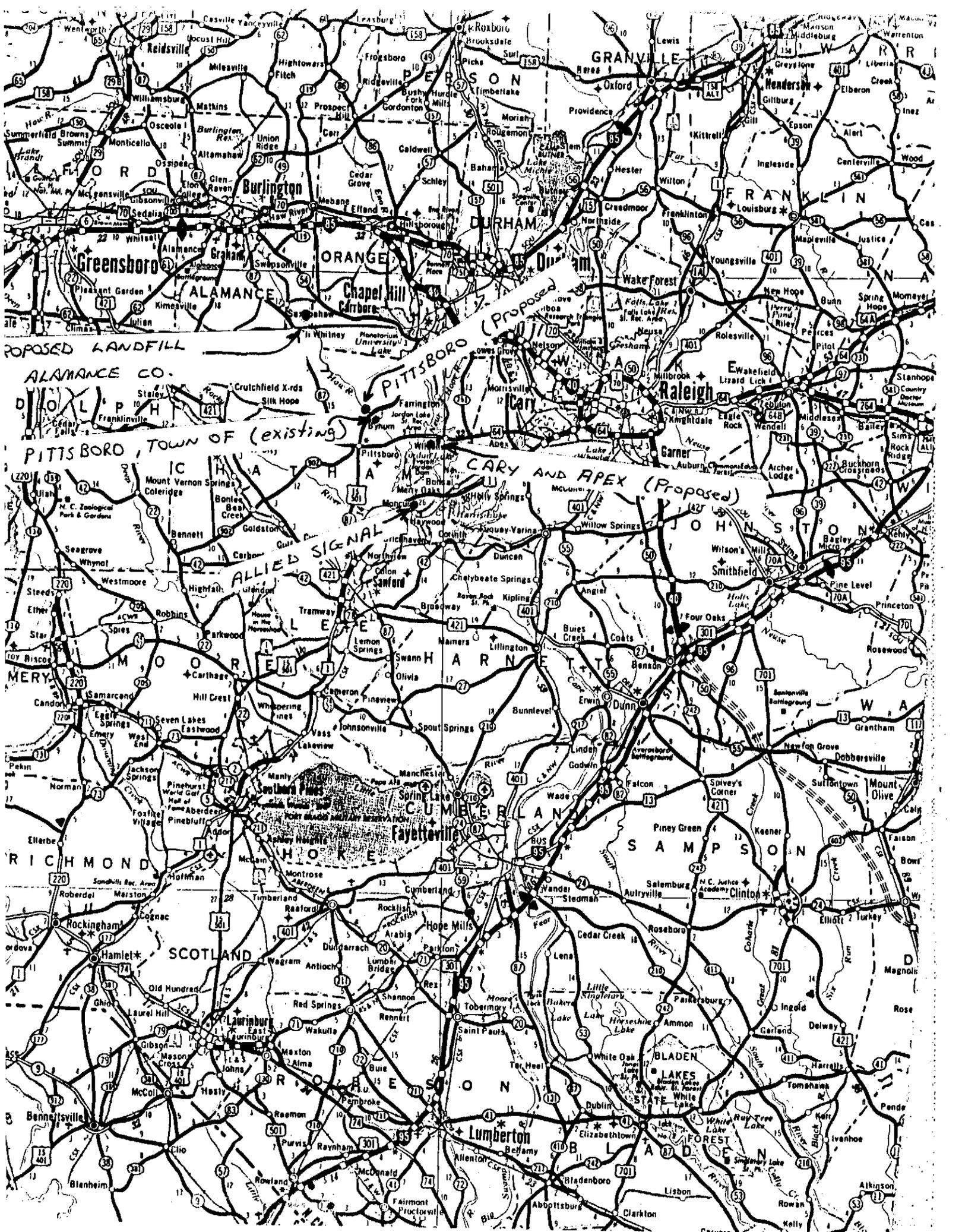
The next intake is also proposed. It will be located on the east side of Jordan Lake at NC-64 Highway on the New Hope River arm of the lake.

Approximately two (2) miles below the dam for Jordan Lake is Allied Signal's raw water intake. This is a NTNC surface system.

Enclosed is a map showing the landfill and intake locations.

WBMaCD:ka

Enclosure





State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

March 12, 1991

Mr. Robert Smith, County Manager
Alamance County
124 W. Elm Street
Graham, NC 27253

RE: Inter-Agency Solid Waste Task Force - Alamance County

Dear Mr. Smith:

The Solid Waste Section has received your request for the Task Force to visit one additional site in Alamance County. The Task Force consists of representatives from the Division of Environmental Management (Water Quality & Groundwater Sections), Public Water Supply Section, and the Solid Waste Section (lead agency). We are scheduled to meet at your office on March 21, 1991, 1:30 p.m.

The purpose of the Task Force is to provide comments on the proposed site, based on the information provided in this preliminary assessment. Each agency representative conducts the site investigation based upon their specific regulatory concerns and forwards their comments to the Solid Waste Section. Some agencies may be able to provide comments based on the Information Package alone, prepared by Hazen & Sawyer. As coordinator, I will compile these comments and the Section will issue a cover letter with the comments attached.

Should you have any questions, please contact me at (919) 733-0692.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gary W. Ahlberg".

Gary W. Ahlberg
Environmental Engineer
Solid Waste Section

cc: Jeff Rodgers
Julian Foscue
Perry Nelson - DEM
Wally Venrick - PWS
Margaret Foster - DEHNR Winston-Salem Region

W. McDonald

MAR. 14 1991



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

March 12, 1991

MEMORANDUM

TO: Inter-Agency Solid Waste Task Force

FROM: *GWA* Gary W. Ahlberg
Task Force Coordinator
Solid Waste Section

RE: Alamance County Request for Task Force - March 21, 1991

Enclosed please find the correspondence scheduling the visit to one site in Alamance County. Also enclosed for your information is a summary of the preliminary investigations performed on this site. As you may recall, the Task Force visited four sites in the County last spring. It is our understanding that preliminary subsurface investigations at these sites were unfavorable and led to the identification of this additional site.

In order to promote the effectiveness of the Task Force, the Section requests that all agency comments be submitted to my attention within 14 calendar days following the site visit. The comments should provide a preliminary assessment of the site, relative to your agency's regulatory interest. Should you have any questions regarding the Task Force or the site visit, please contact me at 733-0692.

cc: Jim Coffey

I. INTRODUCTION

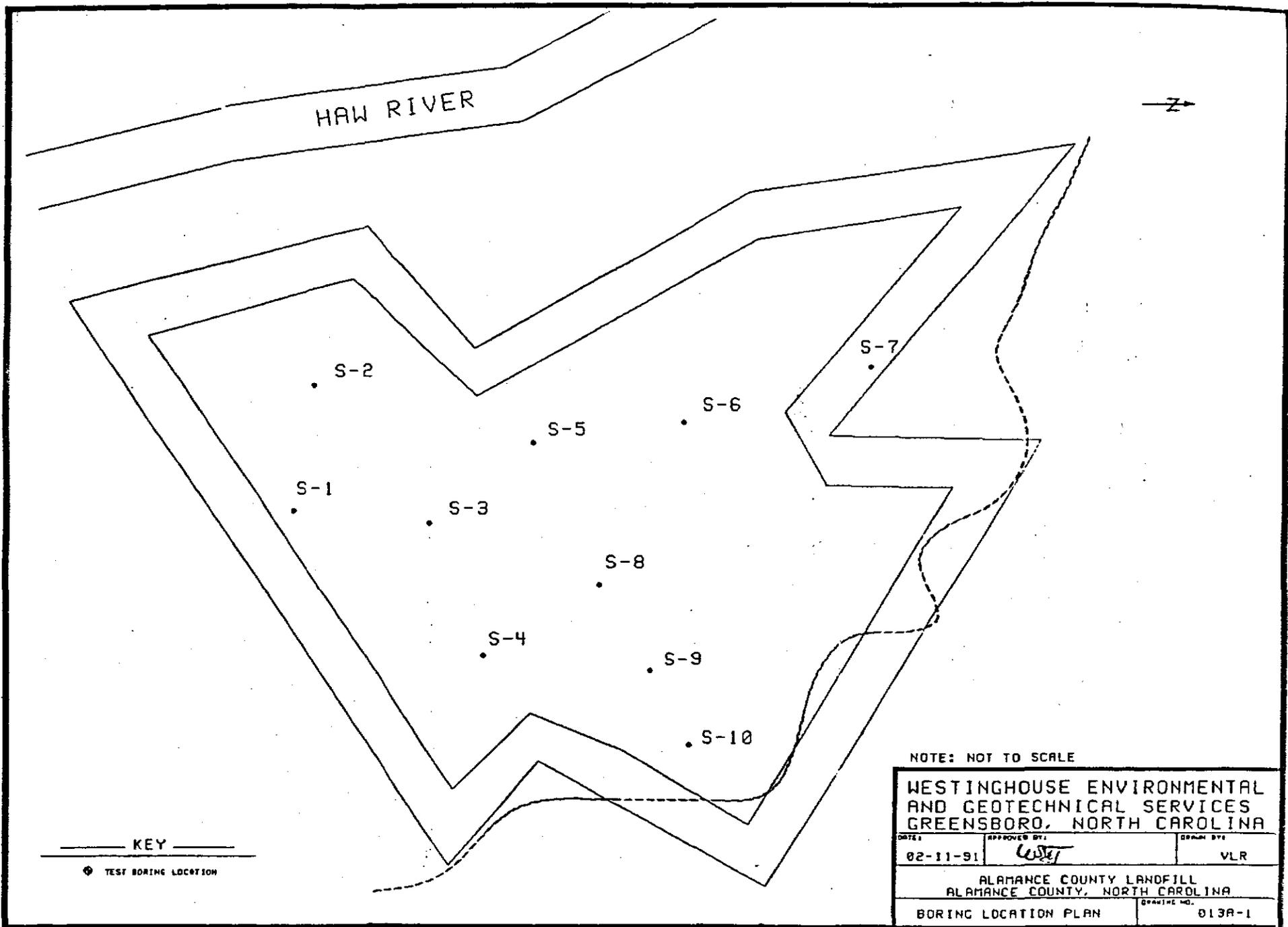
A limited test boring program was completed as part of site evaluation procedures for construction of a new Alamance County landfill. The purpose of drilling was to obtain data on 1) soil depth, 2) soil type, 3) soil characteristics, 4) rock depth, and 5) groundwater occurrence. The information was evaluated with respect to criteria for landfill site applications, consistent with current North Carolina Solid Waste Regulation 10 NCAC 10G, Section .0500, Disposal Sites.

The property contains a total of 369 acres. The site is located about two miles southeast of Saxapahaw, in terrain adjacent to the Haw River. Highway access is via Austin Quarter Road. Hilltops are overgrown with dense growths of volunteer pine covering most of the areas. However, hillsides, drains and creek valleys contain woods of mixed hardwood and pine.

The central and northern part of the area is dominated by Little Mountain at an elevation of 652 feet. Average slopes in the vicinity of the structure are 14%. The southern third of the property contains relatively flat hilltops. Slopes in this area average approximately 3%. Drainage is directed towards the Haw River. There are no named streams within the area of investigation.

II. EXPLORATION PROCEDURES

Ten soil test borings were advanced between January 29, 1991 and February 1, 1991, at the approximate locations shown on Drawing 013-1. Information was obtained on soil depth, type, and characteristics. Additionally, each hole was fitted with slotted pvc pipe to determine groundwater occurrence. Borings were located in the field by Westinghouse personnel using topographic maps and



Alamance County

124 WEST ELM STREET
GRAHAM, NORTH CAROLINA 2725.



TEL. 228-1312
AREA CODE 919

August 25, 1993

Bobby Lutfy
N.C. Dept. of Environment, Health, and National Resources
P.O. Box 27687
Raleigh, N.C. 27611-7687

Dear Mr. Lutfy,

The Alamance County Landfill located at Swepsonville, N.C. (permit number 0101) will be closing October 1, 1993. Enclosed is a copy of a memorandum mailed to landfill users on August 3, 1993 informing them of anticipated changes. As stated in the enclosed memorandum, all operations regarding receiving any waste or recyclable material will cease on October 1, 1993.

During the interim, Alamance County will provide a temporary transfer operation at Austin Quarter Road, Saxapahaw, N.C. to transfer waste to the Piedmont Landfill, Kernersville, N.C.

In addition, Alamance County will sample the monitoring wells and stream at the current Swepsonville site again in October, 1993. Please advise me as to what the sampling requirements will be once this landfill site stops receiving waste.

Should you have questions concerning this matter, I may be reached at (919) 578-4200 or (919) 578-2769.

Sincerely,

Alvin Cagle
Alvin Cagle

AC/ns

MEMORANDUM TO: All Landfill Users

DATE: August 3, 1993

FROM: Alvin Cagle, Landfill Manager AC

SUBJECT: Current Landfill closure and open for operation at Austin Quarter, Saxapahaw, N.C.

The projected closing date for the Alamance County Landfill at Swepsonville, N.C. is October 1, 1993. In order to close out the existing facility in accordance with State requirements and inform landfill users of the above closing date as well as other anticipated changes, the following information is provided:

1. Friday, October 1, 1993 will be the last date solid waste or any other material (recyclables, yard waste, tires, appliances, construction/demolition debris) will be accepted at the current Swepsonville landfill site.

The temporary transfer operation at Austin Quarter Road, Saxapahaw, N.C. will open on Monday, October 4, 1993. All operations will be closed on October 2nd and 3rd, 1993.

2. Temporary Transfer Operation - Alamance County will establish a temporary transfer operation at its new landfill site in Saxapahaw, N.C. The temporary transfer will begin October 4, 1993 and continue until the new landfill becomes operable. The waste will be weighed across the landfill scales, transported to the transfer receiving pad, dumped, and then pushed into transfer trailers to be transported out-of-county for disposal. Due to the high cost of transporting waste out of Alamance County for disposal, cooperation in the separation of as many materials as possible prior to arrival at the transfer station is necessary.
3. Affect on Tipping Fee - The current tipping fee of \$30.67 per ton for solid waste will continue to apply to Austin Quarter. Alamance County has made and will continue to make every effort to hold the line on tipping fees. Should the opening of the new landfill be delayed longer than anticipated, then a tipping fee adjustment may be necessary.
4. Asbestos - In order to close out the asbestos cell, Alamance County will discontinue accepting asbestos on September 15, 1993. Asbestos will have to go directly to an approved disposal site.

5. Tires - To allow adequate time to close out the tire monofil Alamance County will discontinue accepting tires at the Swepsonville site on September 24, 1993 and will plan to accept tires at the Austin Quarter site in Saxapahaw on October 4, 1993.
6. Other Waste - Yard waste, appliances, and construction/demolition will be accepted at the current Swepsonville site until Friday, October 1, 1993.

Monday, October 4, 1993 the above items, with the exception of asbestos, will be accepted at the Austin Quarter Site in Saxapahaw, N.C.

7. Special Waste Requiring Waste Determination - During the interim period when waste is temporarily being transferred out of county, special waste cannot be accepted at the transfer operation. This waste must go directly to an approved disposal site. Once the new landfill becomes operable, this material can be accepted on a case-by-case basis. Please contact the Alamance County Landfill concerning the acceptability of any questionable waste material.

We appreciate all the previous cooperation and hard work each one of you have done involving waste reduction and separation of materials. Future landfill trends will be to maximize separation of materials (construction/demolition debris, metal, tires and yard waste). These materials can then be recycled or diverted from the lined landfill cell into more appropriate disposal areas.

Should you need clarification on a specific waste or have any questions, I may be contacted at 919-578-2769 or 919-578-4200.

AC/ns



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) 733-0892

James B. Hunt, Jr., Governor

Jonathan B. Howes, Secretary

July 7, 1993

Mr. Robert C. Smith
County Manager, Alamance County
124 West Elm St.
Graham, N.C. 27253

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

Dear Mr. Smith,

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 Alamance 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, Alamance 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

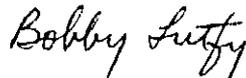
alternatives based on a full-scale ground-water investigation to determine the nature and extent of contamination at the site.

If Alamance 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 Alamance 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: Hugh Jernigan

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



Burlington
Research

Analytical Services • Aquatic Bioassay Testing • Aquatic Toxicity Reduction Evaluations
AATCC Testing Services • NPDES Testing • Reporting & Data Handling Services
PMN Aquatic Bioassay Evaluations

Post Office Box 2481 • 615 Huffman Mill Road • (919) 584-5564 • Burlington, NC 27216-2481

ANALYTICAL REPORT

CUSTOMER: ALAMANCE COUNTY LANDFILL
FACILITY: 124 West Elm Street
REPORT TO: Mr. Alvin Cagle

SAMPLE: April Well Monitoring
MW-1 Grab 4/23/93

WORK ORDER #: 93-04-447-01

COLLECTED: 04/23/93
RECEIVED: 04/23/93
REPORTED: 05/21/93

PARAMETER	METHOD	STARTED	ANALYZED	RESULT
BOD, 5-Day	EPA 405.1	04/23/93	04/29/93	3.8 mg/L
Chemical Oxygen Demand	EPA 410.4	04/27/93	04/27/93	36.0 mg/L
Chloride	EPA 325.2	04/28/93	04/28/93	12.9 mg/L
EPA 8240, Volatiles, Liquid	EPA8240/8260	04/29/93	04/29/93	Attached
Fluoride	EPA 340.2	04/30/93	04/30/93	<0.1 mg/L
Nitrate, Nitrogen	EPA 353.1	05/11/93	05/11/93	3.04 mg/L
pH (Field Determination)	SM 16 423	04/23/93	04/23/93	5.04 SU
Solids, Total Dissolved	EPA 160.1	04/26/93	04/27/93	105 mg/L
Specific Conductance	EPA 120.1	04/23/93	04/23/93	108 umhos/cm @ 25C
Sulfate	EPA 375.4	04/29/93	04/29/93	<6.0 mg/L
Total Organic Carbon, Liq.	EPA 415.1	05/05/93	05/05/93	Attached
Total Organic Halides, LIQ.	EPA 9020	04/30/93	04/30/93	Attached
Arsenic, Total by GF	EPA 206.2	05/14/93	05/18/93	<0.005 mg/L
Barium, Total	EPA 208.1	05/11/93	05/19/93	0.2 mg/L
Cadmium, Total	EPA 213.1	05/11/93	05/14/93	0.007 mg/L
Chromium, Total	EPA 218.1	05/11/93	05/14/93	<0.05 mg/L
Copper, Total	EPA 220.1	05/11/93	05/14/93	<0.01 mg/L
Iron, Total	EPA 236.1	05/11/93	05/12/93	12.4 mg/L
Lead, Total	EPA 239.1	05/11/93	05/18/93	<0.05 mg/L
Manganese, Total	EPA 243.1	05/11/93	05/17/93	0.29 mg/L
Mercury, Total	EPA 245.1	05/13/93	05/13/93	<0.0002 mg/L
Selenium, Total by GF	EPA 270.2	05/14/93	05/19/93	<0.005 mg/L
Silver, Total	EPA 272.1	05/11/93	05/12/93	<0.01 mg/L
Zinc, Total	EPA 289.1	05/11/93	05/18/93	0.102 mg/L

PAGE 2 OF 2

WORK ORDER NUMBER(S): 93-04-447-01

##	ANALYTE	MQL	CONC. (ug/L)	##
43	HEXANONE, 2- (MBK)	20.0	*	43
44	IODOMETHANE	4.0	*	44
45	ISOPROPYLBENZENE (CUMENE)	4.0	*	45
46	ISOPROPYLTOLUENE, para-	4.0	*	46
47	NAPHTHALENE	4.0	*	47
48	PENTANONE, 4-METHYL-2- (MIBK)	20.0	*	48
49	PROPANE, 1,2-DIBROMO-3-CHLORO- (DBCP)	4.0	*	49
50	PROPYLBENZENE, n-	4.0	*	50
51	STYRENE	10.0	*	51
52	TETRACHLOROETHANE, 1,1,1,2-	4.0	*	52
53	TETRACHLOROETHANE, 1,1,2,2-	4.0	*	53
54	TETRACHLOROETHENE 0.7	4.0	4.7	54
55	TOLUENE	4.0	*	55
56	TRIBROMOMETHANE (BROMOFORM)	4.0	*	56
57	TRICHLOROBENZENE, 1,2,3-	4.0	*	57
58	TRICHLOROBENZENE, 1,2,4-	4.0	*	58
59	TRICHLOROETHANE, 1,1,1-	4.0	*	59
60	TRICHLOROETHANE, 1,1,2-	4.0	*	60
61	TRICHLOROETHENE	4.0	*	61
62	TRICHLOROFLUOROMETHANE	4.0	*	62
63	TRICHLOROMETHANE (CHLOROFORM)	4.0	*	63
64	TRICHLOROPROPANE, 1,2,3-	4.0	*	64
65	TRIMETHYLBENZENE, 1,2,4-	4.0	*	65
66	TRIMETHYLBENZENE, 1,3,5-	4.0	*	66
67	VINYL ACETATE	30.0	*	67
68	VINYL CHLORIDE	4.0	*	68
69	XYLENES (TOTAL)	4.0	*	69

*BELOW QUANTITATION LIMITS EXCEPT WHERE NOTED

8240VOA.LIQ
Revised 6/91



EPA 8240/8260 VOLATILE ORGANICS ANALYSIS BY GC/MS - LIQUIDS

WORK ORDER NUMBER(S): 93-04-447-04
METHOD QUANTITATION LIMIT (MQL): See below

##	ANALYTE	MQL	CONC. (ug/L)	##
1	ACETONE	100.0	*	1
2	ACROLEIN	10.0	*	2
3	ACRYLONITRILE	10.0	*	3
4	BENZENE	4.0	8.1	4
5	BROMOBENZENE	4.0	*	5
6	BROMOCHLOROMETHANE	4.0	*	6
7	BROMODICHLOROMETHANE	4.0	*	7
8	BROMOMETHANE	4.0	*	8
9	BUTANONE, 2- (MEK)	30.0	*	9
10	BUTENE, 1,4-DICHLORO-2-	100.0	*	10
11	BUTYLBENZENE, n-	4.0	*	11
12	BUTYLBENZENE, sec-	4.0	*	12
13	BUTYLBENZENE, tert-	4.0	*	13
14	CARBON DISULFIDE	20.0	*	14
15	CARBON TETRACHLORIDE	4.0	*	15
16	CHLOROBENZENE	4.0	*	16
17	CHLOROETHANE	4.0	*	17
18	CHLOROETHYL VINYL ETHER, 2-	4.0	*	18
19	CHLOROMETHANE	4.0	4.2	19
20	CHLOROTOLUENE, 2-	4.0	*	20
21	CHLOROTOLUENE, 4-	4.0	*	21
22	DIBROMOCHLOROMETHANE	4.0	*	22
23	DIBROMOETHANE, 1,2- (EDB)	4.0	*	23
24	DIBROMOMETHANE	4.0	*	24
25	DICHLOROBENZENE, 1,2-	4.0	*	25
26	DICHLOROBENZENE, 1,3-	4.0	*	26
27	DICHLOROBENZENE, 1,4-	4.0	*	27
28	DICHLORODIFLUOROMETHANE	100.0	*	28
29	DICHLOROETHANE, 1,1- 700 (2L draft)	4.0	43.6	29
30	DICHLOROETHANE, 1,2-	4.0	*	30
31	DICHLOROETHENE, 1,1-	4.0	*	31
32	DICHLOROETHENE, cis-1,2-	4.0	253	32
33	DICHLOROETHENE, trans-1,2-	4.0	*	33
34	DICHLOROMETHANE (METHYLENE CHLORIDE)	4.0	99.6	34
35	DICHLOROPROPANE, 1,2-	4.0	*	35
36	DICHLOROPROPANE, 1,3-	4.0	*	36
37	DICHLOROPROPANE, 2,2-	4.0	*	37
38	DICHLOROPROPENE, 1,1-	4.0	*	38
39	DICHLOROPROPENE, cis-1,3-	4.0	*	39
40	DICHLOROPROPENE, trans-1,3-	4.0	*	40
41	ETHYLBENZENE	4.0	*	41
42	HEXACHLOROBUTADIENE	4.0	*	42



PAGE 2 OF 2

WORK ORDER NUMBER(S): 93-04-447-04

##	ANALYTE	MQL	CONC. (ug/L)	##
43	HEXANONE, 2- (MBK)	20.0	*	43
44	IODOMETHANE	4.0	*	44
45	ISOPROPYLBENZENE (CUMENE)	4.0	*	45
46	ISOPROPYLTOLUENE, para-	4.0	*	46
47	NAPHTHALENE	4.0	*	47
48	PENTANONE, 4-METHYL-2- (MIBK)	20.0	*	48
49	PROPANE, 1,2-DIBROMO-3-CHLORO- (DBCP)	4.0	*	49
50	PROPYLBENZENE, n-	4.0	*	50
51	STYRENE	10.0	*	51
52	TETRACHLOROETHANE, 1,1,1,2-	4.0	*	52
53	TETRACHLOROETHANE, 1,1,2,2-	4.0	*	53
54	TETRACHLOROETHENE 0.7	4.0	156	54
55	TOLUENE	4.0	*	55
56	TRIBROMOMETHANE (BROMOFORM)	4.0	*	56
57	TRICHLOROBENZENE, 1,2,3-	4.0	*	57
58	TRICHLOROBENZENE, 1,2,4-	4.0	*	58
59	TRICHLOROETHANE, 1,1,1-	4.0	*	59
60	TRICHLOROETHANE, 1,1,2-	4.0	*	60
TCE 61	TRICHLOROETHENE 2.0	4.0	48.8	61
62	TRICHLOROFLUOROMETHANE	4.0	*	62
63	TRICHLOROMETHANE (CHLOROFORM)	4.0	*	63
64	TRICHLOROPROPANE, 1,2,3-	4.0	*	64
65	TRIMETHYLBENZENE, 1,2,4-	4.0	*	65
66	TRIMETHYLBENZENE, 1,3,5-	4.0	*	66
67	VINYL ACETATE	30.0	*	67
68	VINYL CHLORIDE 0.15	4.0	13.4	68
69	XYLENES (TOTAL)	4.0	*	69

*BELOW QUANTITATION LIMITS EXCEPT WHERE NOTED

8240VOA.LIQ
Revised 6/91



ANALYTICAL REPORT

CUSTOMER: ALAMANCE COUNTY LANDFILL
FACILITY: 124 West Elm Street
REPORT TO: Mr. Alvin Cagle

SAMPLE: April Well Monitoring
 MW-7A Grab 4/23/93

WORK ORDER #: 93-04-447-10

COLLECTED: 04/23/93
RECEIVED: 04/23/93
REPORTED: 05/21/93

PARAMETER	METHOD	STARTED	ANALYZED	RESULT
BOD, 5-Day	EPA 405.1	04/23/93	04/29/93	3.9 mg/L
Chemical Oxygen Demand	EPA 410.4	04/27/93	04/27/93	<20.0 mg/L
Chloride	EPA 325.2	04/28/93	04/28/93	3.2 mg/L
EPA 8240, Volatiles, Liquid	EPA8240/8260	04/30/93	05/01/93	Attached
Fluoride	EPA 340.2	04/30/93	04/30/93	0.12 mg/L
Nitrate, Nitrogen	EPA 353.1	05/11/93	05/11/93	<0.10 mg/L
pH (Field Determination)	SM 16 423	04/23/93	04/23/93	6.21 SU
Solids, Total Dissolved	EPA 160.1	04/26/93	04/27/93	420 mg/L
Specific Conductance	EPA 120.1	04/23/93	04/23/93	151 umhos/cm @ 25C
Sulfate	EPA 375.4	04/29/93	04/29/93	<75.0 mg/L
Total Organic Carbon, Liq.	EPA 415.1	05/05/93	05/05/93	Attached
Total Organic Halides, LIQ.	EPA 9020	04/30/93	04/30/93	Attached
Arsenic, Total by GF	EPA 206.2	05/14/93	05/18/93	<0.005 mg/L
Barium, Total	EPA 208.1	05/12/93	05/19/93	<0.1 mg/L
Cadmium, Total	EPA 213.1	05/12/93	05/14/93	0.008 mg/L
Chromium, Total	EPA 218.1	05/12/93	05/14/93	<0.05 mg/L
Copper, Total	EPA 220.1	05/12/93	05/14/93	<0.01 mg/L
Iron, Total	EPA 236.1	05/12/93	05/19/93	1.4 mg/L
Lead, Total	EPA 239.1	05/12/93	05/18/93	<0.05 mg/L
Manganese, Total	EPA 243.1	05/12/93	05/17/93	0.02 mg/L
Mercury, Total	EPA 245.1	05/11/93	05/13/93	<0.0002 mg/L
Selenium, Total by GF	EPA 270.2	05/14/93	05/19/93	<0.005 mg/L
Silver, Total	EPA 272.1	05/12/93	05/19/93	<0.01 mg/L
Zinc, Total	EPA 289.1	05/12/93	05/18/93	<0.005 mg/L



ALAMANCE Co.
01-01

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

September 10, 1992

William L. Meyer
Director

Mr. Alvin Cagle
Landfill Manager
Alamance County Health Dept.
209 N. Graham Hopedale Road
Burlington, N. C. 27215

RE: Notification Of Semi-annual Sampling Dates For Landfills

Dear Mr. Cagle,

This past January a letter was mailed to all landfill owner/operators informing them that the Solid Waste Section will be requiring semi-annual ground and surface water monitoring beginning January 1, 1993. All landfill owner/operators were requested to notify the Section prior to July 1, 1992, of the months they will be performing each of their semi-annual sampling episodes for the 1993 calendar year. Please note details in the letter of January 10, 1992 that is enclosed with this letter.

As of this date the Solid Waste Section has no record of the proposed sampling dates for next year for your facility. Please notify the Solid Waste Section in writing immediately of the two months you have chosen for sampling this coming year. A response should be received in our office by October 15, 1992.

If you have any questions regarding this request or the water quality monitoring program required at sanitary landfills in North Carolina, please contact the Solid Waste Section at (919) 733-0692.

Sincerely,

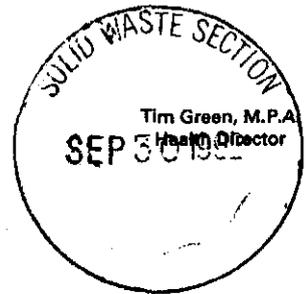
A handwritten signature in cursive script that reads "Bobby Lutfy".

Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Regional Supervisor - JULIAN FOSCHUE
Waste Management Specialist - HUGH JERNIGAN
Attachment

01-01

ALAMANCE COUNTY HEALTH DEPARTMENT
209 N. Graham-Hopedale Road
Burlington, North Carolina 27217-2971
Phone Number (919) 227-0101
Fax Number (919) 570-2725



BOARD OF HEALTH

Alexander F. Alexander, D.D.S.
Joe Barbour, R. PH., County Commissioner
Rebecca Clemmons, R.N.
Donald B. Covert, O.D.F.A.A.O.
Brad L. Evans, M.A., Vice-Chairperson
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William D. Rippy, M.D., Chairperson
Jerry W. Rudd
Darrell L. Russell, P.E.
Grady J. Wheeler, Sr., D.V.M.

September 21, 1992

Bobby Lutfy, Hydrogeologist
North Carolina Department of Environment,
Health, & Natural Resources
P.O. Box 27687
Raleigh, NC 27611-7687

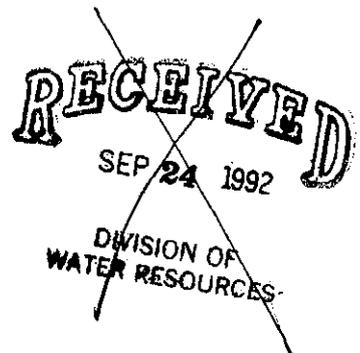
Dear Mr. Lutfy:

This is to notify you that we plan to sample the monitoring wells and stream at the Alamance County Landfill (as required in the 1993 Calendar year) for water quality in the months of April and October. Should you have any questions or comments please do not hesitate to call. I may be reached at 919-578-4200.

Sincerely,

Alvin Cagle
Alvin Cagle
Landfill Manager

AD:dm





State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

August 6, 1992

Mr. Alvin Cagle
Landfill Manager
Alamance County Health Dept.
209 N. Graham Hopedale Road
Burlington, N.C. 27215

RE: Health Risk Evaluation For The Eliud Hebblethwaite Private Well
Located Near The Alamance County Landfill (Permit # 01-01)

Dear Mr. Cagle,

This letter reports the results of the Health Risk Evaluation based on the June 17, and June 25, 1992, sampling analyses of the Eliud Hebblethwaite private drinking water well located near the Alamance County Sanitary Landfill. The evaluations were done by Dr. Ken Rudo, Toxicologist with the North Carolina Environmental Epidemiology Section. A Copy of the Drinking Water Health Risk Evaluation is attached for your review.

The report on the Hebblethwaite private well states that "based on these analytical results, this water should be considered safe for normal usage". Further comments state "levels in both samples are low and should not pose any health risks at this time". Dr. Rudo does advise that the well be resampled in 8 to 12 months.

Please inform the Alamance County Health Department and the private well owner of the results of the Drinking Water Health Risk Evaluation. If you have any questions regarding the water quality analysis of the private wells in the vicinity of the Alamance County Landfill, please contact the Solid Waste Section at (919) 733-0692.

Sincerely,

A handwritten signature in cursive script that reads "Bobby Lutfy".

Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Jan McHargue

Attachments



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

July 20, 1992

MEMORANDUM

TO: Dr. Ken Rudo, Environmental Epidemiology
FROM: Bobby Lutfy, Hydrogeologist, Solid Waste Section *BL*
RE: Request For Health Risk Evaluation For One Private Well
Located Near The Alamance County Landfill

Attached are copies of 502.2 Volatile Organic Analysis from one bored private drinking water well located in the vicinity of the Alamance County Landfill. This well was sampled twice and the results indicate trace amounts of 1,1,1-Trichloroethane and Tetrachloroethylene to be present.

I would appreciate an evaluation as soon as possible since the homeowner is concerned about the suitability of the well as a source of drinking water. I will forward copies of your evaluation to the appropriate parties as soon as I receive them. Thank you for your assistance.



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Epidemiology
P.O. Box 27687 • Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

J. N. MacCormack, M.D., M.P.H.
Director

July 28, 1992

MEMORANDUM

TO: Bobby Lutfy, Hydrogeologist
Solid Waste Section

FROM: Kenneth Rudo, Ph.D., Toxicologist |KMR
Environmental Epidemiology Section

SUBJECT: Private Well Sample Health Risk Evaluations
Buncombe and Alamance Counties

Attached are the Environmental Epidemiology Section's drinking water health risk evaluations for the well water samples for the above sites. Recommendations for continued water use are also given.

If you have any further questions, please feel free to contact me at 733-3410.

KR:tm

Attachments

North Carolina Department of Environment, Health, & Natural Resources
Division of Epidemiology
Environmental Epidemiology Section

Drinking Water Health Risk Evaluation
General

Alamance COUNTY

DATE 7/27/92

LABORATORY NUMBER Hellethwaite well

- Based on these analytical results, this water should be considered safe for normal usage.
- Chemical analysis did not show any contamination. Water should be resampled if odor or taste persists.
- The water should not be used for drinking or cooking purposes, avoid prolonged bathing/showering.
- Based on these analytical results, this water is highly contaminated and should not be used for drinking, cooking or bathing/showering.
- The laboratory results are not conclusive, please resample:

PLEASE INDICATE ON LAB SHEET THAT IT IS A RESAMPLE AND PROVIDE PREVIOUS SAMPLE NUMBER(S).

COMMENTS:

Levels in both samples are low and should not pose any health risk at this time. ~~Do~~ you continued consumption Resample in 8-12 months

For further information, contact Dr. Ken Rudo or Dr. Luanne Williams, Environmental Epidemiology Section, (919) 733-3410.

#10

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

INORGANIC CHEMICAL ANALYSES-PRIVATE WATER SYSTEM

Complete All Items Above Heavy Line
 (See Instructions on Reverse Side)

RECEIVED
 1 1992
 ACHD

Name of System: Eliud Hebblethwaite

Address: 3410 Sweeps. - Sax. Rd.
Graham, N.C. ZIP 27253

County: Alamance

Report To: Carl Carroll

Address: Alamance County Health Dept.
209 N. Graham-Hopedale Rd.
Burlington, NC ZIP 27217-2971

Source of Water:
 Ground Both
 Surface Purchased

Source of Sample:
 House Tap
 Well Tap

Type of Sample:
 Raw Treated

Type of Treatment:
 None Lime
 Chlorinated Soda Ash
 Fluoridated Polyphosphat
 Filtered Water Soften
 Alum Other

Collected By: CARL CARROLL/ERNEST PERRY

Date Collected: 6-17-92 Time: 1:55 AM PM

Location of Sampling Point: OUTSIDE BACK SPIGOT

Remarks: BORED WELL OR POSSIBLE HAND DUG NOT PROPERLY PROTECTED

Regular Parameters			Optional Parameters (List as needed)	
	Results	units		Results mg/l.
pH	<u>6.4</u>			
Arsenic	<u><0.01</u>	mg/l	Barium	<u>0.08</u>
Lead	<u>0.014</u>	mg/l	Cadmium	<u><0.005</u>
Iron	<u>0.24</u>	mg/l	Chromium	<u><0.01</u>
Manganese	<u><0.03</u>	mg/l	Mercury	<u><0.0002</u>
Copper	<u>0.47</u>	mg/l		
Zinc	<u>0.18</u>	mg/l	Total Dissolved Solids	<u>68</u>
Calcium	<u>4.61</u>	mg/l		
Magnesium	<u>1.35</u>	mg/l		
Hardness-CaCO ₃ (Ca, Mg)	<u>17</u>	mg/l		
Alkalinity-CaCO ₃	<u>18</u>	mg/l		
Chloride	<u>6</u>	mg/l		
Fluoride	<u><0.10</u>	mg/l		

Date Received _____ Date Reported 6/30/92 Reported By _____

Date Analyzed _____ Laboratory Number 010848 JUN 1992



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

P.O. Box 27687 • Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

J. N. MacCormack, M.D., M.P.H.
Director

July 28, 1992

MEMORANDUM

TO: Bobby Lutfy, Hydrogeologist
Solid Waste Section

FROM: Kenneth Rudo, Ph.D., Toxicologist *KMR*
Environmental Epidemiology Section

SUBJECT: Private Well Sample Health Risk Evaluations
Buncombe and Alamance Counties

Attached are the Environmental Epidemiology Section's drinking water health risk evaluations for the well water samples for the above sites. Recommendations for continued water use are also given.

If you have any further questions, please feel free to contact me at 733-3410.

KR:tm

Attachments



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

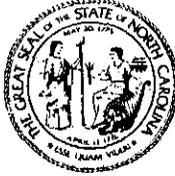
July 20, 1992

MEMORANDUM

TO: Dr. Ken Rudo, Environmental Epidemiology
FROM: Bobby Lutfy, Hydrogeologist, Solid Waste Section *BL*
RE: Request For Health Risk Evaluation For One Private Well
Located Near The Alamance County Landfill

Attached are copies of 502.2 Volatile Organic Analysis from one bored private drinking water well located in the vicinity of the Alamance County Landfill. This well was sampled twice and the results indicate trace amounts of 1,1,1-Trichloroethane and Tetrachloroethylene to be present.

I would appreciate an evaluation as soon as possible since the homeowner is concerned about the suitability of the well as a source of drinking water. I will forward copies of your evaluation to the appropriate parties as soon as I receive them. Thank you for your assistance.



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

June 29, 1992

Mr. Robert C. Smith
Alamance County Manager
124 West Elm Street
Graham, N.C. 27253

RE: Analytical Results From Monitoring Wells MW-4 and MW-9 At The
Alamance County Sanitary Landfill (Permit # 01-01)

Dear Mr. Smith,

This letter is written to report the results of the sampling of two monitoring wells at the Alamance County Landfill that were sampled by the Solid Waste Section on June 5, 1992. The results confirm what we discussed in our meeting on that date. Monitoring Well MW-4 is showing evidence of contamination for several volatile organic compounds. This indicates the need for additional ground water investigation at the site as requested in my letter of May 27, 1992. Monitoring Well MW-9 showed no evidence of significant contamination. This supports my evaluation that the possibility of off-site contamination is extremely remote.

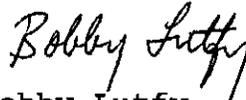
Copies of the sampling results for the two monitoring wells are attached for your review. Based on the results from this sampling event and considering the location of the two wells sampled, there does not appear to be any likelihood of contamination moving off-site at this time. Therefore there is no imminent threat to the public health. However the presence of volatile organic compounds in well MW-4 will mandate that additional water quality investigation be done at the Alamance County Landfill site. Please proceed with the investigation requested in my letter of May 27. Let our office know the date the sampling is scheduled so we can make arrangements to split samples with your sampling contractor.

The letter recently received by our office from Central Virginia Laboratories and Consultants confirms that this laboratory is certified for wastewater analysis rather than drinking water analysis as specified in the "North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities". Future sampling should be analyzed by a laboratory certified by the state of North Carolina for drinking water analysis.

Page 2

If you have any questions regarding the results of the sampling analysis from the two monitoring wells or questions regarding the water quality investigation needed at the Alamance County Landfill, please contact me at (919) 733-0692.

Sincerely,

A handwritten signature in cursive script that reads "Bobby Lutfy".

Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Dexter Matthews
Julian Foscue
Alvin Cagle

Attachments



CENTRAL VIRGINIA
LABORATORIES & CONSULTANTS, INC.

June 12, 1992

Mr. Bobby Lufty
Division of Solid Waste Management
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Dear Mr. Lufty:

Enclosed is a copy of Central Virginia Laboratories and Consultants' (CVLC) North Carolina laboratory certification. Mr. John Palmer, Bain, Palmer & Associates, requested that CVLC forward this to you.

If you should have any questions or comments or require additional information, please do not hesitate to contact me.

Sincerely,

Janet M. Zwetolitz
CVLC Laboratory Manager

Enclosure

*Wastewater Laboratory Certification
(Not Drinking water certification)*



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Environmental Management
512 North Salisbury Street • Raleigh, North Carolina 27604

James G. Martin, Governor
William W. Cobey, Jr., Secretary

George T. Everett, Ph.D.
Director

January 10, 1992

Regional Offices

Asheville
704/251-6208

Fayetteville
919/486-1541

Mooreville
704/663-1699

Raleigh
919/733-2314

Washington
919/946-6481

Wilmington
919/395-3900

Winston-Salem
919/896-7007

Mr. Adrian K. Mood
Central Virginia Labs. & Consultants
P.O. Box 10938
Lynchburg, VA 24506

SUBJECT: Wastewater Laboratory Certification Renewal

Dear Mr. Mood:

The Department of Environment, Health and Natural Resources, in accordance with the provisions of NC GS 143-215.3(a) and 15 NCAC 2H .0800, is pleased to renew certification for your laboratory to perform specified water analysis required by EMC monitoring and reporting regulations 15 NCAC 2B .0500 and 2H .0900.

Enclosed for your use is a certificate describing the requirements and limits of your certification. Please review this certificate to insure that your laboratory is certified for all parameters required to properly meet your certification needs.

Please contact us at 919-733-3908 if you have questions or need additional information.

Sincerely,

Bernard E. Sims, PhD
Chief, Laboratory Section

Enclosure

cc: James W. Meyer

WBE/gwt

ATTACHMENT I

PARAMETER CERTIFICATION

The CENTRAL VIRGINIA LABORATORIES & CONSULTANTS laboratory has been evaluated and found acceptable for the measurement of the parameters listed below that are preceded by an (X).

<u>X</u> BOD	<u>METALS, GROUP I</u>	<u>X</u> ARSENIC
<u>X</u> COD	<u>X</u> ALUMINUM	<u>X</u> BARIUM
<u>X</u> CHLORIDE	<u>X</u> BERYLLIUM	<u>X</u> MERCURY
<u>X</u> COLIFORM, FECAL MF	<u>X</u> CADMIUM	<u>X</u> SELENIUM
<u>X</u> COLIFORM, TOTAL MF	<u>X</u> CHROMIUM, TOTAL	<u>X</u> AMMONIA NITROGEN
<u>X</u> COLIFORM, FECAL TUBE	<u>X</u> COBALT	<u>X</u> TOTAL KJELDAHL NITROGEN
<u>X</u> COLIFORM, TOTAL TUBE	<u>X</u> COPPER	<u>X</u> NITRATE+NITRITE NITROGEN
<u>X</u> CYANIDE	<u>X</u> IRON	<u>X</u> TOTAL PHOSPHORUS
<u>X</u> FLUORIDE	<u>X</u> LEAD	<u>X</u> ORTHOPHOSPHATE
<u>X</u> GREASE AND OIL	<u>X</u> MANGANESE	<u>X</u> pH
<u>X</u> HARDNESS, TOTAL	<u>X</u> NICKEL	<u>X</u> PHENOLS
<u>X</u> MBAS	<u>X</u> ZINC	<u>X</u> RESIDUE, TOTAL
	<u>METALS, GROUP II</u>	<u>X</u> RESIDUE, TOTAL SUSPENDED
	<u>X</u> ANTIMONY	<u>X</u> TURBIDITY
	<u>X</u> SILVER	
	<u>X</u> THALLIUM	

This certification requires maintenance of an acceptable quality assurance program, use of approved methodology and equipment, and satisfactory performance on evaluation samples.

Laboratories may be decertified for violations as set forth in 15 NCAC 2H .0807.

Applications for certification renewal must be submitted to the State Laboratory thirty days in advance of expiration of certification.

Certificate No. 268

Effective Date: January 1, 1992

Expiration Date: December 31, 1994

(LC-21-Rev. 89)



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

May 27, 1992

Mr. Robert C. Smith
Alamance County Manager
124 West Elm Street
Graham, North Carolina 27253

Re: Review Of Ground Water Compliance Monitoring Data From The
Alamance County Sanitary Landfill (Permit # 01-01)

Dear Mr. Smith,

A review of the routine detection monitoring data from the April 1992, sampling of the ground water monitoring wells at the Alamance County Landfill indicates the presence of chemical constituents at levels that exceed the State's Groundwater Standards (NCAC Title 15 Subchapter 2L). A copy of this data is enclosed for your review.

Since this data indicates the presence of possible ground water contamination at the site, additional investigation is necessary in order to confirm and better define the types of chemical contaminants found. Therefore another sampling episode should be scheduled for this year, about six months from the first sampling event. Please inform the Solid Waste Section as soon as this sampling episode is scheduled so we can make arrangements to split samples with your sampling contractor. Analysis should be done for volatile and semi-volatile organic analysis in addition to the routine sampling parameters. Volatile analysis should be done using EPA Method 8240 or 8260 and semi-volatile analysis should be done using Method 8270.

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 along with this Fall's ground water monitoring data. The nearest downstream surface water intake should also be identified and reported.

Thank you for your cooperation. If you have any questions or comments, please contact the Solid Waste Section at (919) 733-0692.

Sincerely,

Bobby Lutfy

Bobby Lutfy, Hydrogeologist
Solid Waste Section

cc: Alvin Cagle
Jeff Rogers
Attachment

BAIN, PALMER & ASSOCIATES, INC.

Environmental Consultants

(919) 272-9713

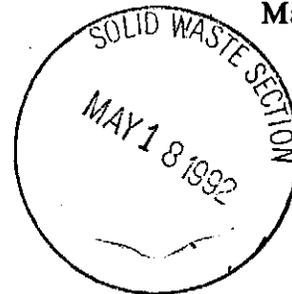
(919) 732-1100

2641-G Randleman Road, Greensboro, NC 27406

230 West Margaret Lane, Hillsborough, NC 27278

May 15, 1992

Bobby Lutfy
Division of Solid Waste Management
P.O. Box 27687
Raleigh, N.C. 27611-7687



RE: Results of Sampling and Analysis
Alamance County Landfill
Bain, Palmer No. 0170.001

Dear Mr. Lutfy:

Attached is one copy of the sampling and analysis report for the Alamance County Landfill. If you have any questions concerning this matter, please do not hesitate to call.

Sincerely yours,

BAIN, PALMER & ASSOCIATES, INC.


John E. Palmer, P.G.
Principal

JEP/jia

Bobby



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

February 7, 1992

Mr. John D. Barnard
Hazen and Sawyer, P. C.
4011 WestChase Blvd.
Raleigh, North Carolina 27607

RE: Interim Review, Alamance County Resubmittal, Site Suitability
Application, Austin Quarter Site

Dear John:

The Solid Waste Section has completed its review of your resubmittal of the above referenced application in response to the "Preliminary Review" letter issued on October 31, 1991. Pursuant to our meeting on January 21 and additional review, the following items must be addressed to continue the review process:

- 1) As referenced in our meeting, the Solid Waste Section shall determine during the site-suitability process the areas within the proposed solid waste management facility which are appropriate for landfilling activities. The Section shall determine appropriate buffers between wetlands and disposal areas based upon the information submitted. Thus, the applicant must depict wetlands on the conceptual design plan showing proposed buffers between wetlands and streams.
- 2) Furthermore, the conceptual design plan depicts the location of the leachate lagoon within the 1000' buffer between the Haw River and proposed disposal activities. This activity shall not be allowed in the buffer areas as designated by the State and the County.
- 3) The conceptual design plan shall be revised to show phased cell development. The phased cell development should further be explained based upon projected life expectancy calculations for each phase.
- 4) As referenced in Policy Memorandum 18 issued on January 15, 1992, all new MSWLFs must meet all the requirements of the new EPA rule. All location restrictions listed in Part 258 must be addressed and discussed under Section 3.0, Environmental Investigation and Section 4.0, Conclusion and Siting Requirements of the submittal.

Mr. Barnard
February 7, 1992
Page 2

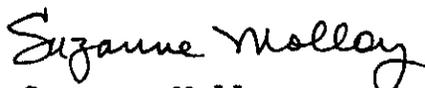
- 5) A proposed groundwater and surface water monitoring plan including well locations and schematics showing proposed screened interval, depth and construction shall be submitted.

The above referenced information shall be resubmitted in conjunction with all the requirements of the "Completeness Review" letter issued on January 13, 1992 pertaining to the "Geologic and Hydrogeologic" study.

Upon receipt of all referenced information or revisions, the Solid Waste Section shall submit the application to the Division of Environmental Management for their review and complete the internal technical review process.

If you have any questions or comments, please contact our office at (919)733-0692.

Sincerely,


Suzanne Molloy
Environmental Engineer
Solid Waste Section

cc: Robert Smith
Bobby Lutfy
Jeff Rodgers
Jim Coffey
Central Files

Bobby



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

January 13, 1992

Mr. John Barnard
Hazen & Sawyer, P. C.
4011 Westchase Boulevard
Raleigh, North Carolina 27607

RE: Completeness Review - Austin Quarter Site, Site
Suitability Application *Alamance County*

Dear Mr. Barnard:

The Solid Waste Section has completed its preliminary review of the above referenced application. The initial review letter for Volume I of the site suitability application was issued on October 31, 1991. This correspondence, in conjunction with the referenced correspondence, addresses the necessary revisions/additional information required for the Section to commence its technical review process.

Enclosed please find Bobby Lutfy's, Section Hydrogeologist, review of the "Geologic and Hydrogeologic Study for the Proposed Alamance County Landfill" prepared by Westinghouse Environmental. Based upon his findings, the Section shall require additional hydrogeological investigation, monitoring, testing, and corrections to augment the report and further characterize the site for suitability of landfilling activities.

These comments are intended to expedite the review of the application and in no way restrict the Section's right to request additional information following the technical review process.

A meeting should be set-up with the Section to further discuss the hydrogeologic review. Please contact our office at

Mr. Barnard
January 13, 1992
Page 2

(919)733-0692 to set-up a meeting.

Sincerely,

Suzanne Molloy

Suzanne Molloy
Environmental Engineer
Solid Waste Section

ENCLOSURES

cc: Robert Smith
Bobby Lutfy ✓
Jeff Rodgers
Julian Foscue
Bob Difiori



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

January 13, 1992

MEMORANDUM

TO: Jim Coffey and Suzanne Molloy
FROM: Bobby Lutfy, Hydrogeologist *BL*
RE: Review Of The "Geologic And Hydrogeologic Study" For The
Proposed Alamance County Site Plan Application

Upon completion of a review of the above referenced Site Plan Application, it appears that the site may be reasonably well suited for landfill development, however some additional hydrogeological investigation is necessary in order to further characterize the site. Only 27 borings were installed to characterize the 404 acre site. Additional information is needed for some parts of the site. It appears that all three of the rock core borings were installed in the same type of environment, on lower slopes near minor drainage features. Additional rock core borings are needed in other types of environments, such as ridges and immediately adjacent to larger drainage features.

Although the February water table readings for borings one through seven are said to be representative of seasonal high water table readings, there is no estimation of seasonal high water table readings for the site as a whole. Since there is an average fluctuation of 3.2 feet between the February and September water table readings for borings one through seven, similar fluctuations would be likely at the other borings at the site. Some additional investigation may be needed to explain why the water table fluctuations for borings one, twelve, and seventeen are significantly greater than water table fluctuations at other boring locations. As suggested in the report "additional water monitoring should be completed in order to better define the seasonal high water table at the site".

There appear to be some errors in the potentiometric surface as pictured on the cross sections and soil profiles. Also there are some discrepancies in the ground surface elevations as reported on the boring logs as compared to the elevations illustrated on the plan sheets.

There was little hydraulic conductivity information for the soil units. I assume this is because the water table was only slightly above partially weather rock or rock and it would be difficult to isolate the soil units with a well screen. However in the more critical locations some undisturbed shelby tube samples may be needed to determine hydraulic conductivity values for these soil units.

There was no ground and surface water monitoring plan submitted as part of the report. While it is apparent that exact locations and depths of proposed monitoring wells can not be proposed until a more detailed construction plan is formulated, there should be some preliminary discussion of a proposed monitoring plan.

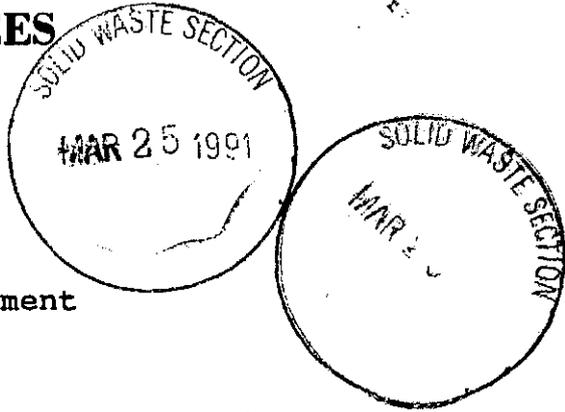
The final submittal of the Hydrogeologic Study must bear the seal of a Professional Geologist. It is my understanding that Hazen and Sawyer is making some revisions to the Site Plan Application. Therefore they or their geotechnical consultant should contact our office to discuss what additional work may be necessary for the final Hydrogeologic Report in the Site Plan Application.

01-01



**PATTERSON
EXPLORATION SERVICES**

P.O. BOX 3008 - SANFORD, N.C. 27331-3008 - (919) 774-3770



March 18, 1991

Mr. Arthur Mouberry
NC DEHNR
Division of Environmental Management
3800 Barrett Drive
Raleigh, NC 27609

RE: Request to abandon and replace monitoring well at Alamance County Landfill.

Dear Mr. Mouberry:

Patterson Exploration Services (PXS) is requesting permission to abandon monitoring well #4 and replace well #4 with an additional monitoring well (monitoring well #9) at the Alamance County Landfill (see attached map for locations). Monitoring well #4 is dry, therefore, we are requesting permission to properly abandon this well.

The attached map, which was provided by Mr. Alvin Cagle of the Alamance County Landfill, shows the location of the monitoring wells to be abandoned and installed. The location of the new monitoring well has been approved by Mr. Jeff Rodgers of the Winston-Salem Regional Office of Environmental Management (Groundwater Section).

We have attached a typical monitoring well schematic and location map. If you have any questions or comments, please don't hesitate to call.

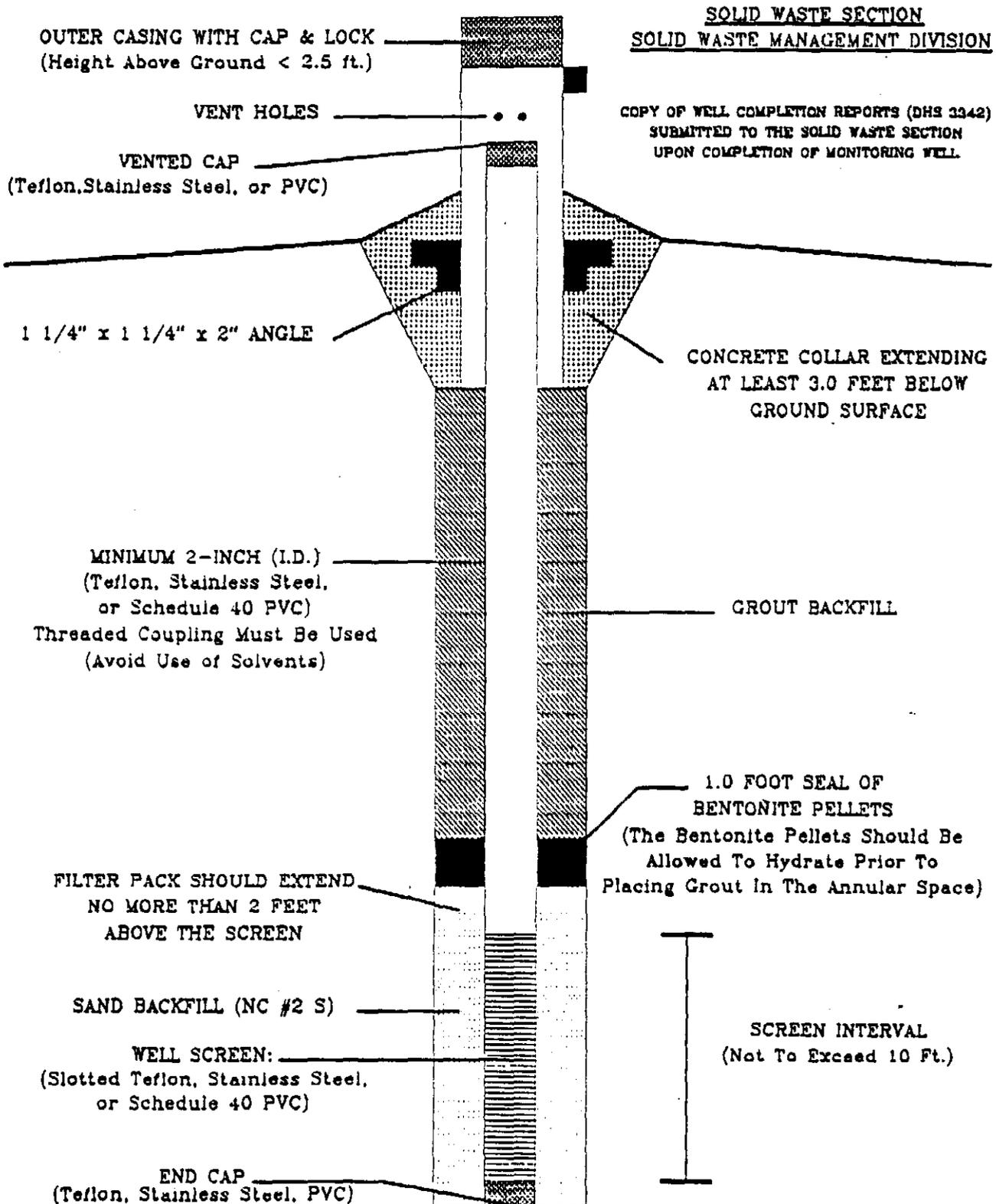
Sincerely,

R. Dennis Holder
R. Dennis Holder, Geologist
Environmental Division Manager

rdh

cc: ✓ Mr. Bobby Lutfy
Mr. Alvin Cagle

TYPICAL MONITORING WELL SCHEMATIC





State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobby, Jr., Secretary

William L. Meyer
Director

July 18, 1990

Mr. Alvin Cagle
Alamance County Health Dept.
209 N. Graham-Hopedale Road
Burlington, N.C. 27215

Re: Ground-water Sampling Analysis At The Alamance County Landfill

Dear Mr. Cagle,

The Solid Waste Section has reviewed the ground-water monitoring analytical data for the 1990 sampling of the Alamance County landfill. Results for Iron and Manganese exceeded the ground water standards at all well locations. All other parameters were reported at levels below the standards.

Iron and Manganese are commonly found naturally occurring in North Carolina. However the levels reported at the Alamance Landfill are higher than those generally found naturally. Therefore there is evidence that leachate is influencing the ground water of the area. Iron and Manganese are common contaminants at landfill sites. The levels of Iron and Manganese present at the Alamance Landfill site do not appear to be sufficiently high at this time to indicate a major threat to the public health or the environment. Therefore, no additional sampling will be required at this time.

The sample results show that monitoring well #4 was dry and could not be sampled. This well must be abandoned and replaced with a properly designed and constructed monitoring well prior to the next annual sampling event. A complete and accurate Well Completion Record should be submitted to the Solid Waste Section within 15 days of the completion of the replacement well. The old well should be abandoned according to the permanent well abandonment procedures outlined in 15 NCAC 2C Section .0113 (a)(2), except that it is not necessary to disinfect the well (line C) as this could introduce contaminants into the ground water of the area.

If you have any questions or comments, please contact our office at (919) 733-0692.

Sincerely,

Bobby Lutfy

Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Jeff Rogers
Attachments



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

June 7, 1990

Mr. Ernest Perry
Alamance County Health Department
209 N. Graham-Hopedale Road
Burlington, N. C. 27215

Re: Map of the Alamance County Landfill (Permit #01-01).

Dear Mr. Perry:

Thank you for the Water Quality Monitoring Analytical Data our office recently received. After an initial review of the data, it was discovered that this office does not have a map clearly showing the locations of the monitoring wells at the landfill. The maps we have at the present time do not show the locations of the new wells with relation to the older wells. Therefore, would you please provide our office with the following information:

1. A map delineating the entire landfill and adjacent property owned (or leased) by you. This map should clearly show the location of the landfill with respect to the entire property. On this map also indicate past, present, and future landfilling activity as well as demolition filling areas. Indicate the locations of existing monitoring wells numbered on the map, (e.g. MW-1; MW-2; etc.) in a manner corresponding to the designations of the wells in the field and the analytical data.

If you have questions or comments please contact this office at (919) 733-0692.

Sincerely,

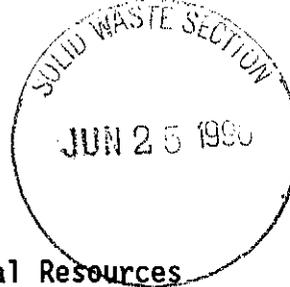
A handwritten signature in cursive script, appearing to read "Gray Stephens".

Gray Stephens
Hydrogeological Technician
Solid Waste Section

cc: ✓ Bobby Lutfy
Jeff Rodgers
Julian Foscue

1700 University Commercial Place ☐ Charlotte, NC 28213 ☐ Phone (704) 597-8454 ☐ FAX (704) 597-8455

June 21, 1990



Mr. Bobby Lufty
NC Dept. of Environmental, Health, & Natural Resources
Solid Waste Mgt. Division
P.O. Box 27687
Raleigh, NC 27611

Dear Mr. Lufty:

Per your request, I am enclosing the chain of custody and groundwater monitoring documentation sheet for Alamance County and samples collected April 20, 1990, PACE project No. 600423.500.

These documents contain the pH and conductivity results which were not placed on our laboratory report.

Please do not hesitate to call if you have any questions.

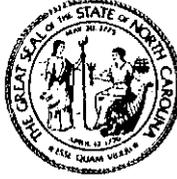
Sincerely,

Rodney H. Lang
Rodney H. Lang
Manager, Field Services

RHL:tp

Enclosure

Bolby - FYI



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

April 25, 1990

MEMORANDUM

TO: Inter-Agency Solid Waste
Task Force Participants

FROM: *WMM* Gary Ahlberg
Task Force Coordinator
Solid Waste Section

RE: Alamance County request to consider four sites - May 16,
1990

Enclosed is the correspondence scheduling the Task Force visit to Alamance County.

In order to promote the effectiveness of the Task Force, the Section requests agency comments be submitted to my attention within 14 calendar days following the site visit. Should you have any questions or conflicts, please advise.

GWA/mj

cc: Larry Coble - DEM
Perry Nelson - DEM
Wally Venrick - PWS
Jeff Rodgers
Julian Foscue



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

April 25, 1990

Mr. Robert C. Smith, County Manager
Alamance County
124 W. Elm Street
Graham, NC 27253

RE: Inter-Agency Solid Waste Task Force - Alamance County

Dear Mr. Smith:

At your request, the Task Force is scheduled to convene on May 16, 1990, 9:00 a.m., at your office in Graham.

Please prepare the maps listed under "Task Force Information" in the enclosed draft document. These maps and any additional information relative to the proposed site will contribute to the effectiveness of our meeting. If you have any questions or conflicts, please advise.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gary W. Ahlberg".

Gary W. Ahlberg
Environmental Engineer
Solid Waste Section

GWA/mj

cc: Larry Coble - DEM
Perry Nelson - DEM
Wally Venrick - PWS
Jeff Rodgers
Julian Foscue
Robert S. DiFiore



ENGINEERING TECTONICS, P.A.
ENGINEERS • GEOLOGISTS • HYDROLOGISTS

P.O. Box 11846, Winston-Salem, NC 27116 (919) 767-8807

July 9, 1990

State of North Carolina
Department of Environment, Health and Natural Resources
Division of Solid Waste Management
P.O. Box 27687
Raleigh, North Carolina 27611-7687



Attention: Mr. Bobby Lutfy
Hydrogeological Technician

Subject: Groundwater Monitoring Well Installation
Alamance County Landfill
Alamance County, North Carolina

Dear Mr. Lutfy:

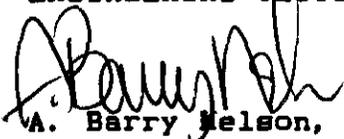
In reference to the above cited project, your letter of September 12, 1989 to Mr. Ernest Perry, my reply to you dated October 19, 1989 and your reply, we have complied with the State's insistence that the two deep bedrock wells at the landfill be completed with the same construction techniques as the shallow regolith wells. This is in no manner an endorsement of this technique which we believe is incorrect. However, in order to lay this matter to rest, we have determined that it is in the best interest of the County of Alamance that these wells be completed to the State's specification. By taking this action, Engineering Tectonics, P.A. and any successors hereby forfeit any responsibility for the adequate function and integrity of the samples from these wells.

You will find the revised well completion forms and schematic diagrams for these two wells attached to this letter. They were equipped with 2 inch diameter Schedule 40 PVC well screens. The screens were ten feet in length, had a slot size of .010 inches, contained a bailer plug of similar material, were screw jointed and installed in the bottom 10 feet of the borehole. A sand pack was installed in the annular space between the well screen and the borehole. The sand pack extended a minimum of 2 feet above the top of the well screen. A bentonite seal with a minimum thickness of 1 foot was placed above the gravel pack in the annular space between the borehole and the riser pipe. The riser was constructed of 2 inch diameter Schedule 40 PVC with screw joints and extended at least 1.5 feet above the ground surface. A small vent hole was placed near the top of the riser. A PVC cap was placed at the end of the riser. No glues or solvents were used in joining the material together. The annular space between the borehole and the riser piped was filled with neat cement grout. The grout was placed by a tremie beginning at the bottom of the well. The grout seal was extended to the top of the ground. A six inch square steel protective cover was placed over the riser pipe. This protective casing contains a locking cap which was attached. All well materials were inspected in the field to insure their integrity. The PVC well materials were stored in unopened plastic bags until their placement in the

wells. A 3' by 3' concrete well pad was placed at the surface of the ground around the protective casing. This pad is approximately 4 inches thick.

We hope that this action will satisfy your requirements even though we strongly object to construction of this type. Should you have any questions or require additional information, please contact us.

Very truly yours,
ENGINEERING TECTONICS, P.A.



A. Barry Nelson, P.G.
Vice President
Chief Geohydrologist

cc: Mr. Ernest Perry



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

October 30, 1989

Mr. Barry Nelson
Chief Hydrogeologist
Engineering Techtonics, P.A.
P.O. Box 11846
Winston-Salem, N.C. 27106

RE: Monitoring Well Construction At The Alamance County Landfill
(Permit #01-01)

Dear Mr. Nelson,

In reference to your letter of October 19, 1989, I am rather surprised that you seem to have forgotten the content of our second telephone conversation and are now reiterating the arguments you made in our initial conversation. My letter to Mr. Ernest Perry of September 12, 1989, which was based on the inaccurate well records available to me at that time, is a reasonable response based upon that data.

These Well Construction Records indicate that three of the wells have no bentonite seal or other seal capable of isolating the targeted hydraulically conductive zone for monitoring or capable of preventing the potential spread of contamination in the fractured bedrock. For well MW-2 the Well Construction Record indicates that the casing ends at a depth of 28 feet, which according to the drilling log is in a soil layer two feet above competent bedrock. Two of the wells constructed are open wells which are clearly prohibited in our "North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities" (refer to page 1, paragraph 1).

Regarding point 2 of your letter, on what basis do you infer from our well schematic diagram that our method "employs drilling of the borehole through the regolith and the bedrock in a single step"? The well schematic merely shows what we expect the end product to look like, not what techniques are utilized to achieve this type of well construction. As we agreed in our second telephone conversation, a two step drilling operation (such as that described in your letter) is desirable for wells constructed in consolidated formations in order to prevent the possible spread of contamination during well installation.

Our office is very much aware of the differences in possible well construction techniques in bedrock and porous media. Acceptable monitoring well design may or may not vary with different types of geologic media depending upon the hydrogeological setting, well depth, and the type and purpose of the ground-water monitoring to be conducted. Open wells in fractured bedrock are often acceptable for drinking water wells and for some monitoring wells, as I am quite sure Don Link and other representatives of the Division of Environmental Management would attest. From a purely technical standpoint, wells properly constructed in this manner may be suitable in certain hydrogeologic settings.

However, since these monitoring wells were installed to a depth of 30 feet into bedrock, rather than 15 feet into bedrock (as specified in the June 1, 1988, letter from Sharon Myers of our office to Mr. Ernest Perry of the Alamance County Health Department), these wells fail to isolate a limited hydraulically conductive zone. As stated in my September 12 letter, this not only makes the well relatively ineffective for monitoring purposes, but also introduces the possibility for the spread of contamination. In order to establish consistency and introduce further control in isolating conductive zones in many highly varied hydrogeologic settings, there has been a general consensus among Federal and State regulatory agencies in requiring fully encased monitoring wells in both porous and consolidated media in most situations.

The Solid Waste Permit for Alamance County, dated May 16, 1989, clearly states in condition 6, sections b and e, that well installation shall conform to the "DHS well standard" (typical well schematic diagram) and "to specifications outlined in the N.C. Water Quality Monitoring Guidance Document for Solid Waste Facilities." Both of these documents clearly call for a fully encased well with a well screen set in a sand/gravel envelope and having a protective bentonite seal. Permit condition 6 is specifically emphasized in the cover letter addressed to the Alamance County Manager that accompanied the Solid Waste Permit. The June 1, 1988, letter from our office to Mr. Ernest Perry also clearly specifies screened wells for the deeper bedrock wells.

To summarize, our office is thoroughly experienced with construction techniques of monitoring wells in both consolidated and unconsolidated media. While our office is aware of the technical feasibility of utilizing open wells in certain situations, it is the carefully considered policy of this office to require fully cased and screened wells even in consolidated bedrock. This provides a degree of consistency in well construction that assists in the comparison of analytical data for different wells. Difficulties associated with the purging and sampling of open wells are eliminated. It also enables the isolation of a particular hydraulically conductive zone. And the potential for the spread of possible contamination is greatly reduced.

Although the corrected well construction data mitigates some of the concern regarding the potential spread of contaminants, the open wells still have the potential to conduct contaminantion to other fractures in the bedrock. In view of the technical considerations, the previously established permit conditions, and the established policy of the Solid Waste Section as clearly stated in the "Guidance Document" and repeatedly expressed in Correspondence with Alamance County, our office continues to support the position in my letter of September 12, 1989. However, as we discussed in our second telephone conversation, rather than abandoning the deep wells, our office will authorize the retrofiting of these two open wells to bring them into compliance with our well construction specifications. Please contact me if you have any questions on approved methods for retrofiting these wells.

Sincerely,



Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Ernest Perry
Bill Meyer
J. Gordon Layton
Jim Coffey
Terry Waddell
Don Link

SEARCHED

Week before xmas Jan 2, 1990

IMPORTANT

To Balby
 Date 1/17 Time 2:40

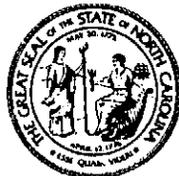
WHILE YOU WERE OUT

M. Ernest Perry
 of Alamance Co.
 Phone 919 227-0101
AREA CODE NUMBER EXTENSION

TELEPHONED <input checked="" type="checkbox"/>	PLEASE CALL <input checked="" type="checkbox"/>
CALLED TO SEE YOU <input type="checkbox"/>	WILL CALL AGAIN <input type="checkbox"/>
WANTS TO SEE YOU <input type="checkbox"/>	URGENT <input type="checkbox"/>
RETURNED YOUR CALL <input type="checkbox"/>	

Message Wells retrofitted the well before Christmas.
Alamance Co. informed 1-2-90.
He will contact Eng. Tech. + have them ~~send~~ forward corrected well compl. Records.

Signed



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

January 16, 1990

Mr. Ernest Perry
Alamance County Health Department
209 N. Graham-Hopedale Road
Burlington, N.C. 27215

Re: Ground-Water Monitoring Wells at the Alamance County Landfill
(Permit #01-01)

Dear Mr. Perry,

In the September 12, 1989, letter to you from our office, some problems were raised with the monitoring wells installed this past Summer at the Alamance County Landfill. The October 30, 1989, letter to Mr. Barry Nelson of Engineering Techtonics, P.A., further clarified the position of the Solid Waste Section regarding the need to replace or retrofit the deep wells to bring them into compliance with our well construction standards. As of this date our office has not received any documentation indicating that these corrections have been made.

If these wells have been brought into compliance, please submit corrected Well Completion Records within 15 days. If the wells have not yet been retrofitted, this should be done immediately and corrected Well Completion Records reflecting these changes should be submitted within 30 days. Also, please send a map of the landfill facility showing the locations of all monitoring wells and their proper designations (MW-1, MW-2, etc.).

If you have any questions or comments, please contact our office at (919) 733-0692.

Sincerely,

Bobby Lutfy
Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Jim Coffey
Terry Waddell



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

October 30, 1989

Mr. Barry Nelson
Chief Hydrogeologist
Engineering Techtonics, P.A.
P.O. Box 11846
Winston-Salem, N.C. 27106

RE: Monitoring Well Construction At The Alamance County Landfill
(Permit #01-01)

Dear Mr. Nelson,

In reference to your letter of October 19, 1989, I am rather surprised that you seem to have forgotten the content of our second telephone conversation and are now reiterating the arguments you made in our initial conversation. My letter to Mr. Ernest Perry of September 12, 1989, which was based on the inaccurate well records available to me at that time, is a reasonable response based upon that data.

These Well Construction Records indicate that three of the wells have no bentonite seal or other seal capable of isolating the targeted hydraulically conductive zone for monitoring or capable of preventing the potential spread of contamination in the fractured bedrock. For well MW-2 the Well Construction Record indicates that the casing ends at a depth of 28 feet, which according to the drilling log is in a soil layer two feet above competent bedrock. Two of the wells constructed are open wells which are clearly prohibited in our "North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities" (refer to page 1, paragraph 1).

Regarding point 2 of your letter, on what basis do you infer from our well schematic diagram that our method "employs drilling of the borehole through the regolith and the bedrock in a single step"? The well schematic merely shows what we expect the end product to look like, not what techniques are utilized to achieve this type of well construction. As we agreed in our second telephone conversation, a two step drilling operation (such as that described in your letter) is desirable for wells constructed in consolidated formations in order to prevent the possible spread of contamination during well installation.

Our office is very much aware of the differences in possible well construction techniques in bedrock and porous media. Acceptable monitoring well design may or may not vary with different types of geologic media depending upon the hydrogeological setting, well depth, and the type and purpose of the ground-water monitoring to be conducted. Open wells in fractured bedrock are often acceptable for drinking water wells and for some monitoring wells, as I am quite sure Don Link and other representatives of the Division of Environmental Management would attest. From a purely technical standpoint, wells properly constructed in this manner may be suitable in certain hydrogeologic settings.

However, since these monitoring wells were installed to a depth of 30 feet into bedrock, rather than 15 feet into bedrock (as specified in the June 1, 1988, letter from Sharon Myers of our office to Mr. Ernest Perry of the Alamance County Health Department), these wells fail to isolate a limited hydraulically conductive zone. As stated in my September 12 letter, this not only makes the well relatively ineffective for monitoring purposes, but also introduces the possibility for the spread of contamination. In order to establish consistency and introduce further control in isolating conductive zones in many highly varied hydrogeologic settings, there has been a general consensus among Federal and State regulatory agencies in requiring fully encased monitoring wells in both porous and consolidated media in most situations.

The Solid Waste Permit for Alamance County, dated May 16, 1989, clearly states in condition 6, sections b and e, that well installation shall conform to the "DHS well standard" (typical well schematic diagram) and "to specifications outlined in the N.C. Water Quality Monitoring Guidance Document for Solid Waste Facilities." Both of these documents clearly call for a fully encased well with a well screen set in a sand/gravel envelope and having a protective bentonite seal. Permit condition 6 is specifically emphasized in the cover letter addressed to the Alamance County Manager that accompanied the Solid Waste Permit. The June 1, 1988, letter from our office to Mr. Ernest Perry also clearly specifies screened wells for the deeper bedrock wells.

To summarize, our office is thoroughly experienced with construction techniques of monitoring wells in both consolidated and unconsolidated media. While our office is aware of the technical feasibility of utilizing open wells in certain situations, it is the carefully considered policy of this office to require fully cased and screened wells even in consolidated bedrock. This provides a degree of consistency in well construction that assists in the comparison of analytical data for different wells. Difficulties associated with the purging and sampling of open wells are eliminated. It also enables the isolation of a particular hydraulically conductive zone. And the potential for the spread of possible contamination is greatly reduced.

Although the corrected well construction data mitigates **some** of the concern regarding the potential spread of contaminants, the open wells still have the potential to conduct contaminantion to other fractures in the bedrock. In view of the technical considerations, the previously established permit conditions, and the established policy of the Solid Waste Section as clearly stated in the "Guidance Document" and repeatedly expressed in Correspondence with Alamance County, our office continues to support the position in my letter of September 12, 1989. However, as we discussed in our second telephone conversation, rather than abandoning the deep wells, our office will authorize the retrofitting of these two open wells to bring them into compliance with our well construction specifications. Please contact me if you have any questions on approved methods for retrofitting these wells.

Sincerely,

Bobby Lutfy
Hydrogeologist
Solid Waste Section

cc: Ernest Perry
Bill Meyer
J. Gordon Layton
Jim Coffey
Terry Waddell
Don Link



ENGINEERING TECTONICS, P.A.
ENGINEERS • GEOLOGISTS • HYDROLOGISTS

P.O. Box 11846, Winston-Salem, NC 27106 (919) 767-8807



October 19, 1989

State of North Carolina
Department of Environment, Health and Natural Resources
Division of Solid Waste Management
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Attention: Mr. Bobby Lutfy
Hydrogeological Technician

Subject: Groundwater Monitoring Well Installation
Alamance County Landfill
Alamance County North Carolina

Dear Mr. Lutfy:

In reference to your letter of September 12, 1989 to Mr. Ernest Perry, Director Alamance County Health Department, my telephone conversations with you on October 2, 1989 and October 11, 1989, and a conversation I had with Mr. Perry on October 18, 1989, we would make the following comments:

1. Groundwater monitoring well construction techniques in a fractured bedrock aquifer system are significantly different than those employed for well construction in porous media.

2. A monitoring well constructed in a bedrock system according to the schematic diagram contained in your letter to Mr. Perry is insufficient in protecting the deep fractured rock aquifer from cross-contamination during installation. Contaminants that may be present in the shallow regolith aquifer system and especially in the transition zone between the regolith and the fractured rock may enter the bedrock aquifer. This is a significant risk since your method employs drilling of the borehole through the regolith and the bedrock in a single step. In a fractured rock system, such as we have in the Piedmont and the Blue Ridge Geomorphic Provinces, well construction to prevent cross-contamination must include the following steps:

A. A minimum eight inch diameter borehole is drilled through the shallow regolith aquifer system using a hollow stem auger. The boring is drilled to auger refusal in the bedrock.

maybe
or
may not be
or monitoring
wells

?

B. A tri-cone roller bit is then used to extend the borehole to a depth of 1-3 feet into the competent rock.

C. A six inch diameter pit casing is then set into the top of the bedrock and the annular space grouted from the bedrock to the ground surface.

D. The grout is allowed to set at least 24 hours.

E. The borehole is then advanced through the bedrock by using either a diamond core rotary bit or an air rotary hammer. Diamond coring is preferable to eliminate blowing rock cuttings into the rock fractures. The boring is extended to the desired depth using this method.

F. A Surface protective casing is then set and grouted in place with a concrete pad at the top of the ground.

G. Appropriate locks, well tags, signs and other designations are then attached at the well head.

3. Placement of a well screen in a bedrock well is neither necessary or desirable. The purpose of a well screen is outlined on page 395 of Driscoll's 1986 edition of Groundwater and Wells. This book is the definitive text on well construction. Per Driscoll, "A well screen is a filtering device that serves as the intake portion of wells constructed in UNCONSOLIDATED aquifers" (emphasis added). Bedrock aquifers in the Piedmont are certainly consolidated, otherwise we could drill in them with earth augers.

4. The well schematic that you have sent to Mr. Perry is the type of well utilized in the regolith portion of the Piedmont Aquifer System and in the Coastal Plain where unconsolidated materials require the presence of a well screen to keep the borehole open. A filter (sand pack) is placed around the screen in the annular space to act as a filter to prevent the entrance of formation materials into the well through the screen. I refer you to Campbell and Lehr, 1973, Water Well Technology, Chapter 11, pg 239 for well construction in consolidated formations.

5. I have reviewed the well construction methods employed on this project, have consulted with the drill crew and reviewed your letter. Based on the field logs, a bentonite seal was placed above the filter pack in shallow well MW-3. I have included an amended well record for this well.

⑥ The items you refer to as potential problems in an openhole well (paragraph 3 of page 2) cannot be substantiated and the possibility of their occurrence certainly would not be lowered or eliminated by the presence of a well screen. Remember that by using the two step well construction method, we have completely eliminated the hydraulic connection between the shallow regolith aquifer and the bedrock system.

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monitoring wells.
+ limited
this -

Good!
never the
amended well
record was not
included.

Wrong!

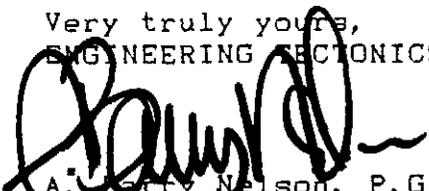
7. If you still are having problems with bedrock wells constructed in this manner, I suggest that you contact the regional hydrologists with the Division of Environmental Management's Groundwater Section located in the Piedmont and Mountain areas of our state (Don Link of the Asheville Office is available at 704-251-6208). Not only are they familiar with this type of construction, they endorse its use.

8. Based on discussions with Mr. Ernest Perry, we are standing by our well design and installation and request that you reconsider your instructions for abandonment of these wells.

9. Your suggestion to the County that we have constructed wells that may serve as conduits of contamination is inaccurate and we believe may be based on a lack of experience with bedrock well construction techniques in the Piedmont. We trust that after further review and consideration, you will reconsider your instructions for abandonment of these wells.

Should you have any questions or desire additional information, please contact us.

Very truly yours,
ENGINEERING TECTONICS, P.A.


A. Terry Nelson, P.G.
Chief Hydrologist

cc: Gordon Layton
Bill Meyer
Jim Coffey
Terry Waddell
Don Link
Ernest Perry



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

September 12, 1989

Mr. Ernest Perry
Alamance County Health Department
209 N. Graham-Hopedale Road
Burlington, N.C. 27215

Re: Well Completion Records for the Alamance County Landfill
(Permit #01-01)

Dear Mr. Perry,

Our office has received Well Completion Records for four monitoring wells recently installed at the Alamance County Landfill. Upon reviewing these records, we found that the monitoring wells were not constructed according to the design specifications required by our office. Three of the wells were not constructed in a manner consistent with the recommendations of the June 1, 1988, letter from our office, or in a manner conforming to the specifications of the "North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities".

It is of critical importance that all monitoring wells be constructed in accordance with the approved specific monitoring well construction requirements found in the "Guidance Document". Our office generally requires that owner/operators of sanitary landfill facilities submit a "ground-water monitoring plan" to us for approval prior to well installation. This enables our staff to evaluate the monitoring plan and make modifications if they are needed. This procedure eliminates potential problems such as those that appear to have occurred at your facility.

If the Well Construction Records submitted to our office are correct, monitoring wells MW-2, MW-3, and MW-4 are not constructed in a manner that is approved for ground-water monitoring purposes. The wells constructed do not meet our design criteria for the following reasons:

1. The shallow well, MW-3, does not have a bentonite seal.
2. The deep wells, MW-2 and MW-4, do not have bentonite seals, and these wells are not completely cased. The deep wells should have been cased for the full length of the well, and screens, gravel packs, and bentonite seals installed as per The Typical Ground-water Monitoring Well Schematic on page 2 of the "North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities." Proper placement of the screens is also of critical importance.

The lack of a bentonite seal in these wells may allow the migration of contaminants to the sampling zone from the surface or intermediate zones or allow cross contamination between strata. There is also the possibility of contamination from the grout itself. This raises the pH, which changes the ground-water chemistry, which changes the way metals and certain organic constituents react and move in the ground-water.

The lack of completely cased boreholes in the deep wells introduces a host of potential problems. In addition to the difficulties associated with the lack of a bentonite seal, it is difficult to sample the well. Contamination may enter from any part of the well, making it impossible to determine where the contamination is migrating from. Dilution and volatilization of the contaminants is also possible. If contamination is present, the open well provides an channel for the rapid spread of contamination to other zones, particularly deeper fracture zones.

Wells MW-2 , WM-3, and MW-4, as constructed, are not suitable for ground-water monitoring purposes. Even more importantly, wells MW-2 and MW-4 may provide a path for rapid migration of contaminants. Therefore, our office recommends that these wells be immediately abandoned according to approved well abandonment procedures (refer to NCAC T15: 02C .0113, except that wells should not be chlorinated).

The location and design of replacement wells should be approved by our office prior to well installation. If you have any questions or comments, please contact our office at (919) 733-0692.

Sincerely,

Bobby Lutfy

Bobby Lutfy
Hydrogeological Technician
Solid Waste Section
Solid Waste Management Division

cc: Jim Coffey
Terry Waddell

Attachments

ALAMANCE COUNTY HEALTH DEPARTMENT

Graham-Hopedale Road
Burlington, North Carolina 27215-2971
Phone Number 227-0101

BOARD OF HEALTH

Alexander F. Alexander, D.D.S.
Cary D. Allred, County Commissioner
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Rebecca Clemmons, R.N.
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Carl M. Sellars, D.V.M.
Grace M. Whitted

Tim Green, M.P.A.
Health Director

September 8, 1989

Mr. Bobby Lutfy
Hydrogeological Technician
Solid Waste Branch
P. O. Box 27687
Raleigh, NC 27611-7687



Re: Letter of August 2, 1989

Dear Mr. Lutfy:

Enclosed is the information requested in the above mentioned letter. Also enclosed is a copy of the lab reports for 1989 monitoring wells and stream sampling.

Sincerely,

A handwritten signature in cursive script that reads "Ernest C. Perry".

Ernest C. Perry, R.S., Director
Environmental Health Section

ECP:bj
Enc.



North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

August 2, 1989

Mr. Ernest Perry
Alamance County Health Department
209 N. Graham-Hopedale Road
Burlington, N.C. 27215

Re: Documentation for Ground-water Monitoring Wells at the Alamance
County Landfill (Permit #01-01)

Dear Mr. Perry,

Upon a recent review of our files, our office found that we do not have sufficient documentation on the ground-water monitoring wells at the Alamance County Landfill. Within the next 30 days would you please provide our office with the following information:

1. A map (preferably 8 1/2" x 11") delineating the entire landfill and adjacent property owned (or leased) by you. This map should clearly show the location of the landfill with respect to the entire property.
2. A specific site map of the landfill itself illustrating the configuration of the landfill per the original permit description. On this map also indicate the following:
 - a. Areas of past landfilling activity
 - b. Area of present landfilling activity
 - c. Area of proposed future landfilling activity
 - d. Areas of demolition waste landfilling
 - e. Locations of existing monitoring wells; Each well should be numbered on the map (e.g. MW-1; MW-2; etc.) in a manner corresponding to the designations of the wells in the field.
3. Complete and accurate Well Completion Records (DHS 3342) for all ground-water monitoring wells. These records should clearly indicate the following:

- a. Well construction specifications pertaining to inner/outer casing diameter
- b. Borehole depth
- c. 24-hour water table elevations
- d. Screen length
- e. Screen slot size
- f. Vertical extent of screen (e.g. where the screen is placed in the aquifer).
- g. All other data required on well construction forms as specified in the "N.C. Water Quality Monitoring Guidance Document for Solid Waste Facilities".

In addition, please submit to us a summary of the hydro-geological data accumulated for the landfill site from the boring operation. Include boring logs and other pertinent subsurface information. Also, designate in writing to this office the name of the contractor you have chosen to perform your annual ground and surface water monitoring extractions, and the date on which you plan to perform your annual sampling.

If you have questions or comments please contact this office at (919) 733-0692.

Sincerely,

Bobby Lutfy

Bobby Lutfy
Hydrogeological Technician
Solid Waste Branch
Solid Waste Management Section

BL

cc: Mike Babuin
Terry Waddell

Attachment



*Recd
5-23-88
copy to [unclear]
man 5-23-88*

North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

May 16, 1988

Mr. Robert Smith, County Manager
Alamance County
124 West Elm St.
Graham, N.C. 28234

RE: Alamance County Sanitary Landfill
Amendment to Permit No. 01-01

Dear Mr. Smith:

Enclosed is an amended Solid Waste Permit, a Certified Copy, and the revised Conditions Of The Permit for the referenced facility.

Please note the revised conditions of the permit, specifically Condition No. 5, concerning construction, and Condition No. 6 concerning ground water monitoring requirements.

Please revise the construction plan to indicate the relocated ground-water monitoring wells following verification in the field of those locations by Solid Waste personnel.

If there are any questions please contact me at (919) 733-0692.

Sincerely,

A handwritten signature in cursive script that reads "James C. Coffey".

James C. Coffey, Environmental Engineer
Solid Waste Branch
Solid Waste Management Section

JCC/mj

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LANDFILL EXTENSION SITE

PROPOSED FINAL CONTOURS

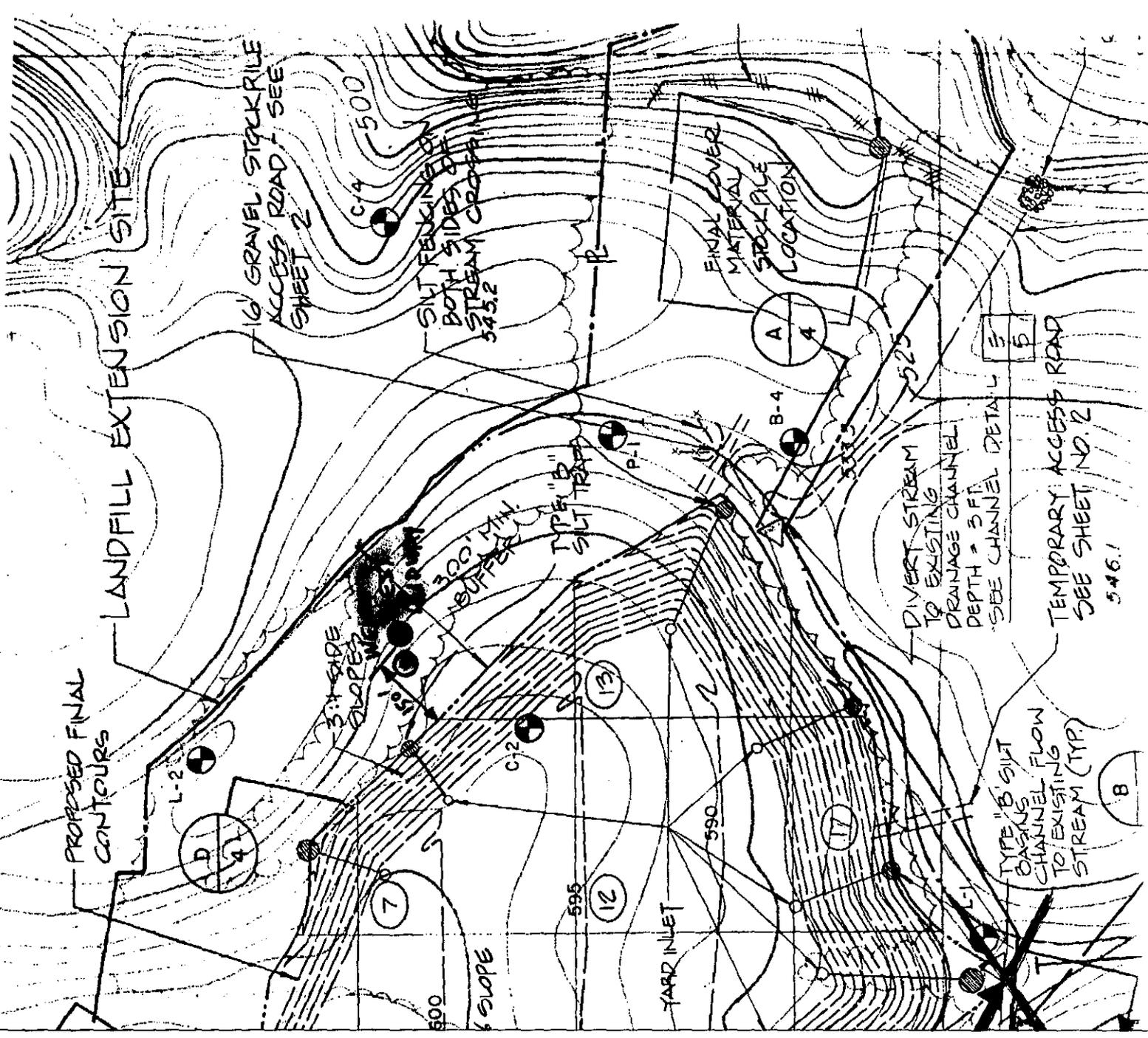
GRAVEL STOCKPILE ACCESS ROAD - SEE SHEET 2

SILT FENCING ON BOTH SIDES OF STREAM CROSSLING 543.2

FINAL COVER MATERIAL STOCKPILE LOCATION

DIVERT STREAM TO EXISTING DRAINAGE CHANNEL DEPTH = 3 FT. SEE CHANNEL DETAIL

TEMPORARY ACCESS ROAD SEE SHEET NO. 2 546.1



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SEE CHANNEL

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AMENDMENT TO PERMIT NO. 01-01

DATE ISSUED 5/16/88

STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES

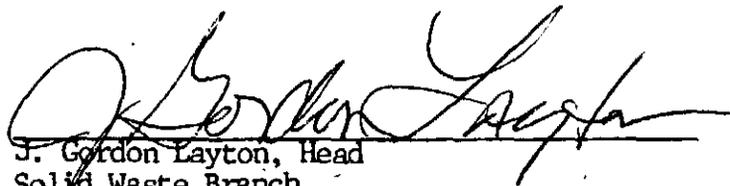
P. O. Box 2091 Raleigh, NC 27602

S O L I D W A S T E P E R M I T

ALAMANCE COUNTY

Is hereby issued a permit to operate a
Sanitary Landfill
located
off S.R. 2164

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 of the site on the attached sheet.



J. Gordon Layton, Head
Solid Waste Branch
Solid Waste Management Section

Property Description of Proposed Alamance County Landfill

Being all that tract of land located in Alamance County, North Carolina, and described as follows:

BEGINNING at an iron stake on the east side of Paris Road (S.R.2164) in the southern boundary line of Dillard Paris, running thence south 77 deg. 11' 31" east 597.12 feet to an iron stake; running thence south 77 deg. 15' 56" east 858.00 feet to an iron stake; running thence south 01 deg. 20' east 52.84 feet to a rock; running thence south 84 deg. 27' 11" east 201.78 feet to an iron stake; running thence with the center line of a branch south 39 deg. 32' 50" east 280.50 feet; running thence south 44 deg. 17' 50" east 211.20 feet; running thence south 40 deg. 02' 50" east 103.62 feet; running thence south 23 deg. 02' 50" east 54.12 feet; running thence south 51 deg. 32' 50" east 95.04 feet; running thence south 37 deg. 17' 50" east 140.58 feet; running thence south 22 deg. 02' 50" east 132 feet; running thence south 19 deg. 02' 50" east 69.96 feet to a point; running thence south 82 deg. 00' 10" east 18 feet to an iron stake; running thence south 82 deg. 00' 10" east 593.70 feet to an iron stake; running thence south 82 deg. 00' 10" east 20 feet to the center line of Haw Creek; running thence with the meanders of Haw Creek north 00' 10' 40" west 216.59 feet; running thence north 24 deg. 23' 28" east 78.68 feet; running thence south 61 deg. 29' 36" east 279.14 feet; running thence south 74 deg. 37' east 151.36 feet; running thence south 89 deg. 34' 38" east 342.00 feet; running thence south 44 deg. 35' 50" east 55.14 feet; running thence south 12 deg. 34' 50" east 194.00 feet; running thence south 21 deg. 21' 47" west 136.68 feet; running thence south 33 deg. 58' 50" east 88.78 feet; running thence north 73 deg. 48' 11" east 109.05 feet; running thence north 38 deg. 58' 51" east 139.70 feet; running thence north 40 deg. 37' 10" east 277.53 feet; running thence north 32 deg. 58' 35" east 144.73 feet; running thence north 41 deg. 09' 14" east 304.66 feet; running thence north 34 deg. 56' 06" east 204.04 feet; running thence north 50 deg. 24' 15" east 133.19 feet; running thence north 22 deg. 39' 31" east 137.37 feet; running thence north 14 deg. 40' 46" east 193.60 feet; running thence north 40 deg. 31' 22" east 223.58 feet; running thence north 63 deg. 36' 14" east 66.40 feet; running thence south 70 deg. 31' 10" east 26.88 feet; running thence south 38 deg. 46' 10" east 221.32 feet; running thence south 16 deg. 44' 15" east 110.21 feet; running thence south 09 deg. 43' 33" west 443.75 feet; running thence south 16 deg. 41' 19" east 120.43 feet; running thence south 68 deg. 03' west 118.80 feet to an iron stake in the boundary line with Wilbour D. Adams; running thence south 09 deg. 57" east 530.48 feet to an iron stake; running thence south 17 deg. 21' 38" west 321.21 feet to an iron stake; running thence south 17 deg. 40' 10" west 212.25 feet to an iron stake in a rock; running thence south 05 deg. 39' 17" west 497.88 feet to an iron stake; running thence south 06 deg. 06' 31" west 625.90 feet to an iron stake; running thence south 06 deg. 08' 10" west 210.30 feet to an iron stake; running thence south 05 deg. 55' west 212.61 feet to an iron stake; running thence south 80 deg. 47' 59" west 433.52 feet to an iron stake; running thence north 50 deg. 15' 51" west 227.18 feet to a 23 inch diameter hickory tree; running thence north 53 deg. 19' 41" west 702.58 to an iron stake; running thence north 68 deg. 04' 16" west 1083.76 feet to an iron stake; running thence north 68 deg. 04' 16" west 46.61 feet to the center line of Haw Creek; running thence with the meanders of Haw Creek north 10 deg. 18' 12" east 254.14 feet; running thence north 03 deg. 04' 02" east 153.72 feet; running thence north 01 deg. 57' 06" west 184.12 feet; running thence north 15 deg. 52' 38" east 106.14 feet; running thence north 55 deg. 24' 22" west 22.44 feet to an iron stake; running thence north 55 deg. 24' 22" west 749.56 feet to an iron stake; running thence south 65 deg. 36' 00" west 847.53 feet to an iron stake; running thence north 80 deg. 27' 31" west 667.61 feet to an iron stake; running thence

S O L I D W A S T E P E R M I T

CONDITIONS OF PERMIT:

1. This permit shall not be effective unless the certified copy is filed in the Register of Deeds Office, in the grantor index under the name of the owner of the land in the county or counties in which the land is located. After recordation, the certified copy shall be returned to the Solid Waste Branch and shall have indicated on it the page and book number, date of recordation, and Register's seal.
2. When this property is sold, leased, conveyed or transferred, the deed or other instrument of transfer shall contain in the description section in no smaller type than that used in the body of the deed or instrument a statement that the property has been used as a sanitary landfill.
3. The following requirements shall be met prior to receiving solid waste at the site:
 - a. Site preparation shall be in accordance with the construction plan.
 - b. Site inspection shall be made by a representative of the Division of Health Services.
 - c. The permit number and the words "NO HAZARDOUS, LIQUID WASTE OR INFECTIOUS WASTE ACCEPTED" shall be posted on an entrance sign.
4. This solid waste disposal site is permitted to receive solid waste as defined in 10 NCAC 10G, .0101(36), except that hazardous waste, liquid waste and any other wastes that may pose a threat to the environment or public health are prohibited from disposal at this site.
5. This permit is for construction according to the attached plans with the following conditions:
 - a. The construction plan is approved for a period not to exceed five years from the date of issuance or until subsequent solid waste management rules supercede the conditions of the permit.
 - b. If excavation results in the exposure of a moderately permeable area, that area will be scarified and a minimum of 3' of well-compacted, low permeability soil will be emplaced as necessary.

Additional conditions and revisions of the approved plans shall be approved by the North Carolina Solid Waste Branch.

6. Ground water monitoring wells and monitoring requirements:
 - a. Two well nests and one shallow well shall be installed at revised locations as shown on construction plans.
 - b. Installation shall conform to DHS well standard (Attachment 1).
 - c. A well completion record shall be submitted to DHS for each monitoring well constructed (Attachment 2) within 30 days upon completion.

CONDITIONS OF PERMIT

Page 2

- d. The location of the monitoring wells shall be physically located in the field and approved by DHS prior to the well being constructed.
 - e. For new site locations, ground water monitoring wells shall be constructed and sampled prior to the acceptance of any waste at the landfill and conform to specifications outlined in the N.C. Water Quality Monitoring Guidance Document for Solid Waste Facilities. Complete specifications are delineated in this document which is available from DHS.
 - f. Surface water sampling shall be performed at the locations specified on the construction plans as per methods outlined in the above-referenced Guidance Document.
 - g. Alamance County shall sample monitoring wells and surface waters, semi-annually, for the first year and annually thereafter as per the above-referenced Guidance Document.
 - h. A readily accessible unobstructed path shall be initially cleared and maintained so that four-wheel drive vehicles may access the monitoring wells at all times.
7. This facility shall conform to operating procedures in Rule .0505 of the Solid Waste Management Rules.
 8. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L (Attachment 3).

AMENDMENT TO PERMIT NO. 01-01

DATE ISSUED 5/16/88

STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES

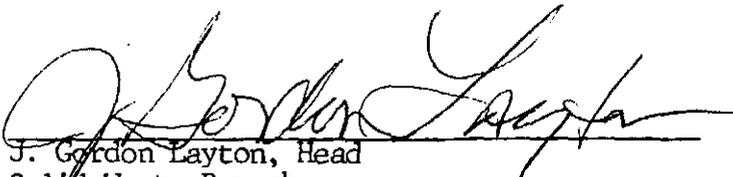
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J. Gordon Layton, Head
Solid Waste Branch
Solid Waste Management Section

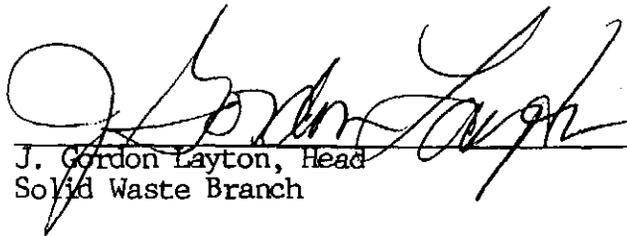
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CERTIFIED COPY OF SOLID WASTE PERMIT

I do hereby certify that the attached PERMIT is an exact and true copy of Permit No. 01-01

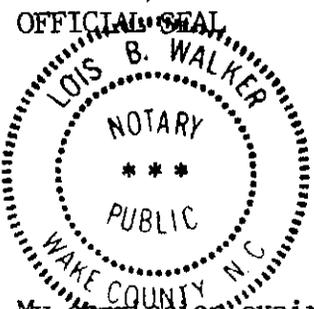


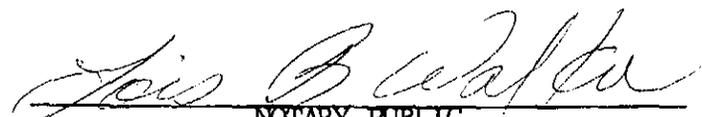
J. Gordon Layton, Head
Solid Waste Branch

North Carolina
Wake County

I, Lois B Walker, a Notary Public for said County and State, do hereby certify that J. Gordon Layton, Head, Solid Waste Branch personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 17th day of May, 1988.





NOTARY PUBLIC

My commission expires 1-29, 1990.

S O L I D W A S T E P E R M I T

CONDITIONS OF PERMIT:

1. This permit shall not be effective unless the certified copy is filed in the Register of Deeds Office, in the grantor index under the name of the owner of the land in the county or counties in which the land is located. After recordation, the certified copy shall be returned to the Solid Waste Branch and shall have indicated on it the page and book number, date of recordation, and Register's seal.
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 8. Ground water quality at this facility is subject to the classification and remedial action provisions of 15 NCAC 2L (Attachment 3).



North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

August 4, 1987

MEMORANDUM

TO: Perry Nelson, Chief Ground-Water Section
Division of Environmental Management

FROM: Paula Byrd, Solid Waste Unit
Solid & Hazardous Waste Management Branch

SUBJECT: Analytical results from Alamance County Landfill Solid Waste
Facility #01-01.

Per the MOA dated June 4, 1987 between NRCD and DHR, enclosed are copies of recent analytical results from the above referenced facility that may indicate contravention or potential contravention of ground-water standards. If any additional information is required please advise.

PDB/mj/6369pg5

cc: R.C. Smith, Alamance County Manager
Terry Waddell
Julian Foscue
✓Michael Babuin

ALAMANCE COUNTY HEALTH DEPARTMENT

Graham-Hopedale Road
Burlington, North Carolina 27215-2971
Phone Number 227-0101

BOARD OF HEALTH

Leonard Alcon, County Commissioner
Anna Bass, M.A.
Rebecca Clemmons, R.N., Chairperson
Donald B. Covert, O.D. F.A.A.O., Vice-Chairperson
Jerry B. Kennedy, R.Ph.
M. Elmo McCorkle, R.Ph.
David Patterson, D.D.S.
Carl M. Sellars, D.V.M.
Kenneth Teague
Robert W. Van Dalen, M.D.
Grace Whitted

Tim Green, M.P.A.
Health Director

August 12, 1987

Memorandum

To: Mike Babuin, P.G.
Solid Waste Hydrogeologist

From: Ernest C. Perry, R.S., Director
Environmental Health Section

Subj.: Ground-Water Monitoring Schedule

Tentative date for sampling ground water monitoring wells at landfill
is April 30 each year.

Please forward a copy of the recommended limits for ground water at landfills.

ECP:bj

cc: Robert Smith
Tim Green

To: Ernest Perry

Carolina Department of Human Resources
Division of Health Services
Box 2091 • Raleigh, North Carolina 27602-2091

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D

Ronald H. Levine, M.D., M.P.H.
State Health Director

August 3, 1987

MEMORANDUM

TO: All Applicable Counties
FROM: Michael L. Babuin, P.G. *MLB*
Solid Waste Hydrogeologist
Solid & Hazardous Waste Management Branch
Environmental Health Section
SUBJECT: Second Notice: Ground-Water Monitoring Schedule.

To date, our records indicate that this office has not received written confirmation regarding a designated annual sampling date for your ground water monitoring wells (and surface water monitoring stations) per page 12 of the "North Carolina Water Quality Monitoring Guidance Document For Solid Waste Facilities". This notification was due July 1, 1987. The above referenced document and an accompanying explanatory letter from William L. Meyer, Branch Head at this office was mailed March 31st of this year to all county managers. An extension shall be granted until September 1, 1987 without further action. Please address all correspondence to the Solid Waste Hydrogeologist at this office.

MLB/mj

RECEIVED
COUNTY
CLERK
AUG 7 1987
9:46

File

ALAMANCE COUNTY HEALTH DEPARTMENT

Graham-Hopedale Road
Burlington, North Carolina 27215-2971
Phone Number 227-0101



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Health Director

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July 8, 1987

Mr. Bill Meyers, Head
Solid & Hazardous Waste Branch
Division of Health Services
P.O. Box 2098
Raleigh, N.C.

Re: 10NCAC 10G .0507

Dear Mr. Myers:

We are currently excavating dirt at the front of the landfill property. When the excavation has been completed, we would like to use this area for the disposal of non-garbage items such as wooden pallets, tires, construction wastes, tree stumps, roofing shingles, etc.. We would like to cover this material on a monthly basis or more often should the disposal area become too large. Funds for fencing the area have been encumbered.

A map of the landfill showing the wells in this area is enclosed.

I would appreciate your approving this request at your earliest convenience.

Sincerely,

Ernest C. Perry, R.S., Director
Environmental Health Section

ECP:jp

cc: Robert Smith, County Manager



North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

September 1, 1987

Alamance County Health Department
Graham-Hopedale Road
Burlington, N.C. 27215
Attn: Mr. Ernest C. Perry

RE: Demolition area, Alamance County Sanitary Landfill, Permit #01-01

Dear Mr. Perry:

The proposed demolition areas in the northwestern portion of the referenced landfill have been reviewed. The northern portion, shaded in blue on the accompanying map is approved for use. The adjacent area to the south, shaded in yellow is approved under the following conditions:

- (1) Disposal will be confined to an area no closer than 300' from the southern property boundary and 100' from the western property boundary (see map)
- (2) A ground water monitoring well will be installed at the location indicated on the map and sampled in accordance with the N.C. Water Quality Monitoring Document.

The demolition areas must be operated in accordance with 10 NCAC 10G, Section .0507 of the Solid Waste Rules.

In addition, demolition waste must be covered with an adequate layer of soil on a monthly basis or when the disposal area exceeds one acre in size.

If there are any questions, please contact me at (919) 733-2178.

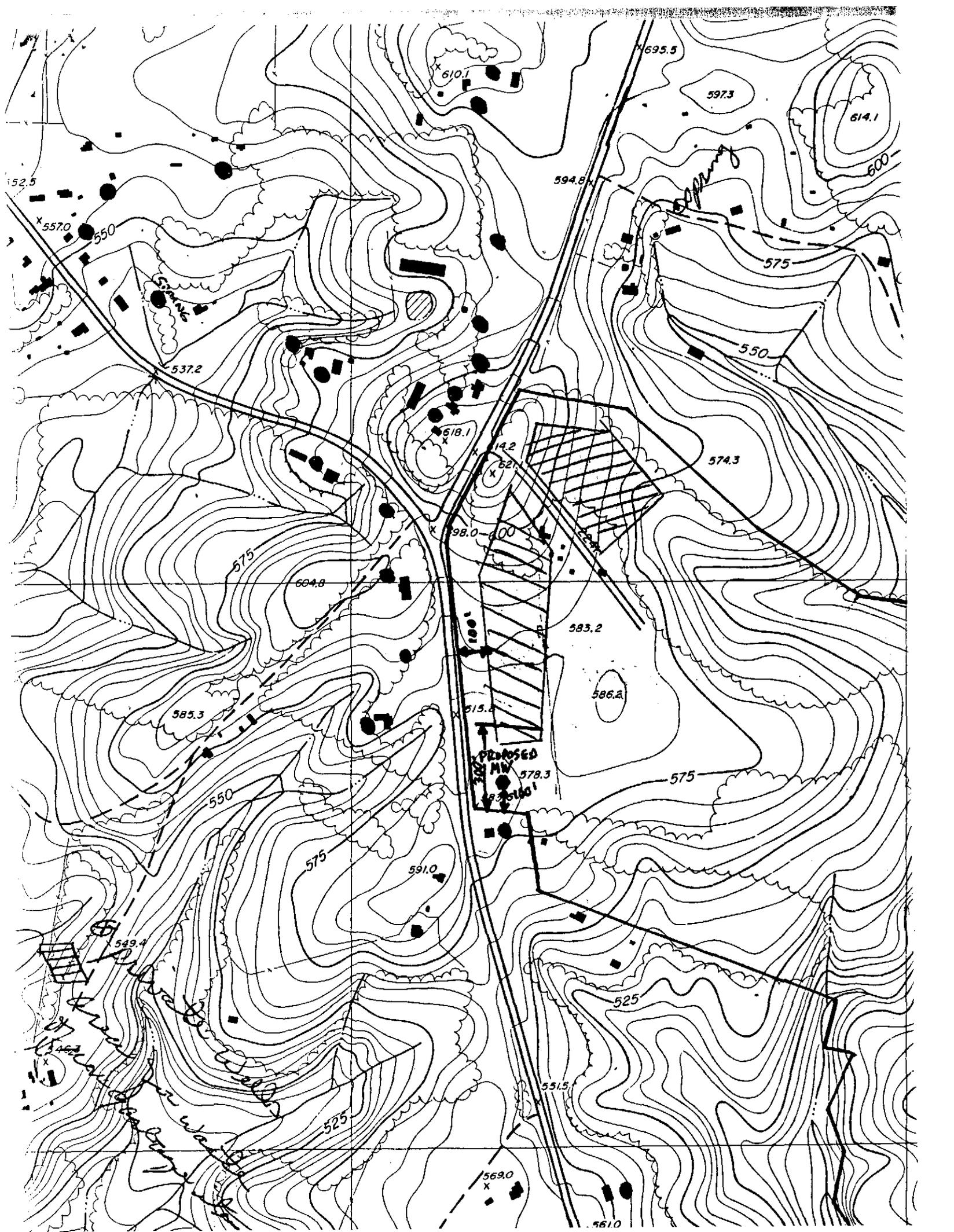
Sincerely,

A handwritten signature in cursive script that reads "James C. Coffey".

James C. Coffey, Environmental Engineer
Solid & Hazardous Waste Management Branch
Environmental Health Section

JCC/mj

cc: Terry Waddell
Julian Foscue





North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
Phillip J. Kirk, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

February 9, 1987

Ernest Perry
Alamance County Landfill
Graham-Hopedale Rd
Burlington, NC C-28215

NOTICE OF DEFICIENCY: Regarding ground-water monitoring wells at Alamance County Landfill.

Dear Mr. Perry:

A recent inspection at the above referenced facility indicates the following problems associated with the operation and subsequent maintenance of the existing ground-water monitoring wells.

1. Rusted lid(s) for the outer casing.
2. Occurance of unknown solvent or grease placed within the well on the PVC threads of the inner casing.
3. Absence of lock(s) to secure well caps.

Because these problems significantly influence and affect the integrity and validity of the analytical results, it is of the utmost importance that these deficiencies be corrected as soon as possible. Your prompt attention to this matter is greatly appreciated.

Yours sincerely,

Tom Will

Tom Will, Hydrogeological Technician
Solid & Hazardous Waste Management Branch
Environmental Health Section

TW/mj/6213pg12

cc: M.L. Babuin



North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
Phillip J. Kirk, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director
919/733-3446

June 30, 1986

MEMORANDUM

TO: J. Gordon Layton

FROM: M.L. Babuin *MLB*

SUBJECT: Deficiencies in Well Construction Associated with the
Alamance County Landfill Groundwater Monitoring Wells

This landfill is divided into an older partially filled area and a newer, somewhat larger expansion. The older part of the landfill has three monitoring wells while the expansion has two. These five wells have the following similarities: (1) they are all cased with 2" PVC pipe, (2) range from approximately 15 to 30 feet in depth, and (3) are seasonally dry during summer months.

The following problems are associated with this facility:

1. Locks were absent from every well cap.
2. All caps were rusted-on, i.e., inside of well cap contained large quantities of rust which were accessible directly to the aquifer.
3. The PVC cap was absent on one well and in another was replaced by a rag stuffed-in from the top.
4. Two wells were installed with the angle iron collar supports welded in to the stick-up above the concrete collar not within the concrete; therefore, the entire stick-up could be yanked out of the ground.
5. One well was installed without a concrete collar, i.e., easy removal of stick-up.