1107gw040302 11-07

CDM
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Raleigh, North Carolina 27612
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APR 2002

April 1, 2002

Mr. Bobby Lutfy
Solid Waste Section
Division of Waste Management
401 Oberlin Road
Suite 150
Raleigh, North Carolina 27605

Fac/Perm/Co ID #	Date	Doc ID#
BC	7/15/01	DIN

Subject: Monitoring Well Installation and Initial Baseline Sampling Report
Buncombe County Subtitle D Landfill Cells 4&5

Dear Mr. Lutfy:

The purpose of this letter is to notify the Solid Waste Section (SWS) that monitoring wells MW-10/10d and MW-11/11d have been installed down gradient of the recently completed Cells 4 & 5 sumps at the Buncombe County Subtitle D landfill. The wells were installed in accordance with the approved Water Quality Monitoring Plan for Cells 4 & 5, which was revised in February 2000.

Well Installation

The wells were installed on March 5 and 6, 2002 by Rueben Caldwell Well Drilling, Inc., under supervision of a CDM geologist. The wells were drilled with a Tamrock, air rotary drill rig. During drilling, whenever a zone of damp cuttings or fractures was noted, drilling was stopped for a period of 5 to 10 minutes to check for accumulated water in the borehole. Drilling was terminated in areas that produced water and the wells were set accordingly.

All of the wells were constructed of 2-inch schedule 40 PVC with 10 or 15 feet of 0.010 inch slotted screen. All of the 4 new wells are screened in bedrock and bracket water-bearing fractures. A well construction summary table for MW-10, -10d, -11, and –11d is presented on Table 1. Boring logs and well construction records are included in Appendix A.

Following installation of the wells, each well was developed and fitted with an above grade steel protective riser. Groundwater samples were collected from each well on March 8, 2002 and submitted to Paradigm Analytical Laboratories in Wilmington, North Carolina for analysis of the North Carolina Appendix I VOC's by EPA Method 8260 and Appendix I metal constituents by EPA Method 6010. The wells were surveyed to State Plane coordinates by Hutchinson Biggs & Associates on March 7, 200. Monitoring well locations along with potentiometric contours from water level data collected on March 7, 2001 are presented on Figure 1. Groundwater elevation data is provided on Table 2.

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Initial Sampling Results
Samples were analyzed for Appendix I VOC and metal constituents. All of the samples were below detection limits for the Appendix I VOC's. MW-10 had detections of chromium at 0.0162 milligrams per liter (mg/l) and cobalt at 0.0181 mg/l. The North Carolina 2L Standard for chromium is 0.050 mg/l. There is no 2L Standard for cobalt, but the Groundwater Protection Standard is 0.002 mg/l. MW-10d had detections of cadmium at 0.0015 mg/l and chromium at 0.0119 mg/l. The 2L Standard for cadmium is 0.005 mg/l. Because these are newly installed wells, the detected metal concentrations are likely due to suspended soil particles in the sample. Further removal of suspended particles will be accomplished during purging for future sampling events.

The samples from MW-11 and MW-11d were below detection limits for the Appendix I metal constituents. Sampling results along with field measurements of pH, temperature, and conductivity for MW-10,-10d, -11, and –11d are presented on Table 3.

For QA/QC purposes, a duplicate sample and a trip blank were also submitted for analysis. The duplicate sample was collected from MW-11d and was analyzed for the Appendix I VOC's and metals. The trip blank was analyzed for VOC's only. All results were below detection limits. Complete laboratory results are included in Appendix B.

The wells will be slug tested prior to the next baseline-sampling event. The slug test data will be forwarded to the SWS shortly there after. Three additional samples will be collected over the next six months from each of the new wells to establish a baseline for each well. Following receipt and statistical analysis of all of the baseline data, a Baseline Sampling Report will be forwarded to the SWS.

I hope that this initial information is sufficient for the County to receive the Permit to Operate in Cells 4 & 5. If you have any questions or need additional information, please call me.

Very truly yours,

Tim Grant

Timothy D. Grant, P.G.
Principal
Camp Dresser & McKee

NORTH CAROLINA LICENSED SEAL 412 GEOLOGIST TIMOTHY DAVID GRANT

Timothy D. Grant
4-1-02

xc: Bob Hunter, Buncombe County
William Sessoms, SWS

Table 1
Well Construction Summary
Buncombe County Subtitle D Landfill
Cells 4&5 Initial Groundwater Sampling

Monitoring Well Designation	TOC Elevation (MSL)	Ground Elevation (MSL)	Depths (feet below ground surface)				Borehole Diameter (inches)	Casing Diameter (inches)	Date of Construction	(feet above mean sea level) Elevation	
			Total Borehole Depth	Screen Interval	Sand Filter Interval	Bentonite Seal Interval				Top of Screen Interval	Bottom of Screen Interval
MW-10	2010.54	2007.44	73.0	58.0-73.0	56.0-73.0	54.0-56.0	6	2.0	3/6/02	1949.44	1934.44
MW-10d	2010.56	2007.16	115.0	100.0-115.0	98.0-115.0	96.0-98.0	6	2.0	3/6/02	1907.16	1892.16
MW-11	1966.71	1964.01	50.0	35.0-50.0	33.0-50.0	31.0-33.0	6	2.0	3/5/02	1929.01	1914.01
MW-11d	1966.15	1963.35	70.0	60.0-70.0	58.0-70.0	56.0-58.0	6	2.0	3/5/02	1903.35	1893.35

NOTES:

MSL - Mean Sea Level
D - Deep

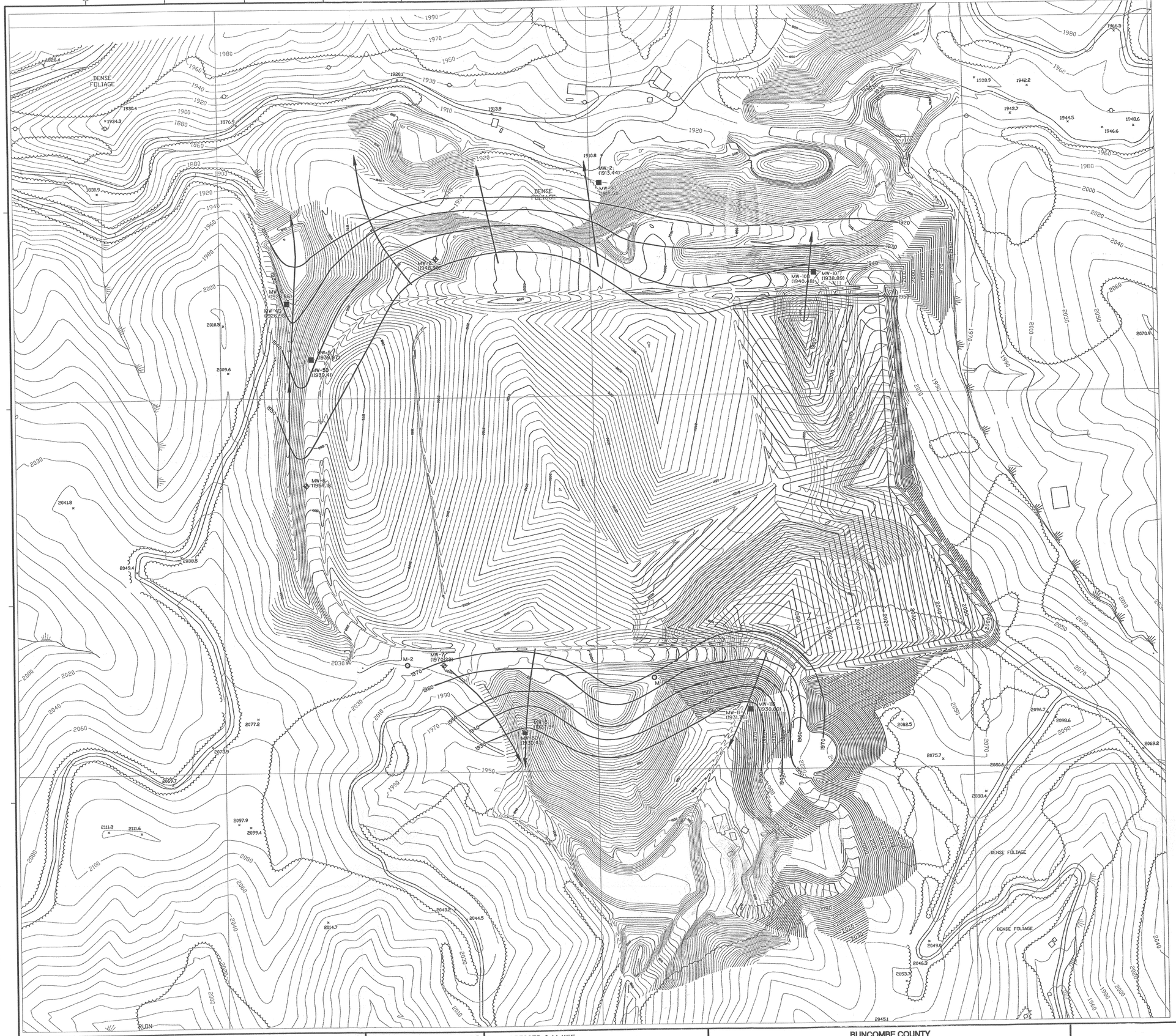
Table 2
Groundwater Elevations
Buncombe County Subtitle D Landfill
Cells 4&5 Initial Groundwater Sampling

Monitoring Well	TOC Elevation (msl)	GW Elevation 3/7/2002
MW-1	2021.22	1948.08
MW-1d	2021.57	1946.86
MW-2	1920.86	1913.44
MW-2d	1920.51	1912.51
MW-3	1987.66	1948.90
MW-4	1944.35	1928.86
MW-4d	1944.64	1926.96
MW-5	1979.12	1939.97
MW-5d	1979.92	1939.41
MW-6	1987.34	1954.18
MW-7	2022.83	1970.20
MW-8	1962.06	1927.94
MW-8d	1962.47	1930.43
MW-10	2010.54	1938.89
MW-10d	2010.56	1940.48
MW-11	1966.71	1931.78
MW-11d	1966.15	1930.60

Table 3
Field Parameters and Detected Constituents
Buncombe County Subtitle D Landfill
Cells 4&5 Initial Groundwater Sampling

Monitoring Well	Date	Field Parameters			Detected Metals		
		pH	Conductivity (msec/cm)	Temperature (C)	Cadmium (mg/l)	Chromium (mg/l)	Cobalt (mg/l)
MW-10	8-Mar-02	6.58	0.177	15.1	<0.001	0.0162	0.0181[1]
MW-10d	8-Mar-02	6.73	0.180	14.0	0.0015	0.0119	<0.01
MW-11	8-Mar-02	6.15	0.150	14.3	<0.001	<0.01	<0.01
MW-11d	8-Mar-02	6.50	0.142	14.4	<0.001	<0.01	<0.01
MW-11d (dup)	8-Mar-02	6.50	0.142	14.4	<0.001	<0.01	<0.01

[1] - Concentration exceeds Groundwater Protection Standard of 0.002 mg/l.



N

1" = 100'

50 0 100

LEGEND

MW-1	MONITORING WELL
MW-2 / MW-2D	MONITORING WELL CLUSTER
M-1	METHANE GAS WELL
(1939.73)	WATER LEVEL ELEVATION (FT. AMSL)
1950	WATER LEVEL CONTOUR (FT. AMSL) (DASHED WHERE INFERRED)
	GROUNDWATER FLOW DIRECTION

NOTES:
1. WATER LEVELS MEASURED 3/7/02
2. MW-1/MW-1D LOCATED EAST OF SITE

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	3/02	JSK	MC	ADDED MW-10/10D AND MW-11/11D LOCATIONS

DESIGNED BY: M. COLONE
DRAWN BY: J. KILLINGSWORTH
SHEET CHK'D BY: T. GRANT
CROSS CHK'D BY:
APPROVED BY:
DATE: MARCH 2002

CAMP DRESSER & McKEE

environmental engineers, scientists, planners, & management consultants

CDM

BUNCOMBE COUNTY
NORTH CAROLINA

BASELINE SAMPLING
BUNCOMBE COUNTY SOLID WASTE MANAGEMENT FACILITY

POTENTIOMETRIC CONTOUR MAP

PROJECT NO. 6447-CDMGEO
FILE NAME: PCM.DWG

SHEET NO.
FIGURE 1

PCM 03/20/02 17:28:58 1:43:28 Killingsworth/s

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LOG OF BORING

BORING **MW-10**
Page 1 of 1

Project Buncombe County Cell 4&5 MW In Location Buncombe County Subtitle D Landfill
Date Drilled 6-Mar-02 Drilling Co.: Reuben Caldwell Well Drilling
Total Depth 73 ft. bls Method Used: 6 in. Air Rotary
Inspector Mat Colone

Job #: 6447-35174
Water elev: dry

Depth (feet)	Sample No.	Blows/6" 140 lbs.	Sample Inter.	Recover (inches)	Org. Vap (ppm)	Sample Description	Strata Change	Remarks (time)
5								
10								
15								
20								
25								
30								
35						Mostly fill material, some boulders throughout profile. Natural ground at about 55 feet.		
40								
45								
50								
55								
60								
65								
70						Bedrock @ 68' bls **Terminate Boring @ 73' bls**	PWR Bedrock	

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WELL CONSTRUCTION SUMMARY

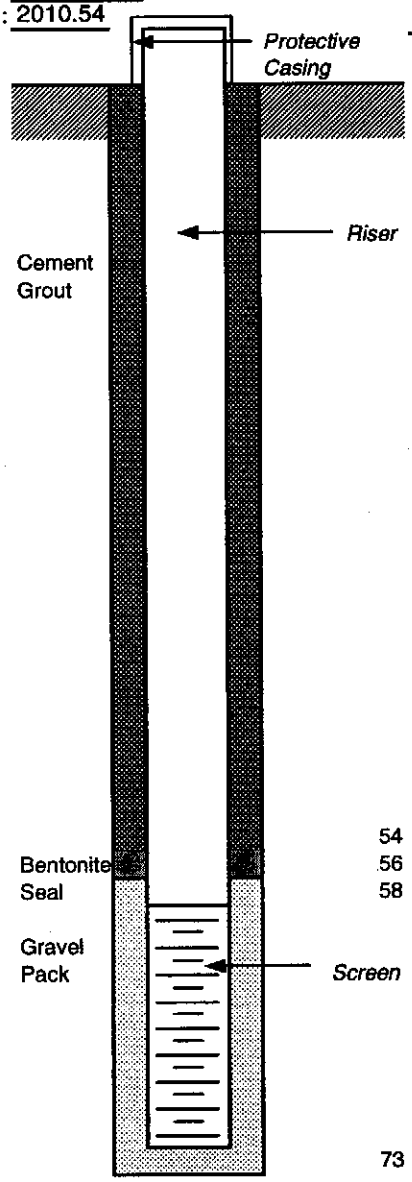
Project: Buncombe County Cell 4&5 MW Installation

Location: Buncombe County SubTitle D Landfill

Well No.: **MW-10**

TOC elev.: 2010.54

Type: *Monitoring Well*



DRILLING SUMMARY

Drilling Company:	Reuben Caldwell	Drillers:	Billie Nash
Drill Rig/Model:	TamRock D25K		
Borehole Diameters:	6 in	Drilling Fluid:	Air
Bits:	6-inch Air Hammer		
Total Depth:	73 ft.	Depth To Water:	71.65 ft. btoc (static)
Geologist:	Mat Colone		

WELL DESIGN

Casing Material:	Schedule 40 PVC	Diameter:	2-in.
Screen Size:	15 ft.	Diameter:	2-in.
Slot Size:	0.010-in.	Setting:	58 to 73 ft. bls
Filter Material:	#2 Filter Sand	Setting:	56 to 73 ft. bls
Seal Material:	3/8 in. bentonite pellet	Setting:	54 to 56 ft. bls
Grout:	type I portland cement	Setting:	0 to 54 ft. bls
Surface Casing Material:	Above Grade Steel		

TIME LOG

	Started	Completed
Drilling:	3/5/02	3/6/02
Installation:	3/6/02	3/11/02
Development:	3/7/02	3/7/02

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LOG OF BORING

BORING **MW-10d**
Page 1 of 1

Project Buncombe County Cell 4&5 MW In Location Buncombe County Subtitle D Landfill
Date Drilled 6-Mar-02 Drilling Co.: Reuben Caldwell Well Drilling
Total Depth 115 ft. bls Method Used: 6 in. Air Rotary
Inspector Mat Colone

Job #: 6447-35174
Water elev: 114' bls (0 hr)

Depth (feet)	Sample No.	Blows/6" 140 lbs.	Sample Inter.	Recover (inches)	Org. Vap (ppm)	Sample Description	Strata Change	Remarks (time)
10								
20								
30								
40								
50						Mostly fill material, some boulders throughout profile. Natural ground at about 55 feet.		
60								
70						Bedrock @ 68' bls	PWR Bedrock	
80								
90								
100								
110						Very competent bedrock, little fracturing to 115 feet. -Small fracture, damp cuttings **Terminate Boring @ 115 ft bls**		
120								
130								
140								

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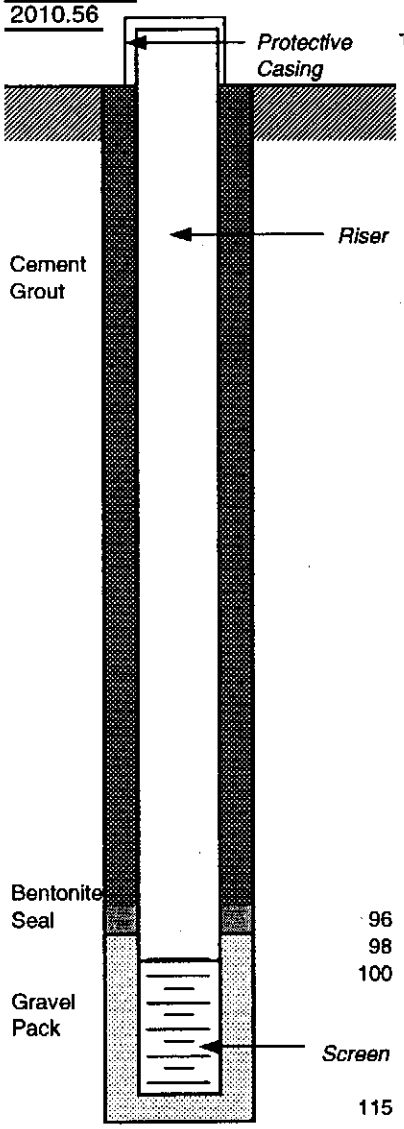
WELL CONSTRUCTION SUMMARY

Project: Buncombe County Cell 4&5 MW Installation

Location: Buncombe County SubTitle D Landfill

Well No.: **MW-10d**
TOC elev.: 2010.56

Type: *Monitoring Well*



DRILLING SUMMARY

Drilling Company:	Reuben Caldwell	Drillers:	Billie Nash
Drill Rig/Model:	TamRock D25K		
Borehole Diameters:	6 in	Drilling Fluid:	Air
Bits:	6-inch Air Hammer		
Total Depth:	115 ft.	Depth To Water:	70.08 ft. btoc (static)
Geologist:	Mat Colone		

WELL DESIGN

Casing Material:	Schedule 40 PVC	Diameter:	2-in.
Screen Size:	15 ft.	Diameter:	2-in.
Slot Size:	0.010-in.	Setting:	100 to 115 ft. bls
Filter Material:	#2 Filter Sand	Setting:	98 to 115 ft. bls
Seal Material:	3/8 in. bentonite pellet	Setting:	96 to 98 ft. bls
Grout:	type I portland cement	Setting:	0 to 96 ft. bls
Surface Casing Material:	Above Grade Steel		

TIME LOG

	Started	Completed
Drilling:	3/6/02	3/6/02
Installation:	3/6/02	3/11/02
Development:	3/7/02	3/7/02

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LOG OF BORING

BORING **MW-11**

Project Buncombe County Cell 4&5 MW In Location Buncombe County Subtitle D Landfill

Page 1 of 1

Date Drilled 5-Mar-02 Drilling Co.: Reuben Caldwell Well Drilling

Total Depth 50 ft. bls Method Used: 6 in. Air Rotary Job #: 6447-35174

Inspector Mat Colone Water elev: 49' bls

Depth (feet)	Sample No.	Blows/6" 140 lbs.	Sample Inter.	Recover (inches)	Org. Vap (ppm)	Sample Description	Strata Change	Remarks (time)
5								
10								
15								
20								
25						Saprolite/PWR to 24' bls.	Sap/PWR Bedrock	
30								
35								
40						Fracture @ 37' bls		
45								
50						Small fracture @ 49' bls **Boring Terminated @ 50' bls**		
55								
60								
65								

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WELL CONSTRUCTION SUMMARY

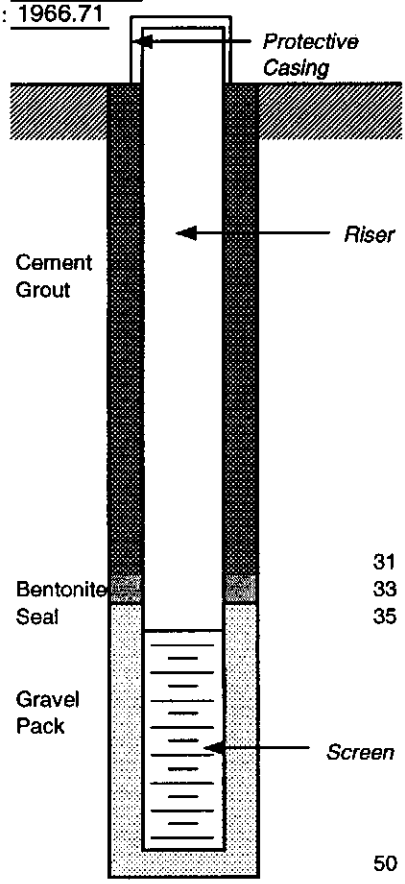
Project: Buncombe County Cell 4&5 MW Installation

Location: Buncombe County SubTitle D Landfill

Well No.: **MW-11**

TOC elev.: 1966.71

Type: *Monitoring Well*



DRILLING SUMMARY

Drilling Company: Reuben Caldwell
Drillers: Billie Nash
Drill Rig/Model: TamRock D25K
Borehole Diameters: 6 in
Drilling Fluid: Air
Bits: 6-inch Air Hammer
Total Depth: 50 ft.
Depth To Water: 34.93 ft. btoc (static)
Geologist: Mat Colone

WELL DESIGN

Casing Material:	Schedule 40 PVC	Diameter:	2-in.
Screen Size:	15 ft.	Diameter:	2-in.
Slot Size:	0.010-in.	Setting:	35 to 50 ft. bls
Filter Material:	#2 Filter Sand	Setting:	33 to 50 ft. bls
Seal Material:	3/8 in. bentonite pellet	Setting:	31 to 33 ft. bls
Grout:	type I portland cement	Setting:	0 to 31 ft. bls
Surface Casing Material:	Above Grade Steel		

TIME LOG

	Started	Completed
Drilling:	3/4/02	3/5/02
Installation:	3/5/02	3/11/02
Development:	3/7/02	3/7/02

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LOG OF BORING

BORING # **MW-11d**

Page 1 of 1

Project Buncombe County Cell 4&5 MW In Location Buncombe County Subtitle D Landfill

Date Drilled 6-Mar-02 Drilling Co.: Reuben Caldwell Well Drilling

Total Depth 70 ft. bls Method Used: 6 in. Air Rotary Job #: 6447-35174

Inspector Mat Colone Water elev: 67' bls

Depth (feet)	Sample No.	Blows/6" 140 lbs.	Sample Inter.	Recover (inches)	Org. Vap (ppm)	Sample Description	Strata Change	Remarks (time)
5								
10								
15								
20								
25						Saprolite/PWR to 24' bls.	Sap/PWR Bedrock	
30								
35								
40						Fracture @ 37' bls		
45								
50						Small fracture @ 49' bls		
55								
60								
65								
70						Water producing fracture @ 67' bls **Terminate Boring @ 70' bls**		

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WELL CONSTRUCTION SUMMARY

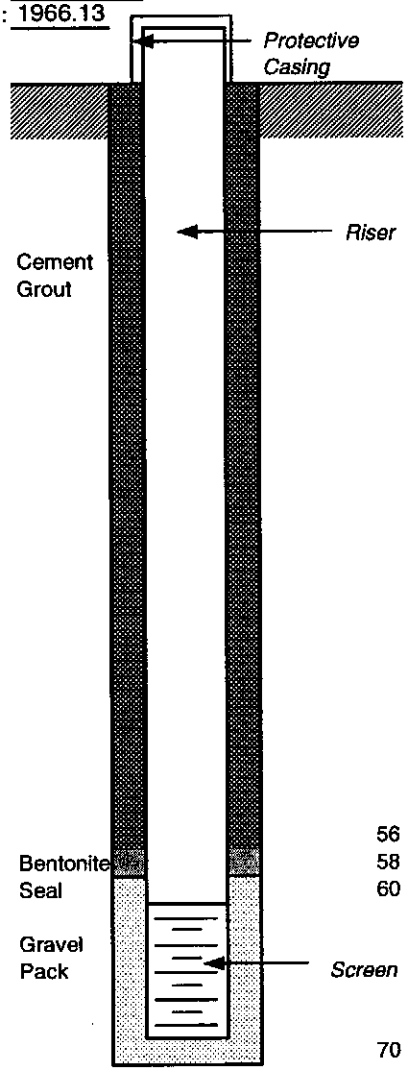
Project: Buncombe County Cell 4&5 MW Installation

Location: Buncombe County SubTitle D Landfill

Well No.: **MW-11d**

TOC elev.: 1966.13

Type: *Monitoring Well*



DRILLING SUMMARY

Drilling Company:	Reuben Caldwell	Drillers:	Billie Nash
Drill Rig/Model:	TamRock D25K		
Borehole Diameters:	6 in	Drilling Fluid:	Air
Bits:	6-inch Air Hammer		
Total Depth:	70 ft.	Depth To Water:	35.55 ft. btoc (static)
Geologist:	Mat Colone		

WELL DESIGN

Casing Material:	Schedule 40 PVC	Diameter:	2-in.
Screen Size:	10 ft.	Diameter:	2-in.
Slot Size:	0.010-in.	Setting:	60 to 70 ft. bls
Filter Material:	#2 Filter Sand	Setting:	58 to 70 ft. bls
Seal Material:	3/8 in. bentonite pellet	Setting:	56 to 58 ft. bls
Grout:	type I portland cement	Setting:	0 to 56 ft. bls
Surface Casing Material:	Above Grade Steel		

TIME LOG

	Started	Completed
Drilling:	3/5/02	3/5/02
Installation:	3/5/02	3/11/02
Development:	3/7/02	3/7/02

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID: MW-10
Client Project ID: Buncombe Cells 4&5
Lab Sample ID: 39150
Lab Project ID: G175-231
Matrix: Water

Date Analyzed: 3/19/02
Analyzed By: EKR
Date Collected: 3/8/02
Date Received: 3/9/02
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acetone	100	BQL
Acrylonitrile	200	BQL
Benzene	5.0	BQL
Bromochloromethane	5.0	BQL
Bromodichloromethane	5.0	BQL
Bromoform	5.0	BQL
Carbon disulfide	100	BQL
Carbon tetrachloride	10	BQL
Chlorobenzene	5.0	BQL
Chloroethane	10	BQL
Chloroform	5.0	BQL
Chlorodibromomethane	5.0	BQL
DBCP (1,2-Dibromo-3-chloropropane)	25	BQL
Ethylene dibromide (EDB)	5.0	BQL
o-Dichlorobenzene	5.0	BQL
p-Dichlorobenzene	5.0	BQL
t-1,4-Dichloro-2-butene	100	BQL
1,1-Dichloroethane	5.0	BQL
Ethylene dichloride	5.0	BQL
Vinylidene chloride	5.0	BQL
cis-1,2-Dichloroethene	5.0	BQL
t-1,2-Dichloroethene	5.0	BQL
Propylene dichloride	5.0	BQL
cis-1,3-Dichloropropene	10	BQL
t-1,3-Dichloropropene	10	BQL
Ethylbenzene	5.0	BQL
Methyl butyl ketone	50	BQL
Methyl bromide	10	BQL
Methyl chloride	10	BQL
Methylene bromide	10	BQL
Methylene chloride	10	BQL
MEK (2-Butanone)	100	BQL
Methyl iodide	10	BQL
Methyl isobutyl ketone	100	BQL
Styrene	10	BQL
1,1,1,2-Tetrachloroethane	5.0	BQL
1,1,2,2-Tetrachloroethane	5.0	BQL
Tetrachloroethylene	5.0	BQL
Toluene	5.0	BQL
1,1,1-Trichloroethane	5.0	BQL
1,1,2-Trichloroethane	5.0	BQL
Trichloroethene	5.0	BQL
CFC-11 (Trichlorofluoromethane)	5.0	BQL
1,2,3-Trichloropropane	15	BQL
Vinyl acetate	50	BQL

Reviewed by: _____

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles

by GCMS 8260B

Client Sample ID:	MW-10	Date Analyzed:	3/19/02
Client Project ID:	Buncombe Cells 4&5	Analyzed By:	EKR
Lab Sample ID:	39150	Date Collected:	3/8/02
Lab Project ID:	G175-231	Date Received:	3/9/02
Matrix:	Water	Dilution:	1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Vinyl chloride	10	BQL
Xylenes (total)	5.0	BQL

Surrogate Spike Recoveries Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	10.0	100
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: [illegible]

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID: MW-10D
Client Project ID: Buncombe Cells 4&5
Lab Sample ID: 39151
Lab Project ID: G175-231
Matrix: Water

Date Analyzed: 3/19/02
Analyzed By: EKR
Date Collected: 3/8/02
Date Received: 3/9/02
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acetone	100	BQL
Acrylonitrile	200	BQL
Benzene	5.0	BQL
Bromochloromethane	5.0	BQL
Bromodichloromethane	5.0	BQL
Bromoform	5.0	BQL
Carbon disulfide	100	BQL
Carbon tetrachloride	10	BQL
Chlorobenzene	5.0	BQL
Chloroethane	10	BQL
Chloroform	5.0	BQL
Chlorodibromomethane	5.0	BQL
DBCP (1,2-Dibromo-3-chloropropane)	25	BQL
Ethylene dibromide (EDB)	5.0	BQL
o-Dichlorobenzene	5.0	BQL
p-Dichlorobenzene	5.0	BQL
t-1,4-Dichloro-2-butene	100	BQL
1,1-Dichloroethane	5.0	BQL
Ethylene dichloride	5.0	BQL
Vinylidene chloride	5.0	BQL
cis-1,2-Dichloroethene	5.0	BQL
t-1,2-Dichloroethene	5.0	BQL
Propylene dichloride	5.0	BQL
cis-1,3-Dichloropropene	10	BQL
t-1,3-Dichloropropene	10	BQL
Ethylbenzene	5.0	BQL
Methyl butyl ketone	50	BQL
Methyl bromide	10	BQL
Methyl chloride	10	BQL
Methylene bromide	10	BQL
Methylene chloride	10	BQL
MEK (2-Butanone)	100	BQL
Methyl iodide	10	BQL
Methyl isobutyl ketone	100	BQL
Styrene	10	BQL
1,1,1,2-Tetrachloroethane	5.0	BQL
1,1,2,2-Tetrachloroethane	5.0	BQL
Tetrachloroethylene	5.0	BQL
Toluene	5.0	BQL
1,1,1-Trichloroethane	5.0	BQL
1,1,2-Trichloroethane	5.0	BQL
Trichloroethene	5.0	BQL
CFC-11 (Trichlorofluoromethane)	5.0	BQL
1,2,3-Trichloropropane	15	BQL
Vinyl acetate	50	BQL

Reviewed by: [illegible]

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles

by GCMS 8260B

Client Sample ID:	MW-10D	Date Analyzed:	3/19/02
Client Project ID:	Buncombe Cells 4&5	Analyzed By:	EKR
Lab Sample ID:	39151	Date Collected:	3/8/02
Lab Project ID:	G175-231	Date Received:	3/9/02
Matrix:	Water	Dilution:	1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Vinyl chloride	10	BQL
Xylenes (total)	5.0	BQL

Surrogate Spike Recoveries Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	9.9	99
1,2-Dichloroethane-d4	10.0	9.9	99
Toluene-d8	10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: _____

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID: MW-11
Client Project ID: Buncombe Cells 4&5
Lab Sample ID: 39152
Lab Project ID: G175-231
Matrix: Water

Date Analyzed: 3/19/02
Analyzed By: EKR
Date Collected: 3/8/02
Date Received: 3/9/02
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acetone	100	BQL
Acrylonitrile	200	BQL
Benzene	5.0	BQL
Bromochloromethane	5.0	BQL
Bromodichloromethane	5.0	BQL
Bromoform	5.0	BQL
Carbon disulfide	100	BQL
Carbon tetrachloride	10	BQL
Chlorobenzene	5.0	BQL
Chloroethane	10	BQL
Chloroform	5.0	BQL
Chlorodibromomethane	5.0	BQL
DBCP (1,2-Dibromo-3-chloropropane)	25	BQL
Ethylene dibromide (EDB)	5.0	BQL
o-Dichlorobenzene	5.0	BQL
p-Dichlorobenzene	5.0	BQL
t-1,4-Dichloro-2-butene	100	BQL
1,1-Dichloroethane	5.0	BQL
Ethylene dichloride	5.0	BQL
Vinylidene chloride	5.0	BQL
cis-1,2-Dichloroethene	5.0	BQL
t-1,2-Dichloroethene	5.0	BQL
Propylene dichloride	5.0	BQL
cis-1,3-Dichloropropene	10	BQL
t-1,3-Dichloropropene	10	BQL
Ethylbenzene	5.0	BQL
Methyl butyl ketone	50	BQL
Methyl bromide	10	BQL
Methyl chloride	10	BQL
Methylene bromide	10	BQL
Methylene chloride	10	BQL
MEK (2-Butanone)	100	BQL
Methyl iodide	10	BQL
Methyl isobutyl ketone	100	BQL
Styrene	10	BQL
1,1,1,2-Tetrachloroethane	5.0	BQL
1,1,2,2-Tetrachloroethane	5.0	BQL
Tetrachloroethylene	5.0	BQL
Toluene	5.0	BQL
1,1,1-Trichloroethane	5.0	BQL
1,1,2-Trichloroethane	5.0	BQL
Trichloroethene	5.0	BQL
CFC-11 (Trichlorofluoromethane)	5.0	BQL
1,2,3-Trichloropropane	15	BQL
Vinyl acetate	50	BQL

Reviewed by: [illegible]

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles

by GCMS 8260B

Client Sample ID:	MW-11	Date Analyzed:	3/19/02
Client Project ID:	Buncombe Cells 4&5	Analyzed By:	EKR
Lab Sample ID:	39152	Date Collected:	3/8/02
Lab Project ID:	G175-231	Date Received:	3/9/02
Matrix:	Water	Dilution:	1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Vinyl chloride	10	BQL
Xylenes (total)	5.0	BQL

Surrogate Spike Recoveries Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	10.0	100
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: _____

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID: MW-11D
Client Project ID: Buncombe Cells 4&5
Lab Sample ID: 39153
Lab Project ID: G175-231
Matrix: Water

Date Analyzed: 3/19/02
Analyzed By: EKR
Date Collected: 3/8/02
Date Received: 3/9/02
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acetone	100	BQL
Acrylonitrile	200	BQL
Benzene	5.0	BQL
Bromochloromethane	5.0	BQL
Bromodichloromethane	5.0	BQL
Bromoform	5.0	BQL
Carbon disulfide	100	BQL
Carbon tetrachloride	10	BQL
Chlorobenzene	5.0	BQL
Chloroethane	10	BQL
Chloroform	5.0	BQL
Chlorodibromomethane	5.0	BQL
DBCP (1,2-Dibromo-3-chloropropane)	25	BQL
Ethylene dibromide (EDB)	5.0	BQL
o-Dichlorobenzene	5.0	BQL
p-Dichlorobenzene	5.0	BQL
t-1,4-Dichloro-2-butene	100	BQL
1,1-Dichloroethane	5.0	BQL
Ethylene dichloride	5.0	BQL
Vinylidene chloride	5.0	BQL
cis-1,2-Dichloroethene	5.0	BQL
t-1,2-Dichloroethene	5.0	BQL
Propylene dichloride	5.0	BQL
cis-1,3-Dichloropropene	10	BQL
t-1,3-Dichloropropene	10	BQL
Ethylbenzene	5.0	BQL
Methyl butyl ketone	50	BQL
Methyl bromide	10	BQL
Methyl chloride	10	BQL
Methylene bromide	10	BQL
Methylene chloride	10	BQL
MEK (2-Butanone)	100	BQL
Methyl iodide	10	BQL
Methyl isobutyl ketone	100	BQL
Styrene	10	BQL
1,1,1,2-Tetrachloroethane	5.0	BQL
1,1,2,2-Tetrachloroethane	5.0	BQL
Tetrachloroethylene	5.0	BQL
Toluene	5.0	BQL
1,1,1-Trichloroethane	5.0	BQL
1,1,2-Trichloroethane	5.0	BQL
Trichloroethene	5.0	BQL
CFC-11 (Trichlorofluoromethane)	5.0	BQL
1,2,3-Trichloropropane	15	BQL
Vinyl acetate	50	BQL

Reviewed by:

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID:	MW-11D	Date Analyzed:	3/19/02
Client Project ID:	Buncombe Cells 4&5	Analyzed By:	EKR
Lab Sample ID:	39153	Date Collected:	3/8/02
Lab Project ID:	G175-231	Date Received:	3/9/02
Matrix:	Water	Dilution:	1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Vinyl chloride	10	BQL
Xylenes (total)	5.0	BQL

Surrogate Spike Recoveries Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.0	100
1,2-Dichloroethane-d4	10.0	9.9	99
Toluene-d8	10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: _____

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID: Dup
Client Project ID: Buncombe Cells 4&5
Lab Sample ID: 39154
Lab Project ID: G175-231
Matrix: Water

Date Analyzed: 3/19/02
Analyzed By: EKR
Date Collected: 3/8/02
Date Received: 3/9/02
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acetone	100	BQL
Acrylonitrile	200	BQL
Benzene	5.0	BQL
Bromochloromethane	5.0	BQL
Bromodichloromethane	5.0	BQL
Bromoform	5.0	BQL
Carbon disulfide	100	BQL
Carbon tetrachloride	10	BQL
Chlorobenzene	5.0	BQL
Chloroethane	10	BQL
Chloroform	5.0	BQL
Chlorodibromomethane	5.0	BQL
DBCP (1,2-Dibromo-3-chloropropane)	25	BQL
Ethylene dibromide (EDB)	5.0	BQL
o-Dichlorobenzene	5.0	BQL
p-Dichlorobenzene	5.0	BQL
t-1,4-Dichloro-2-butene	100	BQL
1,1-Dichloroethane	5.0	BQL
Ethylene dichloride	5.0	BQL
Vinylidene chloride	5.0	BQL
cis-1,2-Dichloroethene	5.0	BQL
t-1,2-Dichloroethene	5.0	BQL
Propylene dichloride	5.0	BQL
cis-1,3-Dichloropropene	10	BQL
t-1,3-Dichloropropene	10	BQL
Ethylbenzene	5.0	BQL
Methyl butyl ketone	50	BQL
Methyl bromide	10	BQL
Methyl chloride	10	BQL
Methylene bromide	10	BQL
Methylene chloride	10	BQL
MEK (2-Butanone)	100	BQL
Methyl iodide	10	BQL
Methyl isobutyl ketone	100	BQL
Styrene	10	BQL
1,1,1,2-Tetrachloroethane	5.0	BQL
1,1,2,2-Tetrachloroethane	5.0	BQL
Tetrachloroethylene	5.0	BQL
Toluene	5.0	BQL
1,1,1-Trichloroethane	5.0	BQL
1,1,2-Trichloroethane	5.0	BQL
Trichloroethene	5.0	BQL
CFC-11 (Trichlorofluoromethane)	5.0	BQL
1,2,3-Trichloropropane	15	BQL
Vinyl acetate	50	BQL

Reviewed by: [illegible]

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID:	Dup	Date Analyzed:	3/19/02
Client Project ID:	Buncombe Cells 4&5	Analyzed By:	EKR
Lab Sample ID:	39154	Date Collected:	3/8/02
Lab Project ID:	G175-231	Date Received:	3/9/02
Matrix:	Water	Dilution:	1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Vinyl chloride	10	BQL
Xylenes (total)	5.0	BQL

Surrogate Spike Recoveries Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.1	101
1,2-Dichloroethane-d4	10.0	9.8	98
Toluene-d8	10.0	10.1	101

Comments:

All results are corrected for dilution.

Reviewed by: _____

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID: Trip Blank
Client Project ID: Buncombe Cells 4&5
Lab Sample ID: 39155
Lab Project ID: G175-231
Matrix: Water

Date Analyzed: 3/15/02
Analyzed By: EKR
Date Collected: 3/8/02
Date Received: 3/9/02
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acetone	100	BQL
Acrylonitrile	200	BQL
Benzene	5.0	BQL
Bromochloromethane	5.0	BQL
Bromodichloromethane	5.0	BQL
Bromoform	5.0	BQL
Carbon disulfide	100	BQL
Carbon tetrachloride	10	BQL
Chlorobenzene	5.0	BQL
Chloroethane	10	BQL
Chloroform	5.0	BQL
Chlorodibromomethane	5.0	BQL
DBCP (1,2-Dibromo-3-chloropropane)	25	BQL
Ethylene dibromide (EDB)	5.0	BQL
o-Dichlorobenzene	5.0	BQL
p-Dichlorobenzene	5.0	BQL
t-1,4-Dichloro-2-butene	100	BQL
1,1-Dichloroethane	5.0	BQL
Ethylene dichloride	5.0	BQL
Vinylidene chloride	5.0	BQL
cis-1,2-Dichloroethene	5.0	BQL
t-1,2-Dichloroethene	5.0	BQL
Propylene dichloride	5.0	BQL
cis-1,3-Dichloropropene	10	BQL
t-1,3-Dichloropropene	10	BQL
Ethylbenzene	5.0	BQL
Methyl butyl ketone	50	BQL
Methyl bromide	10	BQL
Methyl chloride	10	BQL
Methylene bromide	10	BQL
Methylene chloride	10	BQL
MEK (2-Butanone)	100	BQL
Methyl iodide	10	BQL
Methyl isobutyl ketone	100	BQL
Styrene	10	BQL
1,1,1,2-Tetrachloroethane	5.0	BQL
1,1,2,2-Tetrachloroethane	5.0	BQL
Tetrachloroethylene	5.0	BQL
Toluene	5.0	BQL
1,1,1-Trichloroethane	5.0	BQL
1,1,2-Trichloroethane	5.0	BQL
Trichloroethene	5.0	BQL
CFC-11 (Trichlorofluoromethane)	5.0	BQL
1,2,3-Trichloropropane	15	BQL
Vinyl acetate	50	BQL

Reviewed by: [illegible]

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Appendix I Volatiles
by GCMS 8260B

Client Sample ID:	Trip Blank	Date Analyzed:	3/15/02
Client Project ID:	Buncombe Cells 4&5	Analyzed By:	EKR
Lab Sample ID:	39155	Date Collected:	3/8/02
Lab Project ID:	G175-231	Date Received:	3/9/02
Matrix:	Water	Dilution:	1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Vinyl chloride	10	BQL
Xylenes (total)	5.0	BQL

Surrogate Spike Recoveries Compound	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Bromofluorobenzene	10.0	10.3	103
1,2-Dichloroethane-d4	10.0	9.7	97
Toluene-d8	10.0	10.0	100

Comments:

All results are corrected for dilution.

Reviewed by: [illegible]

Flags: BQL = Below Quantitation Limit

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	MW-10	Analyzed By:	PSW
Client Project ID:	Buncombe Cells 4&5	Date Collected:	3/8/02
Lab Sample ID:	39150	Date Received:	3/9/02
Lab Project ID:	G175-231	Matrix:	Water
Batch ID:	2246		

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Antimony	BQL	0.0300	1	MG/L	6010B	3/19/02
Arsenic	BQL	0.0100	1	MG/L	6010B	3/19/02
Barium	BQL	0.500	1	MG/L	6010B	3/19/02
Beryllium	BQL	0.0020	1	MG/L	6010B	3/19/02
Cadmium	BQL	0.0010	1	MG/L	6010B	3/19/02
Chromium	**0.0162**	0.0100	1	MG/L	6010B	3/19/02
Cobalt	**0.0181**	0.0100	1	MG/L	6010B	3/19/02
Copper	BQL	0.200	1	MG/L	6010B	3/19/02
Lead	BQL	0.0100	1	MG/L	6010B	3/19/02
Nickel	BQL	0.0500	1	MG/L	6010B	3/19/02
Selenium	BQL	0.0200	1	MG/L	6010B	3/19/02
Silver	BQL	0.0100	1	MG/L	6010B	3/19/02
Thallium	BQL	0.0100	1	MG/L	6010B	3/19/02
Vanadium	BQL	0.0400	1	MG/L	6010B	3/19/02
Zinc	BQL	0.0500	1	MG/L	6010B	3/19/02

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	MW-10D	Analyzed By:	PSW
Client Project ID:	Buncombe Cells 4&5	Date Collected:	3/8/02
Lab Sample ID:	39151	Date Received:	3/9/02
Lab Project ID:	G175-231	Matrix:	Water
Batch ID:	2246		

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Antimony	BQL	0.0300	1	MG/L	6010B	3/19/02
Arsenic	BQL	0.0100	1	MG/L	6010B	3/19/02
Barium	BQL	0.500	1	MG/L	6010B	3/19/02
Beryllium	BQL	0.0020	1	MG/L	6010B	3/19/02
Cadmium	**0.0015**	0.0010	1	MG/L	6010B	3/19/02
Chromium	**0.0119**	0.0100	1	MG/L	6010B	3/19/02
Cobalt	BQL	0.0100	1	MG/L	6010B	3/19/02
Copper	BQL	0.200	1	MG/L	6010B	3/19/02
Lead	BQL	0.0100	1	MG/L	6010B	3/19/02
Nickel	BQL	0.0500	1	MG/L	6010B	3/19/02
Selenium	BQL	0.0200	1	MG/L	6010B	3/19/02
Silver	BQL	0.0100	1	MG/L	6010B	3/19/02
Thallium	BQL	0.0100	1	MG/L	6010B	3/19/02
Vanadium	BQL	0.0400	1	MG/L	6010B	3/19/02
Zinc	BQL	0.0500	1	MG/L	6010B	3/19/02

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: [illegible]

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	MW-11	Analyzed By:	PSW
Client Project ID:	Buncombe Cells 4&5	Date Collected:	3/8/02
Lab Sample ID:	39152	Date Received:	3/9/02
Lab Project ID:	G175-231	Matrix:	Water
Batch ID:	2246		

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Antimony	BQL	0.0300	1	MG/L	6010B	3/19/02
Arsenic	BQL	0.0100	1	MG/L	6010B	3/19/02
Barium	BQL	0.500	1	MG/L	6010B	3/19/02
Beryllium	BQL	0.0020	1	MG/L	6010B	3/19/02
Cadmium	BQL	0.0010	1	MG/L	6010B	3/19/02
Chromium	BQL	0.0100	1	MG/L	6010B	3/19/02
Cobalt	BQL	0.0100	1	MG/L	6010B	3/19/02
Copper	BQL	0.200	1	MG/L	6010B	3/19/02
Lead	BQL	0.0100	1	MG/L	6010B	3/19/02
Nickel	BQL	0.0500	1	MG/L	6010B	3/19/02
Selenium	BQL	0.0200	1	MG/L	6010B	3/19/02
Silver	BQL	0.0100	1	MG/L	6010B	3/19/02
Thallium	BQL	0.0100	1	MG/L	6010B	3/19/02
Vanadium	BQL	0.0400	1	MG/L	6010B	3/19/02
Zinc	BQL	0.0500	1	MG/L	6010B	3/19/02

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	MW-11D	Analyzed By:	PSW
Client Project ID:	Buncombe Cells 4&5	Date Collected:	3/8/02
Lab Sample ID:	39153	Date Received:	3/9/02
Lab Project ID:	G175-231	Matrix:	Water
Batch ID:	2246		

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Antimony	BQL	0.0300	1	MG/L	6010B	3/19/02
Arsenic	BQL	0.0100	1	MG/L	6010B	3/19/02
Barium	BQL	0.500	1	MG/L	6010B	3/19/02
Beryllium	BQL	0.0020	1	MG/L	6010B	3/19/02
Cadmium	BQL	0.0010	1	MG/L	6010B	3/19/02
Chromium	BQL	0.0100	1	MG/L	6010B	3/19/02
Cobalt	BQL	0.0100	1	MG/L	6010B	3/19/02
Copper	BQL	0.200	1	MG/L	6010B	3/19/02
Lead	BQL	0.0100	1	MG/L	6010B	3/19/02
Nickel	BQL	0.0500	1	MG/L	6010B	3/19/02
Selenium	BQL	0.0200	1	MG/L	6010B	3/19/02
Silver	BQL	0.0100	1	MG/L	6010B	3/19/02
Thallium	BQL	0.0100	1	MG/L	6010B	3/19/02
Vanadium	BQL	0.0400	1	MG/L	6010B	3/19/02
Zinc	BQL	0.0500	1	MG/L	6010B	3/19/02

Comments

BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By: _____

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID:	Dup	Analyzed By:	PSW
Client Project ID:	Buncombe Cells 4&5	Date Collected:	3/8/02
Lab Sample ID:	39154	Date Received:	3/9/02
Lab Project ID:	G175-231	Matrix:	Water
Batch ID:	2246		

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Antimony	BQL	0.0300	1	MG/L	6010B	3/19/02
Arsenic	BQL	0.0100	1	MG/L	6010B	3/19/02
Barium	BQL	0.500	1	MG/L	6010B	3/19/02
Beryllium	BQL	0.0020	1	MG/L	6010B	3/19/02
Cadmium	BQL	0.0010	1	MG/L	6010B	3/19/02
Chromium	BQL	0.0100	1	MG/L	6010B	3/19/02
Cobalt	BQL	0.0100	1	MG/L	6010B	3/19/02
Copper	BQL	0.200	1	MG/L	6010B	3/19/02
Lead	BQL	0.0100	1	MG/L	6010B	3/19/02
Nickel	BQL	0.0500	1	MG/L	6010B	3/19/02
Selenium	BQL	0.0200	1	MG/L	6010B	3/19/02
Silver	BQL	0.0100	1	MG/L	6010B	3/19/02
Thallium	BQL	0.0100	1	MG/L	6010B	3/19/02
Vanadium	BQL	0.0400	1	MG/L	6010B	3/19/02
Zinc	BQL	0.0500	1	MG/L	6010B	3/19/02

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway SE, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC#

Page 1 of 1

Client: CDM
Address: 540 Glenwood Ave Ste 300
Address: RALEIGH, NC 27612
Quote #:

Project ID: BUNCOMBE CELLS 4&5
Contact: MAT COLONE
Phone: 919 781 5620
Fax: 919 781 5730

Date: 3-8-02
Turnaround: STANDARD
Job Number:
P.O. Number:

Report To: MAT COLONE
Invoice To: SAME

Sample ID	Date	Time	Matrix	Preservatives: HCl	HNO3	ICE		Analyses: 8260	6010									Comments: Please specify any special reporting requirements
																		G175-231
MW-10	3-8-02	1225	W	✓	✓	✓		3	1									NC APPENDIX I VOCE
MW-10D	3-8-02	1230	W	✓	✓	✓		3	1									METALS
MW-11	3-8-02	1045	W	✓	✓	✓		3	1									
MW-11D	3-8-02	1030	W	✓	✓	✓		3	1									
DUP	3-8-02	—	W	✓	✓	✓		3	1									
TRIP BLANK	—	—	W	✓		✓		1										

Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested
Matthew Colone	3-8-02	1400	[illegible]	3-9-02	13:00	0.6°C	NC ✓ SC ____ Other ____
							SEE REVERSE FOR TERMS AND CONDITIONS