

Scanned by <i>Zinith Barbee</i>	Date 4/13/10	Doc ID # 10338
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Barbee, Zinith

From: Colone, Mathew [ColoneMF@cdm.com]
Sent: Monday, April 12, 2010 4:28 PM
To: Barbee, Zinith; Keller, Andrea; Gaither, Allen
Cc: Kristy Smith; jerry.mears@buncombecounty.org; Yang, Kenton
Subject: RE: Buncombe County Landfill Gas Monitoring Plan (Permit 11-07)
Attachments: M-11.pdf; M-10.pdf; New Monitoring Well Locations.pdf; Methane Well Installation Report.pdf; M-10 and M-11 Drillers Logs.pdf

Zinith,

As requested in your letter (Doc ID 10334), I've attached the drillers logs and well construction diagrams for landfill gas monitoring wells M-10 and M-11. These wells were installed in October 2009 while CDM was onsite installing additional methane monitoring wells at the adjacent Subtitle D landfill. Wells M-10 and M-11 were installed in the locations described in the Landfill Gas Monitoring Plan for the Phase 5 C&D Expansion. In addition to the drillers logs and well construction diagrams, I've also attached the installation letter that was sent to Allen Gaither in November 2009.

The wells were installed in accordance with 15A NCAC 2C. All wells have locked protective covers and have been fitted with quick-connect sampling valves.

I hope that you find this information suitable to your request. Please let me know if you need any additional information.

Thanks,
Mat Colone

Mathew F. Colone, P.G.
CDM
5400 Glenwood Avenue Suite 300
Raleigh, North Carolina 27612
(919) 787-5620 office
(919) 325-3569 direct
(919) 781-5730 fax

From: Yang, Kenton
Sent: Monday, April 12, 2010 3:54 PM
To: Colone, Mathew
Subject: FW: Buncombe County Landfill Gas Monitoring Plan (Permit 11-07)

From: Barbee, Zinith [mailto:zinith.barbee@ncdenr.gov]
Sent: Monday, April 12, 2010 3:53 PM
To: Jerry Mears
Cc: Kristy Smith; Yang, Kenton; Keller, Andrea; Gaither, Allen
Subject: Buncombe County Landfill Gas Monitoring Plan (Permit 11-07)

Please see the attached letter regarding the Landfill Gas Monitoring Plan for the Buncombe County Solid Waste Management Facility, Permit 11-07.

Zinith Barbee
Hydrogeologist
Solid Waste Section
Division of Waste Management

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

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



FIELD BOREHOLE LOG

BOREHOLE NO.: M-10

TOTAL DEPTH: 15'

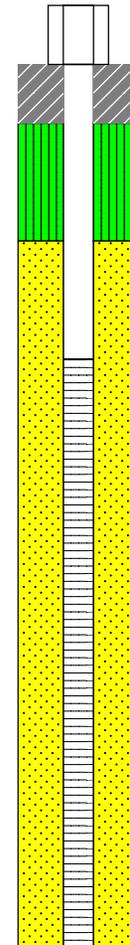
PROJECT INFORMATION

PROJECT: **Buncombe County Methane Well Installation**
 SITE LOCATION: **85 Panther Branch Road, Alexander, NC**
 JOB NO: **6447-73768**
 GEOLOGIST: **Dan Forbes**
 DATE DRILLED: **10/27/09**

DRILLING INFORMATION

DRILLING CO: **SAEDACCO**
 DRILLER: **Stefan Smith**
 RIG TYPE: **Diedrich D-50**
 METHOD OF DRILLING: **8.25" Hollow-Stem Auger**
 SAMPLING METHODS: **Split-Spoon**
 HAMMER WT./DROP: **140 lb., 30 in.**

Depth	Soil Symbol	Soil Description	Sample	Blows/6" (Recovery)	Well Construction	Well Description
0		SAND: some SILT, SAPROLITE transitioning to PARTIALLY WEATHERED ROCK at 5.5 feet, brown with some orangish brown, fine-grained, trace of weathered rock, dense, moist to wet				Locking, Above Grade Protective Cover
-5		(Assumed lithology from 7 to 15 feet due to poor recovery)	S1 (4-6)	4-18-25-50/5 (20")		Cement Grout
-10			S2 (9-11)	50/5 (2")		Bentonite
-15			S3 (14-16)	50/5 (2")		2-inch Schedule 40 PVC Riser
						#2 Silica Sand Filter Pack
						Schedule 40 PVC Screen, 0.010" Slot, from 5' to 15' bls





FIELD BOREHOLE LOG

BOREHOLE NO.: M-11

TOTAL DEPTH: 10'

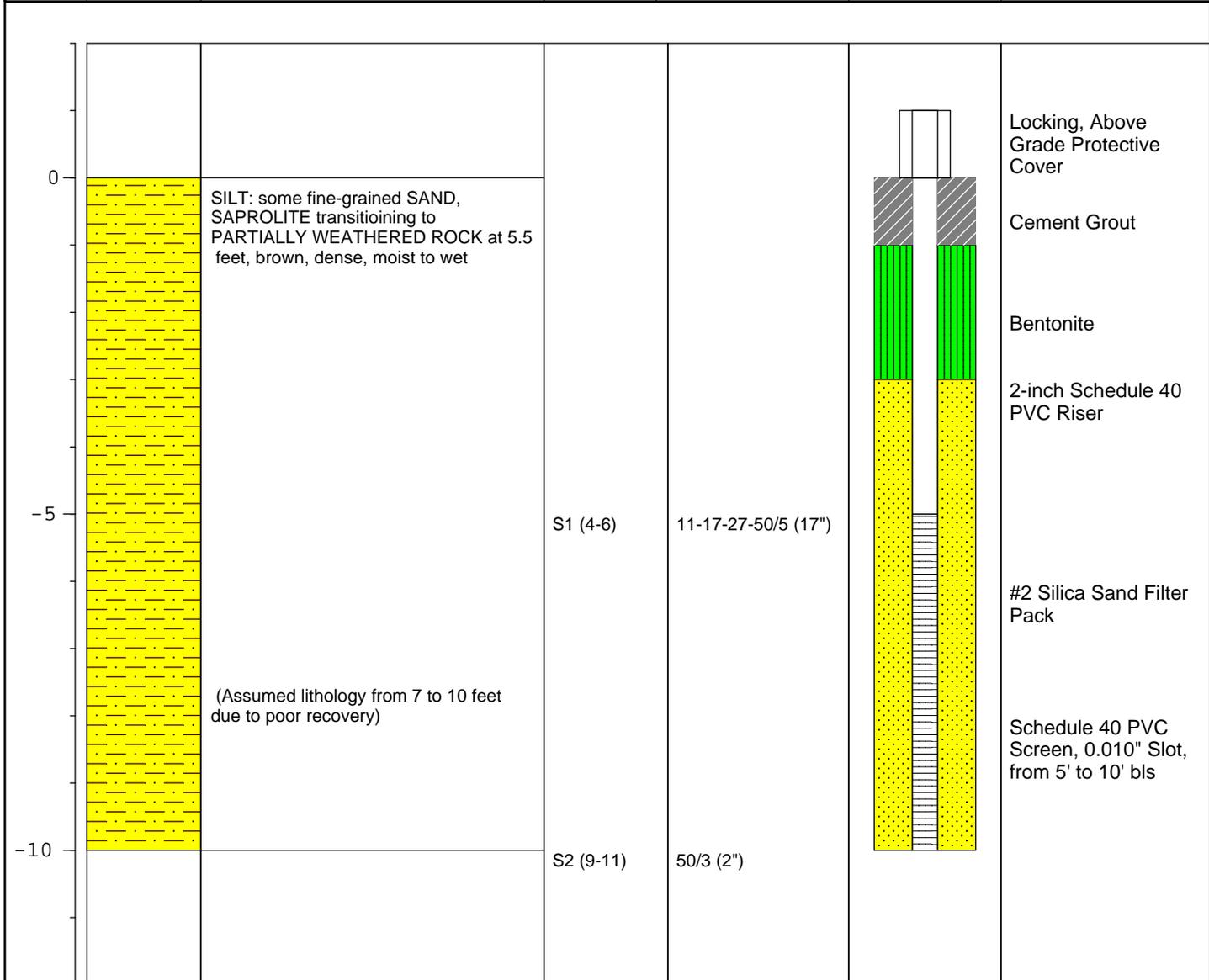
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DRILLING INFORMATION

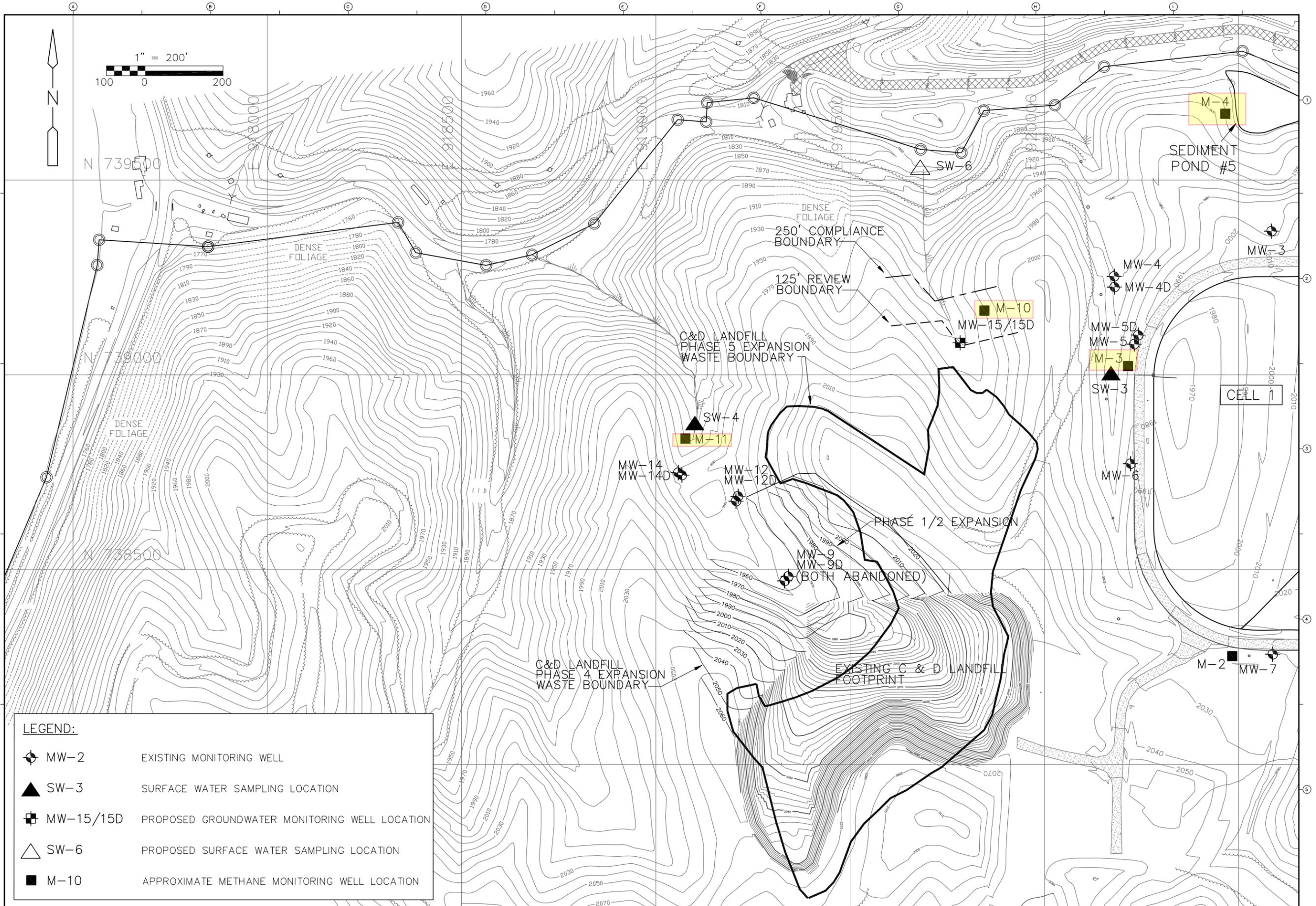
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Depth	Soil Symbol	Soil Description	Sample	Blows/6" (Recovery)	Well Construction	Well Description
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1" = 200'
100 0 200



LEGEND:

-  MW-2 EXISTING MONITORING WELL
-  SW-3 SURFACE WATER SAMPLING LOCATION
-  MW-15/15D PROPOSED GROUNDWATER MONITORING WELL LOCATION
-  SW-6 PROPOSED SURFACE WATER SAMPLING LOCATION
-  M-10 APPROXIMATE METHANE MONITORING WELL LOCATION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: M. COLONE
 DRAWN BY: J. KILLINGSWORTH
 SHEET CHK'D BY:
 CROSS CHK'D BY:
 APPROVED BY:
 DATE: NOVEMBER 2009

CDM Camp Dresser & McKee
 6400 Riverchase Avenue, Suite 500
 Raleigh, North Carolina 27612
 Tel: (919) 787-5620 Fax: (919) 781-5730

BUNCOMBE COUNTY
 NORTH CAROLINA
METHANE MONITORING

METHANE MONITORING WELL LOCATIONS

PROJECT NO. 6447-65973
 FILE NAME: METHANE FIG 1.dwg
 SHEET NO.
1



5400 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612
tel: 919 787-5620
fax: 919 781-5730

November 17, 2009

Mr. Allen Gaither
North Carolina Department of Environmental and Natural Resources
Division of Waste Management
Solid Waste Section
2090 US Highway 70
Swannanoa, North Carolina 28778

Subject: Methane Monitoring Well Installation
Buncombe County Landfill Facility
Alexander, North Carolina
Permit # 11-07

Dear Mr. Gaither:

The purpose of this letter is to notify the Solid Waste Section that methane monitoring wells M-3 and M-4 have been installed downgradient of the existing Buncombe County Subtitle D Landfill. Methane monitoring wells M-3 and M-4 were installed as discussed in the May 2009 Letter of Notice. In addition, methane monitoring wells M-10 and M-11 were installed downgradient of the existing and future C&D facility. Approximate well locations are provided on **Figure 1**.

Well Installation

SAEDACCO, Inc., installed the wells on October 27 and 28, 2009 under supervision of a CDM geologist. The wells were drilled with Diedrich D-50 track-mounted ATV rig utilizing hollow-stem auger drilling methods. At the Subtitle D facility, M-3 was advanced to 35 feet below land surface (bls) and M-4 was advanced to auger refusal at 9 feet bls. At the C&D area, M-10 was advanced to auger refusal at 15 feet bls and M-11 was advanced to auger refusal at 10 feet bls.

All wells were constructed of 2-inch schedule 40 PVC and 0.010-inch slotted screen. Well screen length varied from 5 feet in wells M-4 and M-11 to 30 feet in M-3. Boring logs with well construction diagrams and the driller's well construction records (Form GW-1b) are attached. A summary of the well completion data for the newly installed methane wells is provided in **Table 1**.

Each well was completed with an above grade steel protective riser and a 2-foot by 2-foot by 6-inch concrete pad. The wells will be surveyed to State Plane Coordinates by a North Carolina





Mr. Allan Gaither
November 17, 2009
Page 2

registered surveyor. Following installation, each well was screened for percent methane, percent carbon dioxide, and percent oxygen with a GEM-2000 landfill gas monitor. Table 2 provides a summary of monitoring data for each of the newly installed wells.

If you have any questions or need additional information, please feel free to contact me at (919) 325-3569 or by email to colonemf@cdm.com.

Very truly yours,

Mathew F. Colone, P.G.
Camp Dresser & McKee

xc: A. Keller, NCDENR DWM
J. Mears, BCSWMF
K. Smith, BCSWMF
K. Yang, CDM
C. Gabel, CDM



11/17/2009

**Table 1
Summary of Methane Well Completion Data
Buncombe County Solid Waste Management Facility**

<i>Piezometer Designation</i>	<i>**TOC Elevation (MSL)</i>	<i>**Ground Elevation (MSL)</i>	<i>Date of Construction</i>	<i>Drilling Method</i>	<i>Screened Interval Lithology</i>	<i>*Depths (feet below ground surface)</i>				<i>Borehole Diameter (inches)</i>
						<i>Total Borehole Depth</i>	<i>Screen Interval</i>	<i>Sand Filter Interval</i>	<i>Bentonite Seal Interval</i>	
M-3	--	--	10/28/2009	HSA	Saprolite	35	5.0-35.0	3.0-35.0	1.0-3.0	8.0
M-4	--	--	10/28/2009	HSA	Saprolite/PWR	9	4.0-9.0	2.0-9.0	0.5-2.0	8.0
M-10	--	--	10/27/2009	HSA	Saprolite/PWR	15	5.0-15.0	3.0-15.0	1.0-3.0	8.0
M-11	--	--	10/27/2009	HSA	Saprolite/PWR	10	5.0-10.0	3.0-10.0	1.0-3.0	8.0

NOTES:

MSL - Mean Sea Level

HSA - Hollow-Stem Auger

PWR - Partially Weathered Rock

*Depths below ground surface are estimated

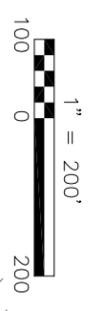
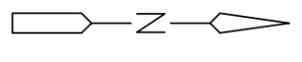
** Survey data pending

Table 2
Methane Monitoring Well Installation - Subtitle D and C&D Landfills
Buncombe County Solid Waste Management Facility

Methane Well I.D.	Landfill Monitored	Date	% CH ₄	% CO ₂	% O ₂	% LEL
M-3	Subtitle D	10/28/2009	0	0.2	20.2	0
M-4	Subtitle D	10/28/2009	0	0.3	20.1	0
M-10	C&D	10/28/2009	0	0.1	20.4	0
M-11	C&D	10/28/2009	0	0.2	20.3	0

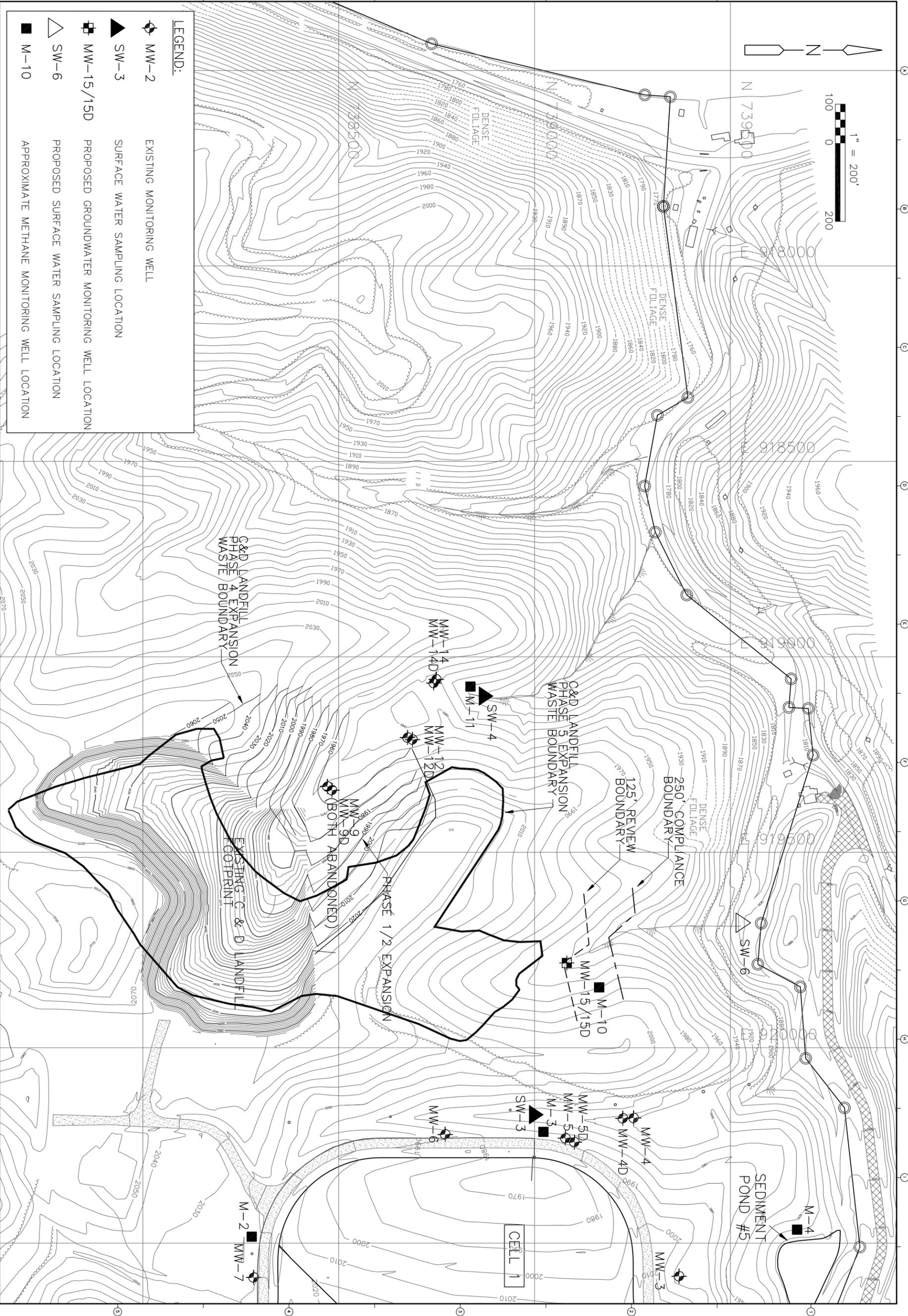
Notes:

1. LEL - Lower Explosive Limit
2. CH₄ - Methane, CO₂ - Carbon Dioxide, O₂ - Oxygen
3. Barometric pressure at time of readings = 29.63 inches of mercury (1,003 millibars)



LEGEND:

	MW-2	EXISTING MONITORING WELL
	SW-3	SURFACE WATER SAMPLING LOCATION
	MW-15/15D	PROPOSED GROUNDWATER MONITORING WELL LOCATION
	SW-6	PROPOSED SURFACE WATER SAMPLING LOCATION
	M-10	APPROXIMATE METHANE MONITORING WELL LOCATION



DESIGNED BY:	M. COLONE
DRAWN BY:	J. KELLSWORTH
SHEET CHECK BY:	
CROSS CHECK BY:	
APPROVED BY:	
DATE:	NOVEMBER 2008

CDM Camp Dresser & McKee
 1000 North Salisbury Street, Suite 200
 Raleigh, NC 27601
 Tel: (919) 751-4600 Fax: (919) 751-5700

BUNCOMBE COUNTY
 NORTH CAROLINA

METHANE MONITORING

PROJECT NO. 4447-65973
 TITLE: METHANE MONITORING FOR 15AW

METHANE MONITORING WELL LOCATIONS

SHEET NO. 1



FIELD BOREHOLE LOG

BOREHOLE NO.: M-3

TOTAL DEPTH: 35'

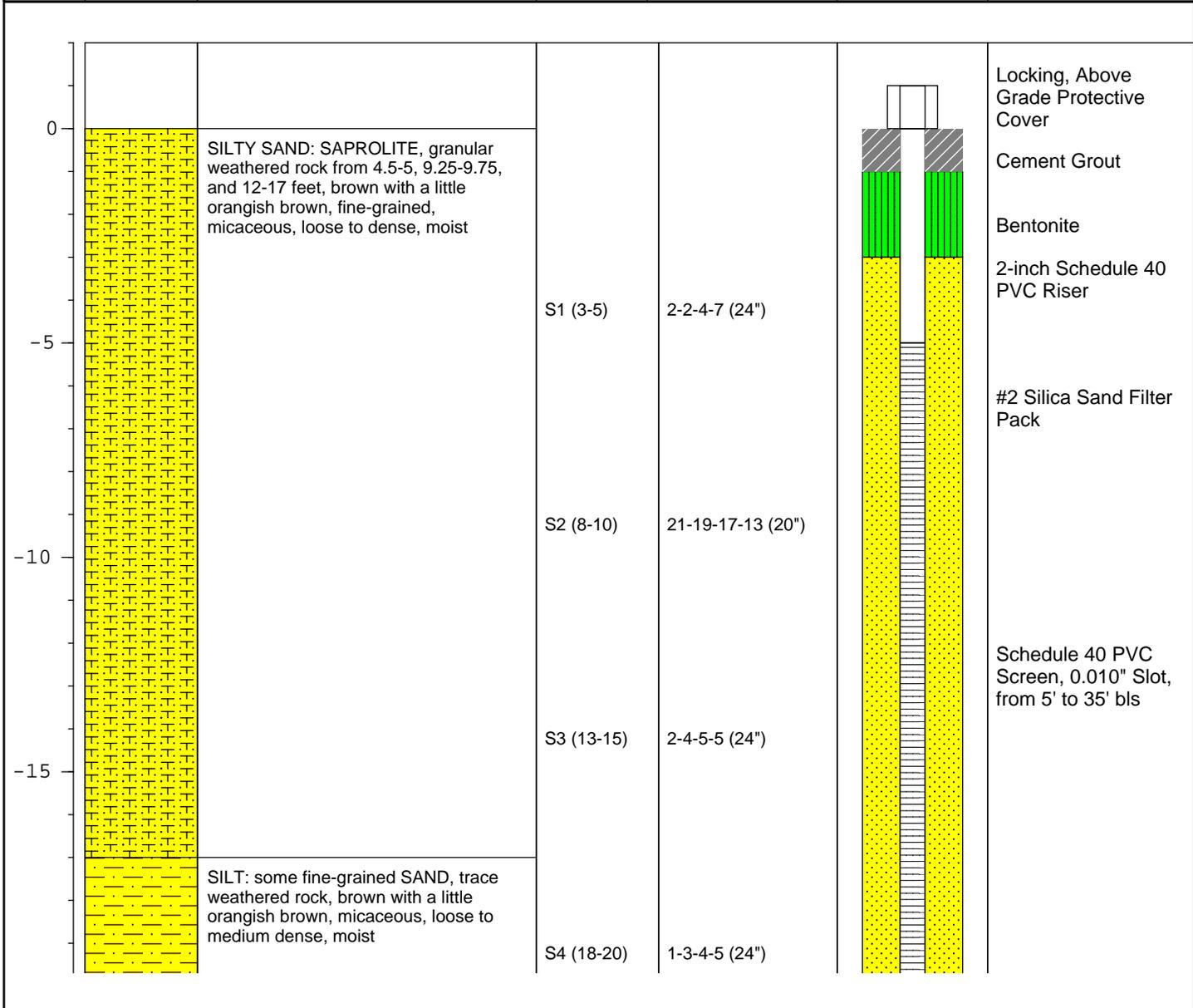
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 DRILLER: **Stefan Smith**
 RIG TYPE: **Diedrich D-50**
 METHOD OF DRILLING: **8.25" Hollow-Stem Auger**
 SAMPLING METHODS: **Split-Spoon**
 HAMMER WT./DROP: **140 lb., 30 in.**

Depth	Soil Symbol	Soil Description	Sample	Blows/6" (Recovery)	Well Construction	Well Description
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Notes:



FIELD BOREHOLE LOG

BOREHOLE NO.: M-3

TOTAL DEPTH: 35'

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Depth	Soil Symbol	Soil Description	Sample	Blows/6" (Recovery)	Well Construction	Well Description
-20						
-25			S5 (23-25)	1-3-5-9 (24")		#2 Silica Sand Filter Pack
-30			S6 (28-30)	2-4-6-8 (22")		
-35		SILTY SAND: trace weathered rock, brown with a little orangish brown, fine-grained, micaceous, medium dense, moist	S7 (33-35)	5-7-6-13 (20")		Schedule 40 PVC Screen, 0.010" Slot, from 5' to 35' bls

Notes:



FIELD BOREHOLE LOG

BOREHOLE NO.: M-4

TOTAL DEPTH: 9'

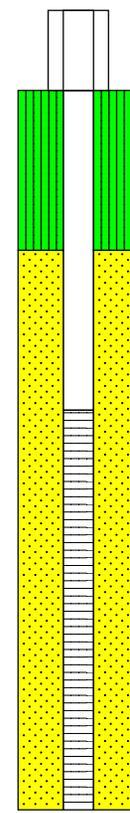
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 METHOD OF DRILLING: **8.25" Hollow-Stem Auger**
 SAMPLING METHODS: **Split-Spoon**
 HAMMER WT./DROP: **140 lb., 30 in.**

Depth	Soil Symbol	Soil Description	Sample	Blows/6" (Recovery)	Well Construction	Well Description
0						Locking, Above Grade Protective Cover
		SILT: some fine-grained SAND, SAPROLITE transitioning to PARTIALLY WEATHERED ROCK at 7 feet, very light brown to brown, micaceous, medium dense to dense, dry to moist				Cement Grout Bentonite
-5		(Assumed lithology from 7 to 9 feet due to poor recovery)	S1 (4-6)	8-10-18-25 (24")		2-inch Schedule 40 PVC Riser #2 Silica Sand Filter Pack
-10			S2 (9-11)	50/2 (2")		Schedule 40 PVC Screen, 0.010" Slot, from 4' to 9' bls



Notes:



FIELD BOREHOLE LOG

BOREHOLE NO.: M-10

TOTAL DEPTH: 15'

PROJECT INFORMATION

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 HAMMER WT./DROP: **140 lb., 30 in.**

Depth	Soil Symbol	Soil Description	Sample	Blows/6" (Recovery)	Well Construction	Well Description
0		SAND: some SILT, SAPROLITE transitioning to PARTIALLY WEATHERED ROCK at 5.5 feet, brown with some orangish brown, fine-grained, trace of weathered rock, dense, moist to wet				Locking, Above Grade Protective Cover
-5		(Assumed lithology from 7 to 15 feet due to poor recovery)	S1 (4-6)	4-18-25-50/5 (20")		Cement Grout
-10			S2 (9-11)	50/5 (2")		Bentonite
-15			S3 (14-16)	50/5 (2")		2-inch Schedule 40 PVC Riser
						#2 Silica Sand Filter Pack
						Schedule 40 PVC Screen, 0.010" Slot, from 5' to 15' bls



FIELD BOREHOLE LOG

BOREHOLE NO.: M-11

TOTAL DEPTH: 10'

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Depth	Soil Symbol	Soil Description	Sample	Blows/6" (Recovery)	Well Construction	Well Description
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